

## Data sheets

**SBR Small Sewage Treatment Plant GRAF Klaro**

**Control unit**

**KLbasic**

**KLplus**

**KL24base**

**KL24plus**



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## 1. Technical data for controls

### 1. Technical data for controls

#### 1.1 Technical data for KL control

|                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Microcontroller with internal FLASH, RAM, ADC.                                                                                                                                                                                                                                                                                                                                                                                        |
| Electrical isolation between internal circuit and outputs.                                                                                                                                                                                                                                                                                                                                                                            |
| Outputs:<br>Relay outputs for 230 VAC consumers:<br>- Compressor: Total current max. 6 A<br>- 4 solenoid valves, metering pump, UV module, fan: Total current max. 2 A,<br>Additional potential-free fault-signalling contact:<br>- Break contact: 230 VAC / max. 2 A or 24 VDC / max. 2 A.<br>A max. of 7 outputs (relays) may be switched simultaneously.<br>The phosphate pump, UV lamp and fan outputs only occur in the KL plus. |
| Cable failure monitoring for outputs (compressor, solenoid valves, UV lamp) by measuring the output currents.                                                                                                                                                                                                                                                                                                                         |
| Contactor monitoring by detecting the switched voltage, 230 V AC.                                                                                                                                                                                                                                                                                                                                                                     |
| Faults are indicated by an LED (red/green), buzzer (at least 8 h in the event of mains failure during operation) and relay contact up to 230 V AC.                                                                                                                                                                                                                                                                                    |
| Display (graphics display for KLplus with 128x32 pixels, text display for KLbasic with 2x8 characters).                                                                                                                                                                                                                                                                                                                               |
| Keypad:<br>14 keys for KLplus: Numbers 0 to 9, Esc, Enter, page forwards and backwards, plus 2 reset keys,<br>4 keys for KLbasic: Set, UP, DOWN, Esc.                                                                                                                                                                                                                                                                                 |
| Serial RS232 interface with 9600 baud via jack bush.                                                                                                                                                                                                                                                                                                                                                                                  |
| Real-time clock with deviation of 5 min./a and capacitor buffering.                                                                                                                                                                                                                                                                                                                                                                   |
| EEPROM for logbook, resistant to zero voltage.                                                                                                                                                                                                                                                                                                                                                                                        |
| Temperature monitoring with precision of 2 K.                                                                                                                                                                                                                                                                                                                                                                                         |
| Buffering by Super CAPS for limited operation in the event of failure of operating voltage.                                                                                                                                                                                                                                                                                                                                           |
| Operating temperature range 0 °C ... +55 °C.                                                                                                                                                                                                                                                                                                                                                                                          |
| Permissible temperature range without operation -20 °C ... +85 °C.                                                                                                                                                                                                                                                                                                                                                                    |
| Inside the device:<br>Relative air humidity 10...95 %, no condensation <sup>1)</sup><br><sup>1)</sup> The control's inherent heating prevents condensation by means of continuous operation.                                                                                                                                                                                                                                          |
| IP54 protection, on the front (with correctly fitted SD card cover and glued-on front film).                                                                                                                                                                                                                                                                                                                                          |
| Operating voltage 230 V AC, ± 20 %, 50 Hz.                                                                                                                                                                                                                                                                                                                                                                                            |
| Power consumption < 10 VA.                                                                                                                                                                                                                                                                                                                                                                                                            |
| Two microfuses can be replaced from outside: 8 A medium slow blow and 2 A slow blow.                                                                                                                                                                                                                                                                                                                                                  |

## 1. Technical data for controls

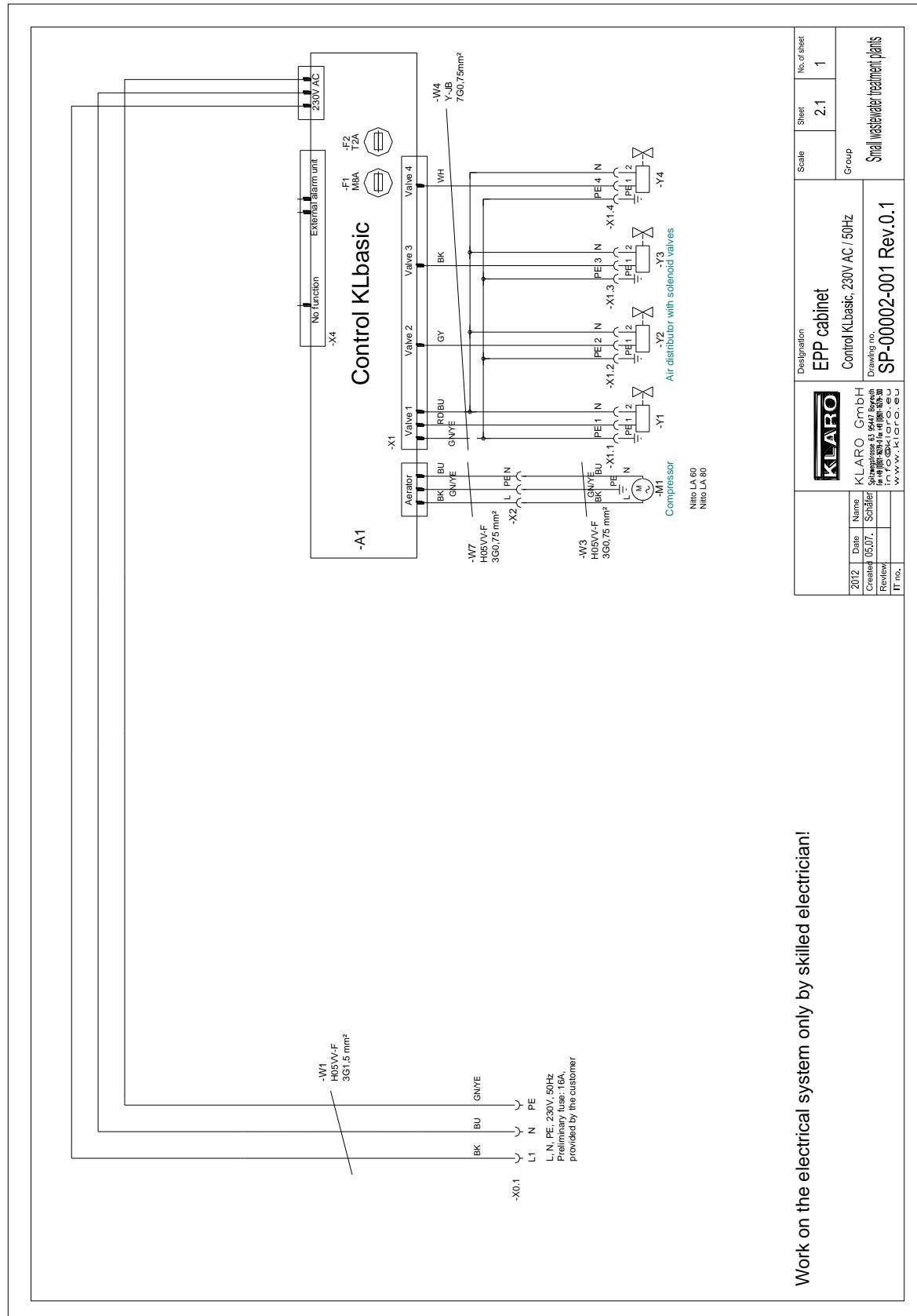
### 1.2 Technical data for KL24 control

|                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Microcontroller with internal FLASH, RAM, ADC.                                                                                                                                                                                                                                                                                                                                                                                                 |
| Electrical isolation between internal circuit and outputs.                                                                                                                                                                                                                                                                                                                                                                                     |
| Outputs:<br>Relay outputs for 230 VAC consumers:<br>- Compressor: Total current max. 6 A<br>- UV module: Total current max. 2 A<br>Semiconductor outputs for 24 VDC consumers:<br>- 4 valves, stepped motors max. 0.4A/winding<br>- Metering pump, fan, external warning indicator, output current max. 0.4A per output;<br>Total current across all outputs < 0.7A<br>The phosphate pump, UV lamp and fan outputs only occur in the KL24plus. |
| Cable failure monitoring for outputs (compressor, stepped motors, hose pump, UV lamp) by measuring the output currents.                                                                                                                                                                                                                                                                                                                        |
| Faults are indicated by an LED (red/green), buzzer (at least 8 h in the event of mains failure during operation) and relay contact up to 230 V AC.                                                                                                                                                                                                                                                                                             |
| Display (graphics display for KLplus with 128x32 pixels, text display for KLbasic with 2x8 characters).                                                                                                                                                                                                                                                                                                                                        |
| Keypad:<br>14 keys for KLplus: Numbers 0 to 9, Esc, Enter, page forwards and backwards, plus 2 reset keys,<br>4 keys for KLbasic: Set, UP, DOWN, Esc.                                                                                                                                                                                                                                                                                          |
| Serial RS232 interface with 9600 baud via jack bush.                                                                                                                                                                                                                                                                                                                                                                                           |
| Real-time clock with deviation of 5 min./a and capacitor buffering.                                                                                                                                                                                                                                                                                                                                                                            |
| EEPROM for logbook, resistant to zero voltage.                                                                                                                                                                                                                                                                                                                                                                                                 |
| Temperature monitoring with precision of 2 K.                                                                                                                                                                                                                                                                                                                                                                                                  |
| Buffering by 3.6 V lithium-ion battery for limited operation in the event of failure of operating voltage.                                                                                                                                                                                                                                                                                                                                     |
| Operating temperature range 0 °C ... +55 °C.                                                                                                                                                                                                                                                                                                                                                                                                   |
| Permissible temperature range without operation -20 °C ... +85 °C.                                                                                                                                                                                                                                                                                                                                                                             |
| Inside the device:<br>Relative air humidity 10...95 %, no condensation <sup>1)</sup><br><sup>1)</sup> The control's inherent heating prevents condensation by means of continuous operation.                                                                                                                                                                                                                                                   |
| IP54 protection, on the front (with correctly fitted SD card cover and glued-on front film).                                                                                                                                                                                                                                                                                                                                                   |
| Operating voltage 230 V AC, ± 20 %, 50 Hz.                                                                                                                                                                                                                                                                                                                                                                                                     |
| Power consumption < 6 VA without connected 24V consumers.                                                                                                                                                                                                                                                                                                                                                                                      |
| Microfuses can be replaced from outside: KL24plus - 6.3 A slow blow and 2 A slow blow;<br>KL24base - 6,3 A slow blow.                                                                                                                                                                                                                                                                                                                          |

## 2. Circuit diagrams

## 2. Circuit diagrams

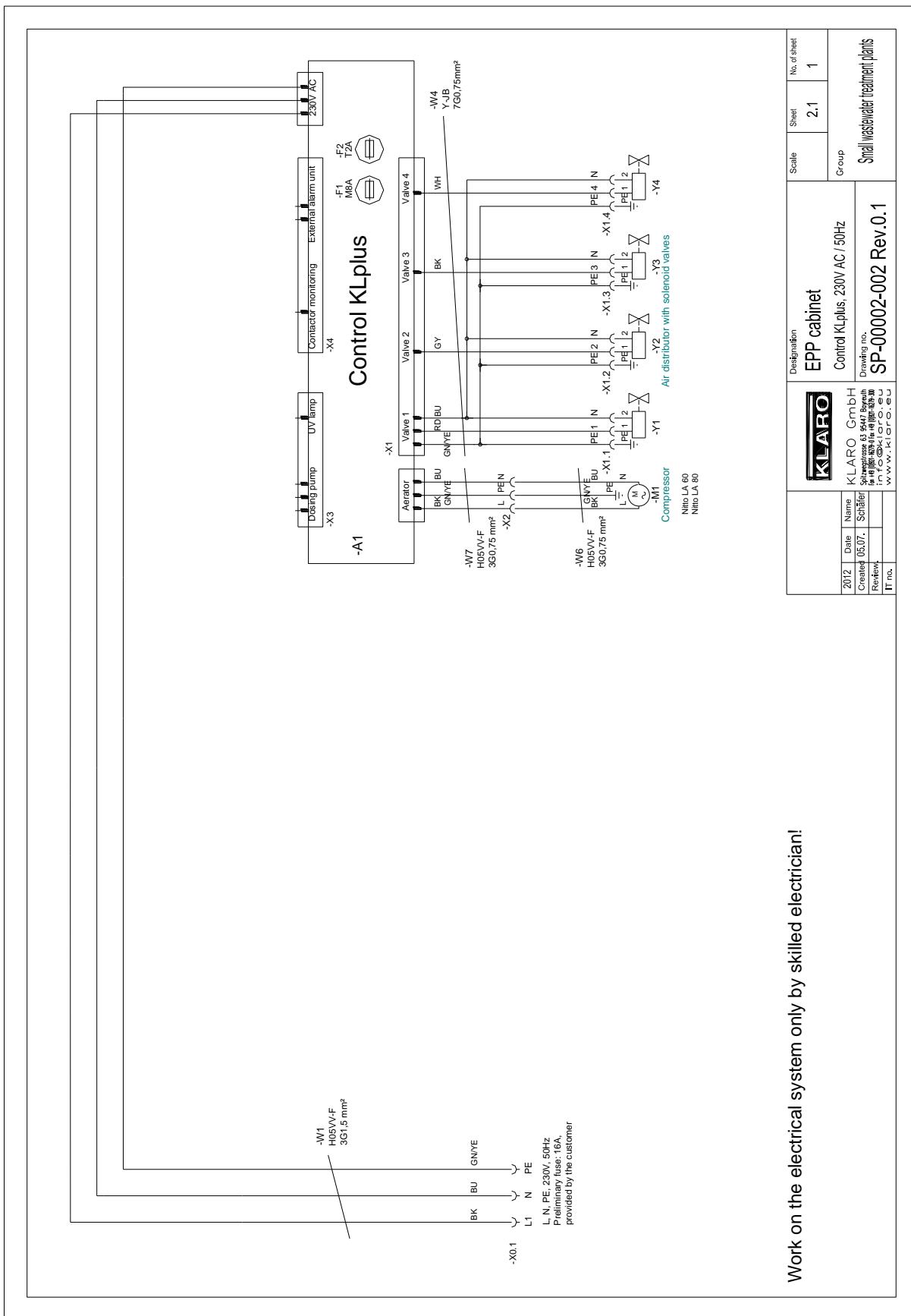
## 2.1 Circuit diagram – EPP cabinet with KLbasic controller



Work on the electrical system only by skilled electrician!

