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Originator of solutions

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REPORT N°6395416-1/1-1SH5R0N/1

BUREAU VERITAS
For the benefit of companies and of Men

Pizza Vending Machine

Compliance audit of safety conditions and CE marking

Review	0	1	2
Date	26/11/2009	14/12/2009	16/08/2016
Issuer	Bruno MARCHATERRE	Bruno MARCHATERRE	Laurent BELLENGER
Auditor	Bruno MARCHATERRE	Bruno MARCHATERRE	Laurent BELLENGER

The review #2 follows the control once the reservations have been lifted.

SUMMARY

1. Subject

This report is the deliverable of ADIAL company order dated 21/07/2016 following the Bureau Veritas Offer referenced 003873/151127_0575 rev 1 dated 28/06/2016.

The subject of this report is to clarify the compliance of automatic pizza vending machine in terms of machinery, electrical, electromagnetic compatibility safety and hygiene rules for food delivered directly to consumers

The change on vending machine management after a temperature over-range in the cold room has been verified and validated on 14/12/09. The audit was conducted on-site, "avenue de l'arbre" in Méré (78)

Reminders:

- For the CE marking, Bureau Veritas has checked the compliance of your pizza vending machine with the machine directive 2006/42/CE and CEM directive 2004/108/CE. The requirements of the low voltage directive 2006/95/CEE are listed in the machine directive 2006/42/CE.
- For the CEM directive 2004/108/CE, the vending machines are considered as built-in in the fixed installation. The compliance has been assessed by verifying the subsets (they must be CE-marked) and the compliance with the rules of the art for cable structure.
- For the hygiene part, Bureau Veritas has checked the compliance of your pizza vending machine with the current order of 9 May 1995, regulating the hygiene for the food directly delivered to consumers.
- The hygiene recommendations of the standard EN 60335-2-75 «Household and similar electrical appliances - safety, part 2-75: special rules for commercial vending machine with or without payment methods» have been consulted.

Note:
The compliance of pizzas and of their packaging with the current regulations is not studied.

2. Applicable documents & reference documents

2.1 Applicable documents

[DA1] Order of ADIAL Company dated 15/107/09, review#1 of the offer dated 04/11/09 and review#2 dated 21/07/2016.

[DA2] Offer of Bureau Veritas referenced 003873/151127-0575 rev1 dated 28/06/2016.

2.2 Reference documents

2.2.1 Guidelines new approach imposing CE marking

[DR1] Machines Directive 2006/42/CE

[DR2] Electromagnetic Compatibility Directive (CEM) 2004/108/CE

[DR3] Low Voltage Directive 2006/95/CE

2.2.2 National regulation

[DR4] Order of 9 Mai 1995 regulating hygiene for the food directly delivered to the consumer (Title 2 Chapter IV: Automatic Distribution, Article 24 and Title 1 Chapter V: Food items, Article 10)

2.2.3 Standards

[DR5] Standard NF EN 60335-2-75+A1+A11 : 2005 «Safety of household and similar electrical appliances - Part 2-75: special rules for commercial Vending Machine with or without payment methods»,

[DR6] Standard NF EN 60335-2-34+A1+A11 : 2005 «Safety of household and similar electrical appliances - Part 2-34: special rules for moto-compressors»,

[DR7] Standard NF EN 60950-1 : 2006 Information processing technology - Safety - Part 1: general requirements,

2.2.4 «ADIAL pizza vending machine» Documents

[DR8] Instruction manual «FRESH PIZZAS VENDING MACHINE» 2016 version,

[DR9] Electric diagram dated 04/12/2013,

[DR10] HACCP Manual writing guide for pizzas vending machine operators,

[DR11] HACCP Manual writing guide for pizzas vending machine operators, 03/12/09 edition,

[DR12] Pizzas vending machine management training course report,

[DR13] Electrical layout and phone jack map dated 16/04/09

[DR14] Kiosk layout map dated 14/09/06

[DR15] Instruction and installation manual of the air cooled unit with HGA horizontal rotary compressor manufactured by «TECUMSEH»,

[DR16] Declaration of incorporation of the cold unit manufactured by «TECUMSEH» dated 04/10/05 referring to the machine directive 89/392/CEE and to the under-pressure equipment directive 97/23/CE,

[DR17] Documentation for 7000 series cash-flow change machine manufactured by «MEI»,

[DR18] Documentation for bill acceptor manufactured by «INOVATINE TECHNOLOGY»,

[DR19] Minutes of the reaction to fire ISOBAR D6 and D14 PUR of LNE n°G030879 dated 16/05/06.

[DR20] Electromagnetic compatibility report according to CFR47 FCC part 15 N°RC051-16-100377-2-A ed 0.

3. Synthesis of conformity assessment

See each regulation references table.

4. Vending machine pizza presentation

4.1 Introduction

The ADIAL company has developed, designed and marketed a pizza vending machine for a direct sales of fresh "ready to cook" or "cooked" pizzas to consumers. Historically, this distributor has been subject to compliance audit relative to the machine directive. However, taking account of vending machine amendments, the ADIAL Company wants to ensure that its equipment meets the essential safety regulations in terms of equipment and hygiene through the audit, subject of the offer ([DA2].

4.2 Presentation

The purpose of this section is to identify and to briefly describe the distributor:

- ✓ Identification,
- ✓ General description,
- ✓ Distributor's role,
- ✓ Constitution,

4.2.1 Identification

- ✓ Brand : ADIAL
- ✓ Model : DPF 70
- ✓ Type : «PIZZA' DOOR» pizzas vending machine
- ✓ Number: 271
- ✓ Manufacture or start date: 2015
- ✓ Declaration of conformity: Submitted on 23/02/2016, signed by M. LE GOUIC Vincent, SAS ADIAL president
- ✓ CE marking : Affixed

4.2.2 General description

Picture 1 : General view

4.2.3 Role of Pizza vending machine

The vending machine allows to distribute «ready to cook» or «cooked» fresh pizzas[1] following a free sale mode to the public by a change machine (coins and notes) and by TPE terminal[2] and credit card.

