



Assembly and Operating Manual

Constant pressure control

CON P1000

English

The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.

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The picture on the cover shows an example configuration. The product supplied may therefore differ from the illustration.

The original manual has been produced in the German language.

Information updated: print 26.01.2016
We reserve the right to make changes

Assembly and Operating Manual

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EC Declaration of Conformity

As required by EC Directive



Electromagnetic Compatibility (EMC) Directive 2004/108/EC

The manufacturer

ruck **Ventilatoren GmbH**
Max-Planck-Strasse 5
D-97944 Boxberg
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declares herewith that the product designated below in its conception and design, and in the version marketed by us complies with the requirements of the named EC directives. In the event of any changes to the product not approved by us, this declaration loses its validity.

Product designation: CON P1000

The following harmonised standards were used:

DIN EN 61000-6-1: 2007 Immunity for residential, commercial and light-industrial environments

DIN EN 61000-6-2: 2005 Immunity for industrial environments.

DIN EN 61000-6-3: 2007 Emission standard for residential, commercial and light-industrial environments

DIN EN 61000-6-4: 2007 Emission standard for industrial environments.

Responsibility for this declaration rests with:

ruck **Ventilatoren GmbH**
Max-Planck-Strasse 5
D-97944 Boxberg

Boxberg, 20.10.2015

A handwritten signature in black ink, appearing to read 'Andreas Seth'.

Andreas Seth
(Technical Director)

1. Important information

This manual contains important information on the safe and appropriate assembly, transport, commissioning, operation, maintenance, disassembly and simple troubleshooting of the product.

The product has been manufactured according to the accepted rules of current technology.

There is, however, still a danger of personal injury or damage to equipment if the following general safety instructions and the warnings before the steps contained in these instructions are not complied with.

- **Read these instructions completely and thoroughly before working with the product.**
- **Keep these instructions in a location where they are accessible to all users at all times.**
- **Always include the operating instructions when you pass the product on to third parties.**



1.1. Rules and regulations

Also observe the generally applicable, legal or otherwise binding regulations of the European or national legislation and the rules for the prevention of accidents and for environmental protection applicable in your country.

1.2. Guarantee and liability

ruck products are made to the highest technical standards in accordance with the generally recognized rules of the profession. They are subject to constant quality control and meet the relevant requirements when delivered. Because the products are being constantly developed, we reserve the right to make changes to the products at any time and without prior announcement. We do not accept any liability for the correctness or completeness of this installation and operating manual.

The warranty only applies to the delivered configuration. The warranty will not apply if the product is incorrectly assembled or handled or not used as intended.

2. General safety instructions

Planners, plant engineers and operators are responsible for ensuring that the product is installed and operated correctly.

- Exclusively use ruck Ventilatoren in good technical order and condition.
- Check the product for visible defects, for example cracks in the housing or missing rivet, screws and covers.
- Only use the product within the performance range provided in the technical data.
- Protection against contact and being sucked in and safety distances should be provided in accordance with DIN EN 294 and DIN 24167-1.
- Generally prescribed electrical and mechanical protection devices are to be provided by the client.
- Safety components must not be bypassed or put out of operation.
- The product may be operated by personnel with limited physical, sensory or mental capacities only if they are supervised or have been instructed by responsible personnel.
- Children must be kept away from the product.

2.1. Intended use

ruck CON P1000 has been designed and developed to comply with the requirements of the EU Low Voltage Directive 2006/95/EU. Use the CON P1000 in accordance with the EU Low Voltage Directive, and in conjunction with a device that is to be regulated by the CON P1000.

The device may only be taken into service when it is properly connected and the requirements of the EU Low Voltage Directive 2006/95/EU are fulfilled.

Observe the operating conditions and performance limits specified in the technical data.

Intended use includes having read and understood these instructions, especially chapter 2 “General safety instructions”.



2.2. Improper use

Any use of the product other than described in chapter “Intended use” is considered as improper. Also note the following points, which are improper and dangerous:

- Operation in a potentially explosive atmosphere.
- Installation outside without any protection against the weather.
- Operation in ambient conditions that require a higher degree of protection than IP55.

2.3. Personnel qualifications

Assembly, commissioning and operation, disassembly and service (including maintenance and repair) require basic mechanical and electrical knowledge, as well as knowledge of the appropriate technical terms. In order to ensure operating safety, these activities may therefore only be carried out by qualified technical personnel or a person under the direction and supervision of qualified personnel. Qualified personnel are those who can recognize possible hazards and institute the appropriate safety measures due to their professional training, knowledge, and experience, as well as their understanding of the relevant conditions pertaining to the work to be done. Qualified personnel must observe the rules relevant to the subject area.



2.4. Safety instructions in this manual

In this manual, there are safety instructions before the steps whenever there is a danger of personal injury or damage to the equipment. The measures described to avoid these hazards must be observed.

