

ANYbotics

ANYmal X

The autonomous inspection robot
built for explosive atmospheres.

ATEX-CERTIFIED FOR ZONES 1 AND 2 //

Certification details on page 5.

- Reduce routine human entry into hazardous areas
- Capture visual, thermal and acoustic asset-condition data
- Deliver inspection results to the systems your plant already uses



Ex-Zone inspections still **depend on people & paper.**

Hazardous-area inspections rely on fixed sensors and manual rounds. Together, they can leave gaps in asset coverage and in the condition data available to reliability and maintenance teams.

01 THE SENSING GAP

Assets beyond the fixed-sensor grid

Many pumps, valves, pipe racks and other assets remain outside the fixed-sensor grid. Their condition is often checked through manual rounds, requiring people to enter hazardous areas.

02 THE DATA GAP

Observations without a consistent record

Manual observations are often captured in paper checklists, free-text notes or disconnected systems. Without consistent asset-level records, changes are harder to compare and findings are harder to use in maintenance decisions.

AS A RESULT, OPERATORS FACE FOUR RECURRING PROBLEMS //

SAFETY

Routine exposure to plant hazards

Manual rounds put people close to hazardous equipment and atmospheres. Site-specific PPE, gas detection and access procedures add coordination and time.

UNPLANNED DOWNTIME

Failures develop between checks

Specialist thermal and acoustic surveys may be infrequent. Leaks, overheating and mechanical degradation can develop between visits, increasing the risk of process losses and unplanned downtime.

KNOWLEDGE DRAIN

Field knowledge is harder to retain

Experienced operators retire while many teams become leaner or more centralized. Inconsistent records make it harder to preserve field knowledge and support remote reliability teams.

COMPLIANCE RISKS

Inspection records must stand up to review

Required rounds must be completed and documented. Fragmented checklists make it harder to demonstrate what was inspected, compare findings and follow up on issues.

3–5×

COST OF AN UNPLANNED FAILURE
VS. A PLANNED REPAIR

41%

OF FATALITIES REPORTED TO
IOGP IN 2024 INVOLVED
EXPLOSIONS, FIRES OR BURNS

ANYmal X **takes people off routine rounds in hazardous areas** and creates a consistent asset-condition record from every inspection.

Autonomous inspection in Ex-Zones.

Actionable asset data.

ATEX-certified for Zones 1 and 2, ANYmal X brings autonomous inspection to hazardous process areas. Legged mobility extends coverage beyond the fixed-sensor grid, and ANYbotics Shift™ turns each round into structured asset-condition data.

WHY ANYMAL X //

01	02	03
Built for Ex-Zones ATEX certification enables autonomous inspection inside hazardous process areas. IECEx certification will be available with first production.	Coverage beyond fixed sensors Legged mobility brings multi-sensor inspection to assets beyond the fixed-sensor grid, so routine rounds no longer require people inside the zone.	Ready for the autonomous plant Shift creates asset-level records teams can compare and act on through existing systems, using a common workflow across robots and sites.



CAPABILITIES //

- Walk approved inspection routes across stairs, gratings and multiple levels
- Capture visual, thermal and acoustic data, with optional gas sensing
- Spot leaks with change detection, flag warnings with object detection and digitize the plant with advanced instrument readout
- Build repeatable condition records for comparison over time
- Deliver inspection results to CMMS, APM, DCS and enterprise systems through our REST API

Zones 1 and 2

ATEX · IIB T4 Gb

IP65

ROBOT INGRESS PROTECTION

45°

STAIRS · SLOPES UP TO 20°

–10 to 50 °C

CONTINUOUS OPERATING
AMBIENT TEMPERATURE

Preliminary specifications, subject to change. Refer to the product certificate and user manual for approved ratings and operating conditions.

Multi-modal inspection on every round.

ANYmal X captures visual, thermal and acoustic inspection data through a protected pan-tilt payload. An optional gas-sensing module adds route-based gas measurements.



Visual

Zoom imaging for instrument readout, equipment-state checks and visual change detection, including liquid leaks and component misalignment.



Thermal

640 × 512 radiometric imaging for hotspots, overheating and temperature changes. Readings can be compared by asset over time.



