

# ITBr //X2

## The Dual-Station Diesel CRDi Test Bench

The first 2-injector bench on the market. Test Two. Repair Two. Zero Idle Time.



Authorized Solution for  
Schaeffler / Continental



**CloudX AZO**

# ITBR //X4 | ITBR //X2

The Benchmark Injector Test Bench.  
Every CRDi System. Every OEM.  
Every EU6 Technology.



## ITBR //X4

The Flagship Diesel  
CRDi Test Bench  
Specialist Service Station.  
4 Injectors at Once. Every  
CRDi System. One Pass.



## ITBR //X2

The Dual-Station Diesel  
CRDi Test Bench  
The first 2-injector bench on the  
market. Test Two. Repair Two.  
Zero Idle Time.



ITBR-X Portable Tool Cart  
Organized storage for adapters,  
fittings, cables and injector clamping  
sets, within arm's reach of the bench.



OVERVIEW

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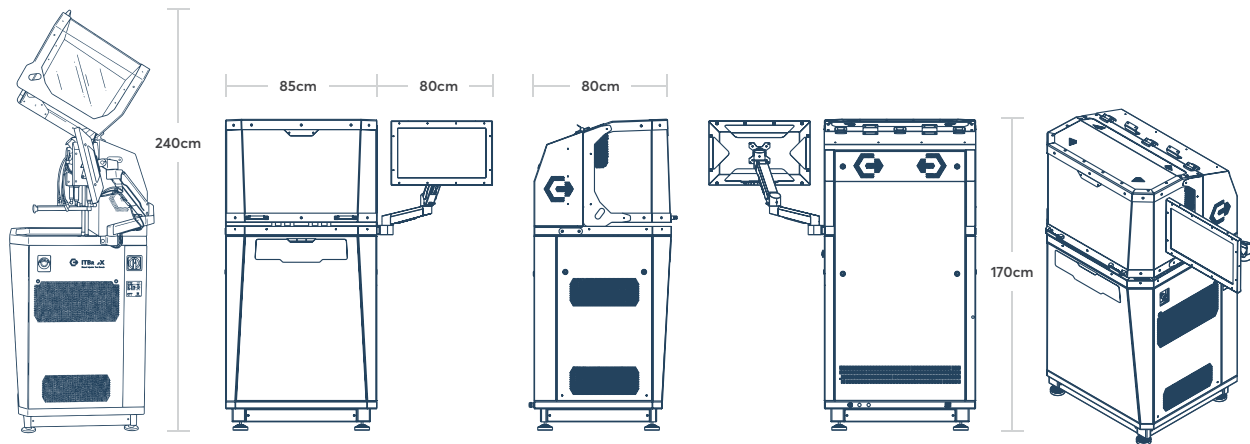
The Benchmark for Common Rail.  
Every OEM. Every EU6.

The flagship specialist CRDi station. The market's most extensive coding capability, up to 3,000 bar, from passenger car to large-engine, with a built-in Test Plan Editor for OEMs and engineering labs.



SPECS & METRICS

|        |       |         |                              |         |      |
|--------|-------|---------|------------------------------|---------|------|
| Weight | 385kg | Voltage | 380-480 V · 3P+PE · 50/60 Hz | Current | 20 A |
|--------|-------|---------|------------------------------|---------|------|



TOTAL SYSTEM COVERAGE

- **All CRDi systems on one bench:** CRi · CRiN (all brands and types)
- **EU6 / EU7 testing standards.** Future-proof from day one
- The market's most extensive CRDi injector coding capability
- **Pressure up to 3,000 bar:** built for the highest-pressure CRDi platforms in production
- **Testing & coding time:** 6-12 min for 1 or 4 injectors respectively
- 11,000+ part numbers in the factory database, updated continuously
- **User database:** built-in Test Plan Editor. Made for OEMs, remanufacturers and engineering labs

ENGINEERED FOR PRECISION

- Integrated waste tank with injector flushing system
- Advanced closed-loop temperature control: EU6 / EU7 compliant
- Water or Air cooling system
- **Powered by CloudX:** every result encrypted, cloud-stored, GDPR-compliant, Industry 4.0 ready
- **AZO v3 operating system:** the most intuitive, user-friendly HMI on the market

OEM-AUTHORIZED. OEM-TRUSTED.