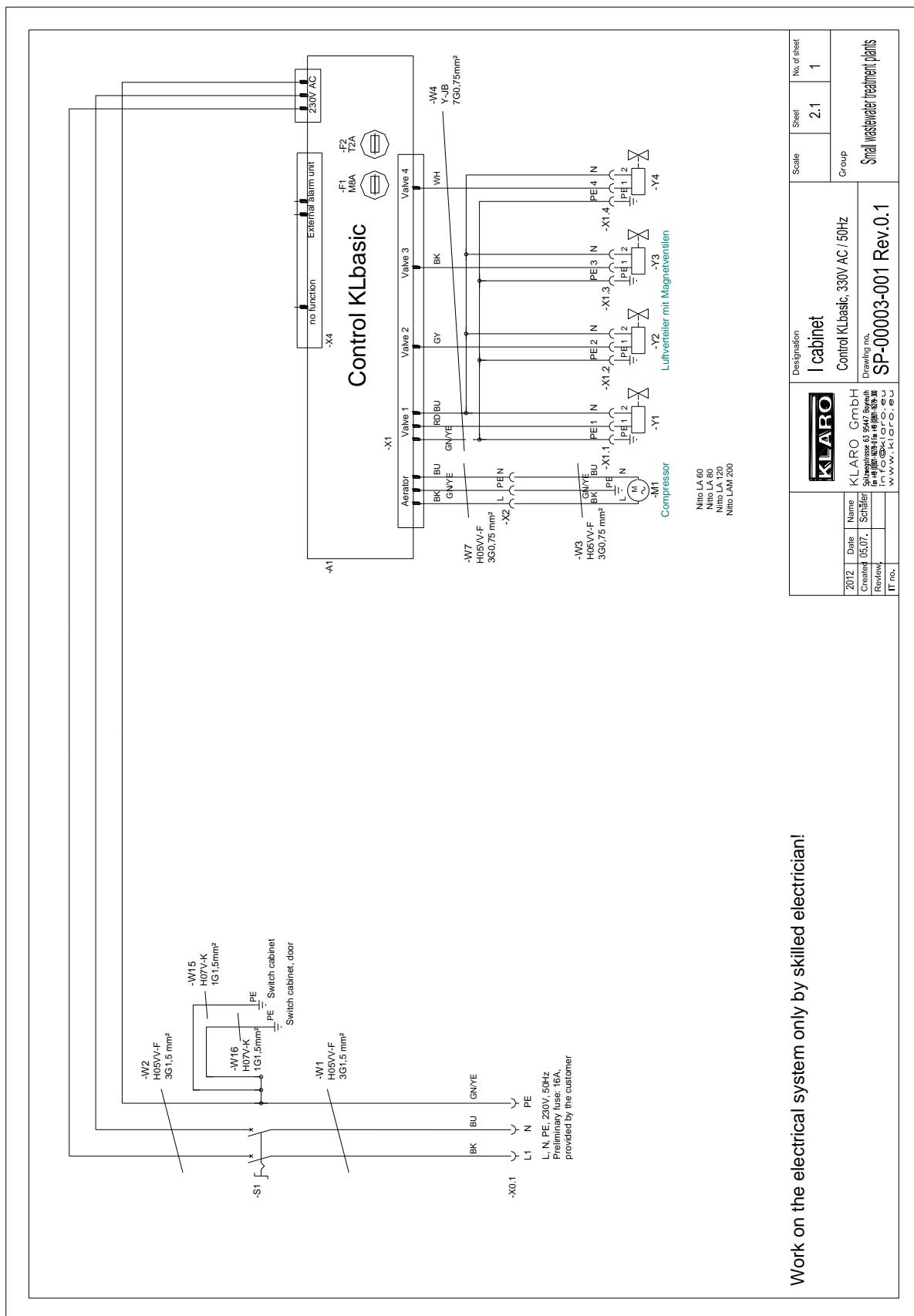
## 2. Circuit diagrams

### 2.2 Circuit diagram – EPP cabinet with KLplus controller



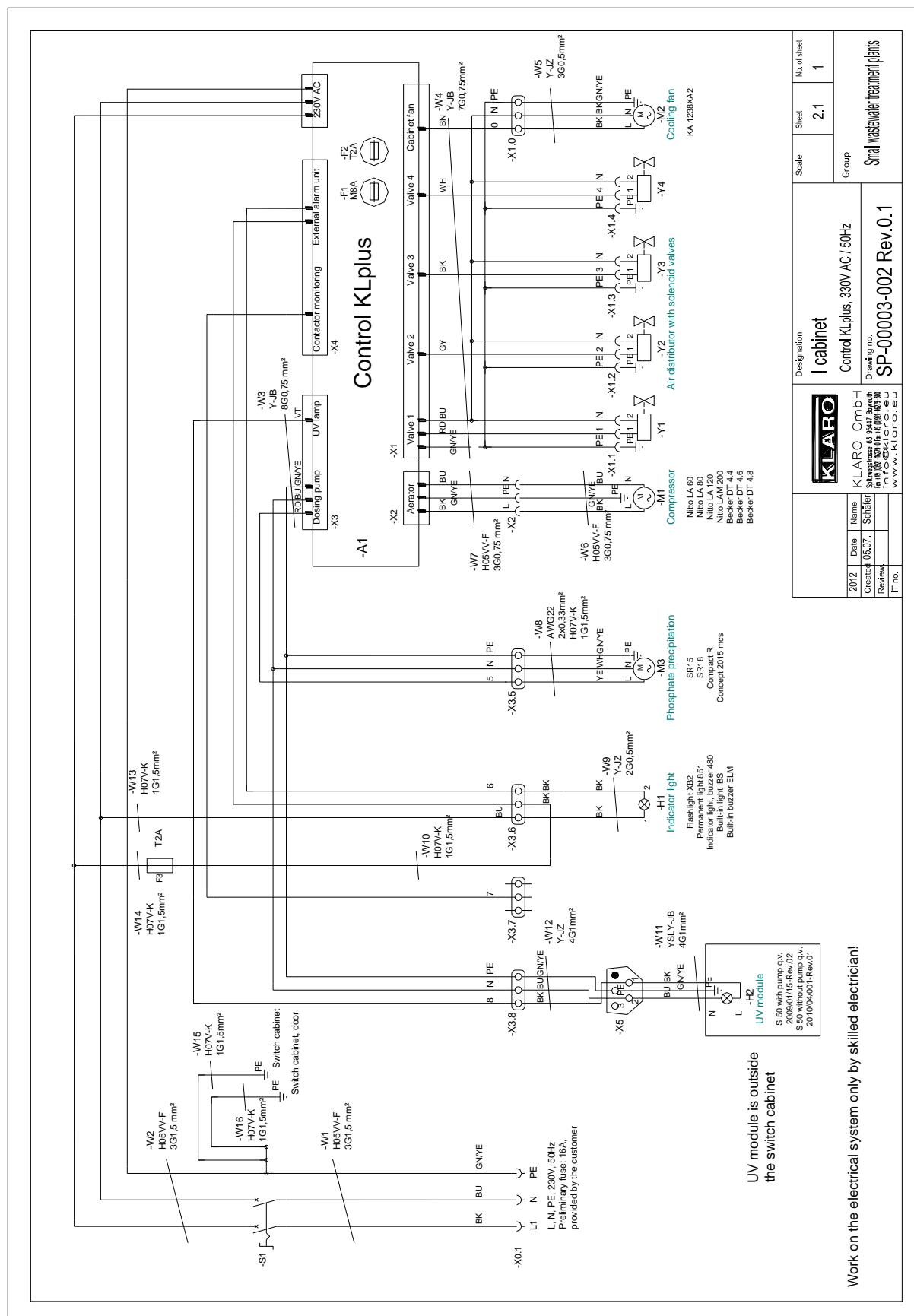
## 2. Circuit diagrams

### 2.3 Circuit diagram – I-cabinet with KLbasic controller



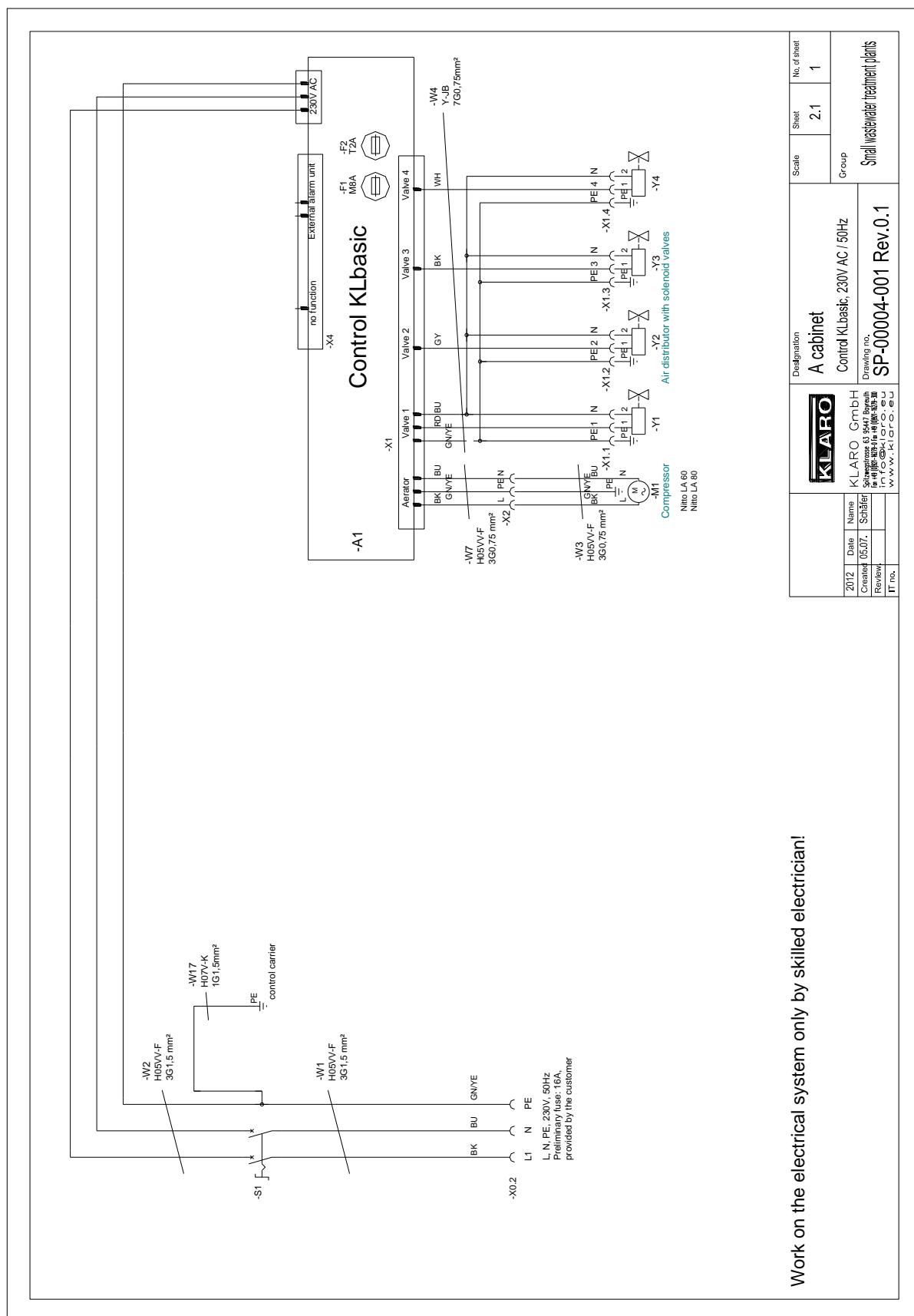
## 2. Circuit diagrams

### 2.4 Circuit diagram – I-cabinet with KLplus controller



## 2. Circuit diagrams

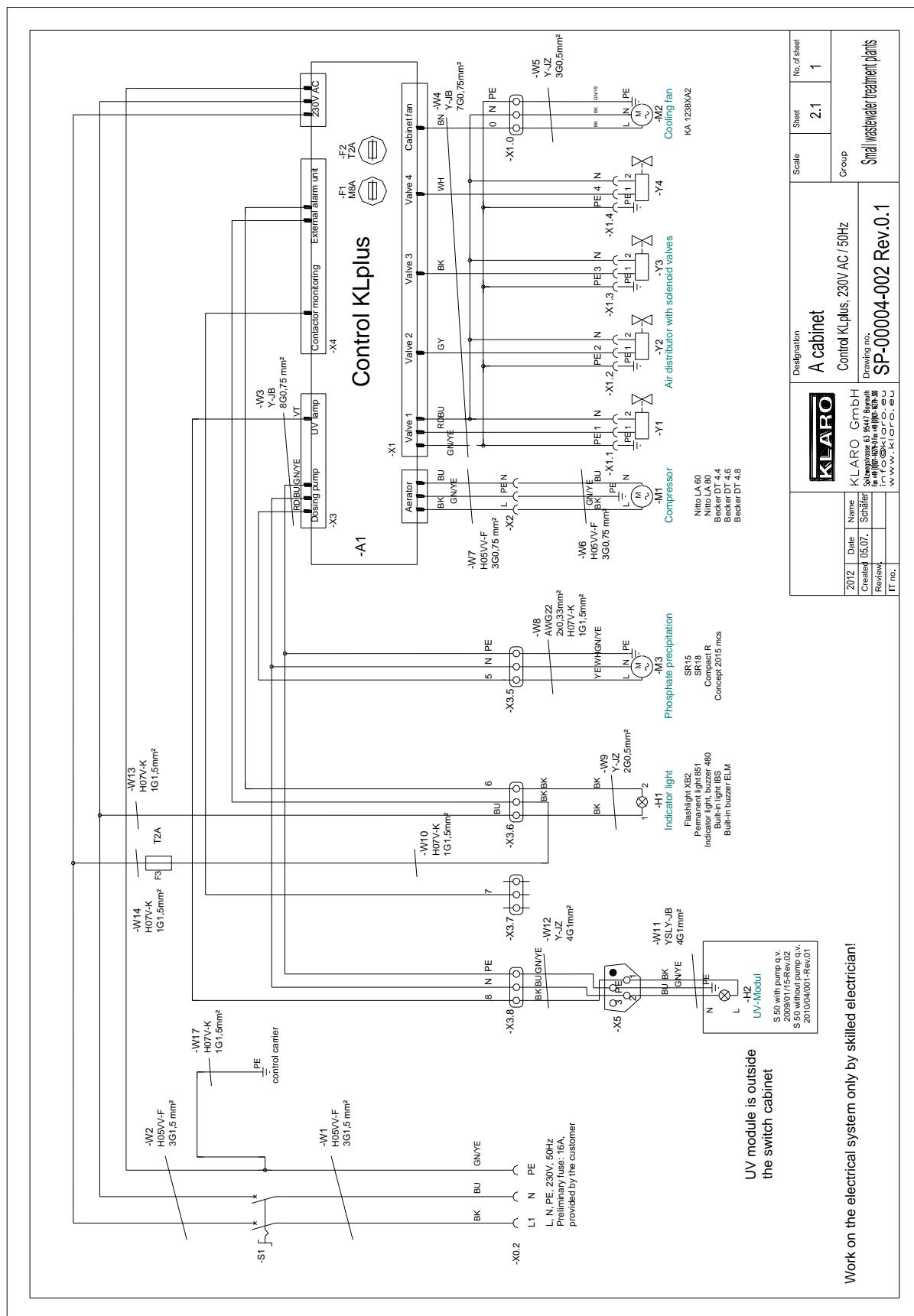
## 2.5 Circuit diagram – A-column with KLbasic controller



Work on the electrical system only by skilled electrician!

