

Unmanned Excavator for Mine Detection & Clearing Product Brochure

Advanced Unmanned Systems for Anti-Mine Warfare Operations

Delivering safe, efficient, and field-proven solutions for mine detection and clearance in high-risk environments.

Field-proven systems deployed in real operational environments.



Unmanned Excavator Platform for Anti-Mine Warfare

The Unmanned Excavator is a remotely operated, dual-mode (manned/unmanned) ground system based on a modified hydraulic excavator, engineered for mine detection support and clearance operations in high-risk environments. The system utilizes a long-reach boom and arm assembly coupled with a 360° continuous swing turret, enabling extended operational envelope, high-precision positioning, and multi-angle engagement of suspected hazardous zones.

The platform supports dynamic sweeping operations through controlled articulation of boom, stick, and bucket/tooling, allowing scalable coverage patterns adaptable to terrain topology and mission requirements.

Integrated remote-control architecture supports beyond-line-of-sight (BLOS) operation via satellite communication systems (e.g., OneWeb and/or Starlink), with low-latency command and telemetry feedback.

“Engineered for safety. Proven in the field. Trusted for mission success.”



Unmanned Excavator



CAT 301, CAT 303 Cr. And CAT 303.5 Cr.

The Unmanned Excavator is specifically engineered for deployment in highland tropical forest environments with restricted access, limited maneuvering space, and low ground-bearing capacity. The system performs effectively in soft soil conditions and is well-suited for operations in areas with a high concentration of anti-personnel landmines, supporting safe, precise, and controlled clearance activities



Mine Clearing Module



Mine Detection Module

CAT 303 CR Mini Unmanned Excavator – Technical Specifications	
Machine Class	Mini Unmanned Hydraulic Excavator (Compact Radius)
Operating Weight	3,025 – 3,545 kg (depending on configuration)
Engine Model	Cat C1.1 Turbo
Net Power	17.6 kW (23.6 hp) @ 2,400 rpm
Displacement	1.1 L
Fuel Tank Capacity	45 L
Performance	
Maximum Digging Depth	2.9 – 3.0 m
Maximum Reach (Ground Level)	4.8 – 5.0 m
Maximum Dump Height	3.2 – 3.3 m
Maximum Cutting Height	4.6 – 4.7 m
Bucket Capacity	0.05 – 0.07 m ³
Tear-out Force	28.4 kN
Dimensions	
Transport Length	4.47 m
Width (Over Tracks)	1.55 m
Height (Cab)	2.5 m
Track Width	300 mm
Tail Swing Radius	0.9 m (compact radius design)
Ground Clearance	300 mm
Hydraulic & Mobility	
Travel Speed	2-speed (automatic)
Swing Speed	9 rpm
Boom Swing	Left: 75° / Right: 50°
Traction Force	3,305 lbf (14.7 kN)
Key Features (Engineering Relevance)	
Compact Radius (CR)	Reduced tail swing for confined areas
Stick Steer Mode	Joystick travel control
Auto Idle / Shutdown	Reduced fuel consumption
Tilt-Up Cab	Easy maintenance access
ROPS / TOPS Certified	Operator safety compliance

Anti Mine Operation – Technical Specifications	
Main Component	
Mine Clearing Module	Roller set (Default) or Customer Designed (Option)
Mine Detector Module	Integrated electromagnetic field detection system
CCTV Cameras	8 HD Cameras
Remote Control	Radio and Coaxial Cable
C2 Console	C2 Software, Laptop Computer and Protection case
Satellite Communication	Optional
Mine Clearing Module (Standard Rollers)	
Blast Survivability	Designed to enhance survivability against anti-personnel and anti-tank mine blast effects.
Maximum Sweep Radius	0 - 4 m. (CAT 303cr)
Width	1.6 m.(CAT303cr.), 1.8 m. (CAT303.5 cr) and 2.0 m. (CAT305.5E2)
Weight	160 kg - 190 kg. (Can be reached to 4 m.)
Roller diameter	20 cm.
Roller and Arms Material	High-strength low-alloy (HSLA) steel with reinforced structural design
Mine Detection Module	
Number of Detectors	12
Detection Coverage	2 m ²
Mine Marking	Color spay
Mine Location	GPS Position and Time stamp on customer tactical map
HD Camera units	2 Units on Stick with LED Lighting
Mine Location Photo Capture	Yes
Data recording	Mine Location, Date-Time, Photo capture
Data base structure	Microsoft Excel
Ground Disturbance Module	
Ground Disturbance Unit	2 Units' redundancy
Cameras	2 on Stick with LED Lighting redundancy
Safety path marker module	
Safety path marker Module	2
Marker Line Indicator	Calcium Hydroxide (Lime)
Mine Recovery Module	
Mine Fuse removal Tools	Under development
Mine Recovery Tools	Under development

Telecommunication Module

Radio Control	Professional Radio Control system 2.4 Ghz. Maximum Range 100 m.
Back up Control	RG-158 U or 50 Ohm. Coaxial Cable compatible 100 m.
Back up Control	1000 Base-SX 550m Multimode Fiber Optic TCP/IP IEEE 802.3z
Beyond Line of Sight (BLOS) (Optional)	Starlink or OneWeb with Cisco VPN.
Emergency Stop	Emergency Stop: Immediate engine shutdown
Signaling Loss	Fail-safe stop (machine stops movement while engine remains running)
Engine Start/Stop	From the remote operator or on-board operator

Unmanned Excavator Model

CAT 301 cr	UGV, for the mountain and rain forest mine detection and clearing, reduce risk to EOD personnel.
CAT 303	UGV, for the mountain and rain forest mine detection and clearing, reduce risk to EOD personnel.
CAT 303.5	UGV, for the mountain and rain forest mine detection and clearing, reduce risk to EOD personnel.
CAT 305.5	UGV, for the mountain and rain forest mine detection and clearing, reduce risk to EOD personnel.
CAT 307	UGV, for the mountain and rain forest mine detection and clearing, reduce risk to EOD personnel.
CAT 313D2	UGV, for the open flat area with wide scanning cost-effective operation and anti-tank-mine survivability
CAT 318	UGV, for the open flat area with wide scanning with cost-effective and anti-tank-mine survivability
CAT 320GC	UGV, for the open flat area with wide scanning with cost-effective and anti-tank-mine survivability



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Photo from Caterpillar: CAT command



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