VODASERVIS s. r. o.
Jamská 2362 / 53, 591 01 Žďár nad Sázavou
tel. / fax: +420 566 620 587
obchod@vodaservis.cz www.vodaservis.cz

MOBILE WATER TREATMENT FACILITY

UMUV

TYPE: UMUV 01 – UMUV 25

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Basic description of facility

UMUV is a multi-purpose mobile water treatment facility which enables treatment from different sources of underground and surface water.

It uses distinguished technologies which all together enable connection in different operation modes depending on water chemistry and type of input water in order to get the required quality of output water.

Technological components of UMUV consist of integrated system installed either on the fixed frame which is placed on the euro pallet or a container (8-40´) according to its size. It enables its quick transport and fitting on the needed place with the minimal costs.

UMUV cleans up undissolved substances, iron, manganese, aluminum, organic substances including humic, color, water turbidity, NH_4 ions, heavy metals (Pb, As, Cd). Water is sanitary afterwards. It can be also extended by modules or facilities enabling to remove volatile substances, CO_2, radon or water salinity.

Use

This treatment facility is designed for the rapid deployment in the affected area or for the use of armed guards for a supply of rear, field hospital and similar facilities. Treated water can be used for immediate consumption, or stored in the accumulation water tanks.

- army – in the rear area, military field camps, during trainings or deployment within military peace missions, during decontamination activities within engineering activities;
- humanitarian help – during humanitarian supplying activities, in the refugee camps, for drinking water supply in the contaminated areas;
- civil protection – as a fixture of integrated emergency system, as a deployment during natural disasters, earthquakes or floods, contamination of traditional drinking water sources, disturbance of local infrastructure, ecological and natural catastrophes, etc.

If UMUV is to be used for permanent supply purposes, it would be preferable to design the equipment not of a standard design (see below), but with slight modifications to suit the given local conditions.

Performance parameters

		A	*B*			
Typ	**Amount of treated water daily in m^3**	**Number of supplied persons**	**Number of supplied persons**	**Weight in kg**	**Power inut in W**	**Dimensions width/depth/height in mm**
UMUV 01	9,6	3200	96	367	2005	800x1200x1400
UMUV 1	24	8000	240	857	2440	1600x2000x1600
UMUV 3	72	24000	720	1677	2840	2000x2700x1750
UMUV 5	120	40000	1200	2496	2940	2000x3500x2200
UMUV 10	240	80000	2400	3792	3840	2100x4400x2400
UMUV 15	360	120000	3600	7025	5240	2200x5700x2400
UMUV 20	480	160000	4800	9707	6120	2200x10000x2400
UMUV 25	600	200000	6000	11098	6620	2200x11600x2400

A - use of treated water only for drinking (3l/person/day)

B - use of treated water for common consumption (100 l / person /day)

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Description

Mobile water treatment facility **UMUV 01 – 25** is a compact automated facility which is placed on the self-supporting construction /palette or container with the transport possibility. The source of a power supply is a *power generator with a gas engine* (part of the delivery). It is placed under the shelter up to the maximum distance of 10m. UMUV can be also connected to the public electrical power network (it is necessary to provide minimum supply as it is supplied by the generator).

The facility contains its own *switchboard*. Grounding of facility frame and switchboard *(electrical cabinet)* must be done before the start-up via *grounding terminal* which is a part of standard equipment.

The pumping of raw water from the surface source is provided by *self-suction pump* with protection against dry running and the water is supplied to the plant by a suction hose of 8m length (part of the facility). The elevation of the plant and the distance from the source is determined by the pump characteristic – maximum distance 20m and maximum elevation 8m. In case of pumping from a greater distance, it is necessary to place a feed pump (optional equipment) into the source. When pumping water from deep boreholes, it is assumed to use an already installed submersible pump; eventually it is possible to supply a suitable pump with mounting and pipe material for starting (optional equipment).