4.2.4 Constitution

The vending machine consists in 5 main parts:

- ✓ 1 cold room for pizzas' storage and conservation,
- ✓ 1 oven for the pizza baking,
- ✓ 1 costumer interface for pizza choice and payment,
- ✓ 1 set and system for the conveyance of pizzas,
- ✓ 1 electric and computer ensuring the operation and the control of the installation.

The vending machine will be installed (cf. [DR14]) in a kiosk (identical to the model shown) or in another area. In any case, only the costumer interface (screen) and the payment schemes are open to the public.

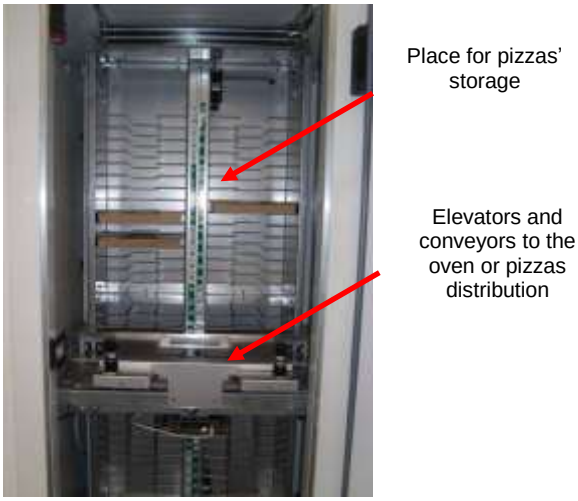
4.2.4.1 Cold room

[1]The ADIAL Company said that the vending machine will only receive fresh pizzas.

[2]TPE: Electronic Payment Terminal

4.2.4.1.1 Cold room

Picture 2: Right side's view



Picture 3: Inside the cold room

The cold room allows to store 70 pizzas at a maximum temperature of 4°C (cf. [DR4]). The recommend storage temperature in the ADIAL documents (cf. [DR8] and [DR10]) is about 3°C.

The elevator allows to take the ordered pizza, according to the consumer choice, and the conveyor assures the pizza transfer out of the cold room.

4.2.4.1.2 Cold unit

Picture 4 : Cold unit

The cold unit will be installed onto the cold room.

4.2.4.2 Oven

Picture 5 : Right side's view

Picture 6 : Baking area's view

The recommended baking temperature is about 220°C during 180 seconds (cf. [DR8])

4.2.4.3 Costumer interface

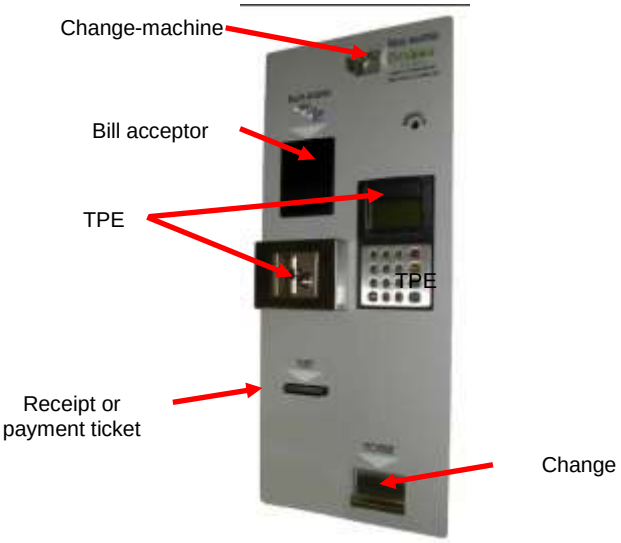
The vending machine includes a screen which displays all kinds of pizzas available.

4.2.4.3.1 IHM

Picture 7 : Costumers interface's view

4.2.4.3.2 Payment methods

On the vending machine presented, the payment methods' interface is not assembled. According to the models, all the payment methods are not systematically built-in.



Picture 8: Payment methods' interface's view

Picture 9: Inside view of the interface

4.2.4.4 Conveyor set and system

In order to ensure the withdrawal of the selected pizzas in the cold room, the vending machine has an elevator and a conveyor system to carry the pizza to the baking area (see ***Picture 3***).

The baking area has a device which allows to put a pizza in the oven if the costumer chose a baked pizza. This system (see ***Picture 6***) has a conveyor which allowed the evacuation of the pizzas (baked or fresh) to the exit on costumers' side.

Picture 10 : View of the exit on costumers' side

4.2.4.5 Electric and computer

4.2.4.5.1 Electrical box

The electrical box above the baking oven received all electrical components for distribution and order.

Picture 11: Location of electrical box

Picture 12: Inside view of electrical box

Picture 13: Rear view of the electrical box

4.2.4.5.2 Owner management and maintenance computer system

The computer system allows the management of the pizza storage, the vending machine operating characteristics and the remote delivery of various operating data (phone line connection). An inverter provides a programmed autonomy of 20s after a power failure so that the system can stay in a safeguarding situation and ensure the latest data communication.

The system is incorporated at the level of the baking area (see ***Picture 14*** and ***Picture 15***). The control panel is mounted on a rotating support allowing to advance it and to access to the oven.

Picture 14: Computer

Picture 15: Inverter and central unit

4.2.4.6 Pizzas packaging

To ensure a perfect isolation between the different parts of the vending machine as well as to allow the different operating phases (storage, transfer and baking), the pizzas are based on aluminum disk into a carton box.

These two components (carton and disk) are not a subject of this study.

Picture 16 : Carton packaging (not folded)

Picture 17 : Carton packaging and aluminum disk

5. Technical description of the Pizza vending machine

5.1 Structure

The different components of the vending machine pizza are integrated in a fabricated steel and bolted structure, only the cold unit (see ***Picture 4***) is mounted above the structure (at the level of the cold room).

