

43_n ΣΥΣΚΕΨΗ
ΔΙΥΛΙΣΤΗΡΙΩΝ

ΕΝΕΡΓΕΙΑ, ΑΣΦΑΛΕΙΑ & ΠΕΡΙΒΑΛΛΟΝ



2025

Ολοκληρωμένη Διαχείριση Εξοπλισμού ATEX στον Κλάδο Oil & Gas:

Από την Εφαρμογή των Οδηγιών
στην Επιθεώρηση και την Ψηφιακή Παρακολούθηση

Εισηγήτρια:

Αθηνά Κασίμη

Διπλ. Ηλεκ/λόγος Μηχανικός (ΕΜΠ), MBA

Διευθύντρια Βιομηχανικής Ασφάλειας, ΕΡΓΟΝΟΜΙΑ ΑΕ

CompEx certified in ATEX Electrical Safety



- Συνοπτική παρουσίαση του κανονιστικού πλαισίου – Οδηγιών ATEX
- Υποχρεώσεις και κρίσιμα σημεία συμμόρφωσης
- Επιθεωρήσεις εξοπλισμού: διαδικασίες & πρότυπα
- Ανάδειξη των προκλήσεων σε ATEX εγκαταστάσεις
- Ψηφιακά εργαλεία παρακολούθησης και συμμόρφωσης
- Παρουσίαση βέλτιστων πρακτικών και ψηφιακού εργαλείου ErgoATEX

1999/92/ΕΚ ATEX (137) – Π.Δ. 42/2003

“Ελάχιστες απαιτήσεις για τη βελτίωση της προστασίας της υγείας και της ασφάλειας των εργαζομένων οι οποίοι είναι δυνατόν να εκτεθούν σε κίνδυνο από εκρηκτικές ατμόσφαιρες”



ATEX
Workplace
Directive

EUROPEAN ATEX DIRECTIVES

1999/92/EC

ATEX 137

Health and
Safety (user)

2014/34/EU

ATEX 114

Equipment &
Protective
Systems

ATEX
“Product”
Directive



2014/34/ΕΕ ATEX (114) – ΥΑ Οικ. 52019/ΔΤΒΝ 1152/2016

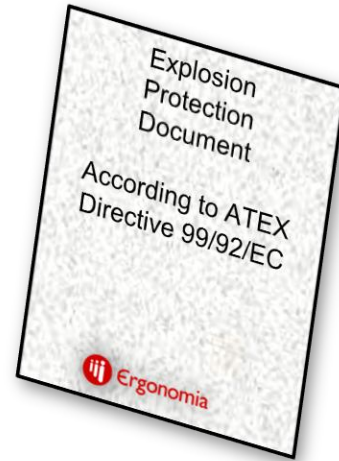
(Replaced ATEX 94/9/EC)

‘Συσκευές και συστήματα προστασίας που προορίζονται για χρήση σε εκρηξιμες ατμόσφαιρες’

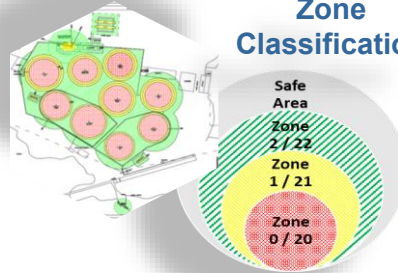
Οδηγία 1999/92/ΕΚ ATEX (137)



