

# Vietnam 3D Explosion Proof Scissor Lift Platform Deep Case Study

This project involves four sets of custom-designed 3D explosion-proof scissor lift platforms for personnel painting operations inside industrial paint booths. The solution was engineered for complex large-scale workpieces requiring multi-axis movement, precise positioning, and the highest level of explosion protection.

## 1. Project Overview

Client Industry: Industrial paint booth & heavy equipment coating

Installation Location: USA

Quantity: 4 Units

Explosion-proof Standard: II2G Ex db IIC T4 Gb

Control System: Siemens PLC + ABB Electrical Components

Power Supply: 480V / 60HZ / 3 Phase

## 2. Core Industry Pain Points

- Traditional scaffolding and boom lifts provide limited point access, resulting in frequent repositioning and inconsistent coating quality.
- Solvent-rich paint booths create flammable and explosive environments requiring IIC-class explosion-proof protection.
- Complex curved workpieces require precise X/Y/Z multidirectional positioning.
- Large workpieces demand simultaneous multi-operator coordination with centralized safety management.

## 3. Customized Technical Solution

The equipment integrates three-dimensional motion into one intelligent explosion-proof lifting platform:

X-axis: Horizontal rail travel up to 22 meters with ABB explosion-proof motor drive.

Y-axis: Vertical lifting range from 550mm to 4200mm using chain transmission structure.

Z-axis: Hydraulic scissor extension reaching 4000mm working depth.

All movement systems use ABB explosion-proof motors and SEW gear reducers.

## 4. Safety & Explosion-Proof Design

- Full explosion-proof electrical configuration for hazardous paint environments.
- IP54 centralized control cabinet installed outside the paint booth.
- Emergency stop buttons, anti-collision logic, and multi-limit protection.
- Audible and visual tower alarms on each platform.
- Door interlock and programmable operation delay logic.

## 5. Intelligent Control System

The project uses Siemens S7-1200 PLC with centralized HMI monitoring.

Functions include:

- Real-time status display for all four lifts
- Manual mode and maintenance mode
- Error alarms and operation feedback
- Interlock protection and programmable delay settings

## 6. Structural Highlights

- Heavy-duty steel frame with reinforced walking rails
- Explosion-proof cable routing with drag chains and conduit protection
- Foldable scissor mechanism with bellows protection covers
- Anti-loosening brake installation for motors
- Industrial-grade platform guardrails and toe boards

## 7. Customer Value

The customized 3D lift platform significantly improves coating efficiency and worker safety while reducing labor intensity inside hazardous paint booths. Compared with traditional access methods, the solution enables continuous precision spraying with lower downtime and higher coating consistency.

## 8. Key Technical Parameters

Parameter	Specification
Platform Load	225KG
X-axis Travel	22000mm
Y-axis Lift Height	550-4200mm
Z-axis Extension	1600-4000mm

Noise Level	70db
Electrical Standard	480V 60HZ 3-Phase
Explosion-proof Rating	II2G Ex db IIC T4 Gb