

DGFR //X

CRDi & GDi Flushing and Screening Bench



OVERVIEW

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CLEAN IT.
CHECK IT.
THEN TEST IT.

An injector removed from an engine still holds fuel, combustion residue, wear debris and water, and may already be beyond repair. The **DGFR-X** flushes it at up to 1,000 bar and screens its basic function first, so only clean, viable injectors reach your high-value test bench.

FLUSHING · PRE-TEST DECONTAMINATION

- **Removes residual fuel, carbon, metallic debris and water** from the injector body and internal passages before it reaches a test bench
- **Protects the measuring system:** prevents contamination of calibration oil, flow meters, filters and high-pressure components on any diesel or gasoline test bench
- **Prevents fuel cross-mixing:** diesel and gasoline injectors handled on the same equipment without diluting or contaminating the test fluid
- **Post-service flushing:** clears debris released during ultrasonic or mechanical cleaning before final testing

SCREENING · BASIC FUNCTION CHECK

- Four checks that separate a repairable injector from a scrap one, before any bench time is spent on it.
- **Electrical condition:** solenoid coil and piezo actuator integrity: resistance, short and open circuit
 - **Pop test:** nozzle opening pressure and spray formation confirmed under pressure
 - **Return / back-leak check:** estimates excessive internal back-leakage from worn control valves
 - **Spray confirmation:** identifies blocked or non-injecting nozzles immediately
 - **Clear go / no-go outcome:** viable injectors proceed to full testing and coding; failed units go straight to remanufacture or scrap, without consuming a full test cycle

SYSTEMS & COVERAGE

- **Diesel CRDi and Gasoline GDi injectors:** all brands and types, on one bench
- **EU6 systems capable**
- **Off-Highway CR applications:** John Deere, Komatsu, Hino, Isuzu
- **Medium and Heavy-Duty:** Cummins XPI, Caterpillar-Perkins C4 / C6 Bosch CRiN 4.2 and others
- **Recommended for Schaeffler / Continental workflows.**
- **Universal fittings and adapters** for every CRDi and GDi injector configuration

Flush it. Screen it. Then decide whether it earns a place on the test bench.

OPERATING PRINCIPLE & CONTROL

- **Air-driven high-pressure pump:** up to 1,000 bar from a standard 6 – 8 bar workshop air supply; no 3-phase installation
- **Separate 4L test oil and 4L flush tanks**
- **Spring-loaded injector holder** with fully adjustable height: all CRDi and GDi body types, minimal set-up time
- **10" Android HMI** with guided flushing and screening procedures; Wi-Fi / Ethernet online updates
- **Self air-cooling system:** continuous operation across all workshop environmental conditions
- **Compact bench-top unit:** 510 × 780 × 780 mm, 66 kg · 2-year full warranty worldwide



SPAR



4 PIEZO INJECTORS
Automatic operation for 4 piezo injectors at once: connects directly at the return (back-leak) port



SPAR · PIEZO STACK FILLER, AIR REMOVER & ACTIVATOR

- A piezo injector that has been opened for service holds air in the actuator chamber. Air is compressible: it absorbs the stack's displacement instead of transmitting it, so needle lift falls short, response time drifts and the injector fails on test, or returns from the vehicle weeks later. SPAR evacuates the chamber under vacuum, refills it under pressure and exercises the stack before the injector reaches the test bench.
- **High-flow vacuum 10 kPa and pressure 100 kPa:** complete evacuation and controlled refill of the actuator chamber
 - **Stack activation:** the piezo element is exercised under controlled cycles to settle the assembly after servicing
 - **Automatic start / stop** linked to specific test plans on the connected bench
 - **Connects to any Carbon Zapp test bench:** single-phase 100 – 240 VAC, lightweight and portable
 - **Adaptable to all types of piezo injectors**

The only automatic solution for post-service piezo conditioning. Recommended for every piezo injector opened during remanufacture, ahead of final testing and coding.