Authorized by Schaeffler / Continental and built to OEM testing standards across Bosch, Delphi, Denso, Stanadyne, Caterpillar, Liebherr, MTU, L'Orange Cummins, John Deere, Komatsu, Hino and Isuzu platforms. Additional authorizations pending.

AFTERMARKET-READY. INDUSTRY-CONNECTED.

**CLOUDX REPAIR HUB.** Certified third-party repair solutions, built to complement the market, not compete with it: hard-to-source parts, test plans not published by OEMs, and calibrations from approved specialists. Co-branded with our partners. OEM testing stays primary; the Repair Hub fills the gaps, optional, clearly marked, your choice.

ERGONOMICS

- All-round workspace access with transparent protective hood
- 22" industrial-grade Android HMI (fully adjustable)
- Fully adjustable Injector mounting designed for mass production: 4-station throughput
- HP-hose-free injector system (fully adjustable - coaxial)
- Intuitive cable and hose management
- Auxiliary racks and shelves (optional)



RKS

Approved third-party repair solutions that complement OEM testing. (page CZ17)

INJECTORS

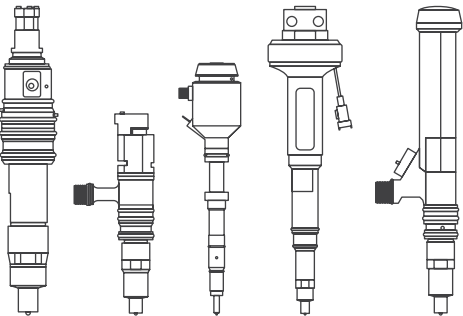
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CRDi · UNIVERSAL COMMON-RAIL DIESEL COVERAGE

Universal CRDi testing and coding for every major diesel injector platform in the global market, passenger car, light-duty, medium-duty, heavy-duty, off-highway and large-engine applications.



**Mounting & Scanning**  
Injectors clamped on the HP-hose-free coaxial rail. QR-scan identification loads the correct test plan and component info automatically.



| Brand                    | Families & Applications                                           |
|--------------------------|-------------------------------------------------------------------|
| Bosch                    | CRi1, CRi2, CRi3, CRiN1, CRiN2, CRiN3, CRiN4.2X, CRiN-LE, NCC/VCC |
| Delphi                   | F2P, F2E, F2R, F3P, F3E, C2i, C3i, C4i                            |
| Denso                    | G2, G3, G4 platforms – passenger car through heavy-duty           |
| Schaeffler / Continental | Piezo CRi injectors – full coverage with CGL Blind-Lift           |
| Caterpillar / Perkins    | C4 / C6 and other Medium and Heavy-Duty CRDi                      |
| Cummins XPI              | ISX15, X15, QSX15 – Heavy-Duty solenoid common rail               |
| John Deere               | PowerTech CR platforms – off-highway and agricultural             |
| Komatsu / Hino / Isuzu   | Off-Highway CR applications – full coverage                       |
| CRIN 4.2                 | Heavy commercial-vehicle injectors – full support                 |
| Large Engine CRiN        | QSK, MTU, L'Orange and others                                     |

3,000 BAR

Maximum rail pressure for testing the latest generation of CRDi injectors.

Testing and coding time: 6-12 min

EU6 / EU7 testing standards  
Future-proof from day one.