Assessment
of explosion
risks



Zone
Classification

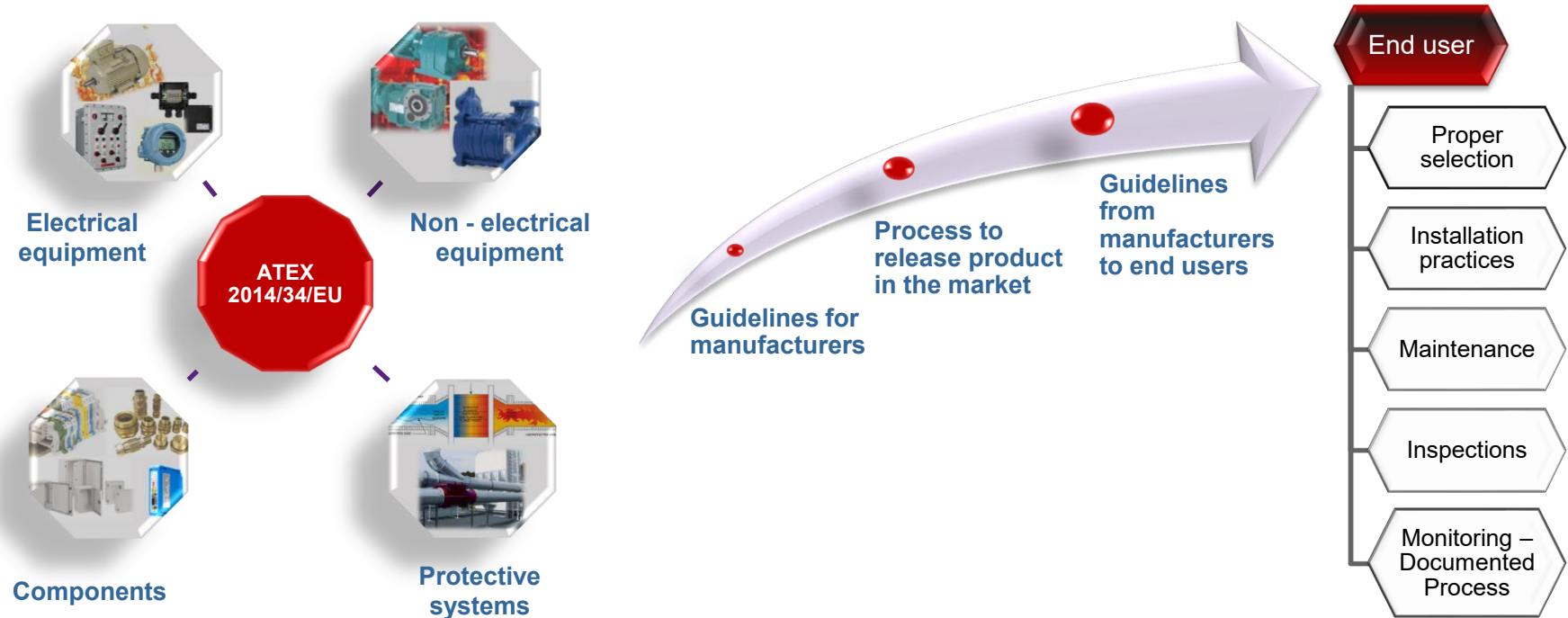


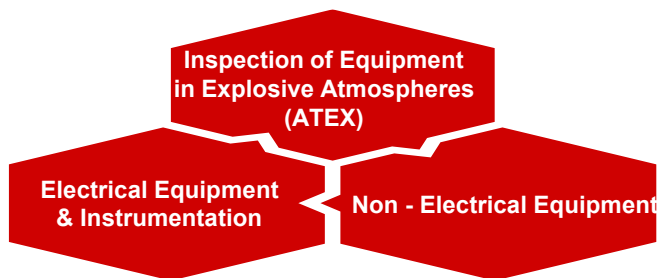
Organizational
Measures



Technical
Measures

Οδηγία 2014/34/ΕΕ ATEX (114)

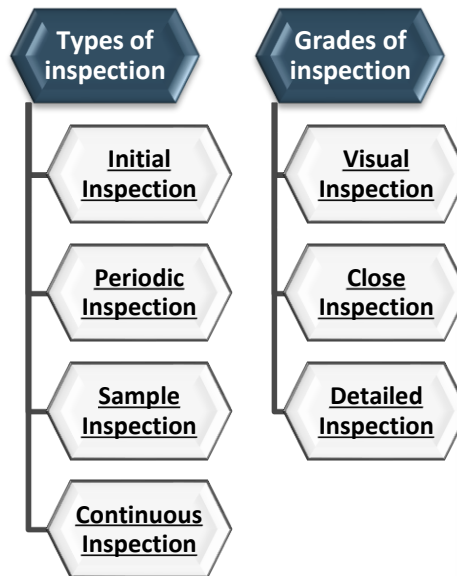
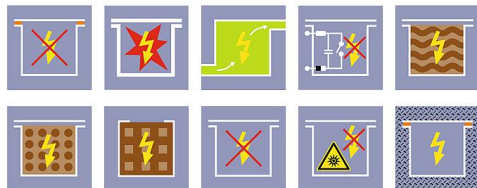




- ELOT EN 60079.0
- ELOT EN 60079.14
- ELOT EN 60079.17
- ELOT EN ISO 80079.36
- ELOT EN ISO 80079.37

Protection Concepts

[Exd, Exe, Exi, Exp, Exn, Exm, Exo, Ext etc..]