5.1.1 Cold room

The cold room is made of insulating sandwich type panels[1], manufactured by ISOBAR in order to ensure a thermal insulation. The fire protection class in the reference document [DR19] indicates M2, which means «fire-resistant». A door allows the access to the shelving of storage area and to the elevator and transfer system to the baking area.

The passage between the cold room and the baking area has a shutter that ensure the gap closure. By its assembly and its form, it can only be opened to the baking area and only when the carton box sidesteps the shutter, when the pizza is transferred out of the cold room.

5.1.2 Baking area

The baking area is made in assembled by welding or bolted sheets. A door allows the access to this area. This door allows the access to the screen and to the different control devices.

5.1.3 Cold room shelving, elevator and conveyance system, oven

All these elements are made in stainless-steel sheets or tubes, folded or assembled by welding or bolted.

NOTA: The pizzas are not in direct contact with ATM components (see § 12).

[1]Sandwich type panel made of a 40 kg/m^3 polyurethane foam core, injected between two 275g/m² galvanized steel sheets. These sheets are coated with a 5µm RAL9010 colored primer. The mass is from 12 to 15.2 kg/m² with a thickness from 60 to 140 mm.

5.1.4 Protection glass costumer screen

In order to protect the costumer screen, as well as choices controls, there's a built-in protective glass in the front panel. In the costumer's side, this laminated glass is made of two 4mm bounded-glass part and one 4 mm clear glass, separated by a vacuum (costumer's side).

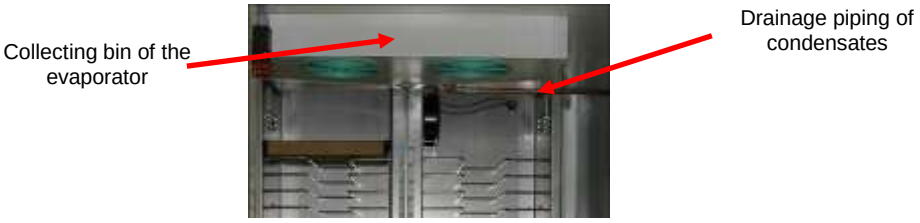
5.2 Cool and baking devices and mechanisms

5.2.1 Cold unit

The refrigeration of the cold room is provided by a cold unit manufactured by TECUMESH which included a declaration of incorporation (see [DR17]) and the installation manual (see [DR16]) refers to the standards family "household and similar electrical appliances safety" (cf. [DR5] and [DR6]).

The refrigerant gas of the cold unit is R404A, the group operating range is from -10°C to +43°C, which is the SN-T climate class.

The evaporator allows to recover and channel the condensates outside of the vending machine.



Picture 18 : Evaporator

5.2.2 Oven

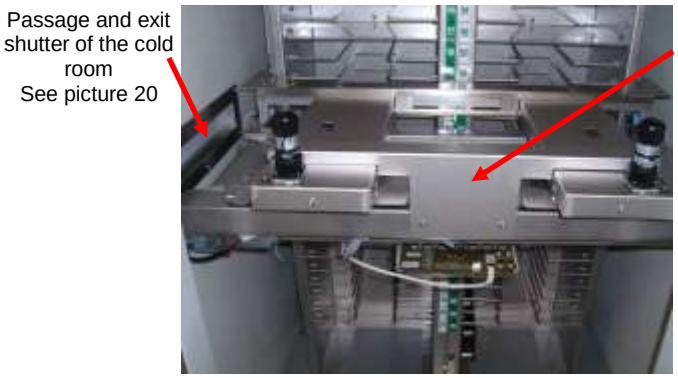
The fully enclosed oven has a single opening to put the pizza in the oven, introduced and raised from the box with a mechanical device (see § 5.2.3.2).

The baking system is constituted by heating resistors disposed below a fan that pulse the hot air onto the pizza.

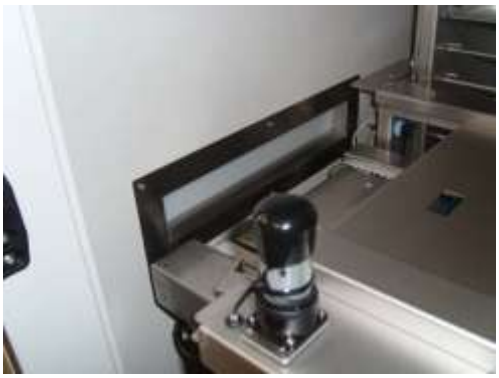
5.2.3 Mechanisms

5.2.3.1 Cold room

The elevator of the cold room allows to destock the pizza corresponding to the choice of the customer thanks to an indexing device and position sensors, monitored and controlled by the process system. The vertical movement is ensured by a DC motor 24VDC. The elevator tray has two gripper pairs (1 pair per side, corresponding to the two storage columns) in order to remove the pizza-box ordered. A 24VDC motor allows the rotation of a rubber belt conveyor to bring the box to the exit of the cold room and a second 24VDC one ensures the translation of the conveyor to remove the shutter in order to let the pizza-box go to the baking area.