Safety instructions are set out as follows:

| | |
|---------------------------------------|---|
| Safety sign (warning triangle) | - Draws attention to the risk |
| • Type of risk | - Identifies the type or source of the hazard. |
| » Consequences | - Describes what occurs when the safety instructions are not complied with. |
| → Precautions | - States how the hazard can be avoided. |

| Safety sign (warning triangle) | Denotation |
|---|--|
|  | General warning! Indicates possible hazardous situations. Failure to observe the warnings may result in personal injury and / or damage to property. |
|  | Electricity warning (hazardous voltage)! Indicates possible hazards due to electricity. Failure to observe the warnings may result in death, injury and/or damage to property. |
|  | Important instructions follow! Instructions for safe, optimum use of the product. |



2.5. Adhere to the following instructions

2.5.1. General instructions

- Observe the provisions for accident prevention and environmental protection for the country where the product is used and at the workplace.
- Persons who assemble, operate, disassemble or maintain ruck products must not consume any alcohol, drugs or pharmaceuticals that may affect their ability to respond.
- Responsibilities for the operation, maintenance and regulation of the product should be clearly determined and observed so that there can be no unclear areas of responsibility with regard to safety.
- Never overload the product. Do not place anything on it.
- The warranty only applies to the delivered configuration.
- The warranty will not apply if the product is incorrectly assembled or handled or not used as intended.

2.5.2. During installation

- Disconnect all of the product's poles from the mains before installing the product or connecting or removing plugs. Make sure that the product cannot be switched back on again.
- Lay cables and lines so that they cannot be damaged and no one can trip over them.
- Before commissioning, make sure that all gaskets and seals in the plug-in connections are correctly fitted and undamaged in order to prevent fluids and foreign matter getting into the product.
- Information signs must not be changed or removed.

2.5.3. During commissioning

- Make sure that all electrical connections are either used or covered. Commission the product only if it is installed completely.

2.5.4. During operation

- In an emergency, or if there is a fault, or other irregularities, switch the equipment off and make sure it cannot be switched back on again.
- The technical data given on the rating plate must not be exceeded.

2.5.5. During maintenance and repair

- If operated correctly, ruck products only require a minimum amount of maintenance. Please follow all of the instructions given in section 10 in this respect.
- Make sure that no connections or components are loosened unless the device is disconnected from the mains. Make sure that the equipment cannot be switched back on again.
- Individual components must not be interchanged. For example, the components intended for one product may not be used for other products.

2.5.6. Disposal

- Dispose the product in accordance with the currently applicable national regulations in your country.

3. Delivery contents

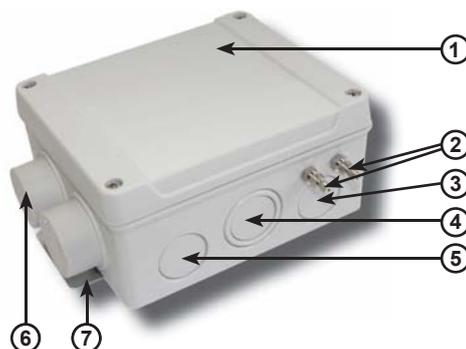
Included in delivery depending on model type:

- 1 x CON P1000 Constant pressure control
- 1 x installation and operating manual

4. Product and Performance description

The ruck Constant Pressure Regulator is used in ventilation plant to maintain a constant pressure level. The Constant Pressure Regulator is installed in a plastic housing that has degree of protection IP55. It must be possible to adjust the speed of the fan by means of a 0-10V DC voltage. Commercially available frequency converters are suitable, as are EC motors. The regulator can be operated without the control unit, but its use makes commissioning much easier; the control unit is available as an accessory. The set-point and current values can be displayed on the control unit.

4.1. Device description



Legend

1. Cover
2. Differential pressure connections
3. Cable glands M25
4. Cable glands M25/32
5. Cable glands M25
6. Cable glands M32
7. Mounting bracket

Fig. 1:
CON P1000 Constant pressure control



5. Transport and storage

Transport and storage should only be performed by specialist personnel in accordance with the installation and operating manual and regulations in force.

The following points should be noted and followed:

- Check the delivery according to the delivery note to ensure it is complete and correct and check for any damage. Any missing quantities or damage incurred during transport should be confirmed by the carrier. No liability is accepted if this is not observed.
- Avoid damage or deformation of the housing.
- The product must be stored in a dry area and protected from the weather in the original packaging. Even weatherproof modules should be covered because their weather resistance is only guaranteed after complete installation.
- Storage temperature between $-10\text{ }^{\circ}\text{C}$ and $+40\text{ }^{\circ}\text{C}$. Avoid severe temperature fluctuations.



6. Assembly

Assembly work may only be performed by specialist personnel in accordance with the installation and operating manual and the regulations and standards in force.

The following points should be noted and followed:

- Installation accessories should be provided by the client.
- Only suitable installation aids, in accordance with regulations, should be used.
- The installation should be easily accessible for maintenance and cleaning and should be easy to dismantle.
- The unit should only be installed with authorized and suitable fastening materials at all fastening points.
- Do not distort the unit when installing.
- No holes should be made in the housing, or any screws screwed into it.

7. Electrical connection



- **Electricity warning (hazardous voltage)!**
- » **Failure to observe the hazard may result in death, injury or damage to property.**
- **Before performing any work on conductive parts, always disconnect the unit completely from the electricity supply and make sure that it cannot be switched back on again.**

Electrical installation may only be performed by qualified electricians in accordance with the installation and operating manual and the national regulations, standards and guidelines in force:

- EN, DIN and VDE specifications, including all safety requirements.
- Technical connection conditions
- Safety at work and accident prevention requirements.

This list does not claim to be complete.

Requirements should be applied under one's own personal responsibility.

The following points should be noted and followed:

- The electrical connections must be made as shown in the corresponding wiring diagrams and terminal diagrams.
- The type of cable, size of cable and method of laying should be determined by an authorized electrician.
- Low and extra-low voltage cables should be laid separately.
- An all-pole mains disconnection device with at least 3 mm contact gap must be provided in the supply line.
- Any cable inlets that are not used must be sealed so that it is airtight.
- All cable inlets must have strain relief.
- Check all protective measures after the electrical connection work (earthing resistance, etc.).