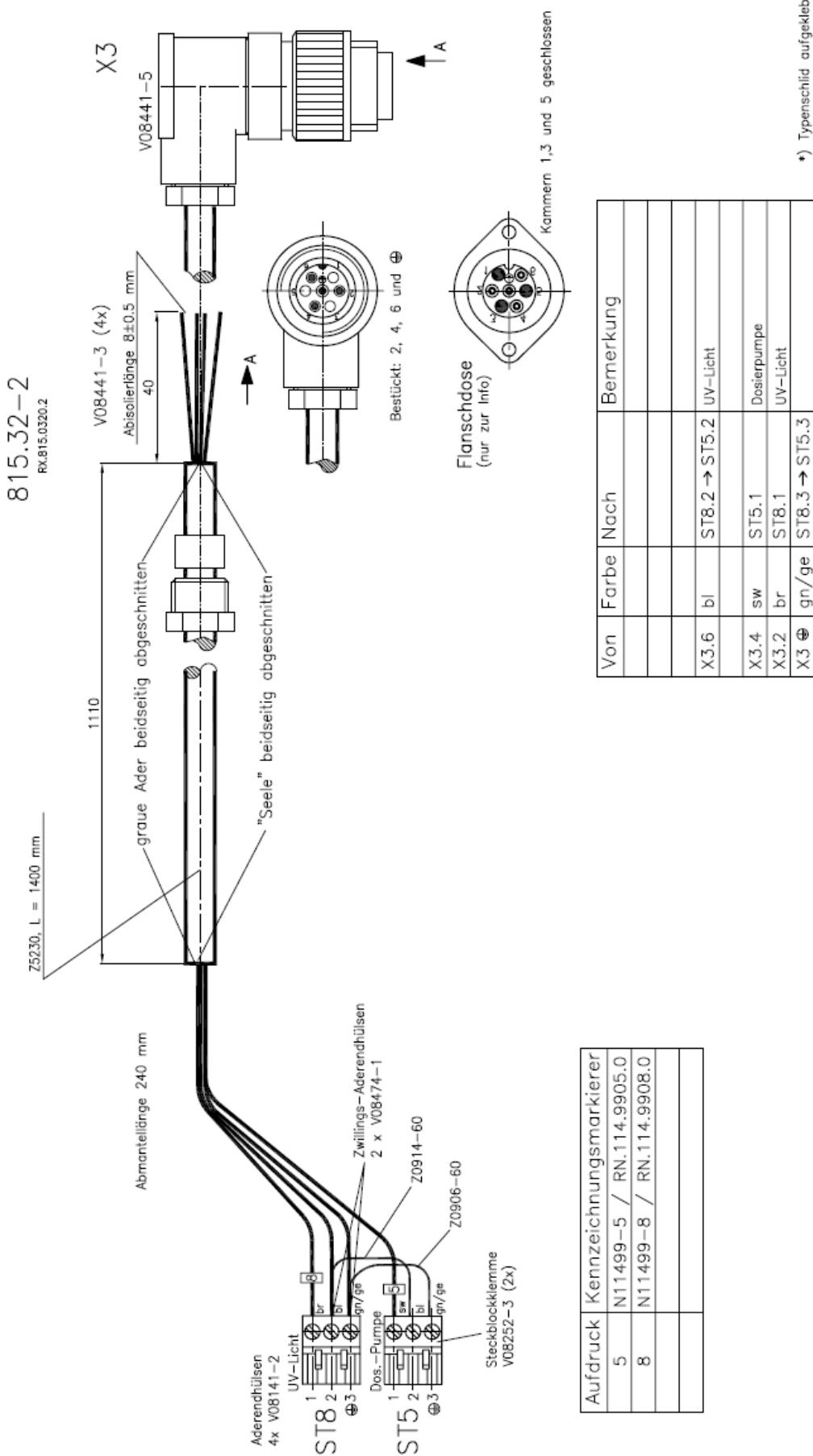
## 2. Circuit diagrams

### 2.6 Circuit diagram – A-column with KLplus controller



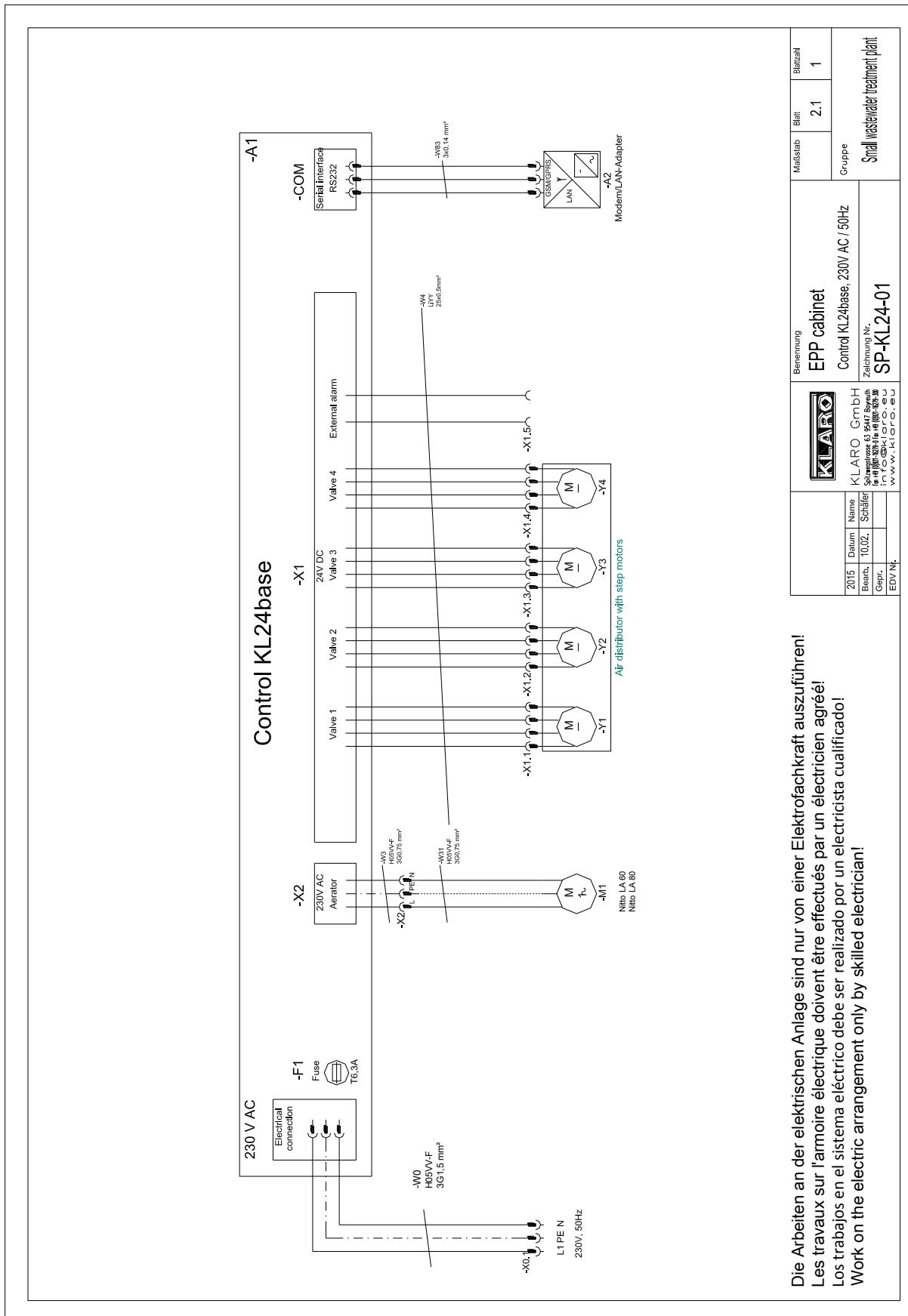
## 2. Circuit diagrams

### 2.7 Circuit diagram – extension cable (for Klplus controller)



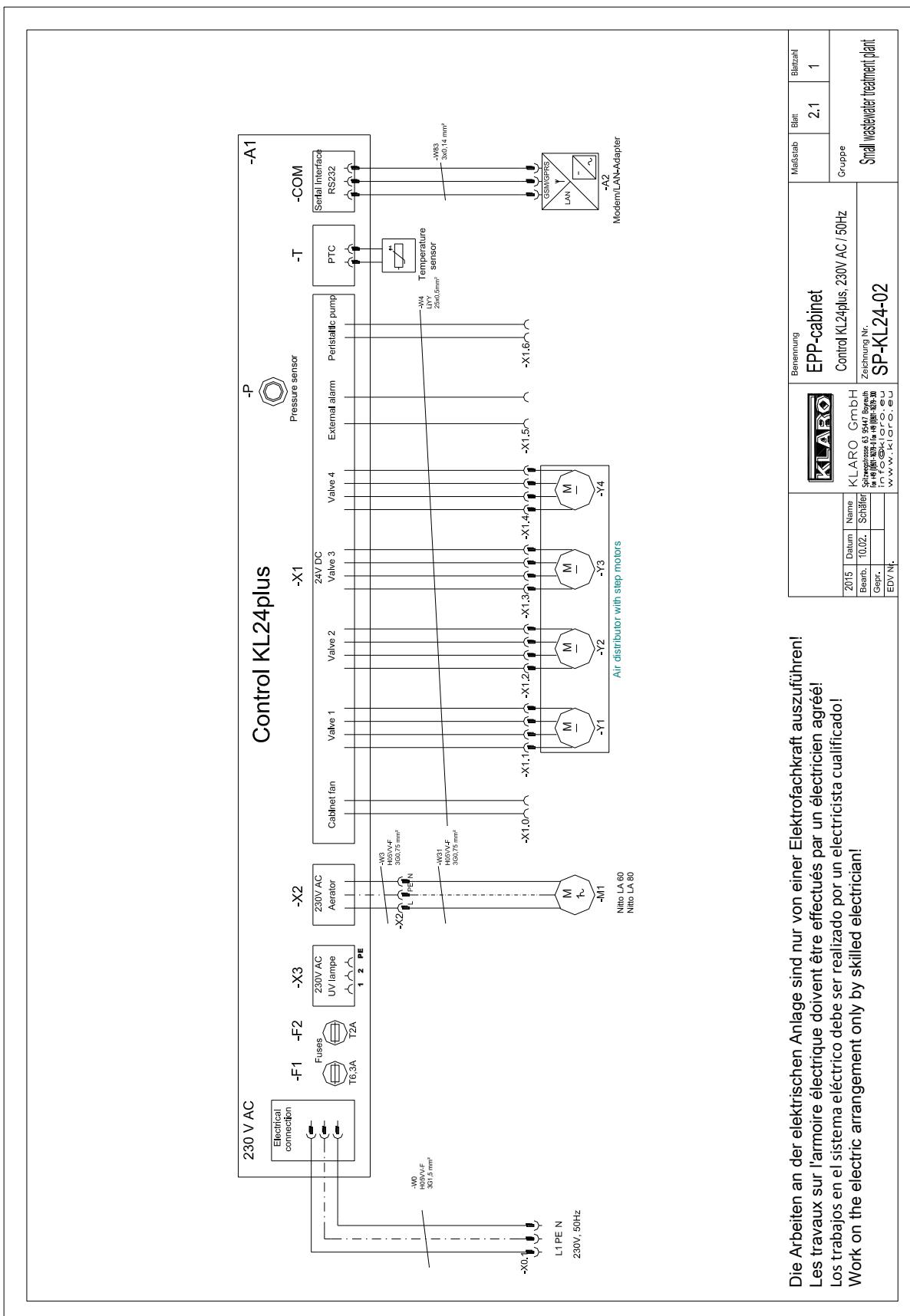
## 2. Circuit diagrams

## 2.8 Circuit diagram – EPP cabinet with KL24base controller



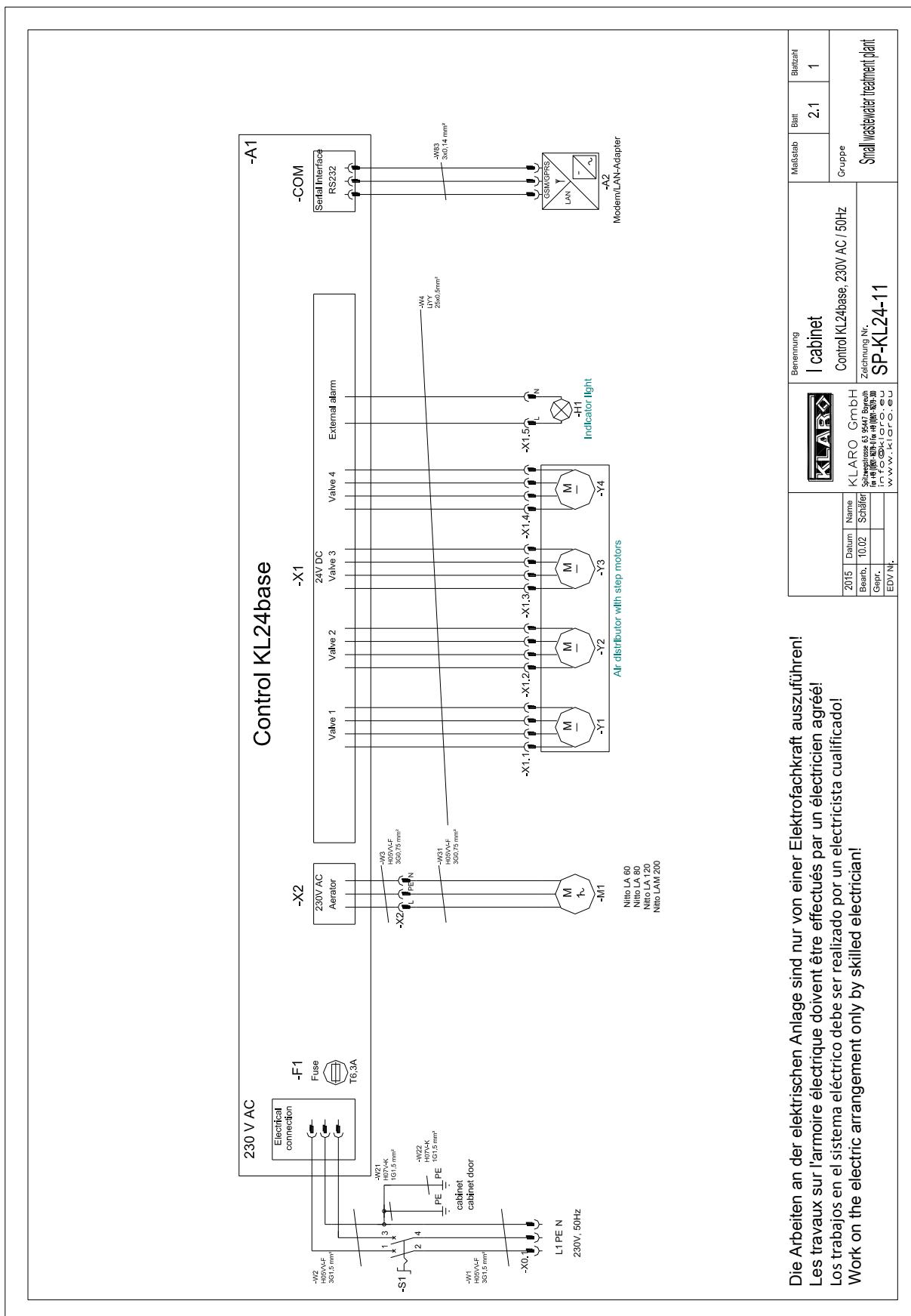
## 2. Circuit diagrams

## 2.9 Circuit diagram – EPP cabinet with KL24plus controller



## 2. Circuit diagrams

## 2.10 Circuit diagram – I-cabinet with KL24base controller

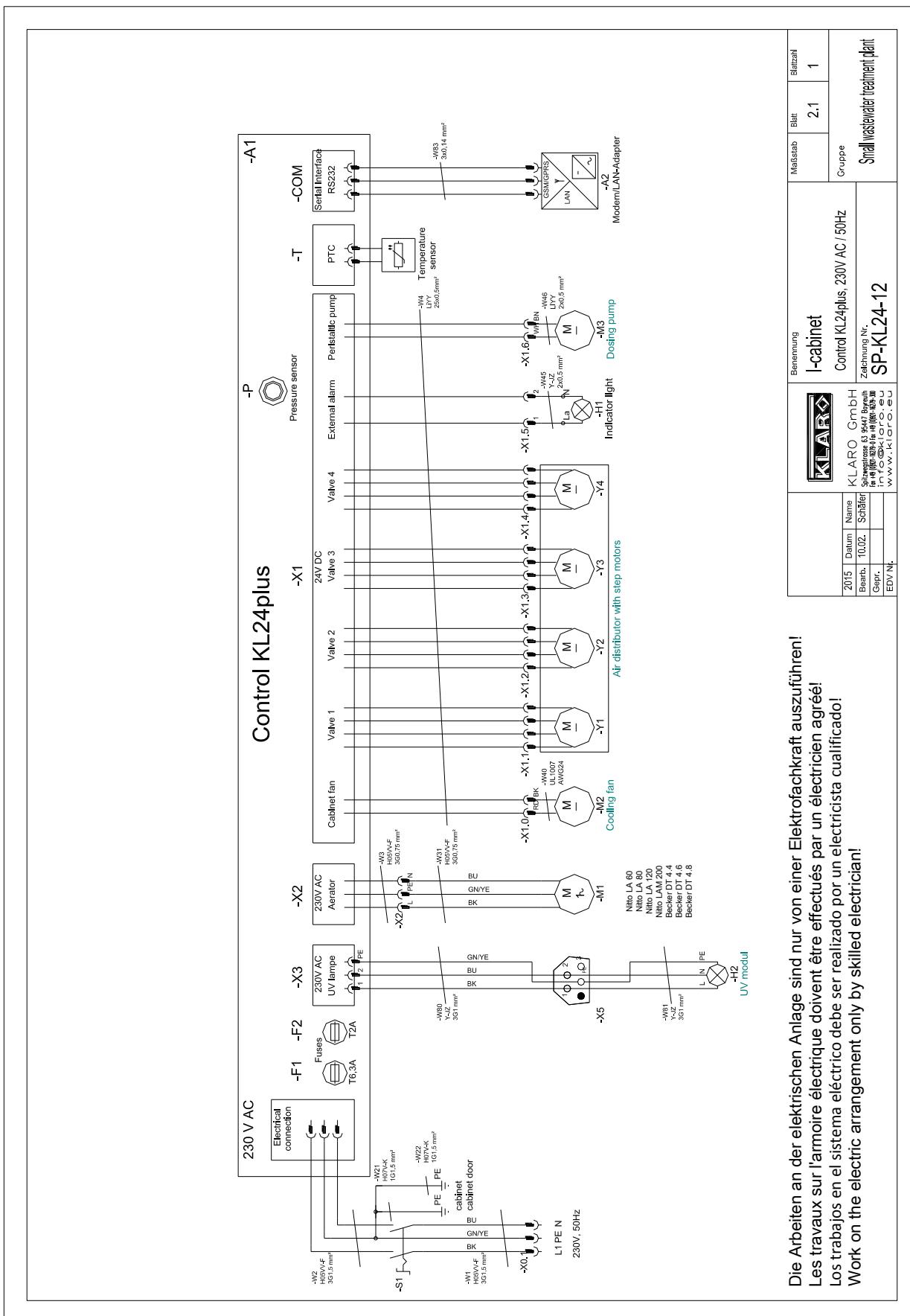


Die Arbeiten an der elektrischen Anlage sind nur von einer Elektrofachkraft auszuführen!  
Les travaux sur l'armoire électrique doivent être effectués par un électricien agréé!  
Los trabajos en el sistema eléctrico debe ser realizado por un electricista cualificado!  
Work on the electric arrangement only by skilled electrician!

|      |       |      |                                                                                                                                                          |           |                                  |        |
|------|-------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------|--------|
|      |       |      |                                                                                                                                                          |           |                                  |        |
| 2015 | Datum | Name | KL A R O GmbH<br>Spartenleitung: E3 6547 Bregenz<br>Kontakt: Tel. +43 5572 800-0<br>Fax: +43 5572 800-100<br>E-Mail: info@karo-eu.com<br>www.karo-eu.com | Bemerkung | Control KL24base, 230V AC / 50Hz | Gruppe |