FEATURES

- Tested to OEM Standards: built to Bosch, Delphi, Denso, Caterpillar, Cummins procedures
- Database: 6,500+ part numbers, continuously online-updated
- OEM Authorized: Schaeffler / Continental
- Full injector coding: Bosch IQA/IMA/ISA/IMA4.2, Denso QR, Delphi C2i/C3i/C4i/F2x/F3x, Schaeffler / Continental IIC/IIC.2, Cummins XPI, CAT (TRM file), QSK
- Up to 9 multiple injections (pilot / main / post), fully configurable
- BIP actuation measurement for all heavy-duty solenoids
- Live response-time measurement for all injectors in real time
- Injector flushing feature, pre-installed

TESTS PERFORMED

- Electrical (Coil / Piezo)
- Insulation Test
- Back-Leak (Static / Dynamic)
- ISA Detection
- Volumetric Flow Measurement (All Operating Conditions)
- Nozzle Opening Pressure (aNOP)
- Nozzle Opening & Closing Response Time (RSP – eRSP)
- EU6 Technology Testing
- iART Testing
- VCC / NCC Technology
- DFI Mapping (Full Spectrum)
- CRG: Regeneration of All Piezo Stacks
- CGL: Piezo Actuator Gap Lift Measurement (OEM Method)
- NLT / LKT: Nozzle Leak Test
- Low Pressure Testing 0–10 bar
- Spray Pattern & Atomization Validation

New database and coding continuously updated for new EU6 applications.

Touch Screen

The 22" adjustable Android HMI.  
Live results, coding and CloudX reports at the operator's eye level.



COMPONENTS

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FSC · FUEL-SYSTEM COMPONENTS

Integrated diagnostics for HP components: HP sensors.



ITBR-X2

**Test 2. Repair 2.**  
**The bench never waits.**

While two injectors run their automated test plan, the operator disassembles, cleans and rebuilds the next two, one continuous cycle, no idle bench time. The throughput of a 4-station workflow, at 2-station investment.



FSC TEST CAPABILITIES

- **Sensor verification:** RDS / RPS curve plotting and tolerance check
- **Electrical tests:** resistance, insulation, current draw, response time

Why it matters:

Component failures are often misdiagnosed as an injector failure. Testing these components first saves the customer the cost of replacing the wrong part. The ITBR-X is integrated with FSC diagnostics.



# AZO

## The intelligence inside every Carbon Zapp machine.

Every Carbon Zapp X-Series bench is driven by AZO, the software platform at the heart of the machine's powerful touchscreen HMI. AZO turns complex injection diagnostics into a guided, fully automatic process: select the component, mount it, and let the machine run the complete OE-level test plan, from actuation and leak checks to dynamic precision flow measurement and coding. The result is expert-level diagnosis, delivered consistently, regardless of who is operating the bench.



AZO on the X-Series touchscreen HMI: one interface for every test, every system, every brand.

### Built for the operator.

#### Fully automatic testing.

Guided sequences take the component from mounting to final verdict in minutes, with no guesswork. Live actuation signals for advanced analysis and R&D work.

#### Fast by design.

Complete test cycles measured in minutes, not hours, e.g. **4 Bosch CRDi injectors tested and coded in 8–10 minutes, Delphi C4i in 10–15 minutes, 4 GDi injectors tested and coded in 8–10 minutes; pumps in 5–15 minutes.**

#### Clear, sellable reports.

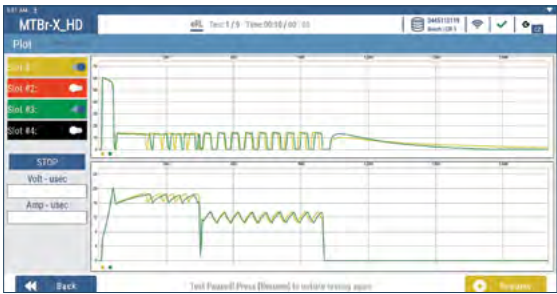
Color-coded pass/fail results per component, a single-page quick report for the customer or a multi-page analytic report for the specialist. Pick your slots with a tap, print or share on the spot, tablet-easy, workshop-fast, and simply incomparable to anything else in the market.

#### Real-time oscilloscope.

Live actuation signals for advanced analysis and R&D work.



The fail-track color report, results your customer understands at a glance.



The live oscilloscope view, every actuation, every microsecond.



Every connection, mapped on screen: numbered points, exact part numbers and adapters for each component, mount, connect and test with zero guesswork.