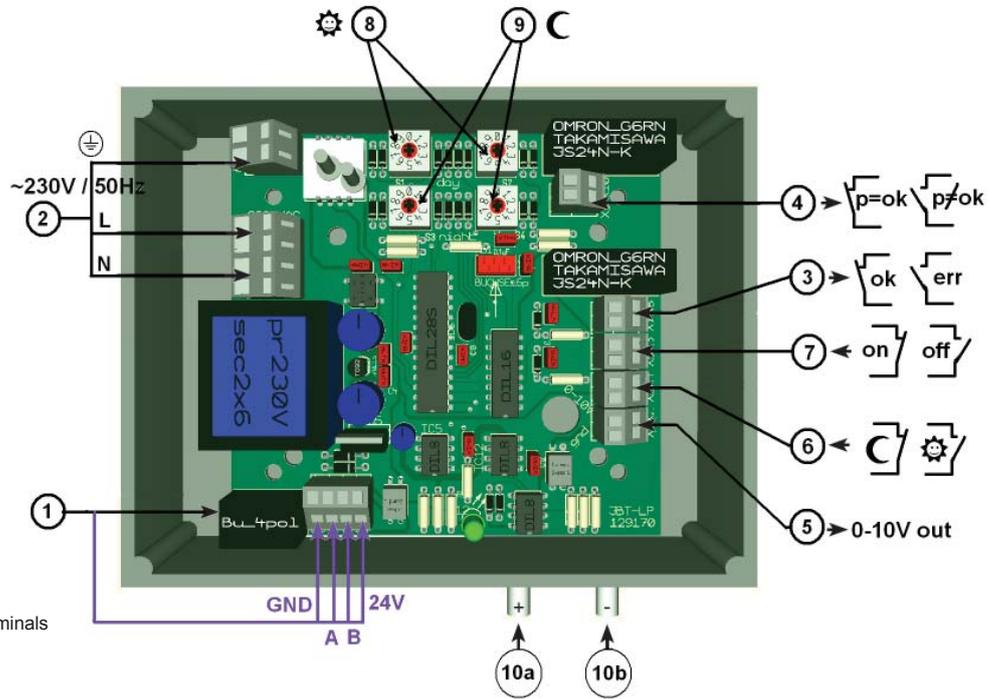


Fig. 2:
Connection terminals
in the regulator

- | | |
|--|---|
| <ul style="list-style-type: none"> 1. Socket for control unit (optionally) 2. Power supply 230V AC 50/60Hz 3. X7, X8 Potential-free contact for enabling frequency converter $I_{max} = 1A$ $U = 24V$ 4. X9, X10 Potential-free contact (set-point reached). $I_{max} = 1A$ $U = 24V$ 5. X1 = GND/X2 = 0-10V DC Analog output | <ul style="list-style-type: none"> 6. X3, X4 Open: day-time operation Closed: night-time operation 7. X5, X6 Open: regulator OFF Closed: regulator ON 8. Set-point: day 10-990 Pa 9. Set-point: night 10-990 Pa 10a. Pressure + Pressure measurement connection for 3-6 mm internal diameter hose. 10b. Pressure - Pressure measurement connection for 3-6 mm internal diameter hose. |
|--|---|



Only potential-free contacts may be connected at terminals X3 and X4, and X5 and X6. Applying an external voltage can seriously damage the regulator. The regulations for safety extra-low voltages must be observed.

The maximum pressure in a ventilation plant must not exceed 5000 Pa. This would result in severe damage to the regulator.

Control unit connection (optionally)

The control unit is connected to the supply air unit's control system with a control cable. A connector on the control cable is plugged directly into the socket on the control unit from beneath (see Fig. 4). At the regulator, the control cable passes first through a cable gland and is then connected at its RJ10 socket on the regulator PCB.

The control cable must not be shortened. Any excess length must be stowed outside of the housing. If the cable is too short, extensions can be ordered from the manufacturer or supplier.



Low voltage control leads must be installed so that they are separated from mains leads.

8. Commissioning



- **Electricity warning (hazardous voltage)!**
- » **Failure to observe the hazard may result in death, injury or damage to property.**
- **Before performing any work on conductive parts, always disconnect the unit completely from the electricity supply and make sure that it cannot be switched back on again.**

Commissioning by trained technical personnel may only be performed when any risk has been ruled out. The following checks should be performed in accordance with the installation and operating manual and the regulations in force:

- Check all mechanical and electrical protection measures (e.g. earthing).
- Voltage, frequency and type of current must correspond with the rating plate.
- Check all electrical connections and wiring.
- Check any electrical, switching, safety and control devices connected.
- Connect pressure measurement hoses!

9. Operation

9.1. Operation without a control unit

Switching the regulator on and off

Bridging terminals X5 and X6 switches the constant pressure regulator CON P1000 on, and removing the bridge switches it off again.

Changing day-time set-point

Adjust set-point Day with the decade switches (8).
e.g. $3 \cdot 2 = 32 \times 10 = 320 \text{ Pa}$

Adjusting the night-time set-point

Adjust set-point Night with the decade switches (9).
e.g. $4 \cdot 1 = 41 \times 10 = 410 \text{ Pa}$

9.2. Operation with a control unit *(optionally)*



Attention: When disconnecting the remote control from the unit, all adjusted parameters are deleted. Then the parameters are valid which have been adjusted at the rotary switch.