Picture 19 : Elevator



Picture 20 : Details of passage and shutter

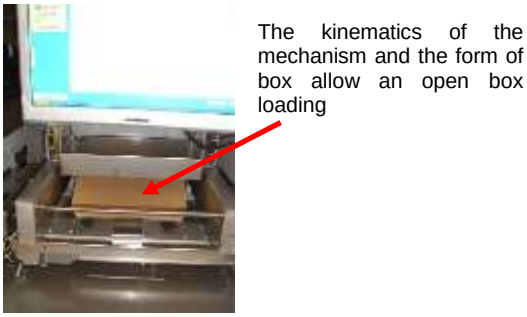
5.2.3.2 Baking area

After being extracted from the cold room, the pizza will be based on the plate (see ***Picture 21***) and whether directly distributed to the consumer without baking or charged into the oven for baking. The baking and distribution sequence is described below:

Picture 21 : Oven area

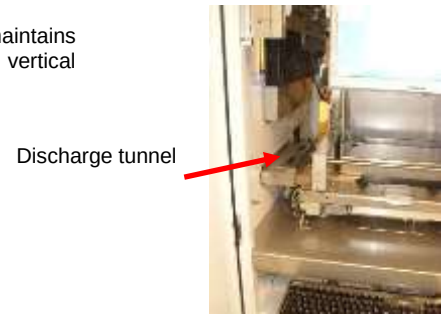
Picture 22 : Pizza on the way to cold room

Picture 23 : Pizza-box awaiting loading



Picture 24 : Pizza-box loading

Picture 25 : Pizza baking



Picture 26 : Pizza-box on the way to costumer

The plate is mounted on a conveying mechanism which ensures a translation movement to the oven and the costumer exit.

To raise the pizza in the oven, the box has some holes (see ***Picture 16***) in order to allow the pins (see ***Picture 34***) to raise the aluminum disk where the pizza is based.

The costumer can take his pizza at the exit (see ***Picture 10***). The discharge tunnel has a moving shutter that can move only in the passage direction of the box (to the costumer exit).

5.3 Power supply and electrical components

The vending machine pizza is powered whether in 400VAC/50Hz (3Ph+N+PE) by 5G 2,5 cable or in 230VAC/50Hz (1Ph+N+ PE) by 3G 6 cable. The power connexion[4] in the operator is realized (cf. [DR13]) whether by 32A plug (single phase) or 16A plug (three-phase).

[4] The connection will be at the expense of the operator, the ADIAL company will provided plugs (male and female) corresponding to the type of network (single or three phase)

The maximum power of the ARM is about 4.5kW for a 24A intensity in single phase and 8A in three-phase. The oven has a maximum power of 2.2kW and the cold unit, 0.7 kW.

A disconnect-switch (see ***Picture 11***) in the electrical box allow to separate the electric power from the power supply and the output (downstream) of the inverter, and for all the poles.

All electric components (components[2], change machine, bill acceptor, printer, costumer screen, control screen, inverter) have a «CE» marking.

Notices or marking of the change machine and bill acceptor refer to standards NF EN 60335 series (see [DR5]) and EN 60950 (see [DR7]). These standards specify electrical safety requirements for the use of commercial Vending Machine and information processing materials.

5.4 On-Mode

The vending machine has two operating modes which are:

5.4.1 Operating mode

Once, the vending machine is on duty (conservation parameters, baking temperature and supply in pizzas settings). Thanks to payment interface, the customers can pay their order (change machine, bill or credit card) and choose their pizza with touch keys and the customer screen (see ***Picture 7***). The customer will take his pizza in the withdrawal window (see ***Picture 10***).

5.4.2 Loading mode

After the pizzas loading, this intermediate mode allows the operator to enlighten the pizzas location in the storage columns, expiration dates of pizzas (DLC[6]) thanks to the management computer system (control screen).

5.4.3 Manual mode

This mode is only suitable for the operator or to make adjustments or troubleshooting operations. The access to various functions of the manual mode can be restricted by passwords, according to the intervention level. It allows to control all movements of the different functions individually. These commands are selected and obtained by the control screen interface and a hold-to-run push button.

For the functions of the «summary» page, the action on the mouse is a hold-to-run action.

For the functions of the system page, the release of the action on the mouse initiates the movement.

5.5 Protectors

The Vending Machine has moving and fixed protectors.

5.5.1 Moving protectors

The cold room and baking area doors (see ***Picture 5***) form moving protectors which insure personal safety so that no movement (elevator, conveyance) can be accessible during a normal use. These doors have safety switches those contacts are associated with the Vending Machine operation.

5.5.2 Fixed protectors

The rear part of the baking area has a fixed protector (sheet) held in place by screws on the Vending Machine structure.

The sampling tunnel forms a fixed protector that protects the output of pizzas so that customers cannot touch the oven conveyor area with their hands. Moreover, a shutter closes the tunnel and thanks to its shape, its opening does not allow opening from the front side (costumer).

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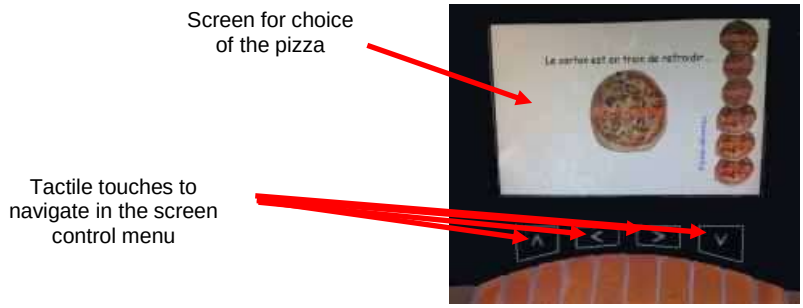
[5] Apart from the electronic cards designed and developed by the distributor.

[6] DLC : **D**ate **l**imite de **c**onsommation (expiry date for consumption)

The laminated glass protects the costumer screen and ensure a protection against the hazards of impact on the screen (vandalism or clods uncontrolled movement).

5.6 Control and protection devices

5.6.1 Costumer control



Picture 27 : Costumer order

For payment orders, please see ***Picture 8***.

5.6.2 Exploitation control

For the Vending Machine use and the «loading» and «manual» mode, the Vending Machine has the following devices:

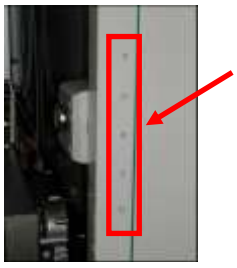
The control screen, the keyboard and the mouse (see ***Picture 14***)

A push button known as "safety button" that allows a manual control of the different movements (see § 5.4.3).