Inspection Checklists

[illegible]

Επιθεωρήσεις Εξοπλισμού σε Περιβάλλον ΑTEX - Στόχοι & Προκλήσεις

Προκλήσεις:

Κρισιμότητα των συστηματικών περιοδικών επιθεωρήσεων

Απαιτητικοί βιομηχανικοί κλάδοι: Oil & Gas, Χημική, Φαρμακευτική, Τσιμεντοβιομηχανία

Μεγάλος Όγκος Δεδομένων προς διαχείριση

Τεκμηρίωση επιθεωρήσεων – δυνατότητες αναφορών

Διαχείριση αποκλίσεων (non-conformities)

Διαχείριση πλάνου ενεργειών (Action plan)

Ανάκτηση δεδομένων από προηγούμενες επιθεωρήσεις – Re-audits

Παρακολούθηση διαδικασίας επιθεωρήσεων

Στόχοι:

Αναβάθμιση της αξιοπιστίας του εξοπλισμού

Ενίσχυση του επιπέδου Ασφάλειας της εγκατάστασης

Δημιουργία ολοκληρωμένου εργαλείου διαχείρισης ασφάλειας

Ψηφιοποίηση των διαδικασιών



Επιθεωρήσεις Εξοπλισμού σε Περιβάλλον ΑTEX – Ψηφιοποίηση Διαδικασιών



ErgoATEX, ένα ολοκληρωμένο Ψηφιακό Εργαλείο Επιθεωρήσεων, Παρακολούθησης και Διαχείρισης της Ασφάλειας του ηλεκτρολογικού και μη-ηλεκτρολογικού (μηχανολογικού) εξοπλισμού εντός ΑTEX

Ψηφιακή Παρακολούθηση Επιθεωρήσεων Εξοπλισμού με το ErgoAT



- ❑ On site recording using ATEX tablets and camera
- ❑ Εργονομικά σχεδιασμένο και εξειδικευμένο λογισμικό



- ❑ Real-time δεδομένα κατά την καταγραφή
- ❑ Άμεση ολοκλήρωση των checklists
- ❑ Λειτουργία on-line & off-line
- ❑ Συγχρονισμός μεγάλου όγκου δεδομένων

