

## THE UNIQUE DOUBLE TOOL UNMANNED DEMINING SYSTEM



# MV-10



The MV-10 is designed for demining and other associated tasks. It can be deployed in support of technical survey and clearance operations. While vast majority of the seriously produced demining machines in medium & heavy class include both a flail and a tiller, which are interchangeable, the MV-10 is the only robotic system in the world with double tool: front-positioned flail tool followed by a rear tiller.

Additionally, whilst other systems of similar class equipped with tiller head can withstand detonations from AT mines to its flail, the tiller is more vulnerable. The MV-10 is well secured from AT explosive affect due to its double tool structure and tiller head special design.

The system is capable of processing various types of terrain containing all types of AP and AT mines.

The flail and the tiller tools of the MV-10 can operate one at a time having both forward and backward rotation. Depends on terrain, the MV-10 system normally applies both tools – a rotating flail designed to activate or shatter AP and AT mines, and a tiller tool that follows as the secondary method and to keep the digging depth constant.



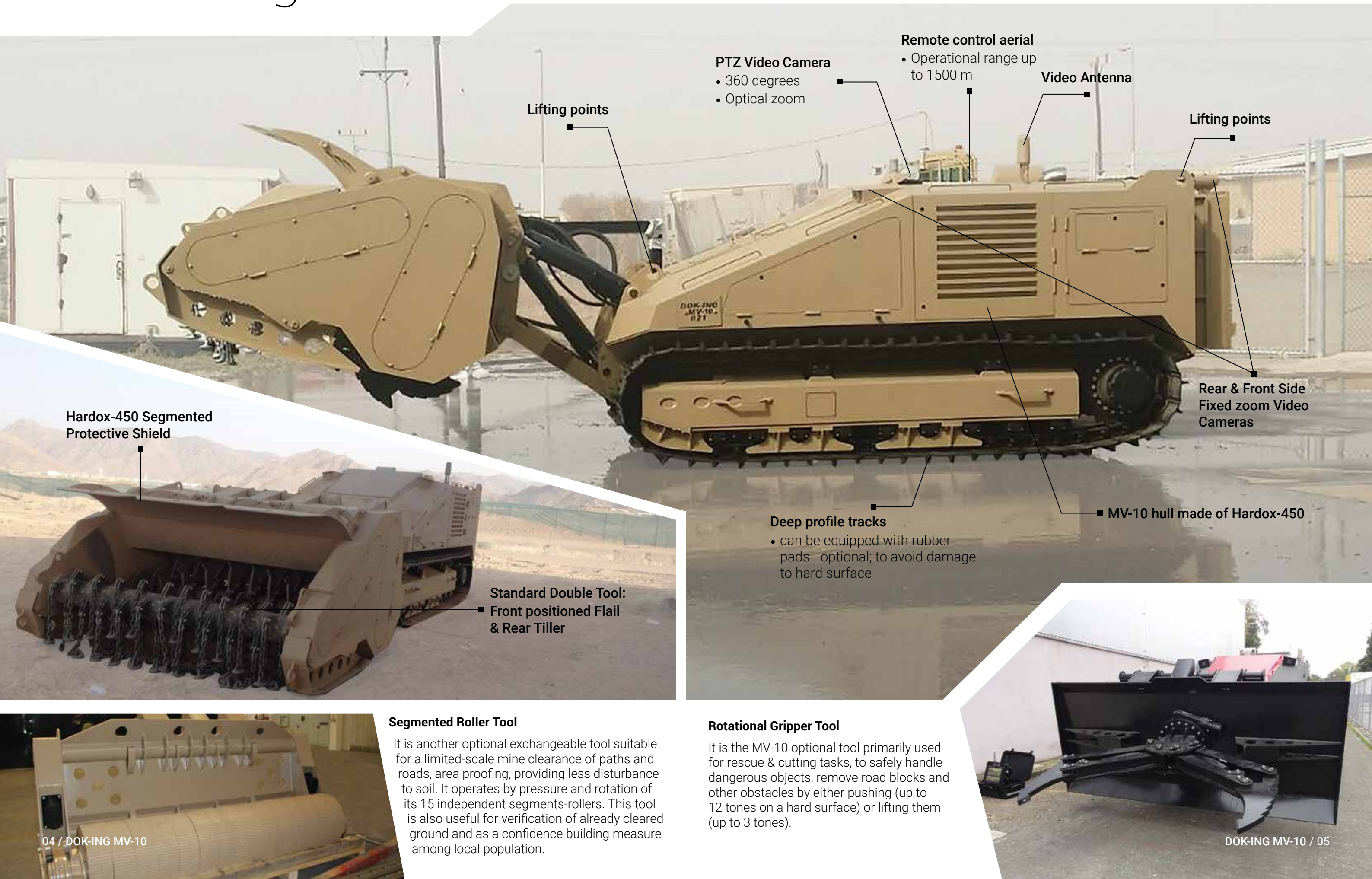
## **Excellent Maneuverability & Cross Country Performance**