Acoustic

Acoustic imaging for gas and air leak localization. Microphone recordings capture equipment sounds for spectral analysis and mechanical fault screening.



Gas

Optional module. Measures selected combustible, toxic and atmospheric gases along inspection routes.

AVAILABLE GAS SENSORS //

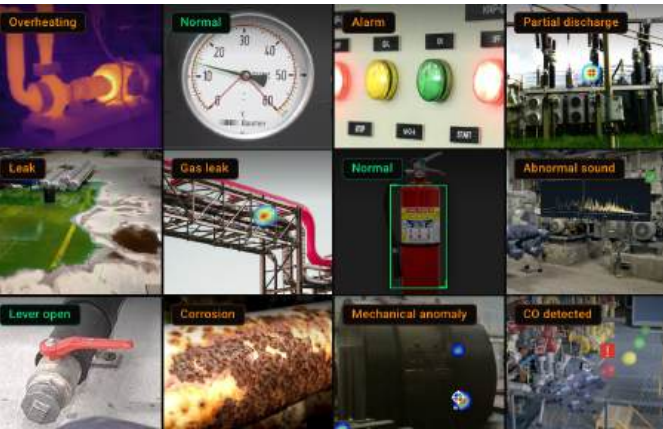
LEL (HC)	CH ₄	C ₃ H ₈	H ₂ S	NH ₃	CO	CO ₂	Cl ₂	SF ₆	SO ₂	O ₂
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Optional:

R134a	NO	NO ₂
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 up to 2 optional sensors

INSPECTION USE CASES //

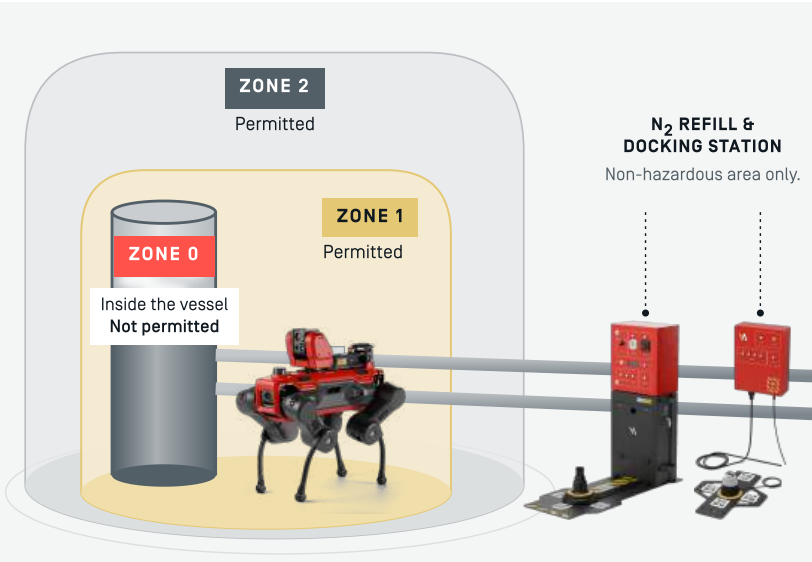


- Gas leak and presence detection across process areas
- Mechanical anomaly detection on rotating equipment
- Thermal analysis across flare lines, vessels and heat exchangers
- Visual change and object detection for liquid leaks and HSE status
- Component misalignment and surface wear inspection
- Equipment operational state verification
- Indicator, gauge and alarm monitoring
- Partial discharge detection in switchgear and substations

Certified for full operation in Zones 1 and 2.

ANYmal X holds an ATEX EU-type examination certificate issued by Bureau Veritas for Zones 1 and 2 [Gas Group IIB, T4]. It combines flameproof, pressurized and intrinsically safe protection to address ignition risks across the robot platform. IECEx certification will be available with first production.

GAS-ATMOSPHERE ZONE SCHEMATIC //



Schematic zone classification per IEC 60079-10-1. Illustrative, not to scale.

- Zone 0**
Explosive gas atmosphere present continuously, for long periods or frequently. Typically inside vessels and process equipment, not on walkable inspection routes. Not permitted.
- Zone 1**
Explosive gas atmosphere likely during normal operation. ANYmal X is permitted within its certified scope.
- Zone 2**
Explosive gas atmosphere unlikely during normal operation and, if present, persists only briefly. ANYmal X is permitted within its certified scope.