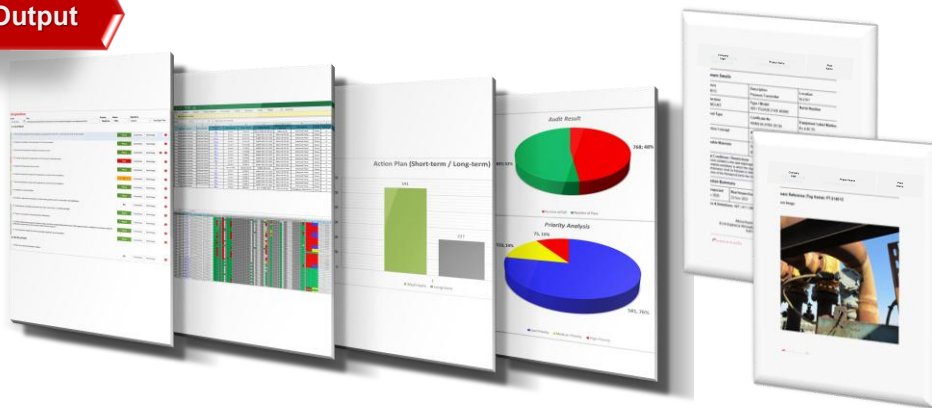


Ψηφιακή Παρακολούθηση Επιθεωρήσεων Εξοπλισμού με το ErgoAT^{Ex}

Input



Output



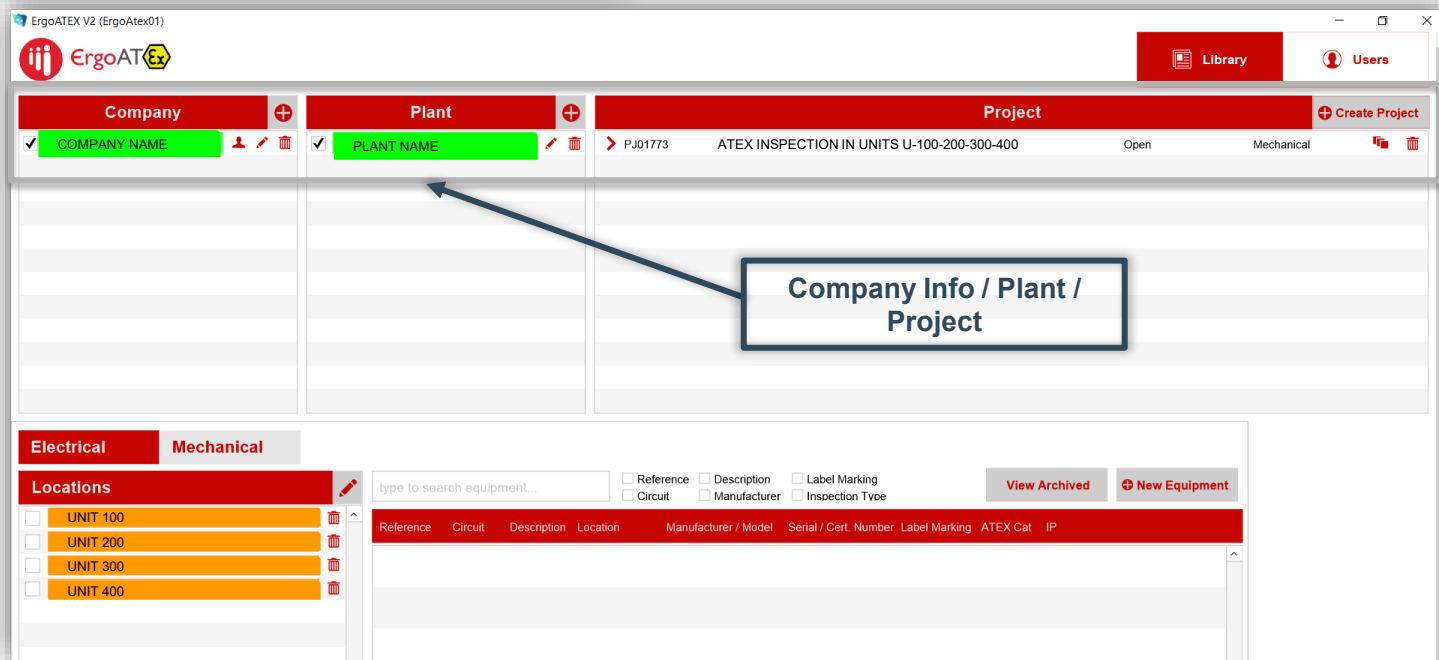
Εύχρηστο εργαλείο επιθεώρησης στο πεδίο

- ❑ Λειτουργία εφαρμογής σε Ex Tablet/ Smartphone
- ❑ Άμεση συμπλήρωση ερωτηματολογίων ελέγχου (Audit checklist)
- ❑ Δυνατότητα συγχρονισμού μεγάλου όγκου δεδομένων
- ❑ Λειτουργία τόσο on-line όσο και off-line
- ❑ Πλήρης αποτύπωση και ταυτοποίηση εξοπλισμού
- ❑ Πιστοποιητικά εξοπλισμού
- ❑ Έγγραφο Προστασίας από Εκρήξεις (Μελέτη ATEX)