## One database. Every system.

### Complete OE & CZ database.

Test plans for all makes and types, continuously updated:

- CRDi** - Common Rail Diesel Injectors
- CRp** - Common Rail Diesel Pumps
- EUi/EUp** - Electronic Unit Injectors & Pumps
- HEUi** - Hydraulic Electronic Unit Injectors
- GDi** - Gasoline (High & Low Pressure) Injectors
- GDP** - Gasoline Rotary & Piston High Pressure Pumps
- Marine & Large Engine components**

### Your tests, your rules.

User-defined test plans and developer-level customization alongside the factory database, shared to all your Carbon Zapp machines effortlessly.

### Machine self-diagnosis.

AZO continuously monitors all the critical points of the bench, sensors, pressures, actuation circuits, and reports the machine's own health before it can affect your results.

### Always connected.

On-board Wi-Fi and LAN connectivity for updates, printing, sharing and the live CloudX link.

### Always current.

Software and database updates delivered over the air, powered by CloudX (see next spread).

# CloudX

## Your machines, beyond the workshop walls.

CloudX is Carbon Zapp's IoT cloud platform the natural extension of AZO. Every connected bench becomes part of a secure cloud environment where data, updates, features and support flow both ways. Fully Industry 4.0 compliant, CloudX means the machine you buy today keeps gaining capabilities tomorrow, without a single technician visit.

### What CloudX does for your business

#### Live updates.

Database and software updates arrive online, automatically, your bench always tests to the latest specifications.

#### Complete cloud backup.

Machine data, settings and test history safely mirrored in the cloud, recover everything in minutes.

#### Features on demand.

Activate new capabilities instantly, online, forever or on a Pay-As-You-Go basis, and invest only when the work demands it.

#### Remote monitoring & reports.

Check machine status and generate, file and print test reports from anywhere, on any device.

#### Fleet management.

Run one bench or twenty: manage every machine, user and location from a single account.

#### Smart maintenance.

Notifications on your phone for oils, filters and service intervals, before downtime finds you.