Picture 28 : Safety button

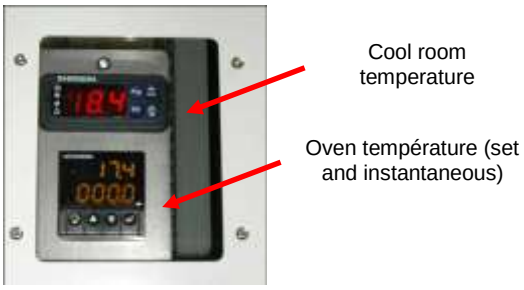
Some leds situated on chassis pillar, between 2 doors, indicate that the Vending Machine is in:

- **Off cycle** when the machine is at standstill.
- **Flashing cycle** when a cold room scanning is in progress.
- **Fixed cycle** when a complete cyle is in progress.



Picture 29 : Indicators

In the electric box (see ***Picture 11***), 2 indicators allow to know oven set temperature and the instantaneous oven and cold room temperatures.



Picture 30 : Temperature indicators

5.6.3 Protection devices

Secondary power supplies:

- A Switched-mode power supply (230VAC/24VDC) supplied by the inverter is protected upstream by a 10A single pole breaker and downstream by an 10A internal fuse,
- A transformer (230VAC / 24VAC) protected upstream by a 10A single pole breaker and downstream by an internal fuse.

Protection of different circuits:

- The inverter, the cold unit, the oven resistors, the lighting and the oven ventilation of 230VAC are protected by 10A circuit breakers 10A,
- The printer and the change machine of 24VDC are protected by 2A instantaneous fuses.

Control of baking, cold unit and power supply resistors (230VAC)

- 3 resistors with 3 static relays,
- The cold unit and the 230VAC power supply are respectively controlled by electromechanical contactors.

Motor protection

- The 24VDC motors are controlled and protected by the electronic cards drivers that control the intensity of microcontrollers.

Safety loop

- The safety loop is formed by two safety switches door (cold and hot) whose contacts supply the KM1 relay which ensure, thanks to its contacts, the following power cuts:
    - 230VAC power supply for oven and cold unit, only during cold room door opening to avoid an excessive ice formation in the evaporator.
    - 24VDC power suplly for all controls including all engines.

For manual operating mode (see 5.4.3), the “safety” button allows to exclude the safety doors.

5.7 Security devices

5.7.1 Ground path

To avoid risks of indirect contacts, equipotential connections are realized in the Vending Machine, cold unit and oven structure.

5.7.2 Electrical connections

In the oven, electric cables are of "high temperature" type in order to avoid risks of damage with temperature. (Voir ***Picture 34***)

5.7.3 Cold unit

The cold unit has a pressure switch that automatically cuts the group.

5.7.4 Oven

The oven is equipped with a thermostat (T: 285°C) that directly cuts the oven and Vending Machine operation. Only the oven ventilation is insured.

5.8 Food hygiene

5.8.1 Distribution and parameters management and control

5.8.1.1 Distribution management and control

The fresh pizzas have an expiry date that is indicated for each pizza at the computer interface during filling operations of the cold room. During the distribution to the consumer, if the date is exceeded, the operating system removes them on the customer interface and blocks their distribution. The operating interface allows viewing outdated ones, the corresponding lines in the cold room locations are red. The operator must remove outdated pizzas and replenish the cold room store.

5.8.1.2 Parameters management and control

The main food hygiene parameters are the conservation and baking temperatures.

Storage temperature

- In response to the decree of 09/05/95 (see [DR4]), the storage temperature for this food type is +4°C maximum[7]. Sur. On the ADIAL Vending Machine, the storage temperature in the cold room is controlled +3°C maximum.
- The temperature is indicated on the screen (see ***Picture 30***), a record of temperature evolution will be continuously performed and be available on one of the control screen pages.
- If the temperature is out of the control range, an alarm will be sent to the operator (SMS, email).
- If the room temperature is above 4°C for 1 hour, the distribution is blocked. The intervention of the operator is required to control the Vending Machine and the pizzas. He will check the respect of hygienic conditions and then decide to withdraw the products or to place on sale again.

Baking temperature

- In response to the requirements of the decree of 05/09/95 (see [DR4]), the temperature of meals delivered hot to the consumer must be above +63°C.
- In order to reach this temperature for meals distributed hot, ADIAL Company (cf. [DR8]) indicates that the baking temperature should be 220°C for 180s of baking time. Through the menu pages, the control interface allows to adjust the temperature and time set points.
- The temperature is indicated on the screen (see ***Picture 30***), a record of temperature evolution will be continuously performed and be available on one of the control screen pages.

[7] + 4 °C maximum : tout aliment très périssable et dont l'absence de maîtrise de la température pendant une courte période peut présenter un risque microbien pour le consommateur, tel que :

Denrées animales ou végétales cuites ou précuites, prêtes à l'emploi, non stables à température ambiante ; préparations froides non stables à base de denrées animales, notamment les viandes froides, les pâtes farcies, les sandwiches, les salades composées et les fonds de sauce ; produits transformés non stables à base de viande ; abats, volailles, lapins ; découpes de viandes ; produits de la pêche fumés ou saumurés non stables ; préparations non stables à base de crème ou d'œuf (pâtisseries à la crème, crèmes pâtissières, entremets) ; lait cru, produits frais au lait cru, crème Chantilly non stable ; fromages découpés ou râpés préemballés ; végétaux crus prédécoupés et leurs préparations ; jus de fruits ou de légumes crus de pH supérieur à 4,5 ; produits décongelés ; produits non stables en distributeur automatique.

- If the baking temperature doesn't reach the target value (220°C), the hot distribution is blocked, an alarm will be sent to the operator (SMS, email).
- To control the baking pizza temperature, ADIAL Company provides a thermometer to allow the operator to check if the delivered pizzas are at +63°C. During the baking temperature tests, the baked pizza was at +66°C (see ***Picture 32***).