Ολοκληρωμένο Σύστημα Διαχείρισης της Ασφάλειας

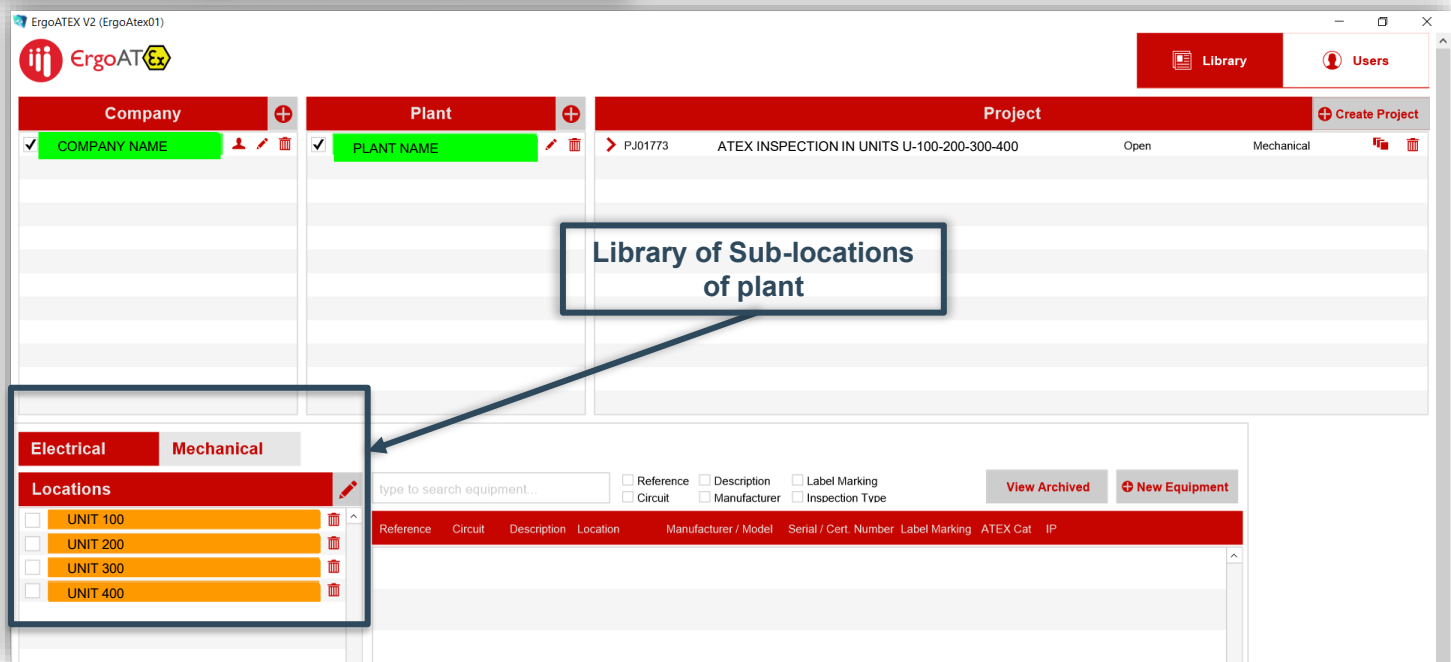
- ❑ Asset Register Management of ATEX equipment
- ❑ Dashboard / Audit Reports
- ❑ Στατιστική Ανάλυση, KPIs
- ❑ Οπτικοποίηση Παραδοτέων
- ❑ Monitoring of inspections / equipment
- ❑ Συνέργεια μεταξύ Επιθεωρητών και Υπευθύνων Εγκαταστάσεων
- ❑ Ιστορικά Δεδομένα / Re - audits
- ❑ Διασφάλιση Ποιότητας - Εξάλειψη Ανθρώπινου Σφάλματος

Introduction to ErgoATEX Interface



The screenshot displays the ErgoATEX V2 (ErgoAtex01) interface. At the top, there is a navigation bar with 'Library' and 'Users' buttons. Below this is a table with three main columns: 'Company', 'Plant', and 'Project'. The 'Company' column has a sub-header 'COMPANY NAME' and a green background. The 'Plant' column has a sub-header 'PLANT NAME' and a green background. The 'Project' column has a sub-header 'PJ01773 ATEX INSPECTION IN UNITS U-100-200-300-400' and a green background. A callout box with the text 'Company Info / Plant / Project' points to the 'Plant' column header. Below the table, there are tabs for 'Electrical' and 'Mechanical'. Under the 'Mechanical' tab, there is a 'Locations' section with a list of units: UNIT 100, UNIT 200, UNIT 300, and UNIT 400. To the right of the 'Locations' list is a search bar labeled 'type to search equipment...' and a set of checkboxes for 'Reference', 'Description', 'Label Marking', 'Circuit', 'Manufacturer', and 'Inspection Type'. There are also buttons for 'View Archived' and 'New Equipment'. At the bottom, there is a table with columns: Reference, Circuit, Description, Location, Manufacturer / Model, Serial / Cert. Number, Label Marking, ATEX Cat, and IP.