**24/7**

Machine visibility from any device

**1 Account**

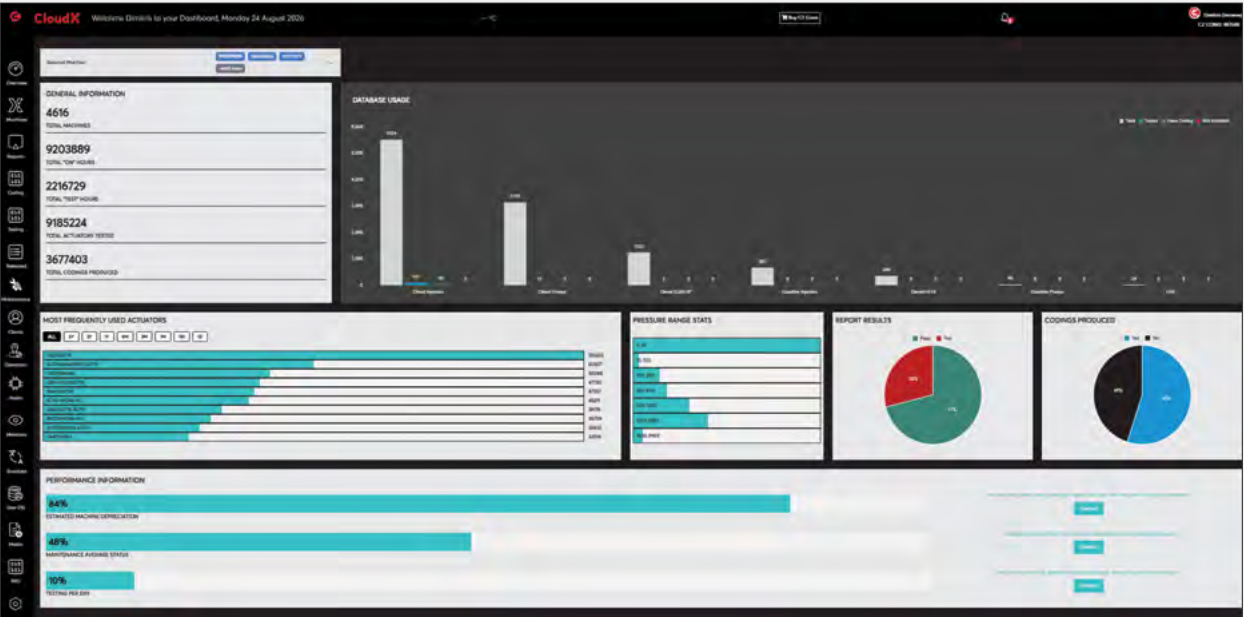
Your entire machine fleet

**Minutes**

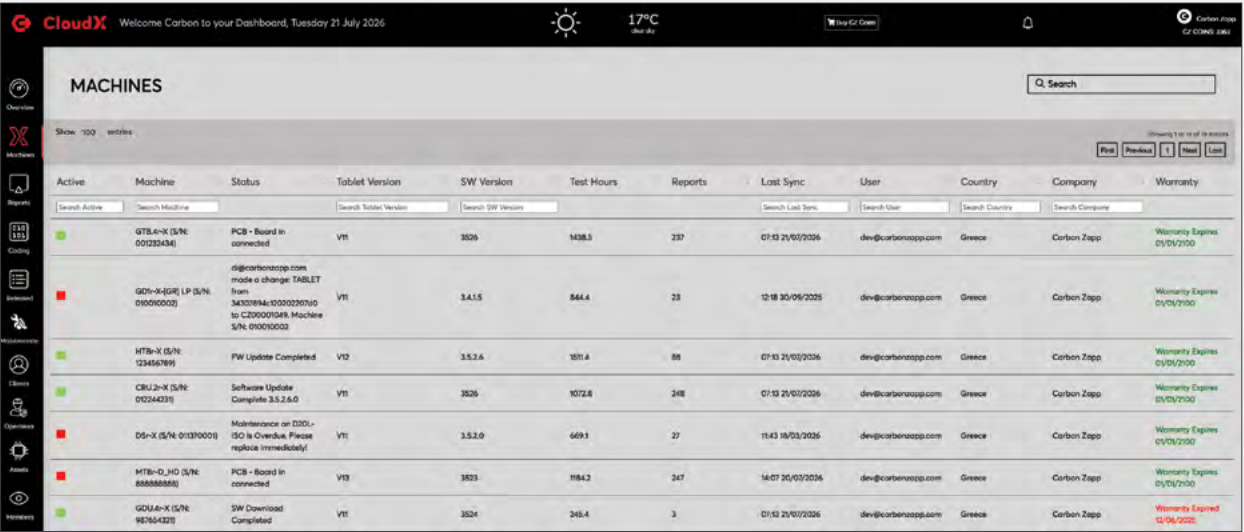
To activate a new feature online



**CloudX**  
is Carbon Zapp IoT Cloud  
computing Platform.



The CloudX overview at [cloudx.carbonzapp.com](https://cloudx.carbonzapp.com) Your job in numbers.



| Active | Machine                 | Status                   | Tablet Version | SW Version | Test Hours | Reports | Last Sync        | User               | Country | Company     | Warranty                    |
|--------|-------------------------|--------------------------|----------------|------------|------------|---------|------------------|--------------------|---------|-------------|-----------------------------|
|        | GTBLA-K (S/N: 00030434) | PCB - Board in connected | V71            | 3.0.6      | 1438.3     | 237     | 07/13 21/03/2026 | dev@carbonzapp.com | Greece  | Carbon Zapp | Warranty Expires 01/05/2030 |
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The CloudX fleet dashboard at [cloudx.carbonzapp.com](https://cloudx.carbonzapp.com) Every machine, status and info in one secure view.