The control unit is used for controlling and entering various functions. The display shows the various operating parameters and error messages. You can select individual menu points or change values with the various buttons.

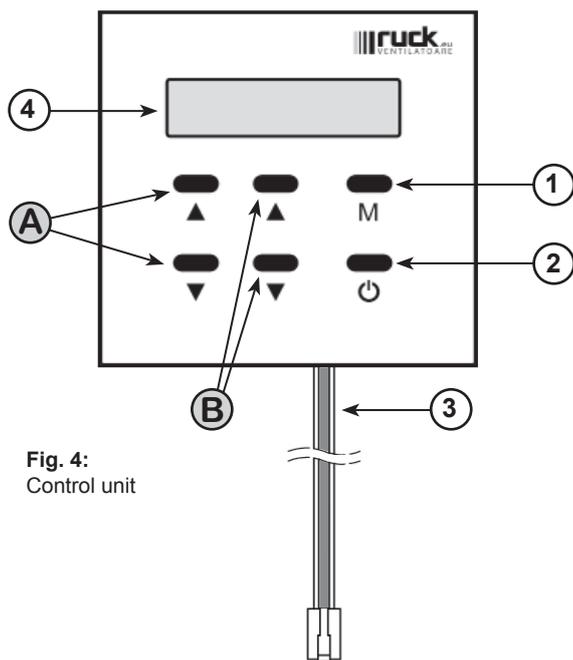


Fig. 4:
Control unit

- 1) Mode Button Switches to the control unit parameter menu.
- 2) ON/OFF Button Button for switching the unit on or off or switching to menu management.
- A) Button A Buttons for increasing and decreasing the set-point for "DAY"
- B) Button B Buttons for increasing and decreasing the set-point for "NIGHT"
- 3) Control cable
- 4) Display

| | | |
|-----|----|----|
| | | PA |
| 150 | 50 | 0 |

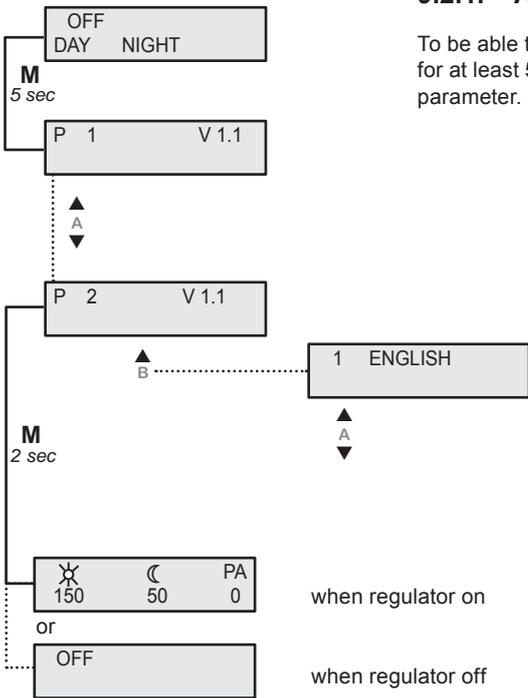
when regulator on

| |
|-----|
| OFF |
|-----|

when regulator off

9.2.1. Adjustment of the control unit parameter

To be able to make changes to the control unit parameter, you must press the „Mode button“ (M) for at least 5 seconds. P 1 will appear on the display. Use button A (▲) to change to your desired parameter.



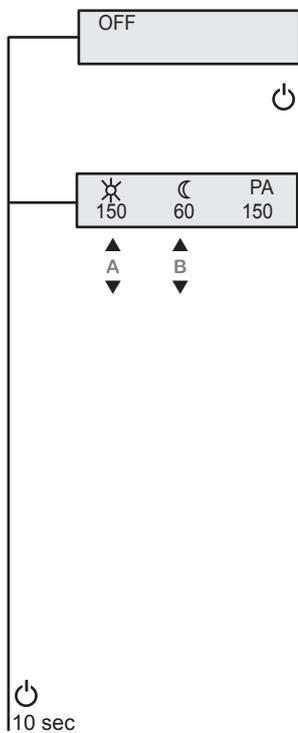
P 2 Language setting

Use button A (▲) to change to language setting P 2. Now press button B ▲ and the control unit will change to input mode. You can now use buttons A (▲ and ▼) to select the language required. Press button B ▲ again to accept the language selected. Then press the „Mode button“ (M) for at least 2 seconds. The parameters will be saved and the menu will close. The Display switches into operating mode.

P 2 Language setting

| Range of values | Factory setting |
|-----------------|-----------------|
| 0 DEUTSCH | 0 DEUTSCH |
| 1 ENGLISH | |
| 2 FRANCAIS | |
| 3 DANSK | |
| 4 ESPAÑOL | |
| 5 NEDERLANDS | |
| 6 PORTUGUÉS | |
| 7 POLSKI | |
| 8 | |
| 9 | |

9.2.2. Menu functions (see Fig. 4)



Status ON / OFF

Switching the unit on/off on the control unit.

Press the ON/OFF button (1) to switch the unit on or off. The unit's status now appears on the display with the current values.

Status display



DAY – Changing the setting

Use the A buttons on the control unit to increase (▲) or reduce (▼) the set-point. (The setting range is limited by parameters P01 and P02.) The DAY set-point is retained in memory after a power failure.