ErgoATEX Interface



The screenshot displays the ErgoATEX V2 (ErgoAtex01) software interface. The main window is divided into three primary sections: **Company**, **Plant**, and **Project**. The **Company** section shows a table with columns for Company Name, and icons for adding, editing, and deleting. The **Plant** section shows a table with columns for Plant Name, and icons for adding, editing, and deleting. The **Project** section shows a table with columns for Project ID (PJ01773), Project Name (ATEX INSPECTION IN UNITS U-100-200-300-400), Status (Open), and Type (Mechanical). A **Create Project** button is visible in the top right of the Project section.

A callout box labeled **Library of Sub-locations of plant** points to a pop-up window. This window has tabs for **Electrical** and **Mechanical**. Under the **Locations** tab, there is a list of sub-locations: UNIT 100, UNIT 200, UNIT 300, and UNIT 400, each with a checkbox and a delete icon. Below the list is a search bar labeled "type to search equipment..." and several filter checkboxes: Reference, Description, Label Marking, Circuit, Manufacturer, and Inspection Type. At the bottom of the pop-up, there are buttons for **View Archived** and **New Equipment**.

Import Locations / Settings for ATEX Directive requirements

Add/Edit Locations Close

Company: Plant:

Name	Parent	Level	Add new
U-100	+	001	
U-200	+	002	
U-300	+	003	
U-400	+	004	
Pump Station	+	001.001	

Add new subcategory for Pump Station

Name

Level

Cancel OK

Edit Location Details

Name

Gas Area Classification Zone

Type

Gas Group Required

Part of

Temperature Classification Required

Flammable Materials

IP Requirements

Location Temperature °C
Min Max

Inspection Frequency

Cancel Save

ErgoATEX Interface

ErgoATEX V2 (ErgoAtex01)

Company **Plant** **Project** **Create Project**

✓ COMPANY NAME ✓ PLANT NAME > PJ01773 ATEX INSPECTION IN UNITS U-100-200-300-400 Open Mechanical

Library of equipment within selected Locations of the plant

Electrical **Mechanical**

Locations

- ✓ UNIT 100
- ✓ UNIT 200
- UNIT 300
- UNIT 400

type to search equipment...

☐ Reference ☐ Description ☐ Label Marking
☐ Circuit ☐ Manufacturer ☐ Inspection Type

View Archived **New Equipment**

Reference	Circuit	Description	Location	Manufacturer / Model	Serial / Cert. Number	Label Marking	ATEX Cat	IP	
PCV -41582		Pneumatic actuators		Nuovo Pignone Bari				IP54	A R
PCV -41911-		Pneumatic actuators		Fisher CL300		Ex II 2 GD 2 GD	IP54		A R
PCV -41911-		Pneumatic actuators		Fisher CL300		Ex II 2 GD 2 GD	IP54		A R
PCV -42005		Pneumatic actuators		Nuovo Pignone Bari				IP54	A R
PCV -42006-		Pneumatic actuators		Fisher				IP54	A R
PDCV -41581		Pneumatic actuators		Nuovo Pignone Bari				IP54	A R
PDIC -41680		Pneumatic actuators		Masonellian				IP54	A R

Import Equipment Data / Create Asset Register List

COMPANY NAME
+ Plant

Add / Edit Locations

- 1. Tank Area
- 2. Pump station
- 3. Filling Area
- 4. Dust Area

type to search equipment

Reference	Description	Location	Manufacturer / Model	Serial	Cert. Number	Circuit Ref.	ATEX Cat	IP
1.1.1.PT1	Pressure transducer	1.1.1. Tank 1 Zone 1	Endress+Hauser	JB011B01129	KEMA 09 ATEX 0048	Tank1	1	IP66/68
35-VITO LT 762	Instrumentation	1.1.1. Tank 1 Zone 1	Honeywell Enraf	VITO LT INTERFACE	KEMA 01 ATEX 1212		1/2	IP65
TT1		1.1.1. Tank 1 Zone 1					2	IP54
BANA2	Junction box	1.1.1. Tank 1 Zone 1	DTS	XBL	LCIE 00 ATEX 6024X			IP65