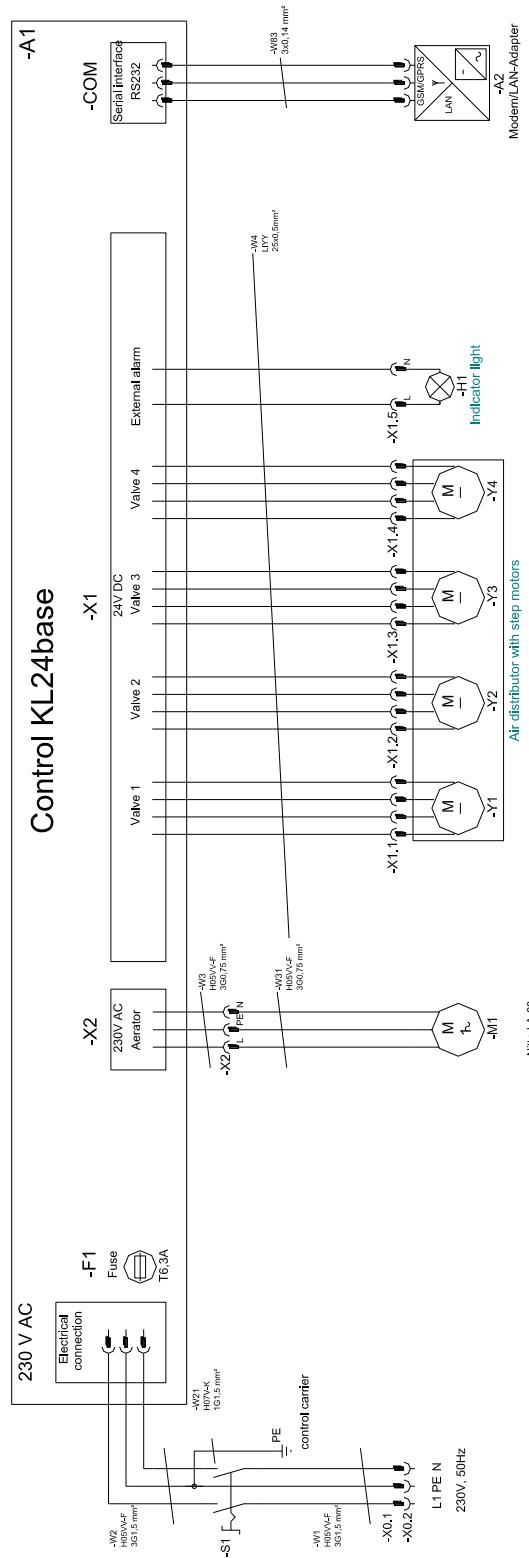
## 2. Circuit diagrams

## 2.11 Circuit diagram – I-cabinet with KL24plus controller



## 2. Circuit diagrams

### 2.12 Circuit diagram – A-column with KL24base controller

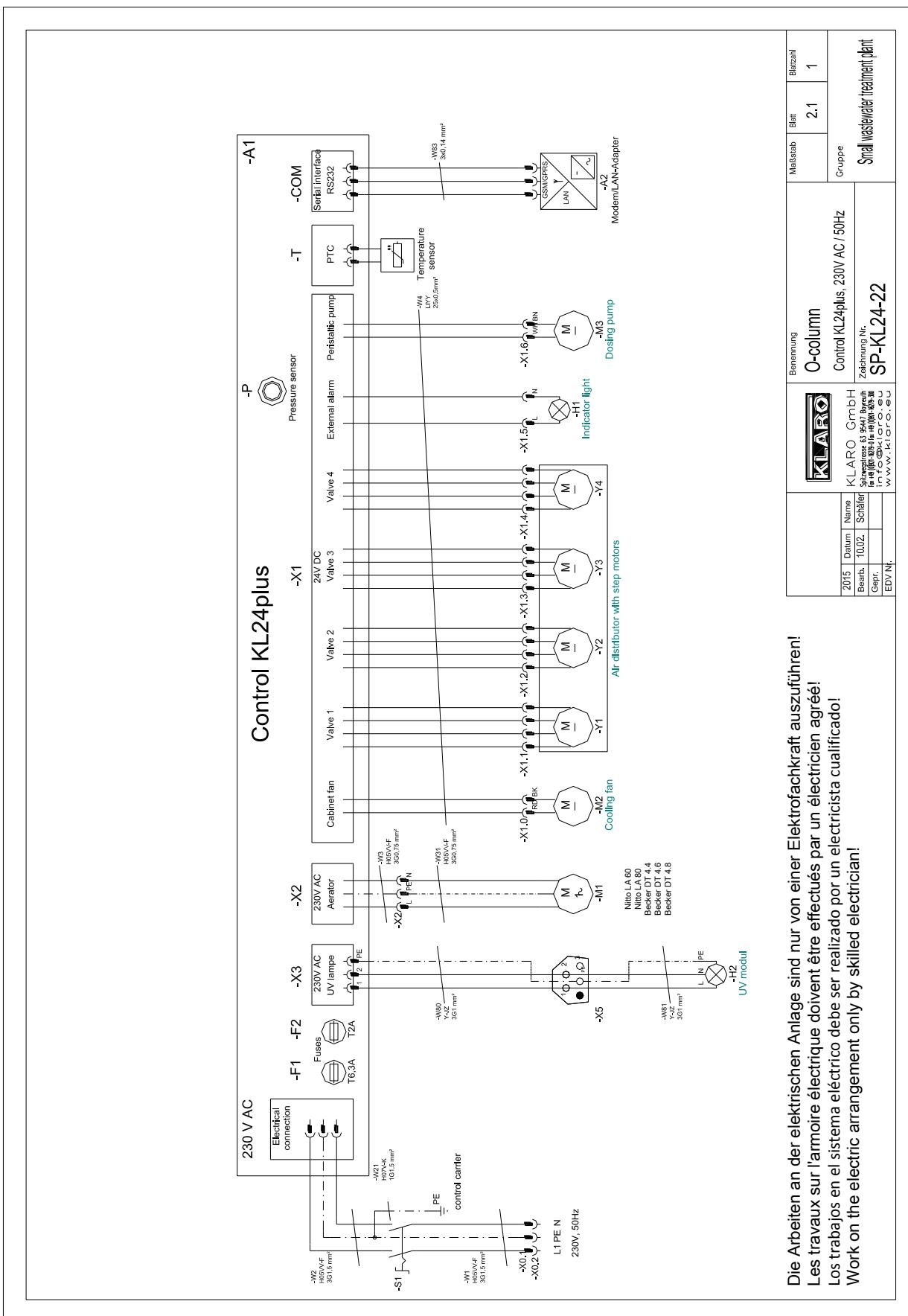


Die Arbeiten an der elektrischen Anlage sind nur von einer Elektrofachkraft auszuführen!  
Les travaux sur l'armoire électrique doivent être effectués par un électricien agréé!  
Los trabajos en el sistema eléctrico deben ser efectuados por un electricista cualificado!  
Work on the electric arrangement only by skilled electrician!

| Bennung       |                                  | Maßstab                          |           | Blatt   | Blattzahl |
|---------------|----------------------------------|----------------------------------|-----------|---------|-----------|
| O-column      |                                  | Control KL24base, 230V AC / 50Hz |           | Gruppe  | 1         |
| KLARO GmbH    | Control KL24base, 230V AC / 50Hz | Zeichnung Nr.                    | SPKL24-21 | EDV Nr. |           |
| Bearb. 10.02. | Name                             | Schliefer                        |           | Gepl.   |           |
| Gepl.         |                                  |                                  |           |         |           |
| EDV Nr.       |                                  |                                  |           |         |           |

## 2. Circuit diagrams

## 2.13 Circuit diagram – A-column with KL24plus controller



### 3. Data sheets

#### 3. Data sheets

**Data sheets, operating and service instructions for:**

- Nitto piston compressor
- Becker rotary vane compressor
- Rietschle DLT 40 rotary vane compressor

**Note:**

The Becker rotary vane compressors used by us are equipped with a relief valve, which is factory preset to a maximum pressure of 0.5 bar.

The normal operating pressure of our systems is < 0.3 bar. If the pressure in the system should exceed 0.5 bar (e.g. due to a kinked air hose), part of the air is blown off via the relief valve. This protects the compressor against damage or excessive wear.

### 3. Data sheets

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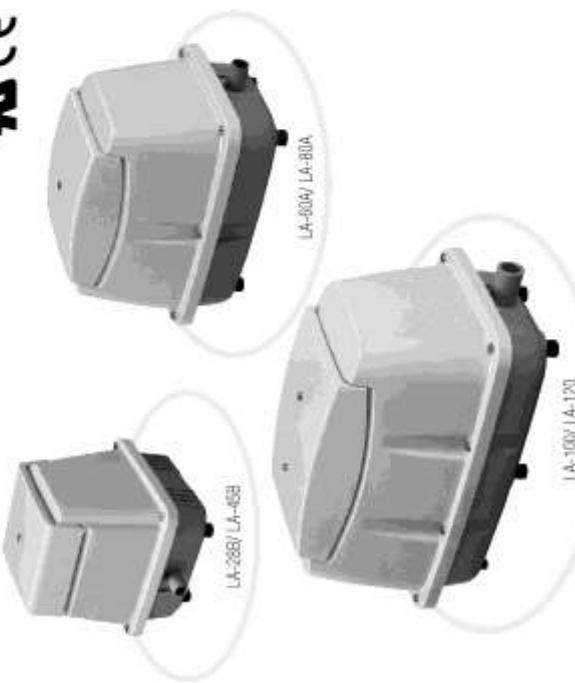
|                                           |    |
|-------------------------------------------|----|
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## MEDO LA BLOWER INSTRUCTION MANUAL

### INSTALLATION & MAINTENANCE

CE



**⚠** This instruction manual should be read and understood thoroughly before any installation and maintenance work is executed.

After reading this instruction manual, please keep it handy for reference.

### 3. Data sheets

## 1. Model and Specifications

| Model              | LA-28B                                            | LA-45B                                            | LA-60A                                            | LA-80A                                            | LA-100                                            | LA-120                                            |
|--------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| Standard Voltage * | 120V AC OR 230V AC                                |                                                   |                                                   |                                                   |                                                   |                                                   |
| Rated Frequency    | 50Hz/60Hz                                         |                                                   |                                                   |                                                   |                                                   |                                                   |
| Rated Pressure     | 0.011MPa(0.11kgf/cm <sup>2</sup> )                | 0.015MPa(0.15kgf/cm <sup>2</sup> )                | 0.016MPa(0.16kgf/cm <sup>2</sup> )                | 0.018MPa(0.18kgf/cm <sup>2</sup> )                | 0.020MPa(0.20kgf/cm <sup>2</sup> )                | 0.025MPa(0.25kgf/cm <sup>2</sup> )                |
| Operating Pressure | 0.005~0.025MPa<br>(0.05~0.25kgf/cm <sup>2</sup> ) |
| Rated Airflow      | 28L/min.                                          | 45L/min.                                          | 80L/min.                                          | 100L/min.                                         | 120L/min.                                         | 130L/min.                                         |
| Power Consumption  | 29/26W                                            | 47/44W                                            | 64/60W                                            | 86/80W                                            | 100/95W                                           | 130/110W                                          |
| Weight             | 2.9kg                                             | 3.0kg                                             | 5.0kg                                             | 5.3kg                                             | 9.4kg                                             | 9.4kg                                             |

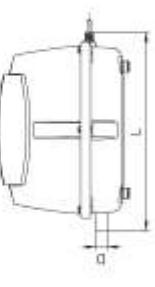
\* The unit must only be operated at the voltage as indicated on the outer casing of the blower.

## 2. Dimensions

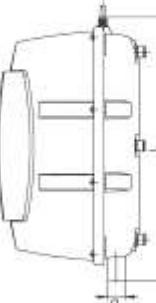
LA-28B/LA-45B



LA-60A/LA-80A



LA-100/LA-120



## 3. Safety Instruction

### Explanation of Diagrammatic Expressions

The term "Attention" used in this manual is to alert you to dangers such as the following:  
**Degree of Danger Indicated by The Term**

#### Term

This term indicates the possibility that continuing to work while ignoring this "Attention", or working incorrectly without full understanding, may cause personal injury or physical damage.

### The Meaning of the Symbols

#### Symbols

This symbol advises you of an item which should **BE NOTED** (including Danger and Warning) and the general notes will be shown by a picture, word or explanatory text inside or along the symbol mark.



This symbol advises you of an action which must **NOT BE TAKEN** (Is PROHIBITED) in order to avoid danger. The general actions which must not be taken will be shown by a picture or explanatory text inside or along the symbol mark.



This symbol advises you of an action which must **BE TAKEN** (Is MANDATORY) in order to avoid danger and the general emphasis of the action which must be taken will be shown by a picture or explanatory text inside or along the symbol mark.

### Safety and Operating Instructions

The following safety precautions should always be followed to reduce the risk of breakdown and/or accident.

### ATTENTION • • • To Prevent Electric Shock And Fire

- ① Don't install the blower where it will be flooded with water.
  - ② Electrical work must be done by a qualified electrician.
  - ③ The power supply should be the rated voltage shown on the label on the blower and be fitted with an earth leakage breaker and over current breaker.
  - ④ The power outlet used should be waterproof and include an earth connection to ground.
  - ⑤ If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or similarly qualified person in order to avoid a hazard.
  - ⑥ Don't place any objects on the electric cable.
  - ⑦ Be sure to unplug the blower before starting maintenance.
  - ⑧ Be sure to put the Upper Case back after maintenance.
  - ⑨ Don't touch the metal part of the blower until it is cooled down as the blower runs very hot.
- Ignoring any of the above may cause an electric shock, a fire or a burn.

## 4. Installation (Septic Tank Application)

### 1. Installation site selection

- ① Install near the septic tank.
- ② If the pipeline is long, the sewage treatment may not perform well due to an insufficient airflow.
- ③ If the pipeline is long, the sewage treatment may not perform well due to an insufficient airflow.
- ④ Don't install over a manhole or on soft ground.
- ⑤ Avoid areas where wind-blown leaves and dust gathers.
- ⑥ Install in a well ventilated place.
- ⑦ Install at least 30cm away from the wall of a house.
- ⑧ Installation in the shade is recommended to suppress heat generation of the blower.
- ⑨ Don't install the Blower where it will be flooded with water.
- ⑩ Don't install where there is excess moisture or humidity.

### 2. Method of Installation

- ⑪ The base should be made of concrete strong enough to bear the weight and block vibration from the blower.
- ⑫ The base should be at least 10cm above the ground level and 5cm larger than the external dimensions of the blower.
- ⑬ Provide a separate power outlet to be only used for the blower.
- ⑭ Electrical work must be done by a qualified electrician.
- ⑮ The power supply should be the rated voltage shown on the label on the blower and be fitted with an earth leakage breaker and over-current breaker.
- ⑯ The power outlet used should be waterproof and include an earth connected to ground.
- ⑰ Place the blower horizontally on the base.
- ⑱ A soft rubber hose must be used for connection between the air outlet of the blower and the pipe.
- ⑲ The rubber hose must be fastened with hose clamps.
- ⑳ When making the connection, level the air outlet and the pipe to ensure the hose is not knotted or blocked.
- ㉑ Before starting the operation of the blower, ensure that the water level in the septic tank is appropriate and the valves on the pipeline are properly opened.

### 3. Start operation

- Insert the power plug into the power outlet with full contact so that the plug itself does not wobble. Incomplete connection may cause and electric shock or a fire.

After starting operation ensure that there is:

No air leakage from the hose and the pipe connection.

No abnormal noise from the blower.

No vibration transmitted to the ground due to strained piping.

## 5. Maintenance (Refer the sketches on the next page)

### 1. Cautions

- ① MEDO blowers are OILLESS. Never lubricate them.
- ② All blowers have already been precisely adjusted. Never disassemble them.
- ③ (Do not try to loosen the Hex. Bolts on the Endcap!)

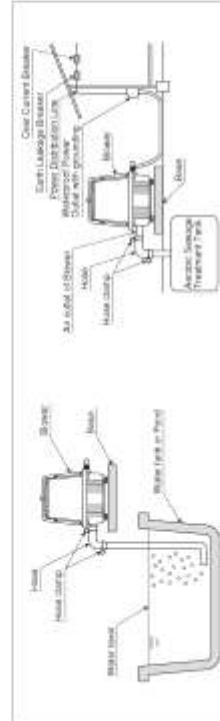
### 2. Replacement of Filter Element

- ① Be sure to unplug the blower before starting the replacement work.
  - ② Loosen the Bind Screw<sup>1</sup> and remove the Filter Cover<sup>4</sup>.
  - ③ Remove the Filter Element(s)<sup>5</sup> from the Upper Case<sup>6</sup> and replace with new One(s). At the same time, clean the air inlet of the Filter Cover<sup>4</sup> and the Upper Case<sup>6</sup>.
  - ④ Assemble the Filter Cover<sup>4</sup> with the Filter Gasket<sup>3</sup> securely positioned.
  - ⑤ Mount the Filter Cover<sup>4</sup> to the Upper Case<sup>6</sup>, then tighten with the Bind Screw(s)<sup>1</sup>.
  - ⑥ Time to replace the Filter Element.
- It is recommended that the Filter Element(s) is cleaned or replaced with new one(s) depending on the extent of its deterioration as determined by the atmospheric conditions around the application. The filter element(s) should be checked every three months.

### 3. Replacement of Piston Set Assy

- ① Be sure to unplug the blower before starting the maintenance work.
- ② Remove the Upper Case<sup>8</sup>, then the Headcover<sup>10</sup> and remove it. In case it is hard to remove the Headcover<sup>10</sup> insert a flat head screwdriver to the slot(s) on the edge of the Headcover<sup>10</sup> and twist the screwdriver gently to open.
- ③ Take out the Piston Set Assy(s).
- ④ Replace all Piston Set Assy(s), Gasket A<sup>11</sup> and Gasket B<sup>12</sup> with new ones.
- ⑤ Be sure to keep the Teflon Seal of the Piston<sup>13</sup> away from any dust, sweat, water, oil or grease. Try not to touch the Teflon Seal of the Piston<sup>13</sup> with your fingers.
- ⑥ Headcover<sup>10</sup> and Gasket B<sup>12</sup> into the Pump Body, then fasten the Headcover<sup>10</sup> on the Headcover<sup>10</sup> and Gasket B<sup>12</sup> with new ones.
- ⑦ Before putting the Upper Case<sup>8</sup> back, start the blower and check if there is any air leakage along the Headcover<sup>10</sup> or the Nozzle Seal(s). By briefly blocking the air outlet, in case there is an air leakage along the Headcover<sup>10</sup>, re-position Gasket A<sup>11</sup> and Gasket B<sup>12</sup> then re-fasten the Hex Bolts<sup>9</sup>. In case there is an air leakage along the Nozzle Seal(s) check if the nozzle seal is installed on the air tank properly and press the pump body down to allow the outlet port of the Headcover<sup>10</sup> to catch the Nozzle Seal(s) correctly.
- ⑧ Put the Upper Case<sup>8</sup> back after installing Gasket C<sup>8</sup> on the Bottom Case properly. Fasten the Bind Screw/Torx Screws<sup>7</sup> evenly and alternately.
- ⑨ Time to replace the Piston Set Assy

It is suggested that the Piston Set Assy is replaced every 12 to 24 months depending on the extent of pressure and airflow drop of the blower. There is a slot on each Teflon Seal of the Piston. The slot shows the degree of wear. If one or both slots have gone, the replacement of the Piston Set Assy is recommended.



### 3. Data sheets

**Piston sectional view**

**Caution**

- Locate the gasket into the piston by running it clockwise.
- Check that gasket is seated on the correct face of the spring seat.
- If the gasket is present, please contact your supplier.
- Never use standard grease as it may cause a malfunctions.
- Replace Teflon Seal every time you do this, never oil or grease.