In spite its respected size, the MV-10 has got excellent cross-country performance. Its robust structure and low silhouette in combination with the powerful engine enables the MV-10 to operate in steep slopes and overcome various obstacles (up to 2,0 m wide and 0,62 m high) and to pass through water up to 0.8 m deep. It is remote controlled system easy to operate by a single man from a safe distance up to 1500 m.





# MV-10 at glance



Lifting points

PTZ Video Camera

- 360 degrees
- Optical zoom

Remote control aerial

- Operational range up to 1500 m

Video Antenna

Lifting points

Rear & Front Side Fixed zoom Video Cameras

Hardox-450 Segmented Protective Shield

Standard Double Tool:  
■ Front positioned Flail  
& Rear Tiller

Deep profile tracks

- can be equipped with rubber pads - optional; to avoid damage to hard surface

■ MV-10 hull made of Hardox-450

## Segmented Roller Tool

It is another optional exchangeable tool suitable for a limited-scale mine clearance of paths and roads, area proofing, providing less disturbance to soil. It operates by pressure and rotation of its 15 independent segments-rollers. This tool is also useful for verification of already cleared ground and as a confidence building measure among local population.

## Rotational Gripper Tool

It is the MV-10 optional tool primarily used for rescue & cutting tasks, to safely handle dangerous objects, remove road blocks and other obstacles by either pushing (up to 12 tones on a hard surface) or lifting them (up to 3 tones).





## PROTECTION

The MV-10 Robotic System has got highly effective protection by the Swedish HARDOX-450 steel plates, which increase the MV-10 survivability. This special material is highly resistant to fragments of landmines, extreme temperature span, tear and wear.



## TRANSPORT OPTIONS

The MV-10 dimensions are within the required limits for road transportation, which is normally undertaken using a standard flat-bed or low loader trailer. It can also be air lifted by various cargo planes (C-130, C-5, IL-76 and similar). For sea transport the MV-10 Double Tool shall be detached from a Prime Mover and put into a separate 20" sea container.

## TRAINING

The major advantage of DOK-ING it is both producer and successful end-user of its demining robotic systems, hence the MV-10 machine is operator-friendly. Over 16 years history in practical demining with zero casualty rate, DOK-ING has transferred into a customer-focused comprehensive training course in English, Russian, Arabic, Croatian and other languages. All training is conducted in both theory and practice and provided for operators, mechanics and electricians.

The course is run for about 2-3 weeks depending on the number and type of the MV-10 supplied tools, future students' qualifications and their experience with remotely controlled demining robotic systems. Only candidates successfully passed training course and final test exam, would be certified to work with the MV-10.



## MAINTENANCE

The MV-4 is easily accessible for inspection, maintenance, trouble-shooting, repair and/or replacement. Maintenance and repairs can be carried out in a field or in a workshop conditions. The tools required for repairs and maintenance are standard wrenches and additional specially modified tools. The recommended preventive maintenance is on a daily basis, while regular service is required to carry out after every 200 working hours.

## AFTER SALES SUPPORT

As the commitment for a high-quality reliable service to its customers, DOK-ING maintains adequate stocks of spare parts at its premises, runs in-house full service capabilities and can send a rapid response technical team at a short notice worldwide.