The facility is fully automated and consists of three-level filtration in automatic *pressure filters TVK , TVK S* and *TVK U* which are filled by layers of various granularity sand, manganese removal material and activated carbon. Control of automatic valves for filter TVK is pneumatic. *Compressor* is the source of compressed air and it is a part of the facility. Filters TVK are controlled by control units with a microprocessor SIEMENS. Filter washing is done automatically. Water is not treated during washing. The waste water flows off through the *waste piping (10m)* out of the facility during filter washing.

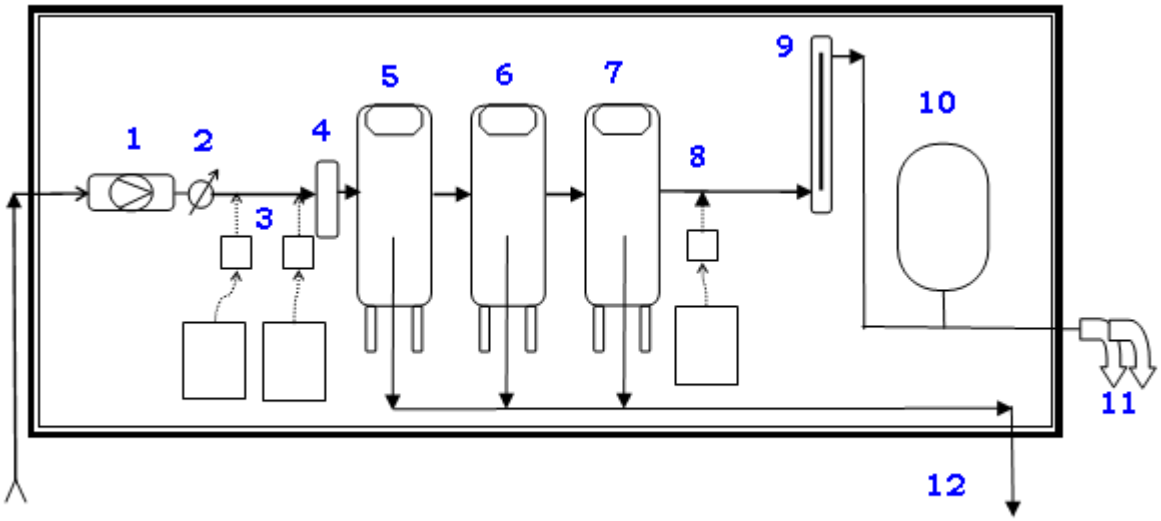
Pre-treatment of raw water before filtration is ensured by automatic chemical supply (commonly used in water-supply industry) according to its quality, flow and treatment requirements. The dosing of the chemicals is controlled according to the instantaneous water flow through a pulse hydrometer and two dosing pumps. The first set-up is done by the trained employee. In the standard design the chemical-coagulant PAX 18 is dosed. To ensure sufficient mixing of the dosed chemical, the treatment plant is equipped with a *mixing pipe*. There are two dosing pumps. The first one doses in front of the first sand filter TVK. In case of extremely impure water the second dosing pump switches on in front of the second sand filter TVK.

Disinfection of treated water is done automatically in 2 levels at the output. First level is done with a help of *pulse dosing pump* by the dose of sodium hypochlorite and second level through *UV radiation*. Then the treated water is accumulated in the *pressure tank* (part of facility) for immediate use.
Output of treated drinking water will be provided by two *taps* ½"with a possibility of disassembly and connection of outlet hose ½". It is also possible to include a larger accumulation (above standard equipment) for the treatment plant and to take water within two days of production.
Set of chemical dosing set-up including check-up measurement of free chlorine in the treated water and basic safety working aids (for the skin and eyes) are also parts of the facility. The water treatment plant consists of various electronic components, so it is necessary to ensure

an ambient temperature of +5 to + 45 ° C. The devices used to regulate the temperature in the container are not included in the standard delivery of UMUV.

We recommend ordering the service set of spare parts due to a necessity of immediate repairing of some worn-out parts.