**4. Purchasing suggestion for the maintenance parts**

(1) Filter Element

| Model                       | Part No. | Quantity  |
|-----------------------------|----------|-----------|
| LA-28B/LA-45B/LA-100/LA-120 | LB02369  | 10pcs set |
| LA-60A/LA-80A               | LB03937  | 10pcs set |

(2) Repair Parts Kit

| Model         | Part No. | Quantity |
|---------------|----------|----------|
| LA-28B        | LB01298  | 1 set    |
| LA-45B        | LB03114  | 1 set    |
| LA-60A        | LB03119  | 1 set    |
| LA-80A        | LB03117  | 1 set    |
| LA-100/LA-120 | LB04151  | 1 set    |

(3) Contents of Repair Parts Kit

| Parts Included   | Part No.      | LA-60A/LA-80A | LA-100/LA-120 |
|------------------|---------------|---------------|---------------|
| ⑤ Filter Element | LA-28B/LA-45B | 1             | 2             |
| ⑪ Gasket A       |               | 1             | 3             |
| ⑫ Gasket B       |               | 1             | 3             |
| ⑬ Piston         |               | 1             | 3             |
| ⑭ Spring Seat    |               | 1             | 3             |
| ⑯ Gasket A       |               | 1             | 3             |
| ⑰ Gasket B       |               | 1             | 3             |
| ⑱ Outer Port     |               | 1             | 3             |
| ⑲ Outer Port     |               | 1             | 3             |

**LA-28B/LA-45B**

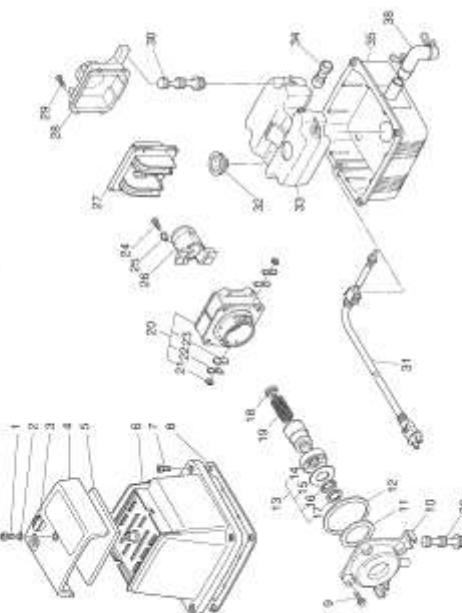
**LA-60A / LA-80A**

**LA-100/LA-120**

### 3. Data sheets

**Exploded View**

**LA-28E / LA-45E**



**Parts List**

| No. | Part Name       | LA28D   | Qty | LA28E   | Qty | LA45E           | Qty | GW |
|-----|-----------------|---------|-----|---------|-----|-----------------|-----|----|
| 1   | Bolt Set        | LP05851 | 1   | LP05851 | 1   | LB01546         | 1   |    |
| 2   | Steel Washer    | LP04030 | 2   | LP04030 | 2   | LP04030         | 2   |    |
| 3   | Fitter Crown    | LD05817 | 2   | LD05817 | 2   | LB02850         | 1   |    |
| 4   | Fitter Crown    | LD08075 | 1   | LD08075 | 1   | LD05982         | 1   |    |
| 5   | Fitter Element  | LD02092 | 1   | LD02092 | 1   | LP01311         | 4   |    |
| 6   | Upper Cover     | LB02937 | 1   | LB02937 | 1   | LD04256         | 4   |    |
| 7   | Hand Screw U.I. | LP02141 | 4   | LP02141 | 4   | LB02541         | 1   |    |
| 8   | Tork Screw U.E. | LD03062 | 4   | LD03062 | 4   | Cable Assy D    | 1   |    |
| 9   | Exhibit C       | LD02061 | 1   | LD02061 | 1   | Cable Assy A    | 1   |    |
| 10  | Hand Nut        | LP01316 | 4   | LP01316 | 4   | Cable Assy J    | 1   |    |
| 11  | Hose Nut        | LD02567 | 1   | LD02567 | 1   | Cable Assy I    | 1   |    |
| 12  | Gasket A        | LD01043 | 1   | LD01043 | 1   | Nut Zinc Steel  | 1   |    |
| 13  | Gasket B        | LD01042 | 1   | LD01042 | 1   | AK Fork Assy    | 2   |    |
| 14  | Piston          | AK01056 | 1   | AK01056 | 1   | AK01056         | 1   |    |
| 15  | Piston Sub Assy | LA07020 | 1   | LA07020 | 1   | Piston Sub Assy | 1   |    |
| 16  | Inlet Valve     | LP03916 | 1   | LP03916 | 1   | AK01056         | 1   |    |
| 17  | Valve Housing A | LP11548 | 1   | LP11548 | 1   | AK01056         | 1   |    |
| 18  | Clothing Ring   | LP12946 | 1   | LP12946 | 1   | OPTION          | 1   |    |
| 19  | Spring Sash     | LP12156 | 1   | LP12156 | 1   | Hose Pipe       | 1   |    |
| 20  | House           | LB01544 | 1   | LB01544 | 1   | L001061         | 1   |    |
| 21  | Spring          | LP12620 | 1   | LP02743 | 1   |                 |     |    |
| 22  | Seal Ring       | LP12670 | 2   | LP12670 | 2   |                 |     |    |
| 23  | Valve Housing B | LP11529 | 2   | LP11529 | 2   |                 |     |    |
| 24  | Outer Valve     | LP10558 | 2   | LP10558 | 2   |                 |     |    |
| 25  | Screen 5 x 20   | LP12599 | 2   | LP12599 | 2   |                 |     |    |
| 26  | Insulation Bush | LP03955 | 2   | LP03955 | 2   |                 |     |    |
| 27  | Flow Control    | LA74413 | 1   | LA74413 | 1   |                 |     |    |

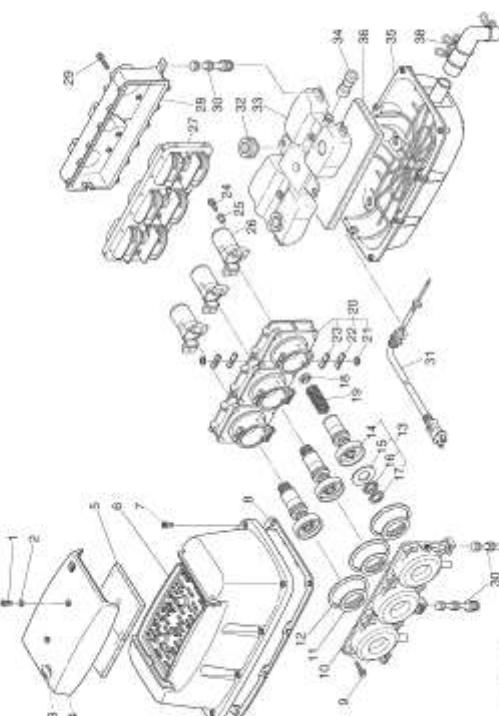
**Parts List**

| No. | Part Name | LA026 | Qty | LA030 | Qty | LA031 | Qty | LA032 | Qty | LA033 | Qty | LA034 | Qty | LA035 | Qty | LA036 | Qty | LA037 | Qty | LA038 | Qty | LA039 | Qty | LA040 | Qty | LA041 | Qty | LA042 | Qty | LA043 | Qty | LA044 | Qty | LA045 | Qty | LA046 | Qty | LA047 | Qty | LA048 | Qty | LA049 | Qty | LA050 | Qty | LA051 | Qty | LA052 | Qty | LA053 | Qty | LA054 | Qty | LA055 | Qty | LA056 | Qty | LA057 | Qty | LA058 | Qty | LA059 | Qty | LA060 | Qty | LA061 | Qty | LA062 | Qty | LA063 | Qty | LA064 | Qty | LA065 | Qty | LA066 | Qty | LA067 | Qty | LA068 | Qty | LA069 | Qty | LA070 | Qty | LA071 | Qty | LA072 | Qty | LA073 | Qty | LA074 | Qty | LA075 | Qty | LA076 | Qty | LA077 | Qty | LA078 | Qty | LA079 | Qty | LA080 | Qty | LA081 | Qty | LA082 | Qty | LA083 | Qty | LA084 | Qty | LA085 | Qty | LA086 | Qty | LA087 | Qty | LA088 | Qty | LA089 | Qty | LA090 | Qty | LA091 | Qty | LA092 | Qty | LA093 | Qty | LA094 | Qty | LA095 | Qty | LA096 | Qty | LA097 | Qty | LA098 | Qty | LA099 | Qty | LA100 | Qty | LA101 | Qty | LA102 | Qty | LA103 | Qty | LA104 | Qty | LA105 | Qty | LA106 | Qty | LA107 | Qty | LA108 | Qty | LA109 | Qty | LA110 | Qty | LA111 | Qty | LA112 | Qty | LA113 | Qty | LA114 | Qty | LA115 | Qty | LA116 | Qty | LA117 | Qty | LA118 | Qty | LA119 | Qty | LA120 | Qty | LA121 | Qty | LA122 | Qty | LA123 | Qty | LA124 | Qty | LA125 | Qty | LA126 | Qty | LA127 | Qty | LA128 | Qty | LA129 | Qty | LA130 | Qty | LA131 | Qty | LA132 | Qty | LA133 | Qty | LA134 | Qty | LA135 | Qty | LA136 | Qty | LA137 | Qty | LA138 | Qty | LA139 | Qty | LA140 | Qty | LA141 | Qty | LA142 | Qty | LA143 | Qty | LA144 | Qty | LA145 | Qty | LA146 | Qty | LA147 | Qty | LA148 | Qty | LA149 | Qty | LA150 | Qty | LA151 | Qty | LA152 | Qty | LA153 | Qty | LA154 | Qty | LA155 | Qty | LA156 | Qty | LA157 | Qty | LA158 | Qty | LA159 | Qty | LA160 | Qty | LA161 | Qty | LA162 | Qty | LA163 | Qty | LA164 | Qty | LA165 | Qty | LA166 | Qty | LA167 | Qty | LA168 | Qty | LA169 | Qty | LA170 | Qty | LA171 | Qty | LA172 | Qty | LA173 | Qty | LA174 | Qty | LA175 | Qty | LA176 | Qty | LA177 | Qty | LA178 | Qty | LA179 | Qty | LA180 | Qty | LA181 | Qty | LA182 | Qty | LA183 | Qty | LA184 | Qty | LA185 | Qty | LA186 | Qty | LA187 | Qty | LA188 | Qty | LA189 | Qty | LA190 | Qty | LA191 | Qty | LA192 | Qty | LA193 | Qty | LA194 | Qty | LA195 | Qty | LA196 | Qty | LA197 | Qty | LA198 | Qty | LA199 | Qty | LA200 | Qty | LA201 | Qty | LA202 | Qty | LA203 | Qty | LA204 | Qty | LA205 | Qty | LA206 | Qty | LA207 | Qty | LA208 | Qty | LA209 | Qty | LA210 | Qty | LA211 | Qty | LA212 | Qty | LA213 | Qty | LA214 | Qty | LA215 | Qty | LA216 | Qty | LA217 | Qty | LA218 | Qty | LA219 | Qty | LA220 | Qty | LA221 | Qty | LA222 | Qty | LA223 | Qty | LA224 | Qty | LA225 | Qty | LA226 | Qty | LA227 | Qty | LA228 | Qty | LA229 | Qty | LA230 | Qty | LA231 | Qty | LA232 | Qty | LA233 | Qty | LA234 | Qty | LA235 | Qty | LA236 | Qty | LA237 | Qty | LA238 | Qty | LA239 | Qty | LA240 | Qty | LA241 | Qty | LA242 | Qty | LA243 | Qty | LA244 | Qty | LA245 | Qty | LA246 | Qty | LA247 | Qty | LA248 | Qty | LA249 | Qty | LA250 | Qty | LA251 | Qty | LA252 | Qty | LA253 | Qty | LA254 | Qty | LA255 | Qty | LA256 | Qty | LA257 | Qty | LA258 | Qty | LA259 | Qty | LA260 | Qty | LA261 | Qty | LA262 | Qty | LA263 | Qty | LA264 | Qty | LA265 | Qty | LA266 | Qty | LA267 | Qty | LA268 | Qty | LA269 | Qty | LA270 | Qty | LA271 | Qty | LA272 | Qty | LA273 | Qty | LA274 | Qty | LA275 | Qty | LA276 | Qty | LA277 | Qty | LA278 | Qty | LA279 | Qty | LA280 | Qty | LA281 | Qty | LA282 | Qty | LA283 | Qty | LA284 | Qty | LA285 | Qty | LA286 | Qty | LA287 | Qty | LA288 | Qty | LA289 | Qty | LA290 | Qty | LA291 | Qty | LA292 | Qty | LA293 | Qty | LA294 | Qty | LA295 | Qty | LA296 | Qty | LA297 | Qty | LA298 | Qty | LA299 | Qty | LA300 | Qty | LA301 | Qty | LA302 | Qty | LA303 | Qty | LA304 | Qty | LA305 | Qty | LA306 | Qty | LA307 | Qty | LA308 | Qty | LA309 | Qty | LA310 | Qty | LA311 | Qty | LA312 | Qty | LA313 | Qty | LA314 | Qty | LA315 | Qty | LA316 | Qty | LA317 | Qty | LA318 | Qty | LA319 | Qty | LA320 | Qty | LA321 | Qty | LA322 | Qty | LA323 | Qty | LA324 | Qty | LA325 | Qty | LA326 | Qty | LA327 | Qty | LA328 | Qty | LA329 | Qty | LA330 | Qty | LA331 | Qty | LA332 | Qty | LA333 | Qty | LA334 | Qty | LA335 | Qty | LA336 | Qty | LA337 | Qty | LA338 | Qty | LA339 | Qty | LA340 | Qty | LA341 | Qty | LA342 | Qty | LA343 | Qty | LA344 | Qty | LA345 | Qty | LA346 | Qty | LA347 | Qty | LA348 | Qty | LA349 | Qty | LA350 | Qty | LA351 | Qty | LA352 | Qty | LA353 | Qty | LA354 | Qty | LA355 | Qty | LA356 | Qty | LA357 | Qty | LA358 | Qty | LA359 | Qty | LA360 | Qty | LA361 | Qty | LA362 | Qty | LA363 | Qty | LA364 | Qty | LA365 | Qty | LA366 | Qty | LA367 | Qty | LA368 | Qty | LA369 | Qty | LA370 | Qty | LA371 | Qty | LA372 | Qty | LA373 | Qty | LA374 | Qty | LA375 | Qty | LA376 | Qty | LA377 | Qty | LA378 | Qty | LA379 | Qty | LA380 | Qty | LA381 | Qty | LA382 | Qty | LA383 | Qty | LA384 | Qty | LA385 | Qty | LA386 | Qty | LA387 | Qty | LA388 | Qty | LA389 | Qty | LA390 | Qty | LA391 | Qty | LA392 | Qty | LA393 | Qty | LA394 | Qty | LA395 | Qty | LA396 | Qty | LA397 | Qty | LA398 | Qty | LA399 | Qty | LA400 | Qty | LA401 | Qty | LA402 | Qty | LA403 | Qty | LA404 | Qty | LA405 | Qty | LA406 | Qty | LA407 | Qty | LA408 | Qty | LA409 | Qty | LA410 | Qty | LA411 | Qty | LA412 | Qty | LA413 | Qty | LA414 | Qty | LA415 | Qty | LA416 | Qty | LA417 | Qty | LA418 | Qty | LA419 | Qty | LA420 | Qty | LA421 | Qty | LA422 | Qty | LA423 | Qty | LA424 | Qty | LA425 | Qty | LA426 | Qty | LA427 | Qty | LA428 | Qty | LA429 | Qty | LA430 | Qty | LA431 | Qty | LA432 | Qty | LA433 | Qty | LA434 | Qty | LA435 | Qty | LA436 | Qty | LA437 | Qty | LA438 | Qty | LA439 | Qty | LA440 | Qty | LA441 | Qty | LA442 | Qty | LA443 | Qty | LA444 | Qty | LA445 | Qty | LA446 | Qty | LA447 | Qty | LA448 | Qty | LA449 | Qty | LA450 | Qty | LA451 | Qty | LA452 | Qty | LA453 | Qty | LA454 | Qty | LA455 | Qty | LA456 | Qty | LA457 | Qty | LA458 | Qty | LA459 | Qty | LA460 | Qty | LA461 | Qty | LA462 | Qty | LA463 | Qty | LA464 | Qty | LA465 | Qty | LA466 | Qty | LA467 | Qty | LA468 | Qty | LA469 | Qty | LA470 | Qty | LA471 | Qty | LA472 | Qty | LA473 | Qty | LA474 | Qty | LA475 | Qty | LA476 | Qty | LA477 | Qty | LA478 | Qty | LA479 | Qty | LA480 | Qty | LA481 | Qty | LA482 | Qty | LA483 | Qty | LA484 | Qty | LA485 | Qty | LA486 | Qty | LA487 | Qty | LA488 | Qty | LA489 | Qty | LA490 | Qty | LA491 | Qty | LA492 | Qty | LA493 | Qty | LA494 | Qty | LA495 | Qty | LA496 | Qty | LA497 | Qty | LA498 | Qty | LA499 | Qty | LA500 | Qty | LA501 | Qty | LA502 | Qty | LA503 | Qty | LA504 | Qty | LA505 | Qty | LA506 | Qty | LA507 | Qty | LA508 | Qty | LA509 | Qty | LA510 | Qty | LA511 | Qty | LA512 | Qty | LA513 | Qty | LA514 | Qty | LA515 | Qty | LA516 | Qty | LA517 | Qty | LA518 | Qty | LA519 | Qty | LA520 | Qty | LA521 | Qty | LA522 | Qty | LA523 | Qty | LA524 | Qty | LA525 | Qty | LA526 | Qty | LA527 | Qty | LA528 | Qty | LA529 | Qty | LA530 | Qty | LA531 | Qty | LA532 | Qty | LA533 | Qty | LA534 | Qty | LA535 | Qty | LA536 | Qty | LA537 | Qty | LA538 | Qty | LA539 | Qty | LA540 | Qty | LA541 | Qty | LA542 | Qty | LA543 | Qty | LA544 | Qty | LA545 | Qty | LA546 | Qty | LA547 | Qty | LA548 | Qty | LA549 | Qty | LA550 | Qty | LA551 | Qty | LA552 | Qty | LA553 | Qty | LA554 | Qty | LA555 | Qty | LA556 | Qty | LA557 | Qty | LA558 | Qty | LA559 | Qty | LA560 | Qty | LA561 | Qty | LA562 | Qty | LA563 | Qty | LA564 | Qty | LA565 | Qty | LA566 | Qty | LA567 | Qty | LA568 | Qty | LA569 | Qty | LA570 | Qty | LA571 | Qty | LA572 | Qty | LA573 | Qty | LA574 | Qty | LA575 | Qty | LA576 | Qty | LA577 | Qty | LA578 | Qty | LA579 | Qty | LA580 | Qty | LA581 | Qty | LA582 | Qty | LA583 | Qty | LA584 | Qty | LA585 | Qty | LA586 | Qty | LA587 | Qty | LA588 | Qty | LA589 | Qty | LA590 | Qty | LA591 | Qty | LA592 | Qty | LA593 | Qty | LA594 | Qty | LA595 | Qty | LA596 | Qty | LA597 | Qty | LA598 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### 3. Data sheets