CERTIFIED SCOPE //

- Zones 1 and 2; EPL Gb, Category 2G
- Gas atmospheres up to Gas Group IIB
- Temperature class T4: maximum surface temperature 135 °C

EXCLUDED //

- Zone 0
- IIC gases, including hydrogen and acetylene
- Explosive dust atmospheres

SITE REQUIREMENTS //

- Conductive floors in Ex-Zones
- Verified stair configurations with guardrails in Zone 1
- Charging and nitrogen refill in the non-hazardous area only

ENGINEERED FROM THE GROUND UP FOR ZONES 1 AND 2 //

Four years of dedicated engineering addressed the ignition risks of a walking robot: electrical faults, hot surfaces, mechanical impacts and static charge. Protection is integrated across the complete platform.

Flameproof protection

Enclosures designed to contain internal ignition and prevent spread to the surrounding atmosphere.

Pressurization

Nitrogen overpressure keeps flammable gas out of protected enclosures. Pressure is monitored as part of the protection system.

Intrinsic safety

Designated circuits limit electrical energy to prevent ignition of the specified gas atmosphere under defined operating and fault conditions.

Battery management

Battery monitoring disconnects power when temperature, voltage or current limits are exceeded.

Walks the full inspection route autonomously.

Industrial plants are built for people, with stairs, grated walkways and narrow passages between pipe racks. Legged locomotion lets ANYmal X navigate the entire route unattended: across multiple levels and over gratings, gravel, concrete, metal or wet and oily surfaces.



MOBILITY HIGHLIGHTS //

45°

Stairs up and down; maximum rise 230 mm, minimum run 210 mm. Zone 1 stair configurations must be verified. Stair guardrails required.

250 mm

Obstacle step-over on approved inspection routes.

> 3 h

Battery runtime per charge.

0.6 m/s

Typical walking speed. Stairs: above 0.1 m/s.

80 cm

Minimum passage width. 90° turn in a 1 m corridor; overhead clearance as low as 60 cm (robot crouches).

0 lux

Navigation in darkness. Visual inspection uses onboard illumination.

FULL AUTONOMY, BUILT IN //

Onboard navigation

Navigation and route replanning run on board. The robot can adjust paths within the operating area where accessible alternatives are available.

Docking and mission resume

The robot returns to a dock in the non-hazardous area for charging. After charging, it can resume the inspection mission.

Offline mission execution

Stored missions can continue offline, with data buffered on board and synchronized with Shift when connectivity returns. Remote assistance requires connectivity.

FROM SITE MAPPING TO SCHEDULED ROUNDS WITHIN DAYS //

01 Prepare the plant model

Import point clouds or use handheld scans in Shift Maps. Define the asset hierarchy, inspection targets and excluded areas.