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.

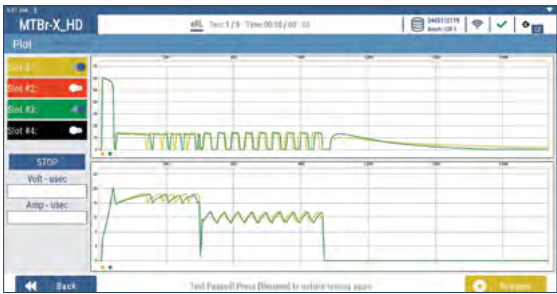
Color-coded pass/fail results per component, a single-page quick report for the customer or a multi-page analytic report for the specialist. Pick your slots with a tap, print or share on the spot, tablet-easy, workshop-fast, and simply incomparable to anything else in the market.

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

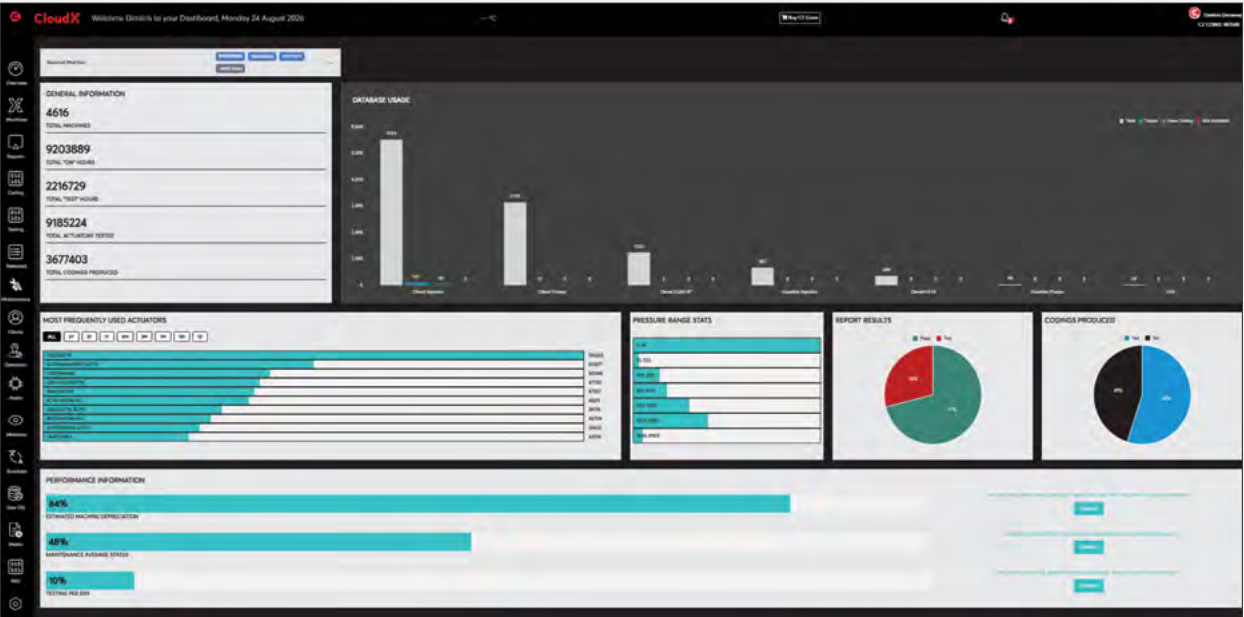
Your entire machine fleet

Minutes

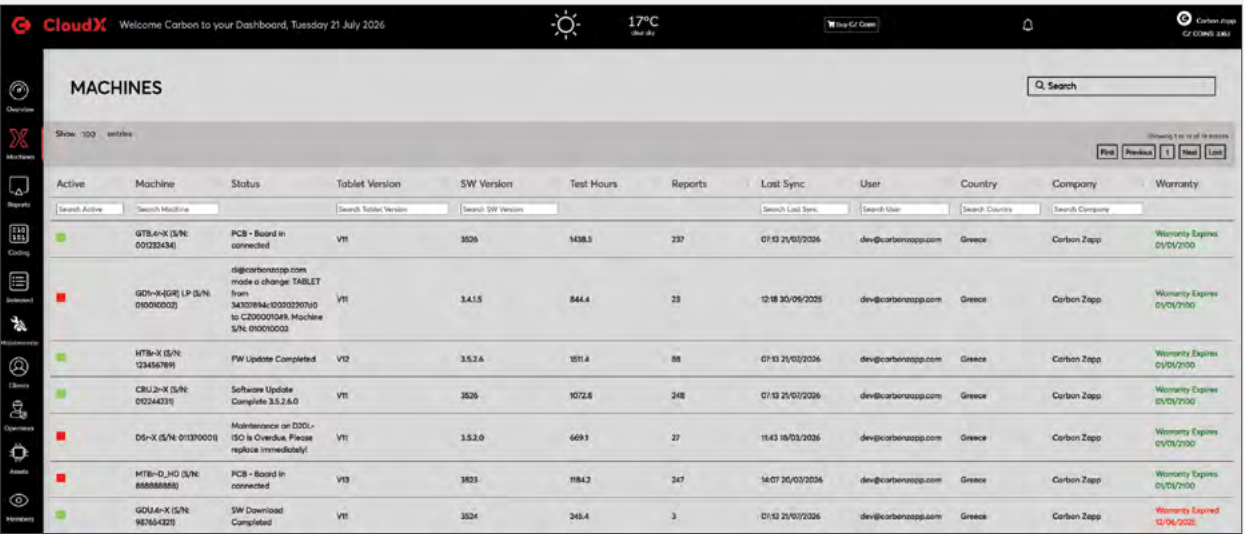
To activate a new feature online



CloudX
is Carbon Zapp IoT Cloud
computing Platform.



The CloudX overview at cloudx.carbonzapp.com Your job in numbers.



The screenshot shows the 'MACHINES' dashboard with a table of machine data. The table has columns for Active status, Machine