**Exploded View**

LA-100/LA-120



**Parts List**

| No. | Part Name          | LA100<br>Qty | LA120<br>Qty | Part No. | No. | LA100<br>Qty        | LA120<br>Qty |
|-----|--------------------|--------------|--------------|----------|-----|---------------------|--------------|
| 1   | End Screw          | LP-05861     | 2            | LP-05861 | 27  | Front Cover Assy. B | LB-04865     |
| 2   | Seat Washer        | LP-05835     | 4            | LP-05835 | 4   | Front Cover Assy. C | LB-04280     |
| 3   | Flute Cover Gasket | LP-05101     | 2            | CA-05101 | 2   | Front Cover Assy. E | LB-04180     |
| 4   | Flute Cover        | LP-05100     | 1            | LP-05100 | 1   | END CAP             | LB-04171     |
| 5   | Flute Element      | LP-29152     | 2            | LP-29152 | 2   | Flute Bolt          | LP-29116     |
| 6   | Upper Cage         | LP-05102     | 1            | LP-05102 | 1   | Rubber Fender       | LP-05039     |
| 7   | Ball Bushing       | LP-05861     | 8            | LP-05861 | 8   | Cable Nut L/H       | LB-05241     |
| 8   | Tyre Screw CE      | LP-05043     | 8            | LP-05043 | 8   | Cable Assy D        | LB-05307     |
| 9   | Gasket C           | LP-05081     | 1            | LP-05081 | 1   | Cable Assy A        | LB-05292     |
| 10  | Hole Bolt          | LP-05116     | 12           | LP-05116 | 12  | Cable Assy J        | LB-05107     |
| 11  | Hubnut             | LP-05038     | 1            | LP-05038 | 1   | Cable Assy I        | LB-04770     |
| 11  | Outer A            | LP-05199     | 3            | LP-05199 | 3   | Nut2in Size         | LB-05298     |
| 12  | Outer B            | LP-05105     | 3            | LP-05105 | 3   | Air Tube Assy       | LB-05171     |
| 13  | Finger             | LP-05770     | 3            | LP-05770 | 3   | Jacket Hose         | LB-05096     |
| 14  | Finger Sub Assy    | LP-05780     | 3            | LP-05780 | 3   | Bottom Case         | LB-05092     |
| 15  | Weld Valve         | LP-05200     | 3            | LP-05200 | 3   | Cushion             | LB-05142     |
| 16  | Weld Retainer A    | LP-15140     | 3            | LP-15140 | 3   | Retainer Prop       | LP-15140     |
| 17  | CS Ring            | LP-15240     | 3            | LP-15240 | 3   | OPTION              |              |
| 18  | Spring Sheet       | LP-05357     | 3            | LP-05357 | 3   | Flame Arrestor      | LP-05070     |
| 19  | Spring             | LP-05117     | 3            | LP-05117 | 3   | LIQUIDATION         | LB-05085     |
| 20  | Retaining          | LP-05770     | 3            | LP-05770 | 3   |                     |              |
| 21  | SC. Ring           | LP-15207     | 6            | LP-15207 | 6   |                     |              |
| 22  | Weld Retainer B    | LP-15276     | 6            | LP-15276 | 6   |                     |              |
| 23  | Orbital Valve      | LP-05159     | 6            | LP-05159 | 6   |                     |              |
| 24  | Screws X 20        | LP-25599     | 6            | LP-25599 | 6   |                     |              |
| 25  | Insulation Bush    | LP-0356      | 6            | LP-0356  | 6   |                     |              |
| 26  | Weld Catcher       | LP-01476     | 3            | LP-01476 | 3   |                     |              |



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**NITTO KOHII CO., LTD.**  
UNIT 1, 11 BOCHAN DRIVE, UNDERWOOD  
QUEENSLAND 4111, AUSTRALIA  
TEL: 07/3802/6668 FAX: 07/3802/4939  
NETTO KOHII AUSTRALIA PTY. LTD.  
MERO U.S.A. INC.  
4025 TURNBERRY DRIVE, HANCOCK PARK  
IL 60143 U.S.A.  
TEL: 847/881-8811 FAX: 847/881-8815

**NITTO KOHII DEUTSCHLAND GMBH.**

MARIESEN 6-2111 WILDENBACH, GERMANY

TEL: 0715/2400-2270 FAX: 0715/2407

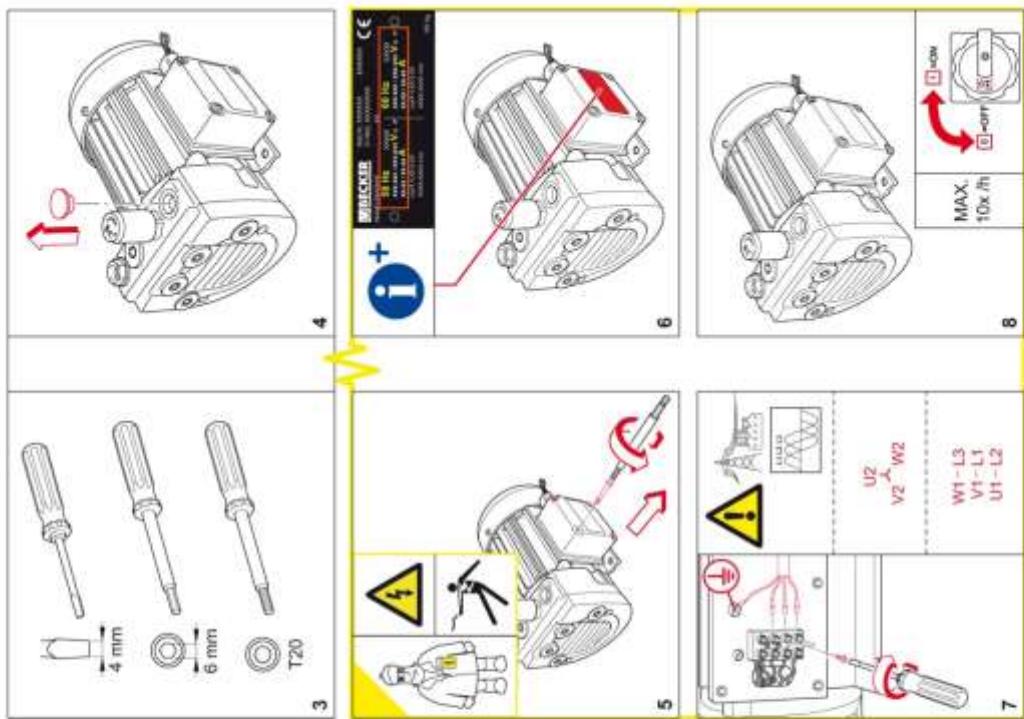
TEL: 0715/2400-3146 FAX: 0715/2407

### 3. Data sheets

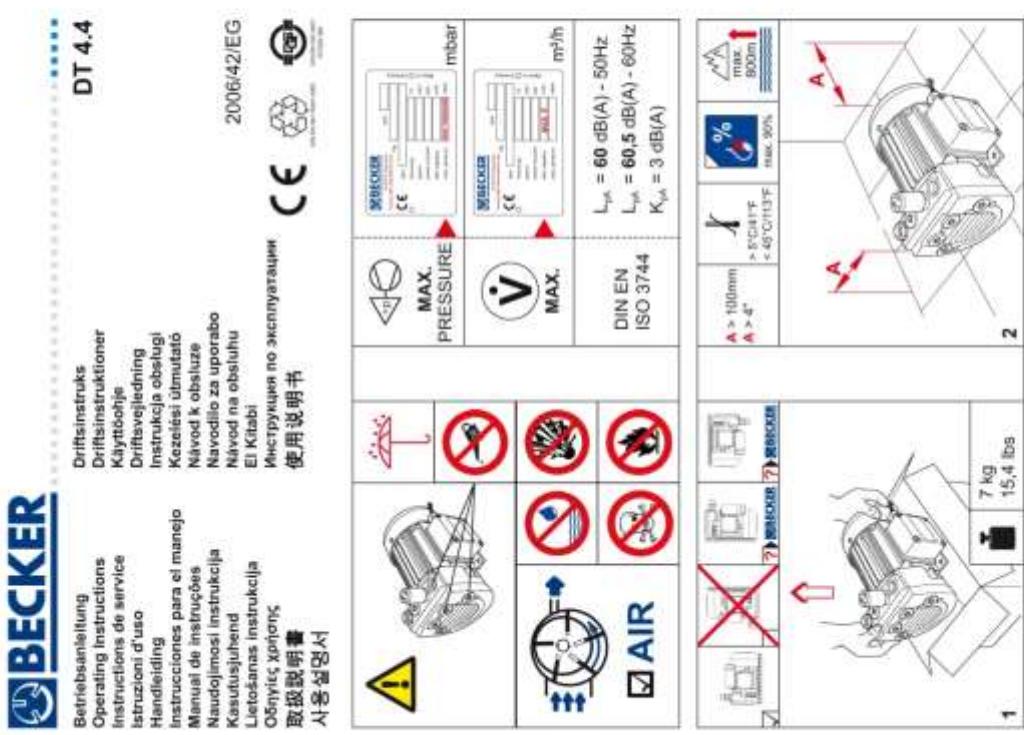


| 1. Warning Notice |                                                                                    |  |                                                                                                        |
|-------------------|------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------|
|                   | <b>High Voltage</b><br>Only qualified staff may work on electronic components      |  | <b>Qualified Staff</b><br>Marked operations may only be executed by qualified electricians             |
|                   | <b>Automatic Start-Up</b><br>When servicing the device must be turned off          |  | <b>Hot Surface</b><br>will cause burns.<br>Let device cool down before maintenance                     |
| 2. Interdiction   |                                                                                    |  |                                                                                                        |
|                   | <b>Pump works without oil</b><br>Avoid absorption of oil fumes                     |  | <b>Marked areas</b><br>may not be subject to weight                                                    |
|                   | <b>Explosive substances</b><br>may not be conveyed                                 |  | <b>Flammable Substances</b><br>may not be conveyed                                                     |
|                   | <b>Assembly</b><br>Incorrect fitting position                                      |  | <b>Toxic Substances</b><br>may not be conveyed                                                         |
| 3. Rules          |                                                                                    |  |                                                                                                        |
|                   | <b>Wear protective goggles</b>                                                     |  | <b>Wear protective gloves</b>                                                                          |
|                   |                                                                                    |  |                                                                                                        |
|                   |                                                                                    |  | <b>Wear protective ear-muffs</b><br>Sound level information<br>e.g. 85 dB (A)                          |
| 4. Advice         |                                                                                    |  |                                                                                                        |
|                   | <b>Active principle</b><br>Rotary vane pump<br>Only air may be conveyed            |  | <b>Active principle</b><br>side channel fan only air may be conveyed                                   |
|                   | <b>Storing / Assembly</b><br>Protect pump from humidity                            |  | <b>Maintenance</b><br>Regularly execute the marked procedures                                          |
|                   | <b>Specification</b><br>Vacuum pump                                                |  | <b>Further Information</b><br>(optional Data)<br>- name plate<br>- Internet                            |
|                   | <b>Factory-made Revolving field clockwise as pre-requisite for pump attachment</b> |  | <b>Safety valve</b>                                                                                    |
|                   | <b>Blow out marked areas with air pressure</b>                                     |  | <b>Arrange Motor-circuit switch</b>                                                                    |
|                   |                                                                                    |  |                                                                                                        |
|                   |                                                                                    |  | <b>Filter Maintenance</b><br>Service according to dust accumulation exchange old cartridge dispose old |

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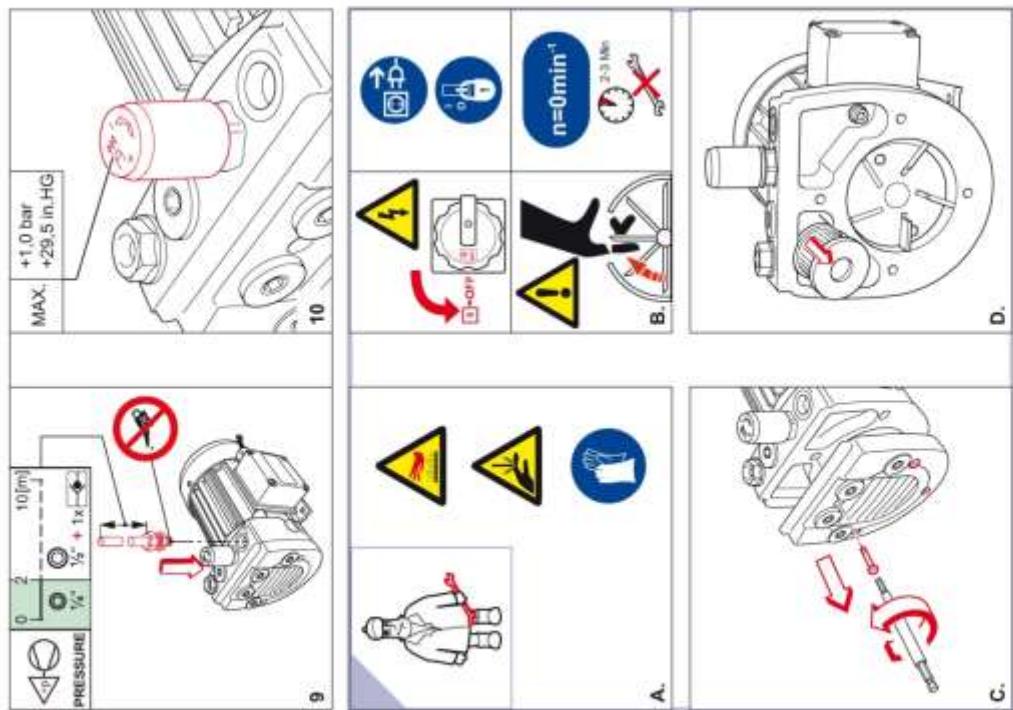
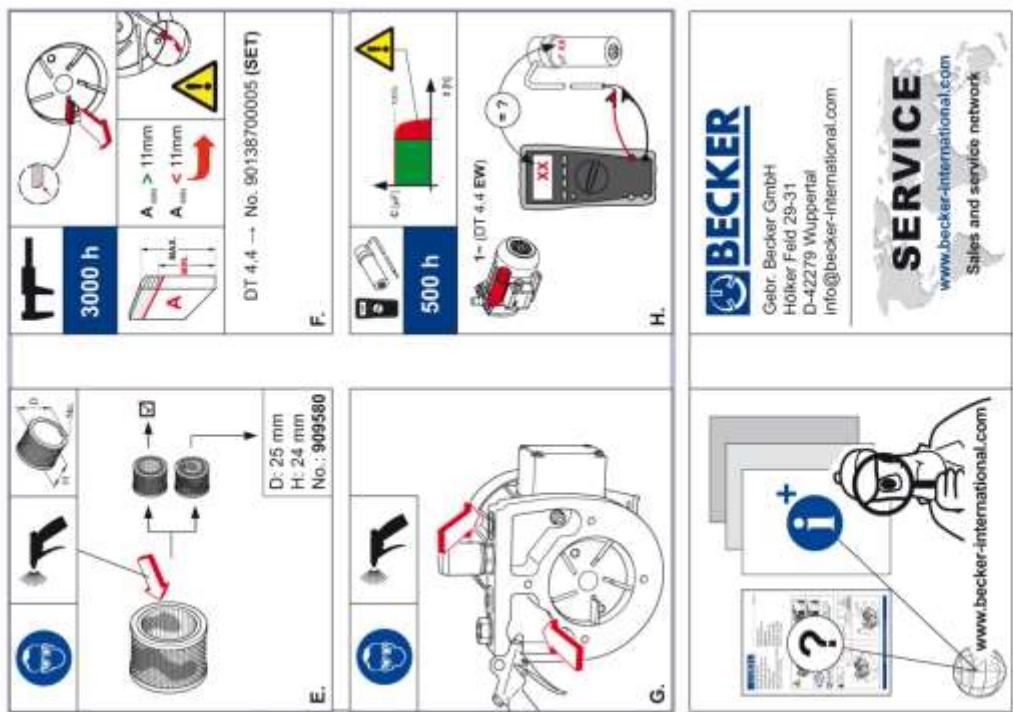


[www.becker-international.com](http://www.becker-international.com)