**MV-10 TECHNICAL CHARACTERISTICS**

| Dimensional data  |  | Obstacle Negotiation                                    |   |
|---|--|---|---|
| Length without attachment (prime mover alone)                 | 4800 mm  | Hill climbing ability (max grade slope °)               | 40°   |
| Length total (w/std. flail/tiller tool)                       | 7227 mm  | Side slope (°)  | 30°   |
| Width without attachment (prime mover alone)                  | 2270 mm  | Vertical obstacle to climb                              | 51 cm   |
| Width total (w/std. flail/tiller tool)                        | 2930 mm  | Vertical obstacle to descend                            | 62 cm   |
| Ground clearance  | 450 mm   | Fording depth   | 80 cm   |
| Height overall (w/std. flail/tiller tool)                     | 2380 mm  | Trench width (w/std. double tool)                       | 200 cm  |
| Mass basic vehicle (prime mover w/lubricants, no fuel)        | 15 760 kg  | Specification of Mine Clearing Equipment                |   |
| Mass basic vehicle (prime mover w/lubricants & fuel)          | 16 163 kg  | Flail/Tiller tool dimensions (LxWxH)                    | 2810 x 2930 x 1775 mm   |
| Mass detachable tool(s)                                       | 1600 - 5200 kg   | Flail/Tiller tool weight (Hardox-450)                   | 4554 kg   |
| Mass overall MV-10 (w/std. flail tool, w/lubricants, no fuel) | 20 950 kg  | Flail/Tiller tool clearing width                        | 2450 mm   |
| Mass overall MV-10 (w/std. flail tool, w/lubricants & fuel)   | 21 350 kg  | Number of chains (Flail Tool)                           | 44  |
| Engine  |  | Flail drum diameter                                     | 406 mm  |
| Make & Model  | CATERPILLAR C18  | Flail rotation speed (rpm)                              | 0-1100 rpm  |
| Engine Description  | In-line, turbo-charged diesel, 4-stroke, water cooled, electronically regulated, 6 cylinders | Clearance depth (flail) in various terrain              | ≤30cm (depending on terrain)                                      |
| Rated power   | 570.5 kW (765 HP) at 2100 rpm  | Number of chisels (Tiller Tool)                         | 58  |
| Rotation direction (from flywheel end)                        | Counterclockwise   | Tiller drum diameter                                    | 475 mm  |
| Torque at rpm   | 3495 Nm at 1400 rpm  | Tiller rotation speed (rpm)                             | 0-540 rpm   |
| Engine weight (approximate)                                   | 1673 kg  | Clearance depth (tiller) in various terrain             | ≤40 cm (depending on terrain)                                     |
| Fuel capacity   | 480 liters   | Method of operation                                     | remote control  |
| Fuel consumption  | 25-50 liter/hour   | Control of clearance depth                              | automatically adjusted  |
| Cooling system type & volume                                  | water cooled, 80 liters  | Video control system                                    | optional, available on request                                    |
| Engine oil capacity   | 80 liters  | Protection level  | Hardox-450 plates   |
| Undercarriage   |  | Specification of Extra Attachable Operational Equipment |   |
| Tracks description  | Metal tracks 600 mm width, deep profile  | Rotational Gripper Tool                                 |   |
| Ground bearing pressure                                       | 0.69 kg/cm <sup>2</sup> (w/std. double tool)   | Rotational Gripper dimensions (LxWxH)                   | 2135 x 2500 x 1475 mm   |
| Power transmission  | Hydrostatic system   | Rotational Gripper weight                               | 1588 kg   |
| Type  | Independent for propulsion and any tool's operation  | Rotational Gripper claws' max opening                   | 1860 mm   |
| Gearbox (multiplying)   | Stiebel 4383, i=0.8125   | Rotation  | 360° in both directions   |
| Gearbox oil capacity  | 5,5 liters   | Rotational Gripper pushing capacity (hard surface)      | up to 12 tones  |
| Hydraulic oil capacity  | 420 liters   | Rotational Gripper lifting capacity                     | up to 3 tones (subject to a shape and material of lifting object) |
| Track gearbox oil capacity                                    | 2 x 1.5 liters   | Rotational Gripper claws' max pressure                  | 1500 kg   |
| Transport speed   | 0-7 km/hour  | Video control   | Optional, available on request                                    |
| Operating speed in clearing mode (flail/tiller)               | 0.1-0.8 km/hour  | Segmented Roller Tool                                   |   |
| Operating speed with segmented roller                         | 0.1-0.8 km/hour  | Segmented roller dimensions (LxWxH)                     | 1200 x 2987 x 1503 mm   |
|   |  | Segmented roller weight                                 | 4387 kg   |
|   |  | Number of rollers                                       | 15 Roller segments  |
|   |  | Roller segment diameter                                 | 535 mm  |
|   |  | Roller segment mass                                     | 170 kg  |
|   |  | Segmented roller drum diameter                          | 168 mm  |