



**DOK-ING**

Innovative Solutions

## ADVANCED ROBOTIC SOLUTION FOR CRISIS MANAGEMENT



# MVF-5 U3

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# MVF-5 U3

## Multifunctional Remote Controlled Robotic System for Emergency Response



### MAIN AREAS OF CURRENT & POTENTIAL USE

- Surveillance and Reconnaissance Tasks
- Unplanned Explosions at Munition Sites (UEMS)
- Rescue support operations
- Shooting Ranges Fire Control
- CRN threat Detection
- C-IED-supported Tasks and Missions
- Anti-Riot and Counter Terrorism Applications
- Flammable Materials Warehouses
- Oil Refineries & Terminals
- Petro Chemical Plants
- Chemical Plants and Warehouses
- Nuclear Power Plants
- Resource Logistic Supply



### GUARANTEED SAFETY

Today the MVF-5 U3 is the world's recognised tailor-made multi-purpose heavy-duty robotic system for emergency response. The MVF-5 U3 body is properly protected by HARDOX-450 steel plates. While its relative small dimensions and robust structure make it highly resistant to fragmentation and blasts, the MVF-5 U3 wide tracked chassis and incorporated 275 HP strong engine provide

exceptional cross-country manoeuvrability to overcome natural & man-made obstacles operating in the most unfriendly environment with radio-operated distance of up to 1500 m. This Unmanned Ground Vehicle (UGV) allows the MVF-5 U3 operator to remain outside of danger zone during operation of the system.

### MVF-5 U3 MAJOR AND SECONDARY OBJECTIVES

The primary objective of the MVF-5 U3 robotic system is fire extinguishing in extreme conditions, inaccessible areas of high risk, clear roadblocks and debris without direct threat to operators. Additionally, the MVF-5 U3 robotic system can be used to assist the first responders (fire trucks & their crews, rescue and medical emergency teams) getting faster & safer access to operational area and assist during people evacuation from areas surrounded by fire.

The previously developed and extensively used MVF standard equipment: set of video cameras with IR thermal camera, heavy-duty engineer tools, multi-source water supply capacity, system for fire suppression of

fires type A and B, set of sprinkler nozzles for self-cooling have proved to be highly effective. Furthermore, the current DOK-ING MVF-5 U3 system for emergency response can be equipped with extra tools and devices, including: various sensors (toxic industrial chemical (TIC), explosive gases and oxygen), CRN detectors, resource hauling (water, diesel and electricity supply), stand-off disruptor for C-IED, as added value. This extra equipment, for example, would allow using the MVF-5 U3 in the capacity of self-propelled decontamination station, life support system or autonomous remote controlled pumping station (by using set of flexible hoses towed by the MVF-5 U3 UGV) and even to locate and neutralize/destroy IEDs or any potentially dangerous objects.





# MVF-5 U3

At a Glance



## Remote Control Aerial

- Operational range up to 1500 meters

## Lifting Point

## Middle Pressure Fire Pump

- Pump output:  
2000 l/min at 10 bar

## Tank Capacity

- 2500 liters of water
- 500 liters of foam

## Low Profile Tracks

## Sensor Kit (TIC, explosive gases, oxygen)

## Gripper Camera

## Thermal Camera

## Video Camera

## Fire Extinguishing System

- Monitor mounted on  
hydraulic arm with range of 55 m

## Sprinkler System

- Self protection

## Side Video Cameras

## Rotational Camera

## Drive Camera

## Lifting Points

## Dozer Blade

- Can push up to  
10 tons of weight

## Rotational Gripper

- Can lift up to 2 tons  
of weight

## MULTIFUNCTIONAL TOOLS

### DOZER BLADE WITH ROTATIONAL GRIPPER

The MVF-5 U3 rotational gripper is used primarily as rescue and cutting tool, to safely handle dangerous objects with the maximum lifting capacity of up to 2000 kg. The gripper can also penetrate structures made of bricks and similar construction material, cut barbed wires, concertina and be used as the Jaws of Life during rescue support operations. In combination with the

attached dozer blade it ensures the MVF-5 U3 to remove debris, road blocks and other obstacles, and to conduct limited-scale fortification activities. Depending on surface type the dozer blade can push up to 10 tons of weight. The MVF-5 U3 combined dozer-gripper multi-tool enables rescue team or firemen to clear a path so that others can follow safely.