Details
Photo
Inspections
Inspection Images
Actions
Attachments

Reference
35-VITO LT 762
Description
Instrumentation
Location
1.1.1. Tank 1 Zone 1
Manufacturer
Honeywell Enraf
Type Model
VITO LT INTERFACE 762
Serial Number
Certificate Number
KEMA 01 ATEX 1212
Circuit Reference
ATEXCat
1/2

Equipment Label Marking
II 1/2G Ex ia IIB T4 Ga/Gb
Inspection Type
i
Certification Ambient °C
40 Min 60 Max
Gas Group
IIB
TClass Gas
T4
Equipment External Surface Temp
(Dust ignition TEMP)
Equipment Dust Group
IP
IP65
Special Conditions / Restrictions

Save
Save & New
Save & Copy
Undo
Delete

Inspection Checklists

Inspection

COMPANY NAME

Date	Title	Priority	Status	Signatory	
18-06-2019	ATEX INSPECTION IN UNITS U-100-200-300-400	Pass	PASS	Kasimi	Top Right Title

A. EQUIPMENT

1. Circuit and/or equipment documentation is appropriate to the EPL / Zone requirements of the location

PASS

Comments

Add Image

1

2. Equipment installed is that specified in the documentation

PASS

Comments

Add Image

1

3. Circuit and /or equipment category and group correct

PASS

Comments

Add Image

1

4. IP rating of equipment is appropriate to the Group III material present

FAIL

Comments

Add Image

1

5. Equipment temperature class correct

PASS

Comments

Add Image

1

6. Ambient temperature range of the apparatus is correct for the installation

L

Comments

Add Image

1

7. Service temperature range of the apparatus is correct for the installation

PASS

Comments

Add Image

1

8. Installation is clearly labelled

PASS

Comments

Add Image

1

9. Enclosure, glass parts and glass-to-metal sealing gaskets and/or compounds are satisfactory

NA

Comments

Add Image

1

10. Cable glands and blanking elements are of the correct type , complete and tight

PASS

Comments

Add Image

1

12. There is no evidence of unauthorized modifications

PASS

Comments

Add Image

1

13. Diode Safety barriers,galvanic isolators relays and other energy limiting devices are of the approved type, installed in accordance with the certification requirements and securely earthed where required

PASS

Comments

Add Image

1

17. The maximum voltage Um of the associated apparatus is not exceeded

PASS

Comments

Add Image

1

B. INSTALLATION

3. There is no obvious damage to cables

NC

Comments

Add Image

1

Inspection Action Plan

X										Export Excel Print Report	
Equipment	Date	Project	Inspection Comments	Action	Priority	Responsible	Timetable	Type of Fail	Status		
JB-41972	2/9/2022	ATEX Inspection of electrical equipment	A03 equipment is not empty enclosure, so there is no temperature class determined.	are component certificates and certify only ex boxes without material	Low	Kasimi	14/12/2023	Installation	Open		
TR-41932	21/6/2022	ATEX Inspection of electrical equipment	A01 Non-ATEX equipment has been installed at the top of Electrostatic Filter. According to the existing EPD (Explosion Protection Document), it is	it is suggested to update the EPD, so the study would also include the Electrostatic Filter Classification Area.	Limitation	Kasimi	14/12/2023	Installation	Open		
TR-41942	21/6/2022	ATEX Inspection of electrical equipment	A01 Non-ATEX equipment has been installed at the top of Electrostatic Filter. According to the existing EPD (Explosion Protection Document), it is	it is suggested to update the EPD, so the study would also include the Electrostatic Filter Classification Area.	Limitation	Kasimi	14/12/2023	Installation	Open		
TR-41951	21/6/2022	ATEX Inspection of electrical equipment	A01 Non-ATEX equipment has been installed at the top of Electrostatic Filter. According to the existing EPD (Explosion Protection Document), it is	it is suggested to update the EPD, so the study would also include the Electrostatic Filter Classification Area.	Limitation	Kasimi	14/12/2023	Installation	Open		
TR-41952	21/6/2022	ATEX Inspection of electrical equipment	A01 Non-ATEX equipment has been installed at the top of Electrostatic Filter. According to the existing EPD (Explosion Protection Document), it is	it is suggested to update the EPD, so the study would also include the Electrostatic Filter Classification Area.	Limitation	Kasimi	25/10/2023	Installation	Open		

