DOK-ING

Innovative Solutions

THE UNIQUE DOUBLE TOOL UNMANNED DEMINING SYSTEM

MV-10

www.dok-ing.com

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 Perfomance

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

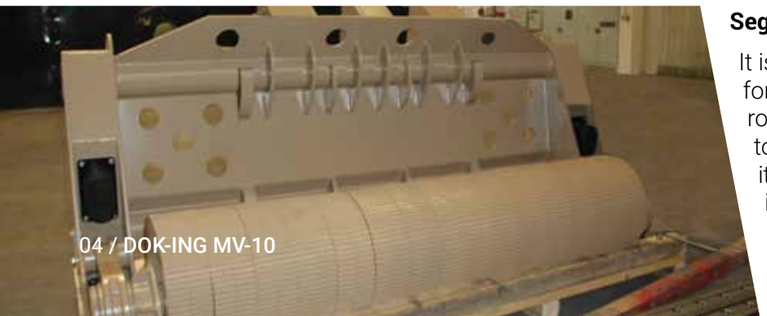
Rear & Front Side Fixed zoom Video Cameras

MV-10 hull made of Hardox-450

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

Hardox-450 Segmented Protective Shield

Standard Double Tool: Front positioned Flail & Rear Tiller



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.

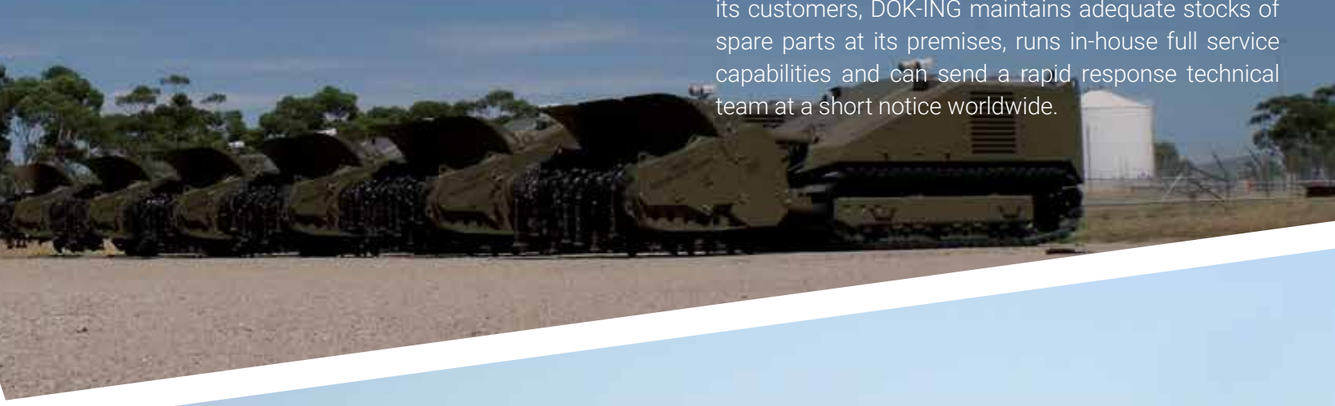
The course is run for about 2-3 weeks depending on the number and type of the MV-10 supplied tools, future students’ qualifications and their experience with remotely controlled demining robotic systems. Only candidates successfully passed training course and final test exam, would be certified to work 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	
Length without attachment (prime mover alone)	4800 mm
Length total (w/std. flail/tiller tool)	7227 mm
Width without attachment (prime mover alone)	2270 mm
Width total (w/std. flail/tiller tool)	2930 mm
Ground clearance	450 mm
Height overall (w/std. flail/tiller tool)	2380 mm
Mass basic vehicle (prime mover w/lubricants, no fuel)	15 760 kg
Mass basic vehicle (prime mover w/lubricants & fuel)	16 163 kg
Mass detachable tool(s)	1600 - 5200 kg
Mass overall MV-10 (w/std. flail tool, w/lubricants, no fuel)	20 950 kg
Mass overall MV-10 (w/std. flail tool, w/lubricants & fuel)	21 350 kg
Engine	
Make & Model	CATERPILLAR C18
Engine Description	In-line, turbo-charged diesel, 4-stroke, water cooled, electronically regulated, 6 cylinders
Rated power	570.5 kW (765 HP) at 2100 rpm
Rotation direction (from flywheel end)	Counterclockwise
Torque at rpm	3495 Nm at 1400 rpm
Engine weight (approximate)	1673 kg
Fuel capacity	480 liters
Fuel consumption	25-50 liter/hour
Cooling system type & volume	water cooled, 80 liters
Engine oil capacity	80 liters
Undercarriage	
Tracks description	Metal tracks 600 mm width, deep profile
Ground bearing pressure	0.69 kg/cm^2 (w/std. doublel tool)
Power transmission	Hydrostatic system
Type	Independent for propulsion and any tool's operation
Gearbox (multiplying)	Stiebel 4383, i=0.8125
Gearbox oil capacity	5,5 liters
Hydraulic oil capacity	420 liters
Track gearbox oil capacity	2 x 1.5 liters
Transport speed	0-7 km/hour
Operating speed in clearing mode (flail/tiller)	0.1-0.8 km/hour
Operating speed with segmented roller	0.1-0.8 km/hour

Obstacle Negotiation	
Hill climbing ability (max grade slope °)	40°
Side slope (°)	30°
Vertical obstacle to climb	51 cm
Vertical obstacle to descend	62 cm
Fording depth	80 cm
Trench width (w/std. double tool)	200 cm
Specification of Mine Clearing Equipment	
Flail/Tiller tool dimensions (LxWxH)	2810 x 2930 x 1775 mm
Flail/Tiller tool weight (Hardox-450)	4554 kg
Flail/Tiller tool clearing width	2450 mm
Number of chains (Flail Tool)	44
Flail drum diameter	406 mm
Flail rotation speed (rpm)	0-1100 rpm
Clearance depth (flail) in various terrain	≤30cm (depending on terrain)
Number of chisels (Tiller Tool)	58
Tiller drum diameter	475 mm
Tiller rotation speed (rpm)	0-540 rpm
Clearance depth (tiller) in various terrain	≤40 cm (depending on terrain)
Method of operation	remote control
Control of clearance depth	automatically adjusted
Video control system	optional, available on request
Protection level	Hardox-450 plates
Specification of Extra Attachable Operational Equipment	
Rotational Gripper Tool	
Rotational Gripper dimensions (LxWxH)	2135 x 2500 x 1475 mm
Rotational Gripper weight	1588 kg
Rotational Gripper claws' max openning	1860 mm
Rotation	360° in both directions
Rotational Gripper pushing capacity (hard surface)	up to 12 tones
Rotational Gripper lifting capacity	up to 3 tones (subject to a shape and material of lifting object)
Rotational Gripper claws' max pressure	1500 kg
Video control	Optional, available on request
Segmented Roller Tool	
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

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R&TTE Directive 1999/5/EC, EMC Directive 2004/108/EC,
Low Voltage Directive 2006/95/EC, Machinery Directive 2006/427EC
Other references: IMAS 09.50, CWA 15044:2009, CWA 15832:2008