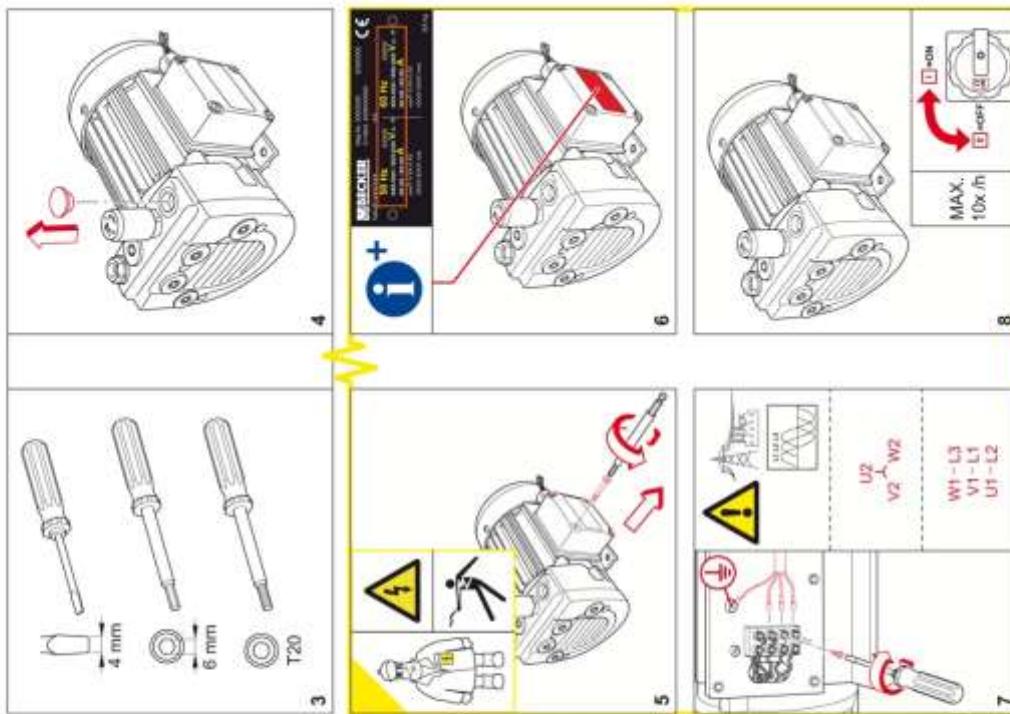


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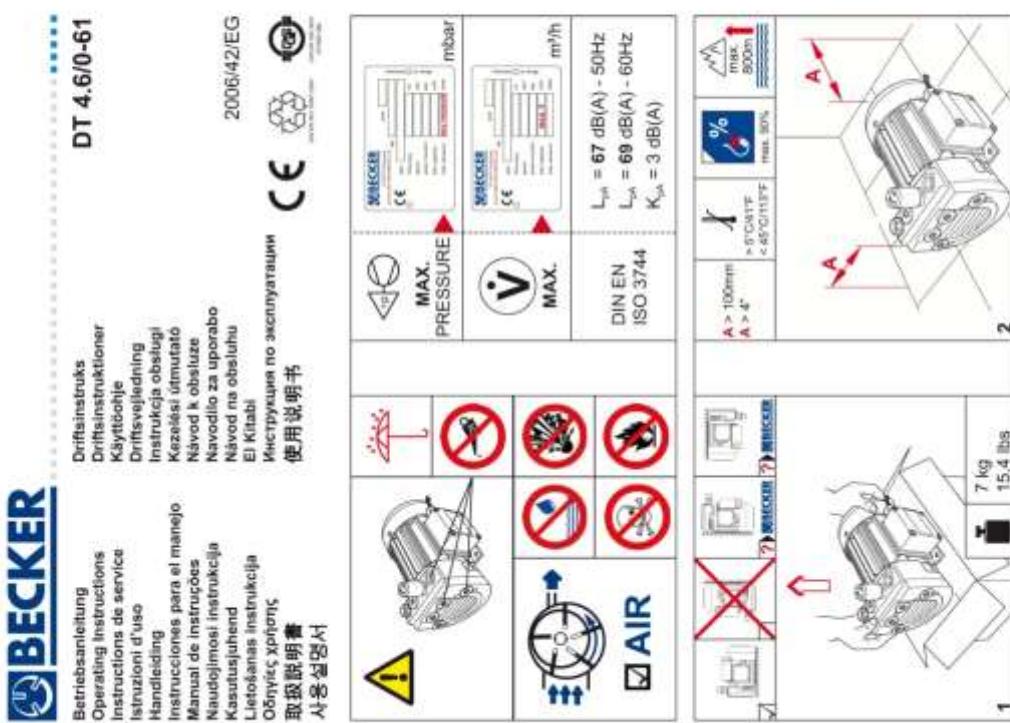
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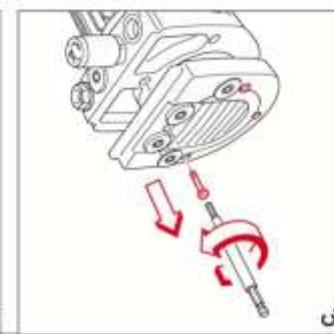
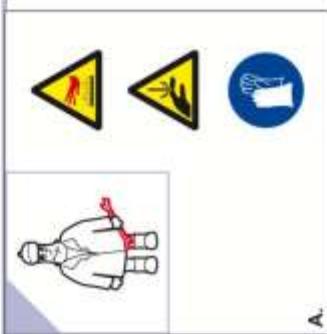
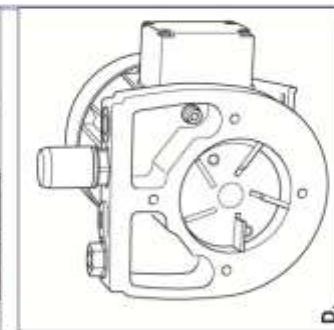
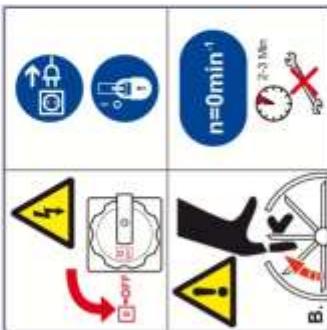
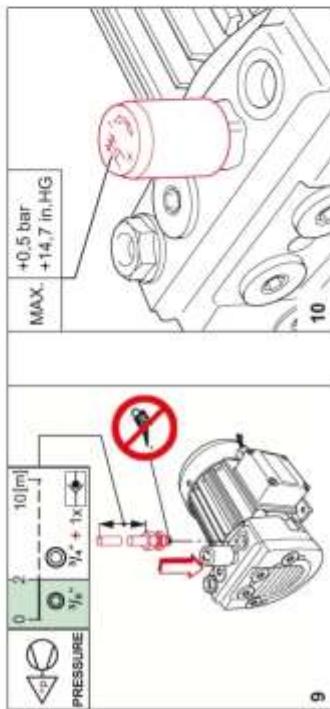
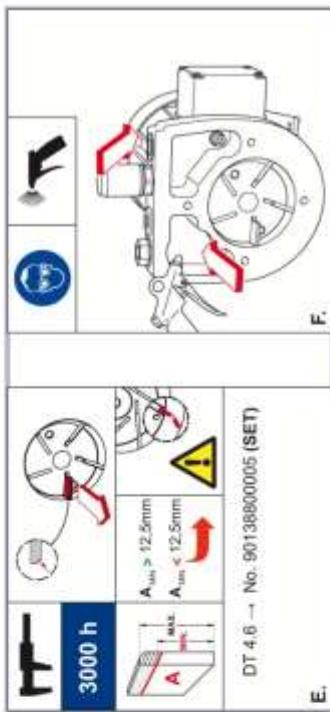
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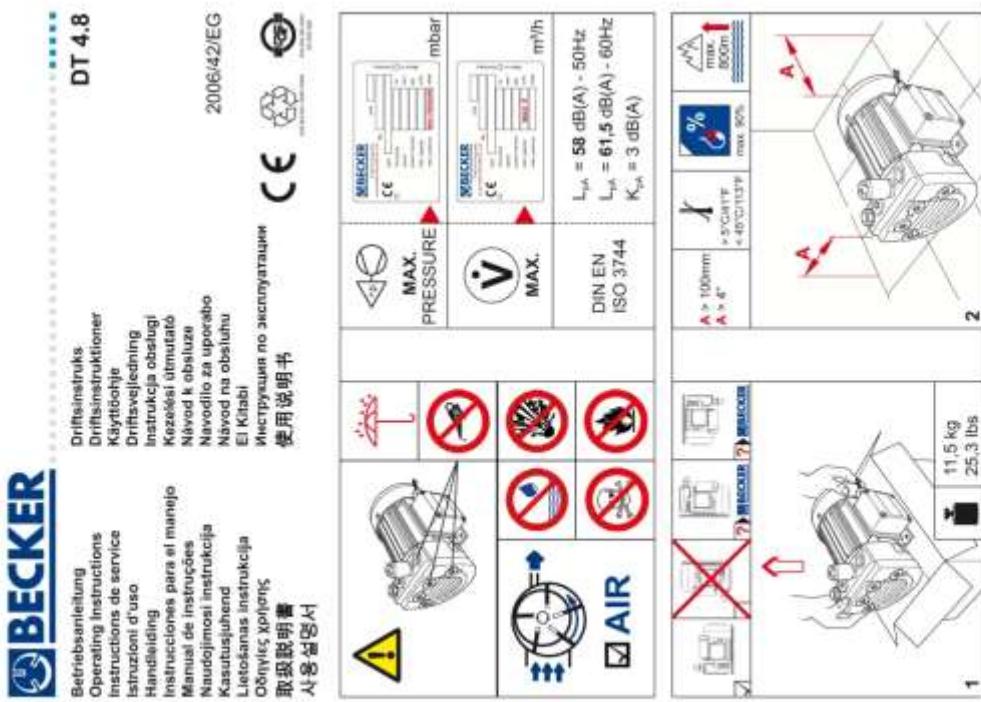
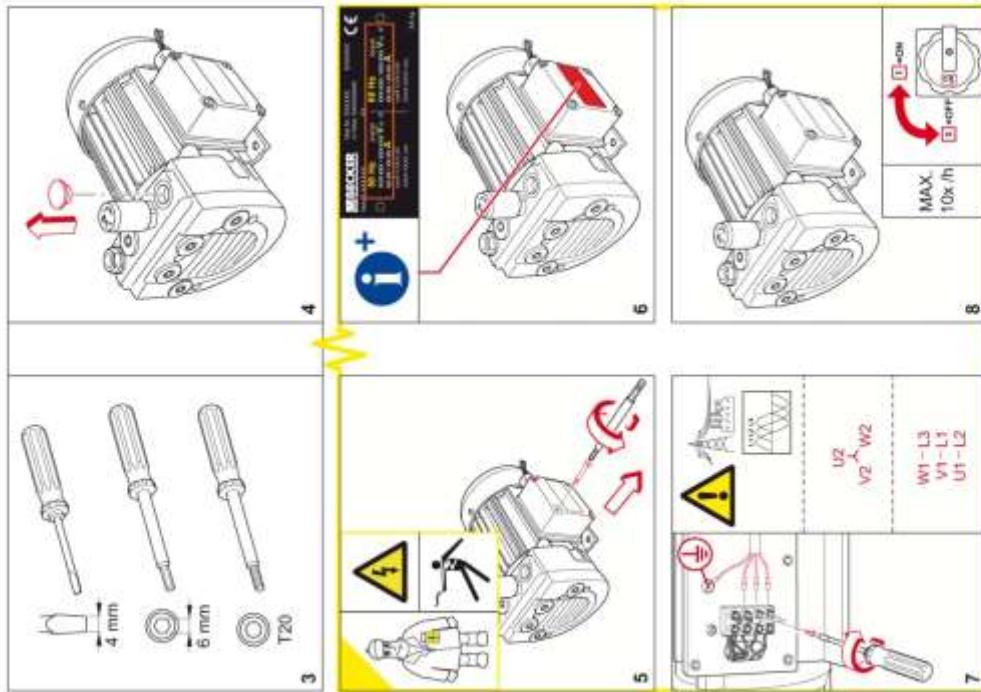
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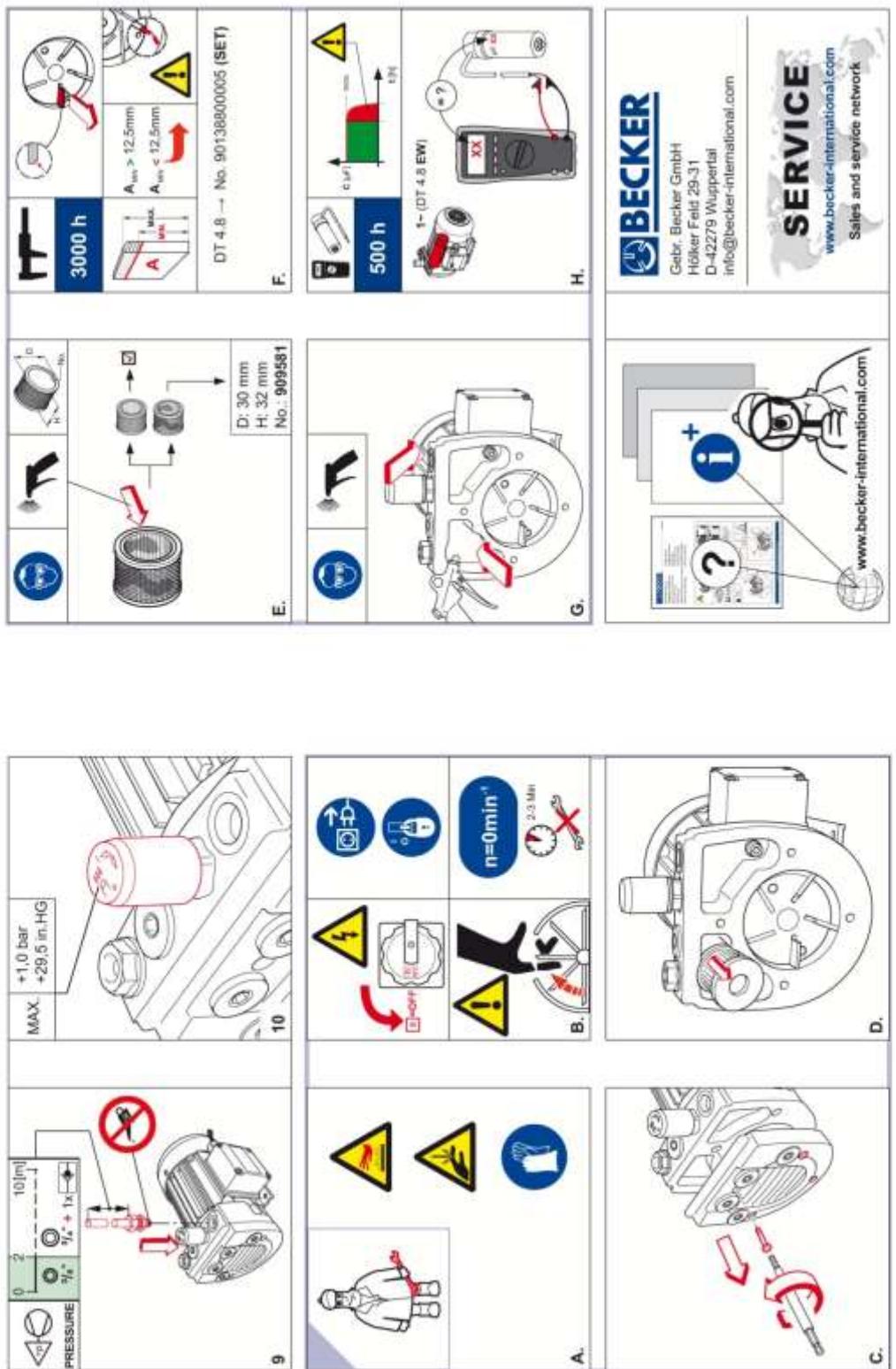
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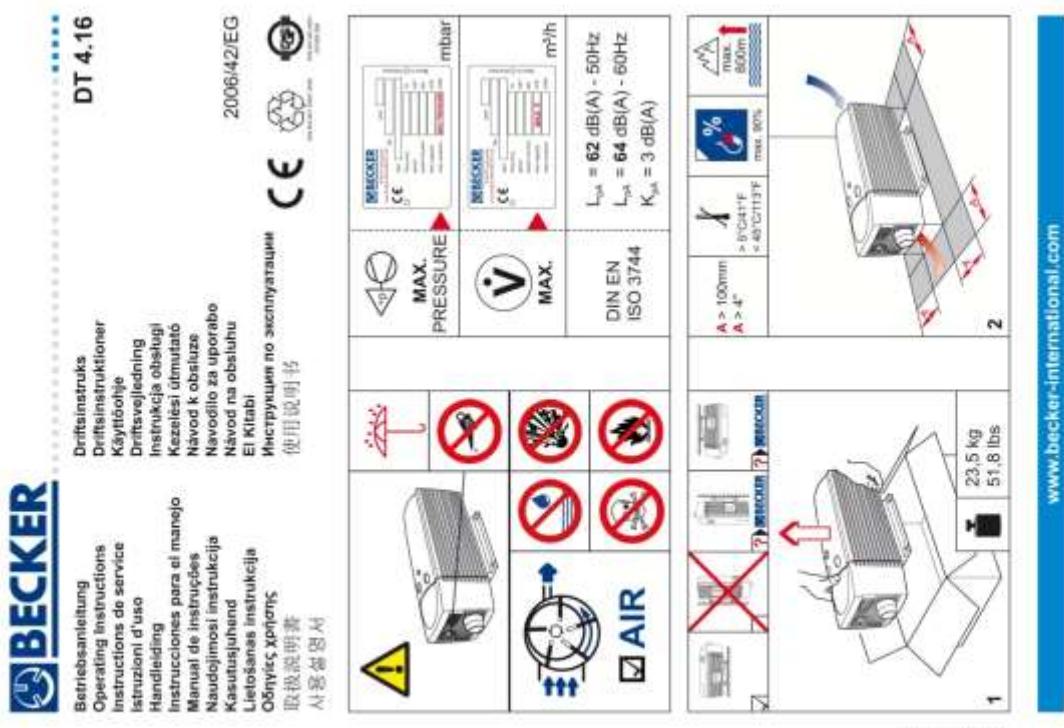
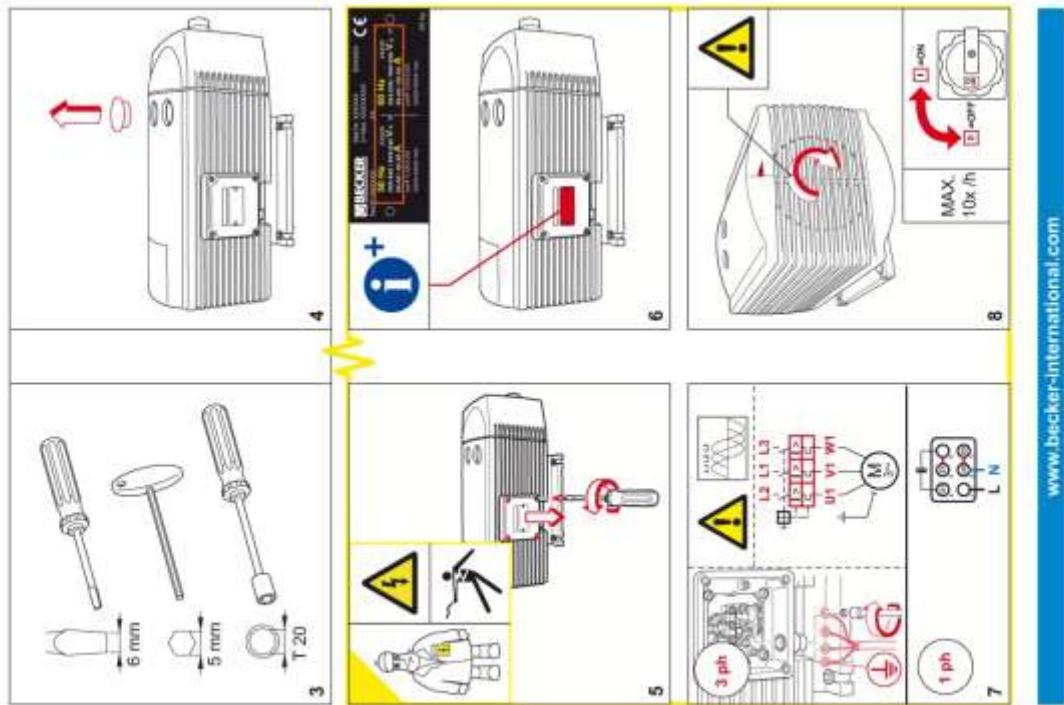