NIGHT - Changing the setting

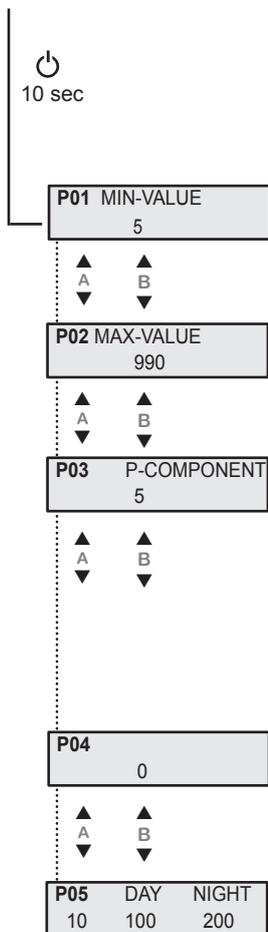
Use the B buttons on the control unit to increase (▲) or reduce (▼) the set-point. (The setting range is limited by parameters P01 and P02.) The NIGHT set-point is retained in memory after a power failure.



Current display
Pressure difference

Parameter settings Menu
see Section 9.2.3

9.2.3. Parameter settings Menu



You move to the parameter settings menu menu P by pressing the ON/OFF button which must be held down for approx. 10 seconds.

Parameter P01 is displayed on the screen. With the A (▲ and ▼) buttons on the control unit, the individual P parameters can be called up. Press the „mode button“ (M) once to return to the starting function.

P01 Minimum set-point on control unit

Parameter for display and setting of the minimum set-point.

The setting range is from 10 Pa to 500 Pa.

The parameters can be changed with the buttons B (▲ and ▼).

P02 Maximum set-point on control unit

Parameter for display and setting of the maximum set-point.

The setting range is from 100 Pa to 990 Pa.

The parameters can be changed with the buttons B (▲ and ▼).

P03 P-Anteil

The setting range is from 5 to 15.

05 = no gain

10 = average gain

15 = high gain

The parameters can be changed with the buttons B (▲ and ▼).

The works setting is 5.

The regulation tends to pulsate at high gain.

P04 Pressure correction

The works setting is "0".

The parameters can be changed with the buttons B (▲ and ▼).

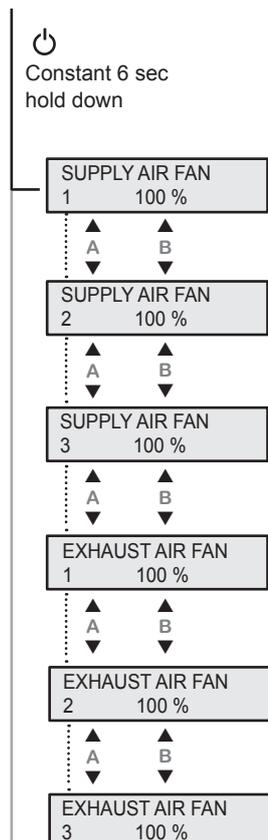
Settings between -20 Pa and +20 Pa are possible.

P05

Control of the decade switches for Day and Night.

The current program version is listed below „P05“.

9.3. Settings to the remote control in use with ETA, RLI/RLE

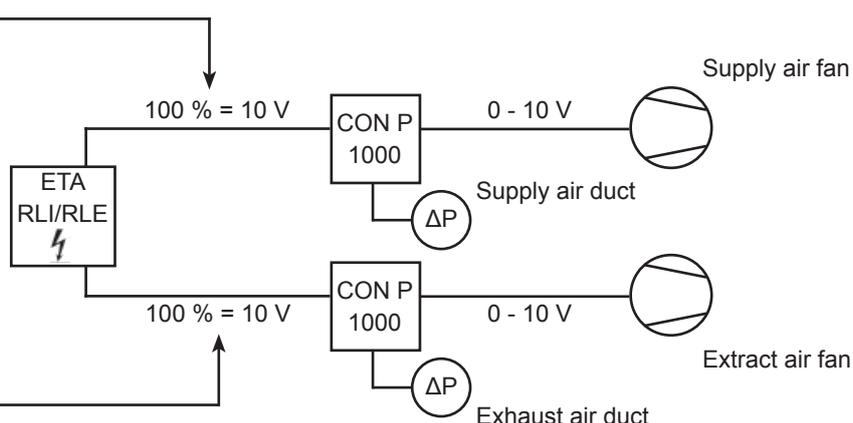


For use together with air handling units like (ETA, RLI/RLE) the supply and exhaust air parameters have to be adjusted accordingly.

You can get to the menu for the supply and extract air parameters by pressing the ON/OFF button for approximately 6 sec. The display then changes to the supply air fan.

The individual menu points can be called up with buttons A (▲ and ▼) on the control unit. You can change the values for the fan stages with buttons B (▲ and ▼). Press the Mode button (M) to go back to the starting functions.

The supply and exhaust air parameters have to be adjusted at 100%.



10. Maintenance and repair

10.1. Important notes



- **Electricity warning (hazardous voltage)!**
- » Failure to observe the hazard may result in death, injury or damage to property.
- Before performing any work on conductive parts, always disconnect the unit completely from the electricity supply and make sure that it cannot be switched back on again.



Maintenance and repairs may only be performed by specialist personnel in accordance with this installation and operating manual and the regulations in force.

Do not repair defective or damaged units yourself, but report the damage or faults to the manufacturer in writing.