Picture 31 :Thermometer

Picture 32 : Temperature control

Remarque 1

The Vending Machine is provided with a remote connection system (see § 4.2.4.5.2), the operator can follow in real time the status of Vending Machine and products in the store.

Remarque 2

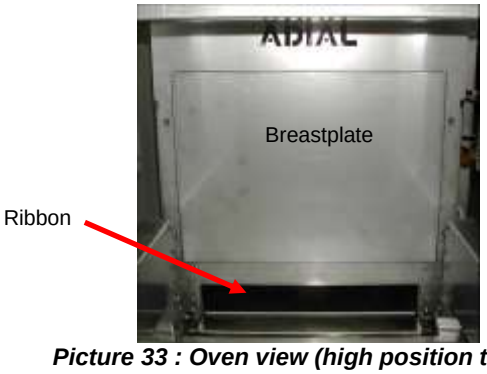
ADIAL company developed a "HACCP manual writing guide" document (see [DR11]) in order to allow the operators to know and apply hygiene rules for ready cooked dishes distribution. This document meets the requirements of the hygiene package after the European regulations on food products safety.
Moreover, before the Vending Machine commissioning, the operator receives training course, formalized through the document "Pizza Vending Machine management training course" document. (See [DR13])

5.8.2 Cleaning

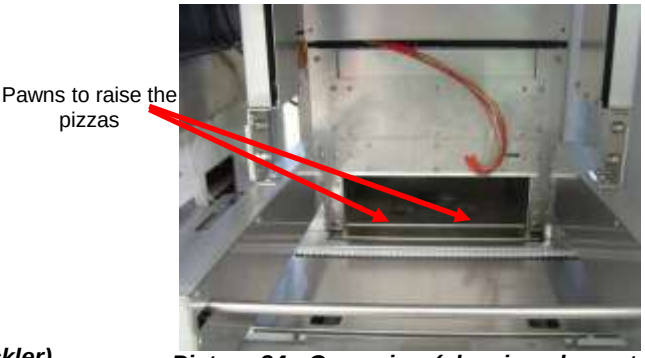
The HACCP notice (cf. [DR8]) and manual (cf. [DR10]) indicate and advocate the cleaning types to use. For the oven area, no cleaning products will be used in order to prevent the risk of fire or poisoning.

In order to facilitate the oven cleaning, the breastplate and the ribbon can be unmounted (screw fastening) to remove the oven casing. The clamp holder (see ***Picture 21*** and ***Picture 33***) can be also be removed by loosening 2 butterfly knurls.

Cleanings are realized with dry cloths, by suction, with a damp sponge and a dry air cylinder.



Picture 33 : Oven view (high position tackler)



Picture 34 : Oven view (cleaning elements unmounted)

Picture 35 : Unmounted clamp holder

6. Compliance audit

6.1 Machine directive 2006/42/CE

The table below allows you to specify the position of the machine compared with the essential health and safety requirements for the design and construction of the machines.

Notices are formulated by:

- ✓ "**C**" Compliant;
- ✓ "**NC**" Non compliant;
- ✓ "**SO**" Not applicable;
- ✓ "**NE**" Non-evaluated;
- ✓ "**NP**" Not taken into account.

ESSENTIAL SAFETY AND HEALTH REQUIREMENTS – DIRECTIVE 2006/42/CE

Theme	Articles	Opinion	N°	Non-compliances description
General remarks				
Security Integration	**1.1.2**	**C**		
Materials and products	**1.1.3**	**C**		
Lighting	**1.1.4**	**C**		
Design for handling	**1.1.5**	**C**		
Ergonomics	**1.1.6**	**C**		
Operating positions	**1.1.7**	**C**		
Seating	**1.1.8**	**SO**		
Control systems				
Safety and reliability of control systems	**1.2.1**	**C**		
Control devices	**1.2.2**	**C**		
Starting	**1.2.3**	**C**		
Stopping	**1.2.4**	**C**		
Normal stop	**1.2.4.1**	**C**		
Operational stop	**1.2.4.2**	**SO**		
Emergency stop	**1.2.4.3**	**SO**		
Assembly of machinery	**1.2.4.4**	**SO**		

Theme	Articles	Opinion	N°	Non-compliances description
Selection of control or operating modes	**1.2.5**	**C**		
Failure of the power supply	**1.2.6**	**C**		
Protection against mechanical hazards				
Risk of loss of stability	**1.3.1**	**C**		
Risk of break-up during operation	**1.3.2**	**NE**		Not evaluated only for the protective glass in front of the screen. The supplier must provide the corresponding features. NOTA The NF EN 60335-2-75 standard specifies the following minimum data: The impact energy of 0.5 J is applied in the maintenance area. In the user area, the value is increased to 1.0 J.
Risks due to falling or ejected objects	**1.3.3**	**SO**		
Risks due to surfaces, edges or angles	**1.3.4**	**C**		
Risks related to combined machinery	**1.3.5**	**SO**		
Risks related to variations in operating conditions	**1.3.6**	**SO**		
Risks related to moving parts	**1.3.7**	**C**		
Choice of protection against risks caused by moving parts	**1.3.8**	**C**		
Moving transmission parts	**1.3.8.1**	**C**		
Moving parts directly involved in the work process	**1.3.8.2**	**C**		
Risks related to uncontrolled movements	**1.3.9**	**SO**		
Required characteristics of guards and protection device				
General requirements	**1.4.1**	**C**		
Requirements related to fixed guard	**1.4.2.1**	**C**		
Requirements for interlocking movable guards device	**1.4.2.2**	**C**		
Requirements for adjustable guards restricting access	**1.4.2.3**	**SO**		
Requirements for protection devices	**1.4.3**	**C**		
Risks due to other hazards				
Electricity supply	**1.5.1**	**C**		
Static electricity	**1.5.2**	**C**		

