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Vacuum Unit Ultima C200 VOD

Product No. VU20CVOD-VTS24V



(Note: example image - delivery may vary per product selection) Jets[™] Vacuum Unit is designed as a complete solution for vacuum evacuation of waste water in a sanitary system.

- The lightweight pump effectively creates vacuum and macerates waste water to a fine pulp.
- Compact multiphase pump design with a small footprint.
- The principle of operation is vacuum on demand (VOD[™]).

Warranty

All products of the company are sold and all services of the company are offered subject to Jets Vacuum AS General Sales Conditions detailing warranty and terms and conditions of sale, copies of which will be furnished upon request. The information provided herein is for guidance only; it does not constitute a guarantee of the performance or specification of any individual product or component.



Technical Data



| Туре | VOD™ (Vacuum on Demand) |
|-------------------|---|
| Pump Type | Multiphase |
| Capacity | 9.5 m³/n ACMH at 500 mbar (50% vacuum) |
| Weight | Approx. 20.7 kg (dependent on selection) |
| Connection Inlet | Ø 50 mm |
| Connection Outlet | Ø 32 mm |
| Conformity | Efficiency class IE1 in accordance with exceptions given in IEC60034-30 |
| Generic Material | PP |

Operating Data

Voltage......230-240V, 12VDC, 24VDC Note:.....Values are dependent on pump selection.

Patents and Trademarks

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Options

Optional functions compatible with this product.

VPDC: Vacuumarator™ Pump DC

Components

Construction Characteristics

| 1 Vacuumarator Tank Kit | 02U016035* |
|---------------------------------|--------------------------|
| 2 Damper for Ultima 200 series" | 02U016033* |
| 3 Lock nut w/flange | |
| (4) Screw, M6x25 | 036305010* |
| 5 Union with clamping ring | |
| 6 Elbow with clamping ring | 034512541* |
| (7) Vacuumarator™ | See options listed above |
| 8 Control System | Product Selection |

* Component/s avaliable as replacement parts.



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Vacuum on Demand (VOD™)

VOD[™] is a design that eliminates the need for piping to be under constant vacuum. Activating the system starts the pump and the build up of vacuum in the pipes sucks waste water into the Vacuumarator [™] pump, in sequence, pumping the content under pressure to a tank, sewer or other outlet type.

The VOD™ principle is an effective and environmentally friendly solution.

System Design

The Vacuum Unit is designed to transport waste water from a source, such as a toilet or grey water tank, to an outlet, such as a tank or mains sewer. Unlike conventional gravity systems, the vacuum unit uses air rather than water to transport waste. The waste water is drawn into the piping by the very air needed to transport it. This greatly reduces water consumption when compared to a standard gravity system.

The pump creates vacuum (negative pressure) in the pipe lines using vacuum on demand principles. Controller activation and deactivation of the unit, transfers waste water to the pump. The pump then grinds the sewage using an integrated macerator, and pumps it to a sewerage system of choice.

The pressure side (outlet side) of the vacuum pump operates under normal atmospheric pressure, separate from the suction (vacuum) side.

One advantage of vacuum pumping is that waste water can be pumped at an incline from the source to the tank, sewer or other outlet type. Water consumption is also greatly reduced.

The pumps lightweight design and small footprint make it ideal for a range of installation solutions including dwellings, cabins, small industrial applications and mobile solutions.

Jets[™] Control Systems

A variety of control options are available depending on installation size and site conditions.

The control system receives and activates signals in a VOD-system. It receives an activation signal (i.e. from a push button, level sensor etc.), which triggers the start/stop of the pump and the transportation of waste water through the unit.

Mode of Operation

The Ultima pump's main function is to create vacuum in a piping system. It has been designed for connection to any kind of sewage treatment plant, collecting tank or virtually any other processing or storage unit. The pump is a lightweight multiphase pump, designed with an in built macerator. The single-shaft design is unique in it's renowned simplicity. The principle of operation is a helical rotor running in a cylindrical housing, which together with two end plates, forms the pump body.

When the Ultima pump is in operation, a liquid ring is created around the rotor. The thickness of the liquid ring is governed by the size of the opening in the end plate on the pressure side. This opening is arranged so that the created liquid ring touches the rotor hub on one side and the rotor tips on the other. This arrangement creates a series of progressive crescent shaped cavities traveling from the suction to the pressure side. Air and waste water is pulled into those cavities and transported through the Ultima pump.

Waste water is macerated by the in built macerator before it enters the pump body. The macerator consists of one rotating knife fixed to the shaft and one stationary knife fixed to the suction chamber.