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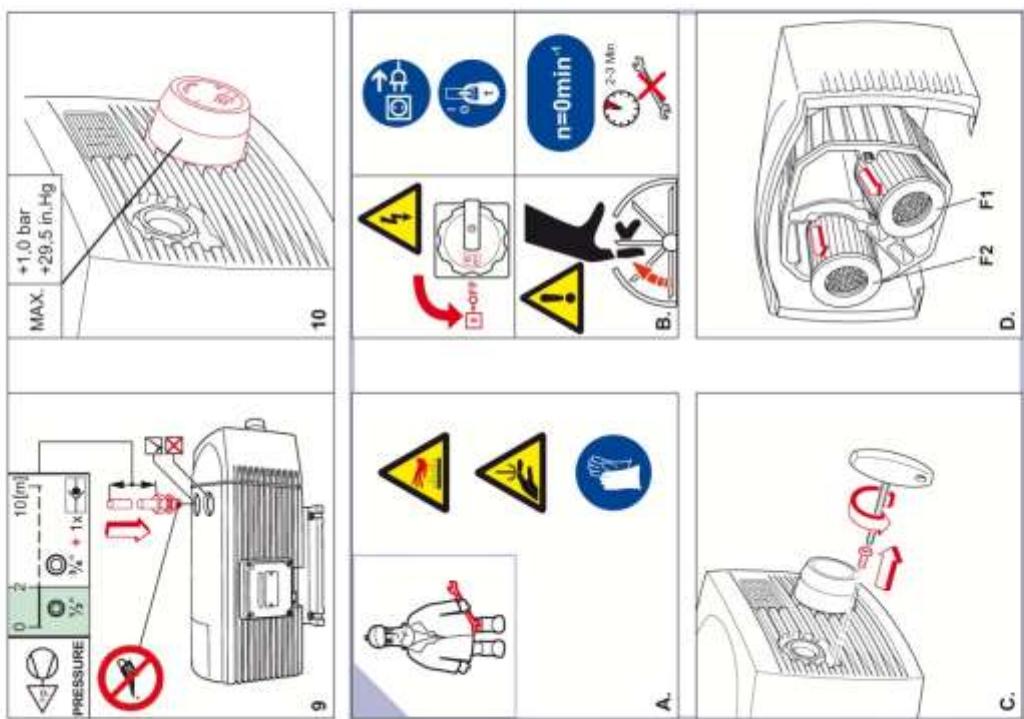
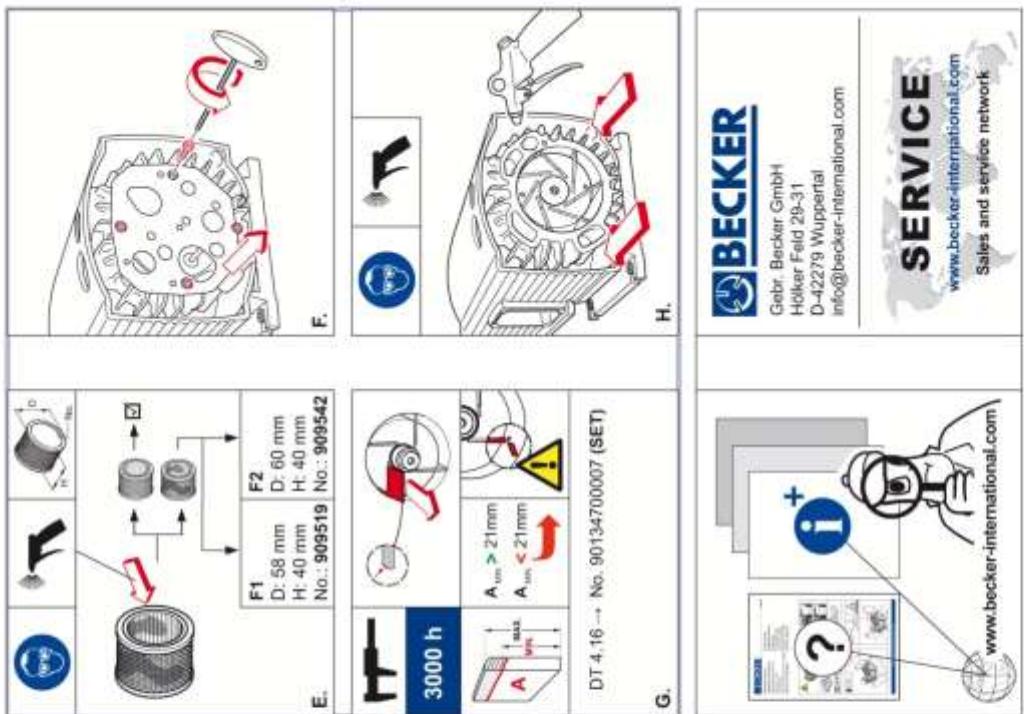
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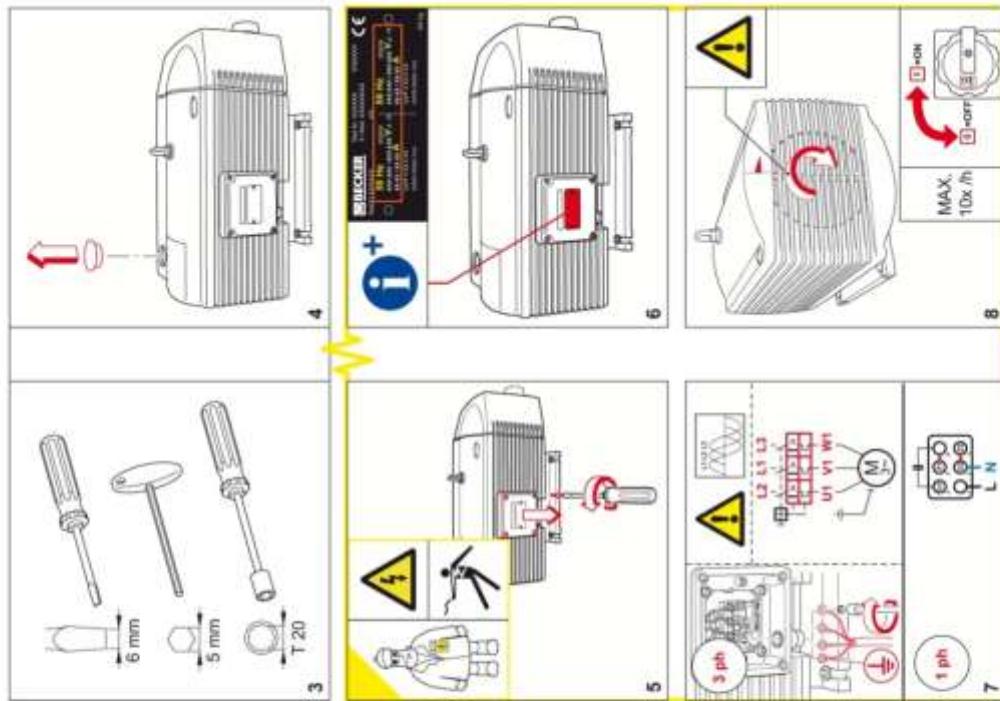
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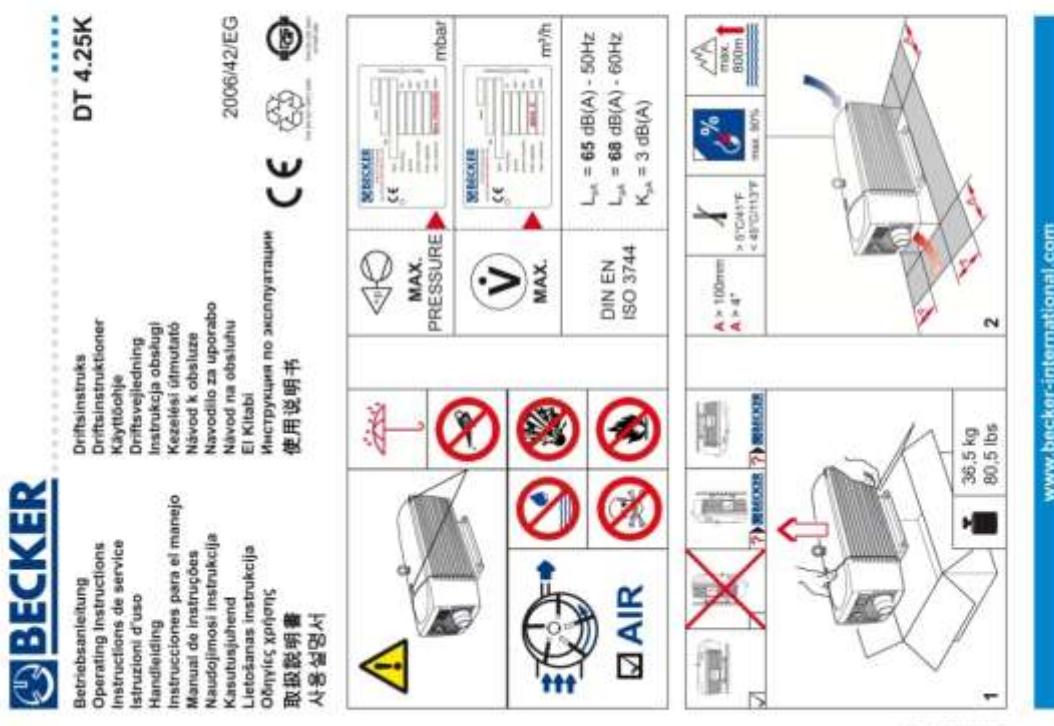
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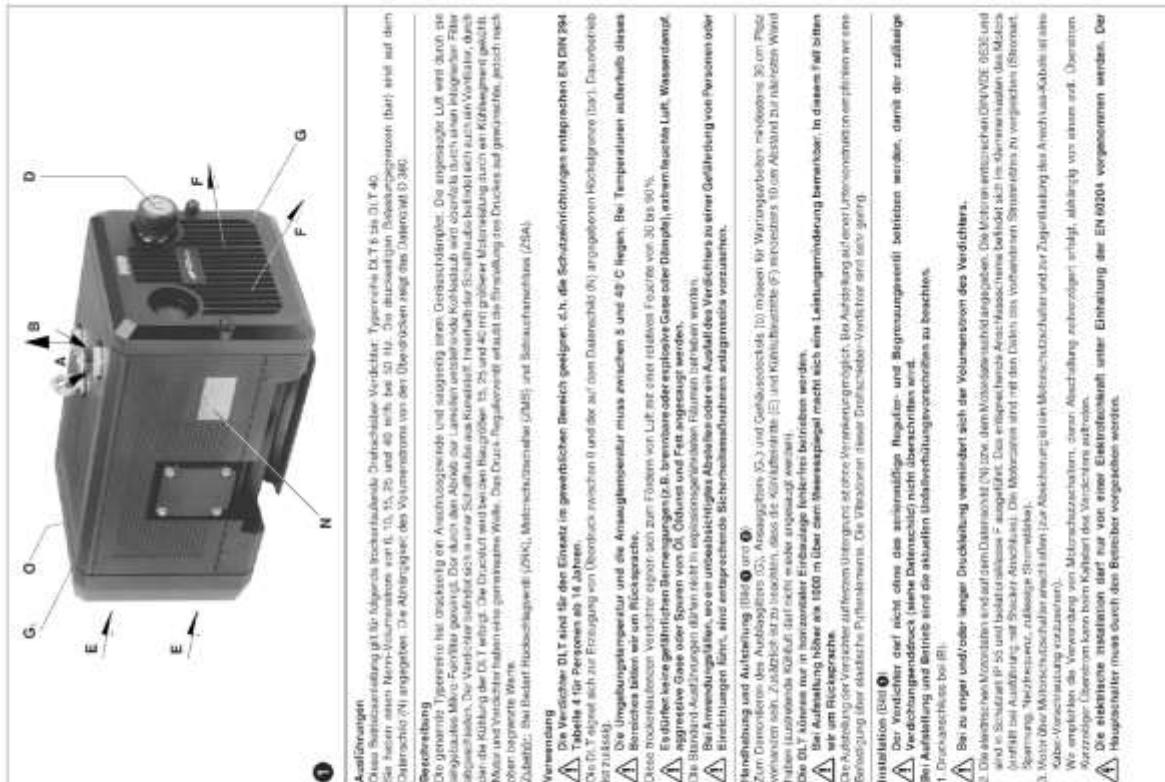


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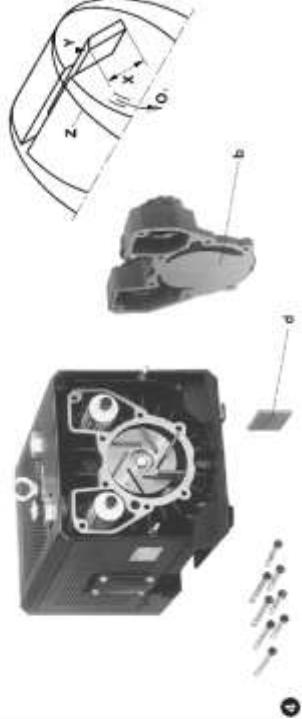


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### **3. Data sheets**



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**Montage der Linsen (Bild 1)**

**Achtung!** Max. Anzahl von Blättern pro Stativfuß: 12 (DL 1 E - 250, 19 (DL 1 G))

1. Mitte zur Drehrichtung (Drehrichtungsrichtung (D) hin zu richten.
2. Anleitung: Bei diesem Artikel darf die Drehrichtung nicht umgedreht werden, sonst Risikoentstehen kann! Durchdrücken kann sich ein Vakuum anzuhaften, das Beschädigungen am Linsenmantel verursacht, da am Bruch des Linsenmantels
3. Druckdichtung am Ende durch eine Laufring von mehr als 2 m Länge mit dem Verbau verbunden, angeheben mit dem Embau etwas zu bewegen.
4. Die notwendigen Druckbelüftungsstellen müssen mit dem Druckring (innerer (D)) umgedreht und auf den Zylinder (a) eingesetzt werden.

**Richtlinien für die Bedienungswartung**

Für Optikmontageartikel 202001, 202002, 202003, 202004, 202005, 202006, 202007, 202008, 202009, 202010, 202011, 202012, 202013, 202014, 202015, 202016, 202017, 202018, 202019, 202020, 202021, 202022, 202023, 202024, 202025, 202026, 202027, 202028, 202029, 202030, 202031, 202032, 202033, 202034, 202035, 202036, 202037, 202038, 202039, 202040, 202041, 202042, 202043, 202044, 202045, 202046, 202047, 202048, 202049, 202050, 202051, 202052, 202053, 202054, 202055, 202056, 202057, 202058, 202059, 202060, 202061, 202062, 202063, 202064, 202065, 202066, 202067, 202068, 202069, 202070, 202071, 202072, 202073, 202074, 202075, 202076, 202077, 202078, 202079, 202080, 202081, 202082, 202083, 202084, 202085, 202086, 202087, 202088, 202089, 202090, 202091, 202092, 202093, 202094, 202095, 202096, 202097, 202098, 202099, 202100, 202101, 202102, 202103, 202104, 202105, 202106, 202107, 202108, 202109, 202110, 202111, 202112, 202113, 202114, 202115, 202116, 202117, 202118, 202119, 202120, 202121, 202122, 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