





Przemysłowy Instytut
Automatyki i Pomiarów PIAP



PIAP

NOT ONLY THE ROBOTS

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Industrial Research Institute for Automation and Measurements (PIAP) is first and foremost famous because its robots – from the smallest, throwable bots for the reconnaissance up to the large and heavy specialty robots, designed for counterterrorism and antiterrorism operations, especially EOD. But PIAP has also multiple other products like specialty vehicles.

PIAP V_{EOD} Typ – VMA1



Not so many people know that PIAP has in its offer also specialised vehicles – of course, the institute is not their manufacturer, but integrator who design specialised bodyworks and supplies an appropriate equipment. Now PIAP can boast of the few realised “vehicle” projects, including the **Mobile Robot Operator Centre (MROC)** and a **PIAP VEOD EOD vehicle PIAP V_{EOD}**.

The original vehicle developed in the PIAP is PIAP V_{EOD} Type – VMA1. This is a vehicle intended for a transport of two EOD techs together with all the equipment necessary to perform EOD/CIED duties. A base for vehicle is a Mercedes Sprinter in two versions: a standard one, in the case of a vehicle with a basic equipment, and a long one for a vehicle with an extended equipment range, with a collapsible mast providing with observation turret (it was necessary to make changes in the vehicle body structure). Normally, it has one driven axle, but on the request it is possible to deliver a car with a 4x4 drive system, and even in the typical off-road version – this option is connected with





the conversion of the bodywork and providing limitations in the transported equipment. Then, a vehicle is shorter and lighter. Optionally, a car can also be equipped with a winch which is transported inside and mounted, depending on the needs, in the front or rear position.

The **PIAP V_{EOD} Type – VMA1** crew comprises two persons travelling in the driver's cab, but there is a possibility to extend a team of one additional person who travels in the cargo space. Normally, these two spaces are divided by a wall, but at the request of customer – a bodywork can be made in the way that enables going from the driver's cab to the cargo space. An access to the interior is ensured by a door in the driver's cab, a sliding side door (on the right side) and a doubled doors in the rear part of the vehicle. In order to facilitate for a tech in the Explosive Ordnance Disposal (EOD) suit getting in and out of the car, under the side door is placed an ejected step equipped with a safety sensor which stops the movement of the step after touching an obstacle (e.g. legs of the team member).



A vehicle is capable to transport single EOD robot nb board (every robot from the offer of the PIAP fits in it), secured during the transport in the manner enabling movement, also during a road collision. A security system, with a working name of "Robofix", is an patented solution of the PIAP and enables a safe transport of the robots of the different manufacturers, both wheeled and tracked. In the nearest future is planned a modification of the rear part of the vehicle in the way that will enable an easier access to the equipment racks also when a robot is on board.

A robot is boarded and disembarked manually through an expandable ramp. It is equipped in the gas springs therefore it can be expanded by one hand. Additionally, a folded ramp has a possibility to deflect to the left in order to allow an access to the rear part of the cargo space.

A robot is controlled from the Mobile Robot Operation Station which can be docked in the work station in the front, left part of the cargo space. This station is equipped with a seat for operator which can be folded during a transport. Docking a robot control panel increases a range of the controlling signal, and by plugging into the electrical installation of the vehicle enables to using its power generator or terminal of the external electrical network. Besides controlling robots from the work station one may also edit on it the video materials or prepare a documentation – it is equipped with a printer.

An additional equipment (flashlights, binoculars, megaphone, soldering station, angle grinder, battery cordless screwdriver, extension cord, crow bar, shovel, hazard warning tape, etc.) are transported in the special racks. They have practically unlimited possibilities of configuration depending on the needs. An original solution of the fastening belts was developed by PIAP, and the shelves and mounting frames themselves were bought as COTS items.







The rack system can be operated with one hand – first of all it comes to fastening and unfastening of the straps which secure the equipment. The racks allow for transporting items of the different dimensions. They are equipped in the thoughtful system of the hooks and sockets enabling practically for an optional adjustment to the dimensions of the assembled cargo and easy fastening and taking off stripes. They allow for a safe transport of the loads with dimensions larger than the shelves, too.

Besides racks a vehicle is equipped with a box for the EOD suits (a light and a heavy one), but at a request it is possible to mount a hanger, also with an extended arm making donning the EOD suit easier.

There is also a special locker for personal weapon, ammunition and detonators in the cargo space. There is also social zone: a container for water, an electric kettle, a refrigerator and a microwave.

The power system of the vehicle allows for a load even of 13 KW and comprises an electric generator powered from the engine, system batteries and 230V external connection. Switching between the

power sources is performed automatically, depending on the source capacity, with a priority in saving batteries and securing them against the total discharging. The change of the power source is invisible to the user and does not cause interferences in the operation of the connected devices. The battery cells have life monitoring system which enables the operators to control such data as an operating time or a degree of charging and an alarm programming or turning off generator. In order to minimise a consumption of the electricity, all internal lighting is based on LEDs.

Certainly it is possible to equip vehicle with the equipment specified or provided by a customer – such an equipment is assembled in the manner that enables easy access to it, it can be also integrated with a controlling system and a power system of the vehicle.

All devices are mounted in such a way that ensures an easy disassembling when there is a need to handle or repair it, and a configuration of the conversion is susceptible to the optional modernisations or a change of the model of the concerned equipment.



A PIAP V_{EOD} Type – VMA1 was recently bought by one of the Arabic countries where it is used in the special police unit.

Weight:

GVW 5000 kg

2500 kg

Load capacity 1600 kg

Dimensions:

Length 7000 mm

Width 2000 mm

Height 2800 mm

Wheelbase 4300 mm

The smallest outer diameter of the turning circle 12,1 m

Engine – depending on the order