Theme	Articles	Opinion	N°	Non-compliances description
Energy supply other than electricity	**1.5.3**	**SO**		
Errors of fitting	**1.5.4**	**C**		
Extreme temperatures	**1.5.5**	**C**		
Fire	**1.5.6**	**C**		
Explosion	**1.5.7**	**SO**		
Noise	**1.5.8**	**NE**		
Vibrations	**1.5.9**	**SO**		
Radiation	**1.5.10**	**C**		
External radiation	**1.5.11**	**NE**		
Laser radiation	**1.5.12**	**SO**		
Emissions of hazardous materials and substances	**1.5.13**	**C**		
Emissions of hazardous materials and substances	**1.5.14**	**SO**		
Risk of slipping, tripping or falling	**1.5.15**	**SO**		
Lightning	**1.5.16**	**C**		
Maintenance				
Machinery maintenance	**1.6.1**	**C**		
Access to operating position and servicing points	**1.6.2**	**C**		
Isolation of energy sources	**1.6.3**	**C**		
Operator intervention	**1.6.4**	**C**		
Cleaning of internal parts	**1.6.5**	**SO**		
Information				
Information and warnings on the machinery	**1.7.1**	**C**		
Information and information devices	**1.7.1.1**	**C**		
Warning devices	**1.7.1.2**	**C**		
Warning of residual risks	**1.7.2**	**C**		
Marking of machinery	**1.7.3**	**C**		
Instructions	**1.7.4**			
General principles for the drafting of instructions	**1.7.4.1**	**C**		
Contents of the instructions	**1.7.4.2**	**C**		
Sales literature	**1.7.4.3**	**NE**		

Themes	Articles	Opinion	N°	Nonconformities description
Requirements for certain categories of machinery				
Foodstuffs machinery and machinery for cosmetics or pharmaceutical products	**2.1**	**C**		

6.2 EMC Directive 2004/108/CE

6.2.1 Warning

The respect of these rules of the art allows to significantly reduce the risks due to the most current EMC problems.

Thus the approach taken to such assistance in assessing the compliance with EMC Directive 2004/108/EC is to verify the compliance with the EMC «rules of art» regarding the components installation and wiring of the equipment. This assumes that all components affecting EMC performance have an EC marking.

The non-compliance with these «rules of art» does not necessarily implies a non-compliance with the essential requirements of the EMC Directive, but implies to perform validation tests.

6.2.2 Definition

The objective of this chapter is to clarify certain themes as:

- ✓ Low-frequencies disturbances «LF»:
  - ➢ Frequency range: 0 ≤ Frequency ≤ 1 to 5 MHz. The low-frequency disturbances «LF» are most of the time in the form of CHANNEL (cables…)
  - ➢ Duration: Often long (dozens of ms). In some cases, the phenomenon may be permanent (harmonic).
  - ➢ Energy: The energy can be significant and cause interconnected devices malfunction or destruction.
- ✓ High-frequencies disturbances «HF»:
  - ➢ Frequency range: Frequency > 5 MHz. The high-frequency disturbances «HF» are most of the time in the form of RAYON (air…)
  - ➢ Duration: HF Impulsions. The rise time of the pulse is less than 10 ns. This may appear permanently (rectifiers, clocks ...)
  - ➢ Energy: The energy is, most of the time, low and can cause surrounding materials malfunction.
- ✓ Sensitive and disruptive materials:

Sensitive	Disruptives
- Programmable Automatons (PAI) - Electronic cards - Regulators - Cables connected to these elements: inputs and outputs such as detectors, sensors, measures probes… - Analog signals cables	- Box transformers - Contactors, circuit breakers ... - Fuses - Switch Mode Power Supplies - Frequency Converters - Speed controller - Switching power supply - Microprocessor clocks - Cables connected to these elements - Supply lines - Overall 'power' cables

✓ Sensitive and disruptive signals :

Signal	signals conveyed or connected materials
Sensitive	- Low level analog output circuits, sensors ... - Measuring circuits (probes, sensors ...)
Low sensitive	- Control circuits on resistive charge - Low level digital circuits (bus ...) - Control circuits on resistive charge - Low level digital circuits (bus ...)
Low disruptive	- Control circuit of inductive charge (relays, contactors, coils, inverters...) with suitable protection - Alternative power supplies
Disruptive	- Welding machines - Overall power circuits - Electronic converters, SMPS

6.2.3 Description of the equipment

Please see chapters [DR19] and **Erreur ! Source du renvoi introuvable.** for more details

6.2.4 EMC Compliance assessment

All components are EC marked, the compliance with the EMC 2004/108/EC Directive is evaluated according to the rules of art as indicated in the table below.

Opinions are expressed by "**C**" (compliant), "**NC**" (not compliant), "**NA**" (not applicable) "**NE**" (not estimated), "**NP**" (not included).

Where a non-compliance is detected, the detailed justification of the non-compliance is indicated in the "Non-compliance description". This justification allows to undertake remove actions on such non-compliance.

The note "Not Evaluated" (NE) is used when the corresponding verification was impossible:

- by inaccessibility,
- by lack of relevant technical documentation or information

« **Rules of the art »**	**Opinion**	**N°**	**Non-compliance description**
Components appliance			
All components are EC marked	**C**	**1**	
Mass network			
For a building, all the metal structures must be interconnected to the mass network (structural steelwork, welded concrete, pipes and metal pipes, conduits, conveyors, metal window frames, gratings ...)	**SO**		
For a machine, all the metal structures of the same equipment must be interconnected together (cabinets, mass plane plate of cabinet base, conduits, pipes and ducts, metal structures and built of the machine, engine ...).	**C**		
For a machine, the local mass network must be connected to the site mass network (if on-site verification) by maximal spreading and multiplying connections.	**NE**		Must be realized during onsite installation