ID, Status, Tablet Version, SW Version, Test Hours, Reports, Last Sync, User, Country, Company, and Warranty. The data is filtered to show 100 entries.

Active	Machine	Status	Tablet Version	SW Version	Test Hours	Reports	Last Sync	User	Country	Company	Warranty
Active	07BL4-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 Every machine, status and info in one secure view.

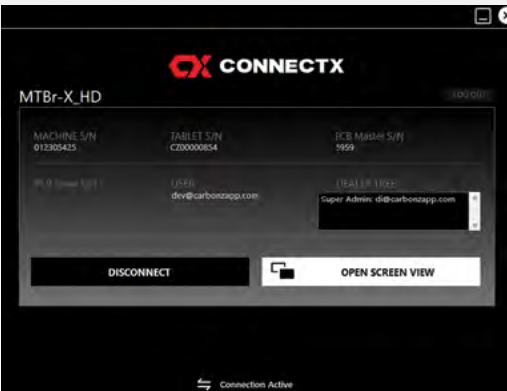


EXPERT FEATURES

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.

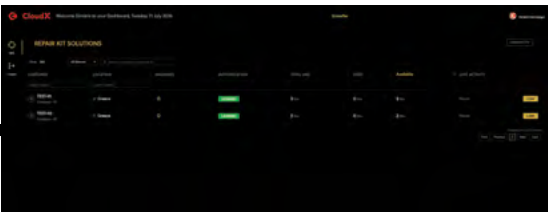
Entitlements are managed per user: only your authorized network can access and purchase your kits.

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.



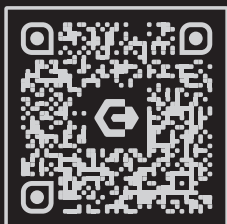
Scan the QR Code
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Scan and Explore
Complete CZ Solutions