02 Configure and validate

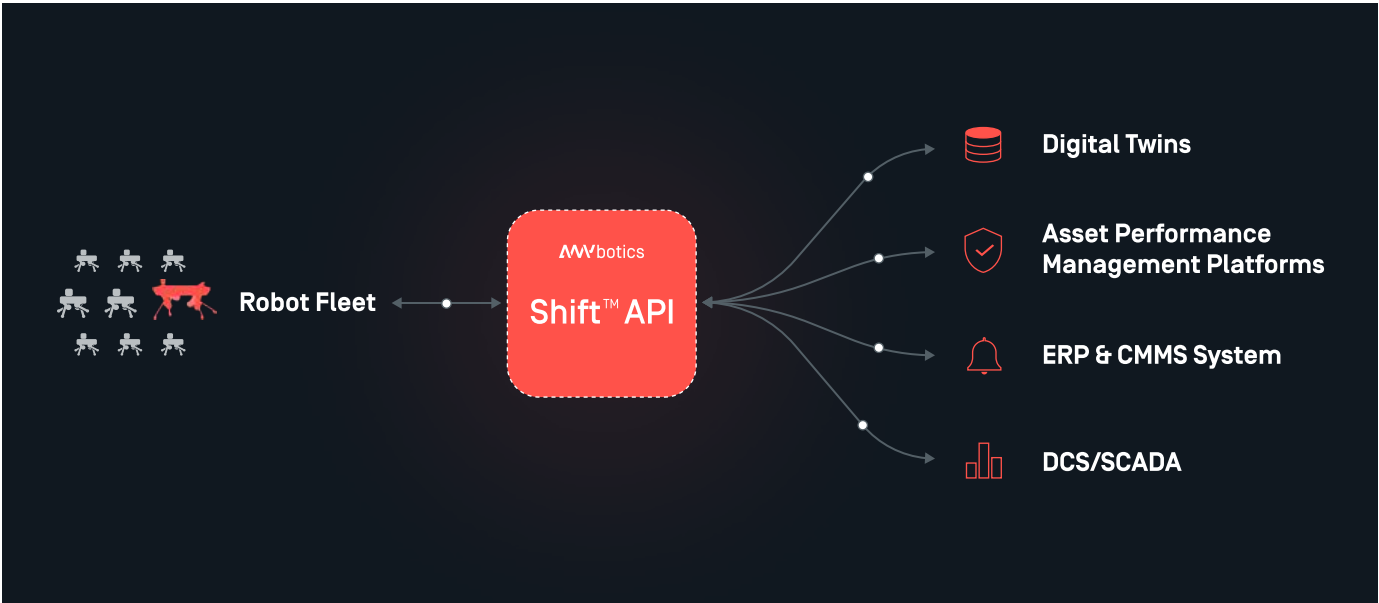
Use equipment templates to configure repeatable checks. Validate inspection tasks, routes, stair configurations and dock access against site conditions.

03 Schedule recurring rounds

Set mission schedules in Shift. Reuse validated missions on every round, and update them as site conditions or inspection requirements change.

From an inspection reading to a **work order**.

ANYbotics Shift™ connects your plant model, robot fleet, asset intelligence and maintenance systems in one workflow. Its four connected modules, supported by Shift AI, plan missions and analyze readings against asset history and operating conditions. Confirmed findings flow into your existing systems as work orders with inspection evidence attached.



01 Shift Maps

Minimize time to deploy

Import scans and asset data, connect them to 2D and 3D plant context, and reuse equipment templates — so a new site is ready for scheduled rounds within days.

02 Shift Fleet

Run the robot fleet

Schedule recurring rounds, monitor robot status and use tele-assist for exceptions. Coordinate charging, availability and task load across the fleet.

03 Shift Insight

Detect problems early

Analyze readings against asset history and operating conditions. Combine visual, thermal, acoustic and available gas data with trends and thresholds to identify anomalies and flag assets that need attention.

04 Shift Connect

Turn findings into work orders

Send confirmed findings into maintenance systems as work orders with evidence. Bidirectional APIs and connectors allow work orders, DCS thresholds and APM alerts to trigger new inspection missions.

INTEGRATION EXAMPLES //

SAP PM	IBM Maximo	GE Vernova APM	Yokogawa
Cognite	Siemens Energy	AVEVA PI	Honeywell
Emerson AMS	ABB	Oracle EAM	Palantir
Seeq			
SLB			

REST API for data landing, mission triggering, scheduling and monitoring, robot health and environment setup.

anybotics.com/solutions/shift

ENTERPRISE-GRADE //

- ANYbotics operates an ISO 27001-certified information security management system
- Single sign-on, role-based access and encryption in transit and at rest
- Managed cloud, customer-hosted cloud or on-premises deployment, as agreed for the project
- You retain ownership of your inspection data

Expand autonomous inspection across your plants.

A first route proves the business case. From there, the same robots, software and data model extend to more units and plants, so each step builds on the last.