« **Rules of the art** »	**Opinion**	**N°**	**Non-compliance description**
Each cabinet has a plane plate of cabinet base (unpainted).	**C**		
The metal mass of components and of components mounted in the cabinet are directly bolted onto the mass plane plate.	**C**		
In case of disruptive HF equipment, the mass connections are provided by braids and not yellow-green conductors.	**SO**		There is no disruptive HF material > 5Mhz
The length of mass connections is as short as possible.	**C**		
The length (m) of the mass cable is less than 10 / f (MHz)	**C**		
The cable trays (conduits...) are bolted together and on cabinets.	**SO**		
Supply			
Devices supplies are wired in wye from the power source.	**C**		
Supplies of highly disruptive materials are separated from supplies of highly sensitive materials.	**C**		
The disruptive materials are closer as possible to the source (power supply, generator ...) and more sensitive ones as far as possible when powered by a single source.	**C**		
The frame of transformers is mounted metal to metal on a conductive mass plane.	**C**		

« **Rules of the art** »	**Opinion**	**N°**	**Non-compliance description**
Cabinets			
Disruptive cables are filtered as soon as the entry into the cabinet.	**SO**		
The cables are divided by sensitivity and make their way in separate conduits.	**C**		
The lighting of the control cabinets is provided by filament lamps.	**SO**		
The «disruptive» components are separated from «sensitive» components	**C**		
The cables are not mixed (the excess cable is wound on itself).	**C**		
Cables			
The authorized cables type corresponds to the nature of the signals.	**C**		
The conductors carrying sensitive signals are in a cable and/or a different strand of those carrying disruptive signals.	**C**		
Disruptive and sensitive cables make their way in separate cables (except cases below)	**C**		
Sensitive cables do not coexist with disruptive ones in the same conduits except if both are shielded.	**SO**		

« **Rules of the art** »	**Opinion**	**N°**	**Non-compliance description**
The cable length is as short as possible.	**C**		
Conductors carrying sensitive signals are far away as possible (at least 20 cm) of those carrying disruptive signals.	**SO**		
The surface of the mass loop is reduced.	**C**		
The continuity of the mass plane is provided between two cabinets, machinery, equipment...	**SO**		
The GO conductor makes his way as close as possible to the BACK conductor.	**C**		
The BF cables shielding is connected to the mass, at least at one end.	**SO**		
The RF cables shielding is connected to the mass, at 2 ends.	**SO**		
For very long shielded cables, the shield is grounded at least every 15m.	**SO**		
Any free or unused cable conductor is grounded (chassis, downspout, cabinet ...) at 2 ends.	**SO**		
Conductors or cables carrying sensitive signals cross disruptive conductors only with right angled corner.	**C**		
Cables carrying disruptive signals are plated on the mass plane.	**SO**		

« **Rules of the art** »	**Opinion**	**N°**	**Non-compliance description**
Cables trays			
The ends of conduits or metal pipes are bolted to the metal cabinets (unpainted metal/metal contact)	**SO**		
The conduits of interfering cables are metal and are closed.	**SO**		
Connexions			
At the contacts ensuring the continuity of the masses, there is no paint.	**C**		
The screws which ensure the contact between components or a component and a mass plane are mounted without thread lock, painting or teflon.	**C**		
Shield end connections are provided by a 360 degrees takeover metal on metal.	**SO**		
Filters			
The filter input cable is not near the output cable.	**SO**		
Filters (if present) are mounted in the cabinet entry and are bolted to the chassis or mass plane of the cabinet base.	**SO**		

« **Rules of the art** »	**Opinion**	**N°**	**Non-compliance description**
Ferrites			
The "GO" and "BACK" conductors of the polluted signal have to pass through the ferrite (if present).	**SO**		
If a ferrite is used to mitigate emission problems, it must be placed closer to the disruptive device.	**SO**		
If a ferrite is used to mitigate immunity problems, it must be placed as closer to the sensitive device (to do only if the disruptive device can not be identified).	**SO**		

6.3 Hygiene

The table below allows you to indicate the location of the Vending Machine, in terms of hygiene; compared to requirements introduced by the modified decree 09/05/95 [DR4]. To be comprehensive, these rules are accompanied by requirements on hygiene indicated by the NF EN 60335-2-75 [DR5].

Themes	Baseline		Opinion	N°	Non-compliance description
	Ar. 09/05/95 [DR4]	NF EN 60335-2-75 [DR5]			
Chapter II: Equipment. Article 5 - Cleaning equipment	X	X	C		See § **Erreur ! Source du renvoi introuvable.** of this notice
Chapter V: Food items Article 8 - Handling, storage, packaging, exhibition	X		C		
Chapter V: Food items Article 10 - Storage temperature	X	X	C		The system can manage each expiry date for consumption of pizza and thus prohibit distribution. In the event of a power failure, the cold room cannot maintain temperature as for short periods. The pizzas are not kept at the optimum temperature, however, after the return of the power, the cold room will recover the storage temperature and the distribution will be start again, while the pizzas have maybe reach temperatures >+4°C. Recommendations: For other periods than those defined as "short", you have to ensure that the distribution is automatically prohibited by the process of the Vending Machine. ***Removal of reservations dated 14/12/09***: A amendment of the management system allows to stop the distribution of pizzas based on the following parameters: - The temperature of the cold room is higher than +4°C for an extended period (1 hour). - A long power failure and the temperature is higher than +4°C. The audit was conducted on the Vending Machine, located “avenue de l’arbre” at Quené in Méré (78) after a high temperature detection, the costumer interface is blocked (that indicates that the vending machine is reloading), and the operator interface indicates that the temperature was above +4°C. The restarting requires a vending machine and pizzas checking by the operator.

Themes	Baseline		Opinion	N°	Non-compliance description
Chapter VII: Controls and audits. **Article 17** - Controls and audits	X		C		
Chapter IV: Automatic distribution **Article 24** - Design, construction, installation, cleaning, maintenance	X	X	C		See HACCP guide (cf. [DR11])
Annexes **Storage temperatures of food items** +4°C for storage, For ready-cooked dish delivered to consumers> to +63°C	X		C		See § **Erreur ! Source du renvoi introuvable.**