Technological scheme – standard equipment



1. self-suction pump for raw water	**1pc**
2. pulse water flowmeter	**1 pc**
3. dosing pumps for pre-treatment	**2 pcs**
4. mixing pipe	**1 pc**
5. stainless steel pressure sand filter TVK	**1 pc**
6. stainless steel pressure manganese filter TVK S	**1 pc**
7. stainless steel pressure active carbon filter TVK U	**1 pc**
8. dosing pump for sodium hypochlorite	**1 pc**
9. UV radiation	**1 pc**
10. pressure accumulation of treated water	**1 pc**
11. intake taps	**2 pcs**
12. sewage water from filter washing	**1 pc**

Technical conditions for operation

- Normally it is necessary to place the facility under the shelter (covering for the free-standing placement – see option equipment)
- Grounding of frame and electrical cabinet via grounding terminal
- Outdoor temperature +5°C up to + 45°C
- Permanent supply of raw water
- Suction of raw water from the depth of max. 7m (increase up to 13m – see option equipment)
- Source distance max. 10m
- Guarantee of drinking water quality required in the ordinance of Czech Ministry of Health No. 252 Coll. dated 22.4. 2004 which fixes sanitary requirements for drinking water and by ordinance No. 187 dated 4.5. 2005 which supports the ordinance 252/2004 Sb. and according to drinking water quality guidelines of WHO 2004 („Guidelines for Drinking

Water Quality") is ensured in case of facility use for raw water quality of limiting values which are mentioned in the appendix No.13 enclosed to the ordinance of MH No.428/2001 Coll., category I. a II.); facility use for waters which do not meet the criteria of this ordinance should be consulted with the manufacturer
- Facility activation period from the finalization of electrical installation and piping connection is approx. 2-7 hours
- Set-up of chemicals dosing will be done by the trained employee
- Average daily service 1 hour

Optional equipment

- *Spare chemicals PAX 18, SAVO,* potassium permanganate
- *Spare UV radiator* – doubled sanitary protection (operation period 8000 hours)
- *Covering for UMUV 01* – proof against the dripping water (rain)
- *Car trailer* –transport possibility for UMUV 01
- *Feeding sewage pump 0,7 kW* – for the suction increase
- *Suction hose 10m, 1", incl. rapid coupling – for the possibility to connect feeding pump*
- *Outlet rubber hose 25m, 1/2", incl. rapid coupling* – connection to distant consumption point
- *Remote control*
- *Reverse osmosis unit*
- *Accumulation tank for treated water*
- *Water aeration device*
- *Etc.*

Product documentation and certificates

All manufacturing is certified according to ČSN EN ISO 9001:2001 and 14001:2005.
Technology of water treatment is manufactured from the facilities and materials with drinking water certificates.VODASERVIS, s.r.o. owns utility design of UMUV and filters TVK registered at Patent Office, Czech Republic.
Manual UMUV 01 (CZ).
Operation log (CZ).
Declaration of conformity of individual facilities.
Electrical revision.
Overseas packing.

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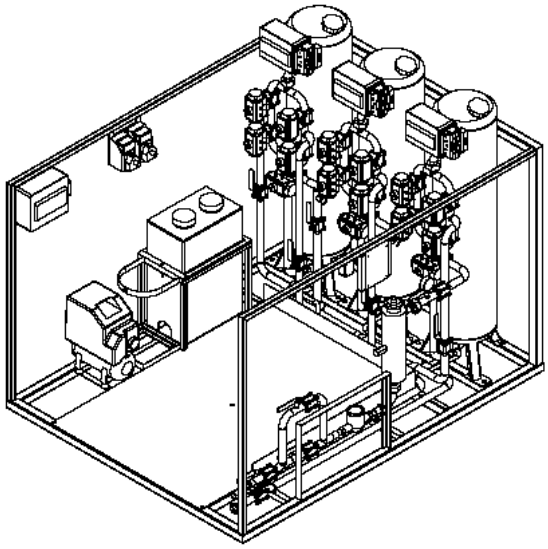
Illustrative pictures

UMUV manufactured for Army of Czech Republic

UMUV 1 in the small container at the fair



UMUV design preview

UMUV 01