# TRAINING, MAINTENANCE & AFTER-SALES SUPPORT

## PROVEN PLATFORM

The MVF-5 U3 is the third product launched by DOK-ING, which has been designed based on the serious development, followed by rigorous testing and practical use of the previous and present DOK-ING systems in extreme environment. It is an example of highly advanced robotic vehicle incorporating state-of-the-art technology solutions that enables end-user to extinguish fires and conduct rescue support operations in the harshest, most demanding and life threatening conditions.

## FIRE EXTINGUISHING SYSTEM

The MVF-5 U3 is equipped with internationally proven fire extinguishing system. The industry leading components provide the UGV operator with a capability to use water, foam, or a combination of both extinguishing liquids. The MVF-5 U3 can spray up to 2000 liters of water or foam per minute. The MVF-5 U3 reservoir capacity consists of **2500** liters of water and **500** liters of foam. The water monitor is fitted on a specially designed 3-segment hydraulic arm, which enables fire extinguishing 360°. Alternatively the MVF-5 U3 can be fitted with 4000 l water tank without foam. A telescopic-type of water turret is available with the said option of the UGV. The MVF-5 U3 can be additionally connected to multiple sources of water and foam supply.

## VIDEO CONTROL SYSTEM

The MVF-5 U3 video control system allows the operator to have full control of vehicle movement during all phases of its operation. It consists of 8 high resolution and water-proof cameras. In addition to that, the MVF-5 U3 is also equipped with one thermal camera allowing it to operate during reduced visibility. The cameras are positioned on the water monitor (2 +1 thermal), gripper attachment (1) and the MVF-5 U3 prime mover (5), which allows the MVF-5 U3 operator to have consistent control over the system and its performance during various operational modes.



## TRAINING

The major advantage of DOK-ING it is both producer and end-user of its UGV's during numerous practical shows, demonstrations, training exercises and other related events, hence the MVF-5 U3 machine is operator-friendly. DOK-ING set up 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 MVF-5 U3 supplied tools, future students' qualifications and their experience with remotely controlled robotic systems. Only candidates successfully passed training course and final test exam, would be certified to work with the MVF-5 U3.

## MAINTENANCE

The MVF-5 U3 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.



## COMMAND AND CONTROL CENTER (OPTION)

The Command and Control Center (C&CC) is a wheel-based vehicle that serves both to provide extra security for the MVF-5 U3 crew and give a higher level control over its operation. Additionally, it is used as extra water supply source and method of transportation for the MVF-5 U3.

## AFTER SALES SUPPORT

After sales support is an integral part of DOK-ING everyday business. 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 or provide a high-quality technical support through its extensive in-country local agent network.

## TRANSPORTATION

Due to its compact size, the MVF-5 U3 can be easily moved by various means of transportation: from a standard 20 feet sea container to a standard flat-bed or low loader trailer. The MVF-5 U3 system is also air transportable by different cargo planes class of C-130 Hercules or IL-76 Cargo.

The most frequent mode of transportation is by road. Having precision driving power and steep climbing ability, the MVF-5 U3 can be loaded on any above-said trailer in few minutes.

Once in operational site, the MVF-5 U3 is ready for use in a couple of minutes.