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Function and Principle - Jets™ Vacuum Unit

Explanation of the Vacuum Unit's Function

1 Inlet

④ Motor

2 Macerator

3 Helical Screw

⑤ Outlet
⑥ Motor Controller
⑦ Control System

⑦ Control Sy⑧ NR Valve





Normal Position - Unit Inactive

- Control System ⑦ INACTIVE
- NR Valve
 8 CLOSED
- Motor Controller
 6 INACTIVE
- Motor ④ INACTIVE
- Helical Screw ③ INACTIVE Macerator ② - INACTIVE

Running Conditions - Activated Sequence

- 1. Control System ⑦ RECEIVES/SENDS START SIGNAL
- 2. Motor Controler 6- RECEIVES/SENDS START SIGNAL
- 3. Motor ④ ACTIVATED
- 4. Helical Screw ③ ACTIVATED Macerator ② - ACTIVATED
- 5. Inlet ① FLOWS
- 6. NR Valve (8) OPENS
- 7. Outlet (5) FLOWS

Running Conditions - Deactivated Sequence

- 1. Control System 7 SENDS STOP SIGNAL
- 2. Motor Controller 6 SENDS STOP SIGNAL
- 3. Motor ④ DEACTIVATED
- 4. Helical Screw ③ STOPS Macerator ② - STOPS
- 5. Inlet ① FLOW STOPS
- 6. NR Valve (8) CLOSES
- 7. Outlet (5) FLOW STOPS



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Important Health and Safety Information

Installation, operation and maintenance must be carried out in strict accordance with this guide and with all applicable regulations. For your own protection and the protection of others, it is necessary to familiarize yourself with, and always follow, the contained safety and environmental precautions for our products.

This manual is an integral part of the product/delivery. Always keep it in a safe place for future reference. It is entirely the owner's responsibility to ensure that all safety and environmental measures, in accordance with local, state and federal laws are followed. Jets Vacuum AS assumes no responsibility for equipment damage, personal injury or death and/or delays that result from a lack of respect for the instructions for installation and/or use as stated in this documentation. Disregarding these instructions may invalidate all warranties.

Safety information references are in accordance with Jets Vacuum AS documentation system. If you do not understand the warnings, stop work immediately and contact Jets Vacuum AS (citing the safety reference number) for further clarification.

For further information about the included warnings or any other safety concerns please contact Jets Vacuum AS.

Safety Warning Symbols



General information to all users





Symbol denotes required personal protective equipment is required



Warns of biological materials that carry a significant health risk



CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or equipment damage.

Important Health and Safety Warnings



1.4 Warning Safety equipment (PPE) necessary for the prevention of accidents at the installation and operating site must be provided in accordance with local regulations



1.10 Warning

Failure to properly lift and support equipment can result in serious physical injury and/ or equipment damage.



2.6 Notice Place the equipment in an area that is easily accessible for maintenance

3.1 Warning All wiring should be performed by a licensed or certified electrician.



Ensure that the line voltage and frequency of electrical current supply agrees with the equipment specifications

3.10 Warning

For equipment fitted with a frequency converter: In European CE compliant installations and in other installations where EMC emissions must be minimized, make a 360° high frequency grounding of cable entries in order to suppress electromagnetic disturbances

3.15 Warning

For equipment fitted with a frequency converter: Always ensure by measuring with a multimeter (impedance at least 1 Mohm) that the following is observed.

3.17 Warning

Do not work on the control cables when power is applied to the frequency converter or to the external control circuits. Externally supplied control circuits may cause dangerous voltages inside the frequency converter even when the main power on the frequency converter is switched off.



When reconnecting the motor cable, always check that the phase order is correct.



Do not use plugs or connectors that are damaged.



ever work on the equipment when power is applied

Symbol denotes required personal protective equipment is required.

result in death or serious injury or equipment damage

WARNING: Indicates a potentially hazardous situation which, if not avoided could



Symbol denotes required personal protective equipment is required.



DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury or equipment damage



NOTICE: Indicates important information, which if not followed, may cause damage to equipment



1.5 Personal Protective Equipment - Goggles Wear safety glasses with side shields at all times when working with equipment.

2.1 Warning



The safety of the equipment is guaranteed only if it is used in compliance with the instructions provided by the supplier. The limits indicated must never be exceeded in any given situation.



2.11 Warning Beware of sharp surfaces

3.2 Warning

Never work on the equipment when mains power is applied. For equipment fitted with a frequency converter. After disconnecting the input power, always wait for 5 min to let the intermediate circuit capacitors discharge before you start working on the equipment.



Risk of electric shock. Never connect the green (or green and yellow) wire to a live terminal.



3.16 Notice

Voltage between frequency converter input phases U1, V1 and W1 and the frame is close to 0 V



Do not make any insulation or voltage withstand tests on the frequency converter or frequency converter modules.