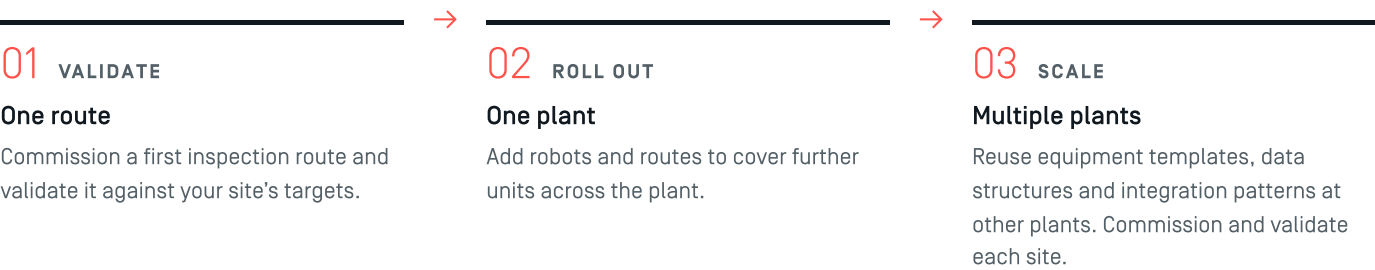
FLEET BENEFITS //

Wider coverage	More inspection routes and assets across the plant.
Higher frequency	Inspection schedules based on asset criticality and operating requirements.
Better data	Comparable findings across units and sites, so recurring issues stand out.

WHAT STAYS THE SAME //

Robot	ANYmal X robots and stations, deployed within the certified scope at each site.
Platform	Shared mission planning, fleet management and inspection results in Shift.
Data model	Consistent asset-level records across routes, units and sites.

FROM FIRST ROUTE TO FLEET DEPLOYMENT //



EXAMPLE BUSINESS CASE // PETROCHEMICAL SITE

~\$330K _{/yr}	84%	~4,900 h _{/yr}
Estimated annual value from automating operator rounds	of assessed inspection tasks identified as automatable	Estimated operator-hours freed for other work

Estimates for one site, based on assessed inspection tasks, round times and local labor costs, using a 75% takeover assumption. Figures exclude reliability benefits from early anomaly detection.

Trusted by industrial teams worldwide.

Results from existing ANYmal deployments show how regular, structured inspections support reliability, maintenance planning and safety. ANYmal X now brings the same approach into Zone 1 and Zone 2 areas.

Autonomous industrial inspection at scale

120,000+ inspections analyzed every month

1,000+ industrial assets monitored

POWER & UTILITIES //

SIEMENS energy

GE VERNOVA

SMUD

Kanadevia INOVA

amprion

EQUANS

MATERIALS //

NUCOR

CLIFFS

BlueScope

VICAT

TITAN

PRATT INDUSTRIES

CUSTOMER RESULTS //

GRACE | CHEMICALS

+1.5%

Increase in plant uptime

Autonomous inspection rounds at the Düren facility help identify anomalies and plan maintenance.

GE VERNOVA | UTILITIES

40%

Reduction in reactive maintenance

At a 500 MW power plant in Ireland, robot inspection data feeds GE Vernova APM and helps teams prepare maintenance for planned shutdowns.

OUTOKUMPU | METALS

80%

Reduction in employee exposure to hazardous environments

Autonomous inspections relay condition data to control rooms, so fewer site visits are needed.

VIGIER | CEMENT

33,000+

Inspections across 450 points in 16 months

Nightly rounds cover three mills across six floors. Readings are structured by asset, helping teams identify changes and plan repairs.

“ Having ANYmal X Ex-certified up to Zone 1 will really enable us to bring the robot very close to our process area, and that’s where you create value.

Iskandar Al-Thani Mahmood
Manager Robotics, PETRONAS

ANYmal X at a glance.

Key specifications for the robot, inspection payload and deployment infrastructure.

ROBOT //

Certification	ATEX; Zones 1 and 2; Gas Group IIB; T4; EPL Gb; Category 2G. IECEx certification will be available with first production.
Dimensions	960 × 596 × 1,015 mm [L × W × H]
Weight	92 kg
Walking speed	Typical 0.6 m/s; maximum < 1.3 m/s; stairs > 0.1 m/s
Battery	Lithium-ion; rated 42.9 V DC, 28 Ah, 1.2 kWh
Battery runtime	> 3 h
Ingress protection	IP65 robot; IP67 inspection payload
Intended service life	3 years post-sale, for the robot and safety-relevant components

MOBILITY AND NAVIGATION //

Stairs	Up to 45°; maximum rise 230 mm; minimum run 210 mm; open risers and grated steps. Only verified stair configurations in Zone 1. Stairs must have guardrails.
Inclines and declines	Up to 20°
Obstacle step-over	Up to 250 mm
Passage width	≥ 80 cm; 90° turn in a 1 m corridor
Overhead clearance	As low as 60 cm [robot crouches]
Obstacle detection	≥ 5 cm wide, ≥ 25 cm tall; ground clutter < 5 cm passable
Lighting	Operates in full darkness, 0 lux