- **Unauthorized repairs may cause personal injury and / or damage to property, in which case the manufacturer's guarantee or warranty will not apply.**

10.2. Cleaning and care

Servicing, troubleshooting and cleaning may only be performed by specialist personnel in accordance with this installation and operating manual and the regulations in force.

If operated correctly, ruck products only require a small amount of maintenance.

The following work should be performed at regular intervals, in accordance with health and safety regulations:

- Check the operation of the control system and safety devices.
- Check electrical connections and wiring for damage.

Before putting back into service after care and maintenance work, carry out a safety check as described in Sections 7 + 8!



11. Expansion and reconfiguration

The unit must not be reconfigured.

ruck Ventilatoren's warranty only applies for the configuration delivered.
The warranty will cease to apply after any reconfiguration or expansion.



12. Dismantling and disposal



- **Risk of injury if dismantled under hazardous voltage!**
- » If you do not switch off the voltage before starting to dismantle the unit you may injure yourself and damage the product or parts of the installation.
- **Make sure that the relevant parts of the installation have been disconnected from the voltage supply.**

Dismantle the unit as follows:

12.1. Disassembling the product.

Observe the safety instructions given in Sections 2 to 8 and Section 12 when decommissioning and disassembling the unit.

12.2. Disposal

Careless disposal of the unit may cause pollution.

Please therefore dispose of the unit in accordance with the national requirements that apply in your country.



13. Troubleshooting

Please note the following instructions:

- Proceed systematically and purposefully when troubleshooting, even when under the pressure of time. In the worst case, randomly and indiscriminately dismantling and changing settings may result in it no longer being possible to determine the original cause of the fault.
- Get an overview of the unit's operation in conjunction with the overall installation.
- Try to clarify whether the unit provided the required function in the overall installation before the fault occurred.
- Try to find any changes to the overall installation in which the unit is installed:
 - » Have the unit's operating conditions or operating range been changed?
 - » Have any changes (e.g. reconfigurations) or repairs been performed on the overall system (installation, electrics, control) or to the unit? If yes: what?
 - » Has the unit been operated correctly?
 - » How does the fault appear?
- Form a clear idea of the cause of the fault. If necessary, question the immediate operator or the installation operator.

If you have not been able to remove the fault, please contact the manufacturer. The contact address can be found at www.ruck.eu or on the back cover of this operating and installation manual.

13.1. Possible operating faults.

Further faults may occur before and during operation of the unit which are not indicated by an error message on the display.

| Fault | Possible causes | Fault correction |
|-------------------|--|---|
| Fan does not run. | <ul style="list-style-type: none"> • The regulator is not switched on. • No electricity supply • Supply lead not connected. | <ul style="list-style-type: none"> • Switch on regulator. <ul style="list-style-type: none"> - With remote control (optional) - with a contact between X5 and X6 (see Section 7!) • Check fuse / power supply. • Have electrical power supply connected by an authorised electrician. |
| No regulation! | <ul style="list-style-type: none"> • Pressure measured in the wrong place | <ul style="list-style-type: none"> • Connect measurement hose to a suitable point in the ventilation duct |