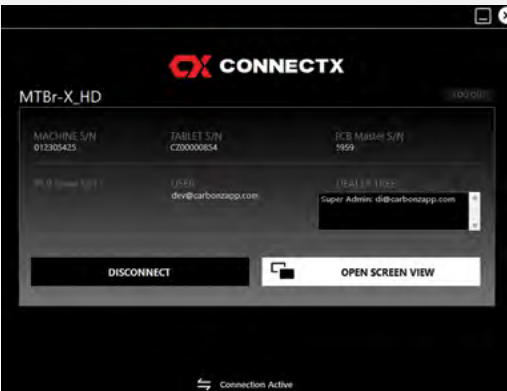


# EXPERT FEATURES

CloudX unlocks three expert-level extensions  
ConnectX, API Integration and the Repair Kit Solution (RKS).



A ConnectX session in progress: the machine's screen, live, wherever support happens to be.



## ConnectX

Support at the speed of a click.

ConnectX gives authorized eyes and hands on the machine, remotely and per account. When something needs attention, whether a question, a setting or a fault, Carbon Zapp support, your distributor or your own fleet manager can securely connect to the bench and act immediately. No travel, no waiting, no lost workdays.

### Instant troubleshooting.

Direct remote assistance from the Carbon Zapp factory or your local distributor, right on the machine screen.

### Fleet control.

Fleet managers reach any machine in their network to monitor, adjust, update or resolve, from anywhere.

### Per-account access.

Connections are permission-based and tied to accounts: you decide who can reach which machine.

### Minimum downtime.

Most issues are resolved in a single remote session. The bench is back to testing the same day.



## API Integration

Your test data, in your business systems.

Test data shouldn't stop at the bench. The CloudX API bridges your machines to your own IT environment, so results, reports and machine information flow automatically into the systems your business already runs on: ERP, workshop management, quality and warranty platforms.

### Automated workflows.

Test results attach themselves to job cards, invoices and warranty files. No re-typing, no lost paperwork.

### Built for scale.

Ideal for remanufacturers, OE service networks and multi-site operations with existing infrastructure.

### Secure by design.

Data travels over the same secure cloud environment that powers CloudX.



From the test chamber to your ERP: one connected data path, no manual steps.



## Repair Kit Solution

The authorized channel

### For kit providers

#### Deploy to your network.

Publish your repair kits, data and test plans directly to your authorized workshops through CloudX.

#### Control who buys.

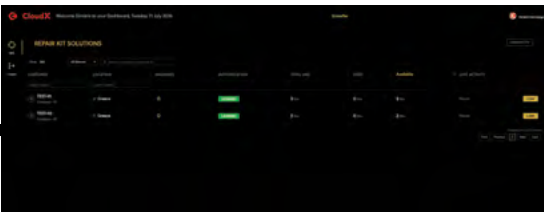
Entitlements are managed per user: only your authorized network can access and purchase your kits.

#### Protect your brand.

Every kit is diagnosed and validated on a Carbon Zapp bench, against your specifications. Quality and warranty stay in your hands.

#### A complete, branded solution.

From kit deployment to the final test report, the whole workflow carries your brand, a professional, consistent outcome across your entire network.



The RKS area in CloudX: providers publish, workshops access, and every kit is tested the authorized way.

### For workshops

#### Genuine kits, on the bench.

Access authorized repair kits with the matching test plans, right where the work happens.

#### No more parts hunting.

Become an authorized workshop with any of the available providers for your systems, the right kit is always one click away.

#### Certified results.

Diagnosis and post-repair testing follow the provider's approved procedure, every repair leaves with proof.

## One machine. One platform. The complete ecosystem.

AZO runs the test. CloudX connects the machine. ConnectX keeps it running. The API brings the data home. RKS closes the loop between component, kit and certified repair. Together, they turn a Carbon Zapp bench into a business platform.



## **Built to Move the Industry Forward.**

From advanced testing equipment and connected intelligence to technical expertise and global support, Carbon Zapp brings every solution together in one complete ecosystem.

## **Let's Connect and Discover Future Opportunities.**



Scan the QR Code  
and easily download  
the Product Catalog  
to your phone.



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