OPERATING ENVIRONMENT //

Continuous operating ambient temperature	−10 to 50 °C
Charging temperature	0 to 45 °C
Storage / transport temperature	−10 to 50 °C
Humidity	5–95% operating, non-condensing
Rain	Operates in light (< 4 mm/h) and moderate (< 16 mm/h) rain
Altitude	0–2,000 m above sea level
Ex-Zone floor requirement	Conductive floors

INSPECTION PAYLOAD //

Visual	Zoom camera; visual change and object detection; advanced instrument readout
Thermal	640 × 512 radiometric imaging
Acoustic	Acoustic imager and microphone for leaks, mechanical faults and spectral analysis
Dimensions / weight	193 × 251 × 267 mm; 6.95 kg
Protection / interface	IP67; USB and Ethernet

GAS SENSING — OPTIONAL MODULE //

Combustible	LEL [HC], methane [CH ₄], propane [C ₃ H ₈]
Toxic / process	H ₂ S, NH ₃ , CO, CO ₂ , Cl ₂ , SF ₆ , SO ₂
Atmospheric	Oxygen [O ₂]
Optional	R134a, NO, NO ₂ ; up to 2 sensors

Gas measurements support inspection and are not a safety-rated alarm function.

DEPLOYMENT INFRASTRUCTURE //

Connectivity	Wi-Fi 6, 2.4 / 5 GHz; 5G / 4G LTE
Docking	Autonomous; dock installed in a sheltered location in a non-hazardous area
Station footprint	Docking station approximately 1 × 2 m; nitrogen refill station approximately 1 × 2 m [2 × 2 m combined]
Nitrogen supply	Purity ≥ 99.9%; oxygen content ≤ 0.1%

SOFTWARE //

Robot software	Localization, mapping, path planning, motion control and diagnostics
Operations platform	ANYbotics Shift™ with inspection intelligence and REST API
Hosting	Managed cloud, customer-hosted cloud or on-premises
Information security	ISO 27001

Preliminary specifications, subject to change. Refer to the product certificate and user manual for approved ratings and operating conditions.

Safe by design, supported from day one.

ANYmal X runs scheduled rounds in hazardous areas without an accompanying operator and returns to its dock in the non-hazardous area between missions. Hardware safety functions keep people on site informed and in control, and ANYbotics supports your team from the first assessment to scheduled operation.



Dock, charger and nitrogen refill station. Floor-mounted installation in a sheltered location in the non-hazardous area. Equipment footprint: approximately 2 × 2 m. Additional site clearances follow the installation requirements.

SITE OPERATIONS //

Docking	Autonomous; missions resume after charging
Battery runtime	> 3 h per charge
Nitrogen supply	Purity ≥ 99.9%; oxygen content ≤ 0.1%, supplied through the nitrogen refill station
Connectivity	Wi-Fi 6; 5G / 4G LTE; onboard offline buffering
Tele-assist	Remote assistance for mission exceptions
Support	Onboarding, ANYbotics Academy training and Customer Success support

HARDWARE BUILT FOR SAFETY //

Emergency stop

Hardware button immediately cuts power to the robot’s actuators.

Active warning light

Indicates that the robot’s actuators are powered on. Personnel keep at least 2 m away while the light is active.

ATEX-rated control tablet

Supports setup and robot control in approved hazardous areas. With the optional gas-sensing module, it also shows gas warnings. These do not replace site safety systems.

GETTING STARTED //

01 Business Value Assessment

ANYbotics reviews your inspection rounds and asset-health practices, builds a site-level ROI case and selects a validation site and use cases.

02 Preparation and onboarding

The ANYbotics field team supports commissioning, IT/OT integration and operator training. Your team provides site approvals, network access and coordination.

03 Go live

Missions are commissioned and validated on site before scheduled rounds begin. The setup then carries over to further units and plants.



Ready to take ANYmal X on site?

ANYbotics works with your team to define the business goals and routes ANYmal X should take over, then provides an offer for your site. Ask for a Business Value Assessment or an on-site demonstration.

TALK TO AN EXPERT

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