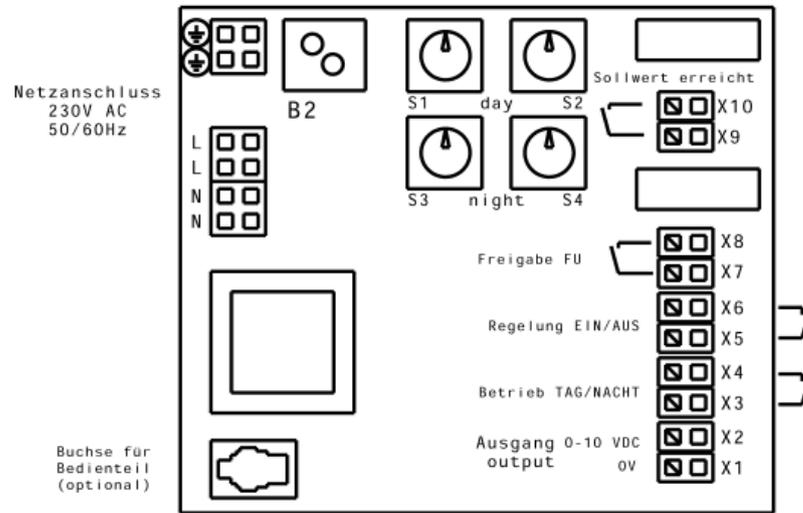
14. Technical data



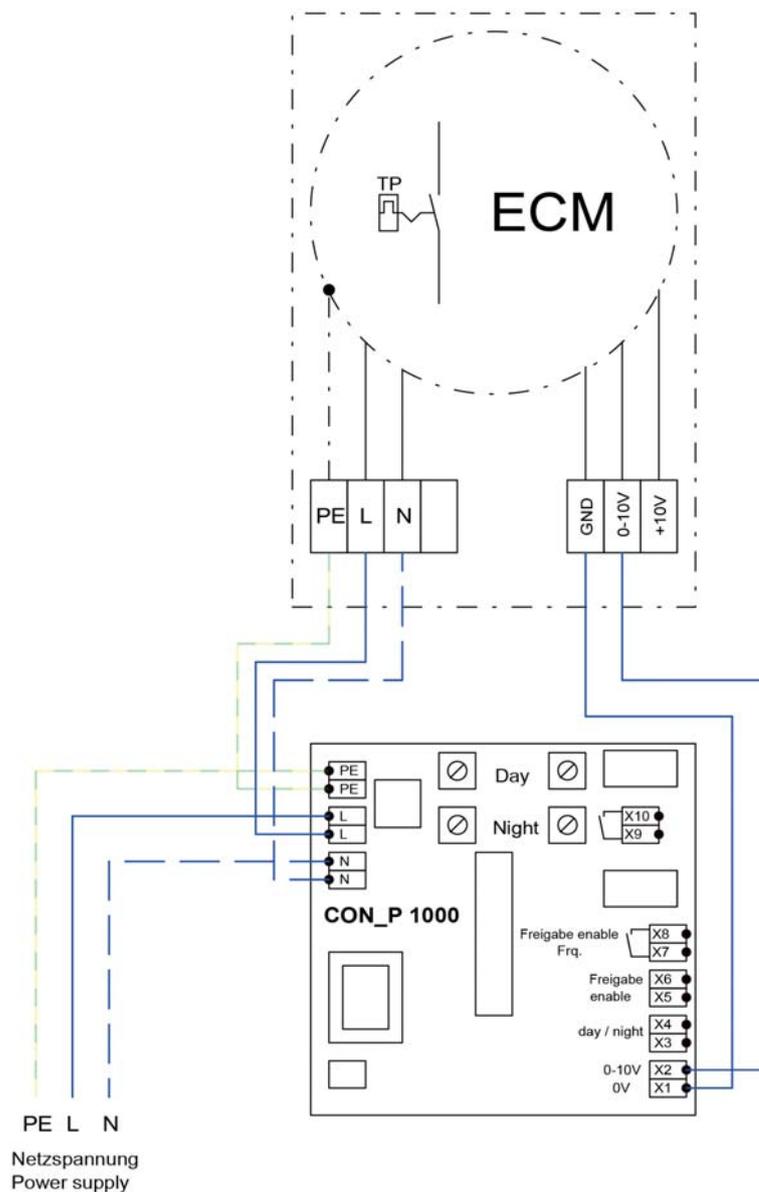
| Model: | CON P1000 Constant pressure control | |
|----------------------------|-------------------------------------|--|
| Size: | | |
| Length | <i>L</i> mm | 139 |
| Width | <i>B</i> mm | 118 |
| Height | <i>H</i> mm | 70 |
| Technical data: | | |
| Pressure regulation range: | | 10 – 990 Pa |
| Supply voltage: | | 230V AC 50/60 Hz |
| Digital inputs: | | 2 x potential-free (on/off, day/night switching) |
| Relay outputs: | | 2 (enable frequency converter, set-point reached) 24 V - 1 A |
| Analog output: | | 0–10V DC |
| Degree of protection: | | IP55 |
| Interfaces: | | 1 x RS485 for control unit (optional remote control unit) |