Audit Reports / Equipment Inspection Forms

Company Logo

Project Name

Plant Name

Equipment Reference (Tag Name): FT-21401C

Equipment Image:

Inspection Report

Company Logo

Project Name

Plant Name

Equipment Details

Reference	Description	Location
FT-21401C	Pressure Transmitter	N-2101
Manufacturer	Type / Model	Serial Number
ROSEMOUNT	3051 TGA2B 21AS 4K3MS	
Approval Type	Certificate No.	Equipment Label Marking
ATEX	KEMA 00 ATEX 2013X	Ex d IIC T5
Protection Concept	ATEX Cat	IP
d	1	66/68
Flammable Materials	Gas Group	T Class Gas
Gas	IC	T5
		Ext. Surf. T °C
		N/A
		N/A

Special Conditions / Restrictions

This device contains a fire wall diagram. Installation, maintenance and use shall take into account the environmental conditions to which the diagram will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in order to ensure safety during its expected lifetime. For information on the dimensions of the fireproof parts the manufacturer shall be contacted.

Inspection Summary

Date Inspected	Next Inspection	Inspection Grade	Inspection Type	Status
22 Nov 2020	22 Nov 2021	Close	d	FAE

Failures & Incidents:

A07 (A11) (B06) (C01)

Conducted by

Athina Kasim (Electrical & Computer Engineer (NTUA))

Ex14 Explosive Atmosphere, Responsible Person / Competent Cert No: 8026RP

Exd1 dA7 Complex Cert No: 0843220V

Inspection Report

Company Logo

Project Name

Plant Name

Questions

A01 - Equipment is appropriate to the EPL / Zone requirements of the location

PASS

A02 - Equipment group is correct

PASS

A03 - Equipment temperature class is correct (only for GAS)

PASS

A05 - Degree of protection (IP Grade) of equipment is appropriate for the level of protection/group/conductivity

PASS

A07 - Equipment circuit identification is available

LI

Comments

There is no permanent tag on the equipment.

A08 - Enclosures, glass parts and gaskets to metal sealing gaskets and/or compounds are satisfactory

PASS

A10 - There is no evidence of unauthorized modifications

PASS

A11 - Bolts, cable entry devices (direct and indirect) and blanking elements are of the correct type and are complete and tight - Physical check

FAE

Comments

Improper insertion of cable to the cable gland. The outer insulation is not retained into the cable gland.

A12 - Threaded Covers on enclosures are of the correct type, are tight and secured - Physical check

PASS

Inspection Report

Company Logo

Project Name

Plant Name

Image Analysis

A11 - Bolts, cable entry devices (direct and indirect) and blanking elements are of the correct type and are complete and tight - Physical check

The outer insulation is not retained into the cable gland.

Inspection Report

Equipment
General Image

Equipment &
Inspection Details

Inspection
Checklist

Findings
Analysis

Audit Reports / Inspection Matrix

[illegible]

- ❑ Η **Προστασία από Εκρήξεις** αποτελεί κρίσιμη παράμετρο ασφάλειας για διεργασίες με εύφλεκτες / εν δυνάμει εκρήξιμες ουσίες
- ❑ Οι **αρχικοί** και **περιοδικοί έλεγχοι** είναι απαραίτητοι για τη διασφάλιση της **αξιοπιστίας** και της **ασφαλούς λειτουργίας** του εξοπλισμού
- ❑ Οι έλεγχοι θα πρέπει να **καταγράφονται**, να **τεκμηριώνονται** και να **παρακολουθούνται**
- ❑ Τα **ψηφιακά εργαλεία** ενισχύουν την αποτελεσματική **διαχείριση της ασφάλειας** και την **ιχνηλασιμότητα των ενεργειών**.
- ❑ Το **ErgoATEX** αποτελεί ένα **ολοκληρωμένο ψηφιακό εργαλείο επιθεώρησης** και **παρακολούθησης** του εξοπλισμού εντός Εκρήξιμων Ατμοσφαιρών (ATEX)

Η συνεχής **Τεχνολογική Εξέλιξη** και τα **Διδάγματα από το πεδίο** δημιουργούν νέες **Προκλήσεις** και προοπτικές για **Περαιτέρω Ανάπτυξη** . . .



THANK YOU!