3.20 Warning

The terminals on the equipment are at a dangerously high voltage when the input power is on, regardless of whether the motor is running or not.



3.27 Warning

Never work on the equipment when mains power is applied. For equipment fitted with a frequency converter: After disconnecting the input power, always wait for 5 min to let the intermediate circuit capacitors discharge efore you start working on the equipment. Before undertaking any electrical service, the main circuit breaker should be de-energized and labeled "out of service"



7.1 Warning To reduce the risk of electrical shock, the pump should be plugged directly into a properly installed and grounded 3-prong grounding type receptacle. The green (or green and yellow) conductor in the cord is the grounding wire. The motor must be securely and adequately grounded for protection against shock.

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3.6 Warning





3.18 Notice

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7.2 Warning

Do not touch an operating motor. Do not work on the equipment when the rotor is in operation. Before installation and maintenance work on equipment, stop the motor. Be aware of rotating parts of the motor.

7.4 Warning

Never place objects on top of the vacuum system. Restricting the vacuum system ventilation openings can cause overheating

Ŵ 7.6 Warning

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Never install, use or service any component of this device in an atmosphere with potentially flammable or explosive vapors.

7.8 Warning

Pump motor is equipped with an automatic resetting thermal protector and may restart unexpectedly. Protector tripping is an indication of motor overloading because of operating pump at low heads (low discharge restriction), excessively high or low voltage, inadequate wiring, incorrect motor connections or defective motor or pump.

7.10 Notice

DO NOT obstruct the openings and slits provided for ventilation and heat dispersal.

7.12 Warning

A pump is a pressure vessel. Any pressure vessel can explode, rupture, or discharge its contents if sufficiently over pressurized causing death, personal injury, property damage, and/or damage to the environment. All necessary measures must be taken to ensure over pressurization does not occur.



Disease Hazards: Effluent is a common mode of transmission for parasitic organisms. Some of these may be pathogenic, meaning that they may have the capability of causing serious communicable disease. Good personal hygiene, use of disinfectant soap and avoidance of hand to mouth transfer are necessary for all working in contact with the equipment. Skin abrasions, punctures or wounds of any other nature require immediate and proper medical attention

12.5 Notice

Use this equipment only in the manner intended by Jets Vacuum AS. If you have questions after reading these instructions contact Jets Vacuum AS directly.

Delivery, Receipt of Goods and Transportation

or distributor





12.6 Notice DO NOT use the Jets™ sanitary system if any component is damaged or missing

Goods to be protected against shock, dust, humidity and moisture. Suitable adequately dimensioned transporting equipment is to be used. Note that the equipment may contain components that are easily damaged as a result of inappropriate handling. Jets Vacuum AS is not responsible for or liable for delivery delays resulting from occurrences outside of Jets Vacuum AS' immediate control. On receipt of goods, check for visual damage. Any damage detected after dispatch should be reported immediately to Jets Vacuum AS. Damages and/or discrepancies must be reported in writing no later than eight (8) days after receipt of goods. Commissioning must be postponed until the equipment has been inspected. Do not dispose of damaged items. Your direct supplier will advise you of the procedure to follow.

Storage

The Vacuumarator™ has been designed to operate at peak performance under the following climatic conditions: Site to be a dry environment between 0°C and +45°C at altitudes <3000m above sea level. Operation above this altitude will result in de-rated values. Operation in temperatures above 45°C will result in reduced pump capacity. Use in environments below 0°C requires use of antifreeze. The site location is to be low vibration (Vrms ≤0.2 mm/s) with vibration resistance to acceleration up to 0.7g. The site is to be dust free, free from moisture, free from condensation and have an average relative humidity of maximum 95%.

Installation to End Use

The Vacuumarator™ pump has been designed to operate at peak performance under the following climatic conditions: Site to be a dry environment between +0°C and +45°C at altitudes ≤3000m above sea level. Operation above this altitude will result in de-rated values. Operation in temperatures above 45°C will result in reduced pump capacity. Use in environments below 0°C requires use of antifreeze. The site location is to be low vibration (Vrms ≤0.2 mm/s) with vibration resistance to acceleration up to 0.7g. The site is to be dust free, free from moisture, free from condensation and have an average relative humidity of maximum 95%.

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not insert any objects into the motor

7.5 Warning Never operate the vacuum system with the cover removed.



7.3 Danger



Do not handle the pump or pump motor with wet hands when standing on a wet or damp surface or when standing in water. Fatal electric shock may occur

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7.9 Warning Operation of any pumping system with a blocked suction and discharge must be avoided in all cases. Operation, even for a brief period under these conditions, can cause superheating of enclosed pump and result in a violent explosion. All necessary measures must be taken by the end user to ensure this condition is avoided

Keep fingers and foreign objects away from ventilation and other openings. Do



7.11 Warning

Do not run the pump dry. Running the pump without sufficient water will result in damage to equipment. Ensure that a sufficient water level is maintained. 7.15 Warning



Reverse operation will cause extenssive damage to the pump

12.2 Notice Additional and replacement parts should only be obtained from the manufacturer





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Installation

Lifting Instructions



1.10 Warning Failure to properly lift and support equipment can result in serious physical injury and/or equipment damage

When lifting any equipment, the following information is to be considered.