## MVF-5 U3 TECHNICAL CHARACTERISTICS

Dimensional data	
Length without attachment (prime mover alone)	4420 mm
Length total (Gripper tool in transport position)	5750 mm
Length total (Gripper tool w/jaws extended)	6320 mm
Width without attachment (prime mover alone)	1530 mm
Width total	2280 mm
Ground clearance (depending on track plate type)	260-270 mm
Height overall	2240 mm
Mass basic vehicle (prime mover w/lubricants & fuel)	13000 kg
Mass overall MVF-5 U3 (w/lubricants, fuel, water & foam)	16000 kg
Engine	
Make & Model	CATERPILLAR C7.1 ACERT
Engine Description	In-line, turbo-charged diesel, 4-stroke, direct injection, water cooled, electronically regulated, 6 cylinders
Rated power	205 kW (275 HP)
Rotation direction	Counter clockwise (at flywheel)
Torque at rpm	1257 Nm at 1400 rpm
Engine weight (dry)	715 kg
Fuel capacity	240 liters
Fuel consumption	25 liters/hour
Cooling system type	Liquid cooled
Engine oil capacity	16 liters
Undercarriage	
Tracks description	Metal tracks 400 mm wide, profile optional
Number of metal track pads	51
Ground bearing pressure	0.68 – 0.84 kg/cm <sup>2</sup> (depending on water tank fill)
Power transmission	Hydrostatic system
Type	Independent for propulsion and any tool's operation
Gearbox (multiplying)	Stiebel 4382, i=0,6572
Gearbox oil capacity	5,5 liters
Hydraulic oil capacity	220 liters
Track gearbox oil capacity	2 x 2 liters
Transport speed	0-11 km/hour
Obstacle Negotiation	
Hill climbing ability (max grade slope °)	30
Side slope (°)	20
Specification of Fire-fighting system	
Ziegler Firefighting pump FPN 10-2000-2H	
Type	2-stage fire pump, middle pressure
Flow	2000 L/min at 10 bar
Management	Remote controlled

Foam system	
Type	Automatic dosage unit
Pump type	Gear pump
Flow	For 100 – 2000 l/min of water flow
Dosage	3 – 6 %
Management	Remote controlled
Water tank	
Capacity	2500 l (+/- 5%)
Filling pressure	4 bar
Foam tank	
Capacity	500 l (+/- 5%)
Filling pressure	4 bar
Roof monitor Ziegler ZW 16	
Installation position	Roof mounted hydraulic arm
Flow	1600 l/min at 10 bar
Management	Remote controlled
Range	Water aprox. 55 m, Water/foam aprox. 45 m
Hydraulic arm components	Base, arm, forearm, wrist (monitor)
Base rotation	360° in both directions
Specification of Attachable Operational Equipment	
Blade/Rotational Gripper Tool	
Rotational Gripper width	2280 mm
Rotational Gripper height	960 mm
Rotational Gripper length (jaws retracted-extended)	1345-1915 mm
Rotational Gripper weight	1100 kg
Rotational Gripper claws max opening	1450 mm
Rotation	360° in both directions
Blade pushing capacity	Up to 10 tones depending on surface type and object
Rotational Gripper lifting capacity	2000 kg
Video system	See separate video system specs
Protection level	Hardox-450 plates
Winch	
Winch drive	Hydraulic motor
Clutch	Manual
Rated pulling force	8165 kgf
Rope length	25 m
Gear reduction	36:1
Video system specs	
Number of cameras (total)	9
Number of cameras on the prime mover	5 (PTZ camera w/zoom, 4 Fixed cameras)
Number of cameras on the monitor	3 (Zoom camera, Thermal camera, Fixed camera)
Number of cameras on the gripper tool	1 (Fixed camera)
Optional Equipment	
Detectors	CWA (Chemical Warfare Agent) Detection TIC (Toxic Industrial Chemicals) Detection Radiation Detection
Sensors	Oxygen Temperature TIC (Toxic Industrial Chemicals) Explosive Gases
Other types of fire-fighting equipment	Pump Water monitor

All technical data are subject to possible MVF-5 U3 configuration change.