15. Wiring diagrams

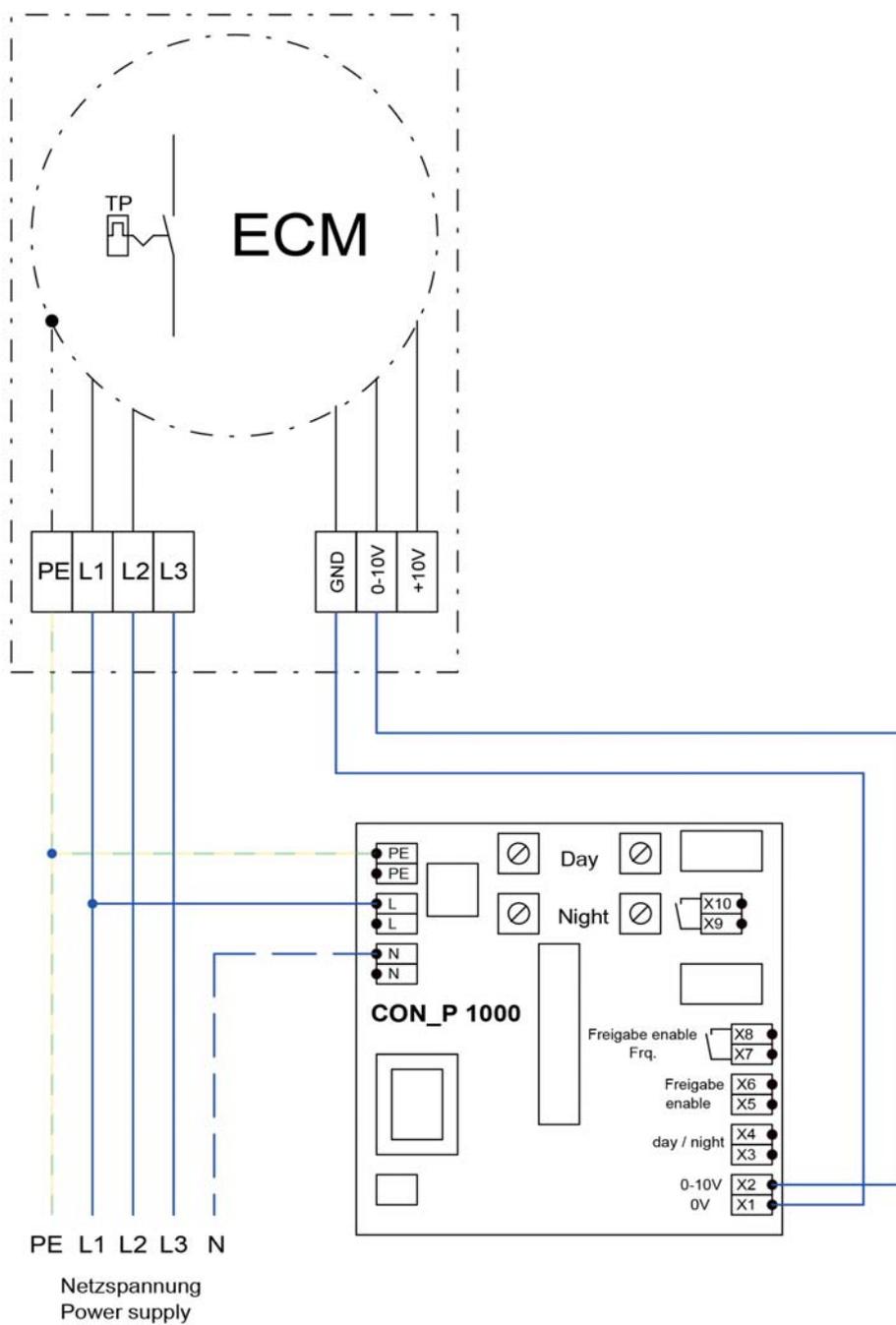
126050



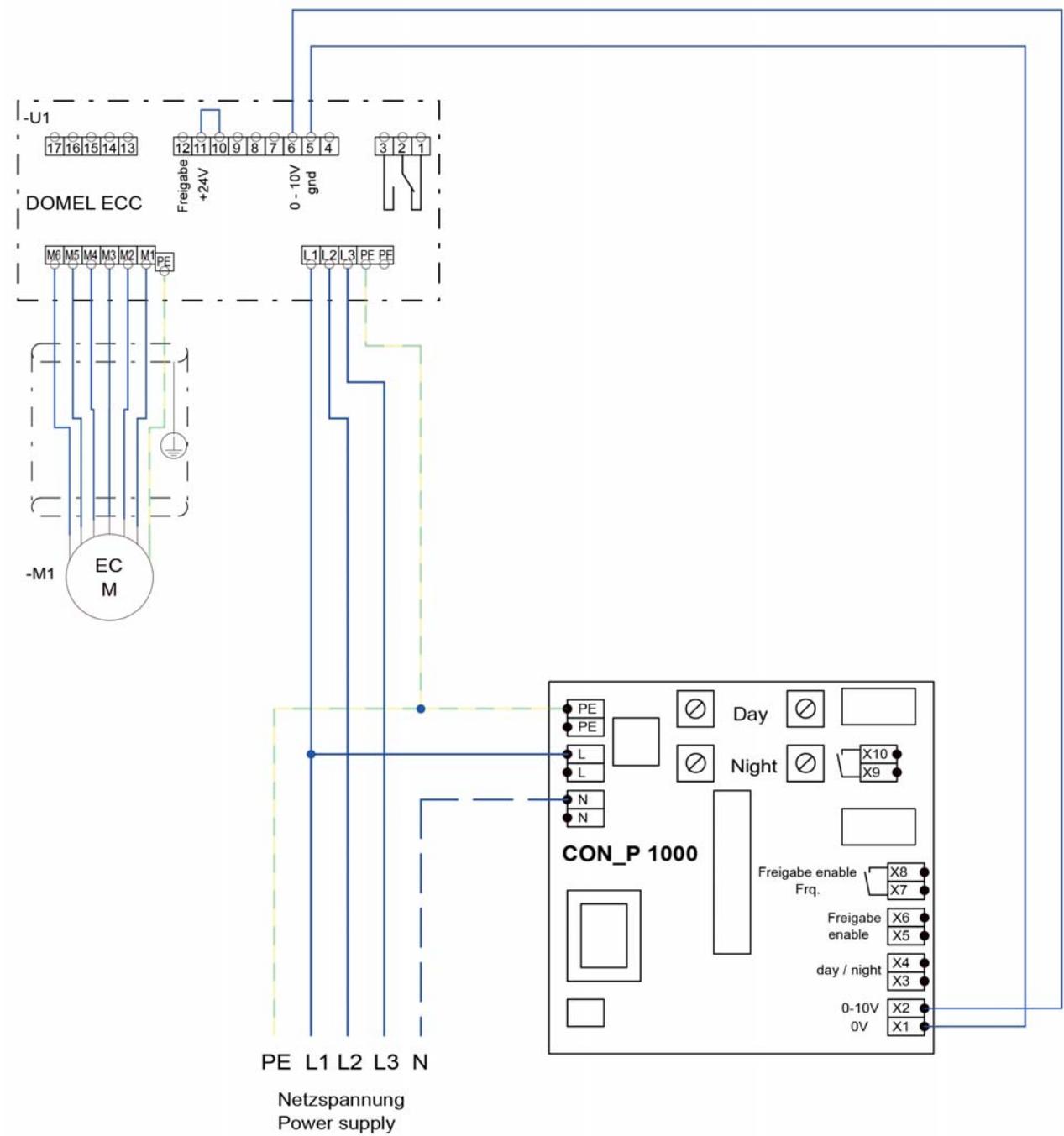
EC Motor 1~



EC Motor 3~



Domel EC Motor 3~



Mech-Elec[®] Irl.

<http://www.mech-elec.ie>

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The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information.

The information given does not release the user from the obligation of own judgment and verification.

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