- Total weight.
- Center of gravity.
- Maximum outside dimensions.

For specific considerations, refer to the technical data for any of the supplied components.

Installation Site Considerations

- 1. Information required to determine floor spaces/installation space requirements can be determined from the dimensions drawings. Consider pipe installations and other installations such as mounting of the controller.
- 2. The location of the installation should have sufficient clearance around the pump to allow for ventillation and heat dispersal.
- 3. Installation must comply with all local, state and federal safety codes and practices.
- 4. Select a mounting plate/surface that is sturdy and will minimize vibration.
- 5. Components are to be installed in a location where they can be accessed for routine service and maintenance.
- 6. The control system is to be placed in a location where settings may be adjusted.
- 7. Check ambient conditions. If outside of limitations, insulate or ventillate as necessary.

Pipes and Plumbing

Information and recommendations regarding pipe connections and plumbing is available in Jets™ piping guide. Contact a Jets™ approved supplier for further information specific to your installation type.

All local, state and federal piping and plumbing regulations are to be observed. All pipe work should be carried out by a qualified and experienced plumber.

Tools

It is suggested that the following tools (not included in the delivery) be available during installation.

- Spanner
- Saw for cutting pipe lengths
- Phillips head screwdriver
- Knife
- 4 screws for mounting the controller (not included).

Outlet Pipe Connection

On the pressure side (outlet) of the pump, the outlet pipe must lift vertically (direct pipe) to a minimum height of 32cm (total height from the pump outlet). The maximum lifting height is 200cm.

For lifting capacity over and above the maximum lifting height, contact your local Jets™ supplier.

If there is an incline in the pipe connection from the outlet, a stop valve is recommended to prevent backflow during service and maintenance on the pump. Refer to Jets™ Piping Guide for details.

Non-Return Valve

The unit is delivered with a Vacuumarator Tank Kit. This kit acts as a non-return valve, providing the unit with a greater lifting capacity.

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Lifting Height - Outlet Pipe Connections



(A) Maximum 200cm

If there is an incline in the pipe connection from the outlet, a stop valve is recommended to prevent backflow during service and maintenance on the pump.

Refer to Jets™ Piping Guide for piping details and recommendations.

Installation Details

General installation information follows. Product related installation details are provided in the technical data for the following components. Please refer to their individual technical documentation for product specific installation details.

- Pump
- Control System
- Vacuumarator Tank Kit

Prior to Installation

Read and understand all documentation prior to starting installation. Ensure that all safety precautions have been taken in line with this document. Note that product installation information and details is located in the products technical data sheet.

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Installation Steps

NOTE! The following drawings are for illustration purposes only and may vary from the products included in the delivery. Please refer to the technical information provided for each component in the delivery for specific installation details.



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Carry out a system test for the control system.
 Carry out the startup procedure for the pump.

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Service and Maintenance

See service and maintenance recommendations for the following components. The information is located in the products technical information.

- Pump
- Controller

Spare Parts and Accessories

Available spare parts are indicated in the component list for the pump. Spare parts and accessories can be ordered via your local Jets Vacuum AS supplier. For multi-pump installations, a complete recommendation for spare parts is available. Contact your Jets Vacuum AS supplier for details.

- Disassembly of components may void the warranty.
- Refer to the technical data sheets for specific product information. Refer to the products troubleshooting information for general maintenance.
- It is recommended that service and maintenance routines be carried out in accordance with the information in this document.
- Note that spare parts may be available for sub-assembly products. See the individual product data sheets for spare part listings.

Service and Maintenance Assistance

Jets Vacuum AS provides all customers with 24 hour worldwide technical assistance. For urgent matters, please contact Jets Vacuum AS Service Department at +47 70 03 91 00. For other matters, please contact your nearest authorized supplier.

When making enquiries, please have the following information available.

- Order Number
- Pump model number.
- Pump serial number (the serial number identification is located on the label applied to the pump).
- Part number, description, quantity (see the product component list for details).

Disassembly Instructions

Prior to carrying out disassembly/assembly of the equipment, ensure that all safety information has been read and understood. Turn the power switch off and disconnect the power plug before starting any maintenance. Refer to the installation instructions and carry out the procedure in reverse.

Disassembly and assembly information for vacuum unit components is located in the products technical information.