# Operating Manual

SCROLLline

ölfrei Made in Germany

RENNER® Kompressoren


***Please read this operation manual carefully before start of operations and follow the instructions.***

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**EN**

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# Chapter 0
# General Information

**Contents**

In this chapter you will find general information on

- the use of this operating and maintenance manual
- the machine and
- personnel requirements.

**Overview**

This chapter is subdivided into the following sections:

## 0.1 General points

**Contents**

Here you can find some general information on the operating manual.

**Applicability**

This operating manual applies to the following machine:

| Characteristic | Description |
|---|---|
| Model | Scroll compressor |
| Year of manufacture | |
| Serial no. | |
| Plant no. | |
| Location | |

**Manufacturer**

RENNER Compressors
Emil-Weber-Strasse 32
D-74363 Güglingen

**Version date**

September 2010

**Safekeeping and completeness**

- This operating manual is a component of the machine and must be available for consultation by authorised persons at any time.
- Under no circumstances may any chapters be removed from this manual. In the event of loss, the missing operating manual or missing pages - in particular the chapter "Safety Instructions" - must be replaced immediately.

*Continued overleaf*

## 0.1 General (continued)

### Copyright

This documentation contains information protected by copyright law. It may not be photocopied, duplicated, translated or stored on data carriers, in full or extracts thereof, without the prior written consent of
RENNER Kompressoren GmbH.

We reserve all other rights.

### Modifications to the compressor

Any modifications and changes are only permitted after consultation with the manufacturer for safety reasons.
Once a machine has been modified it may be necessary to change the conformity or manufacturer declaration.This may also invalidate the operating permit of the machine.

In these cases, the process for conformity evaluation pursuant to 2006/42/EC for all components may need to be carried out again.

### Supplier Documents

(for optional accessories)

The documents supplied form part of this Operating Manual and must be stored and observed together with the Operating Manual:

| Documentation for | Manufacturer |
|---|---|
| Operating manual<br>Compressed air drier<br>RKT | RENNER GmbH<br>D-74363 Güglingen |

## 0.2 Layout and use of the operating manual

### Contents

Here you can find information on the layout and use of the operating manual.

### Chapter

This operating manual contains the following chapters:

| Chapter | Contents |
|---|---|
| 0 | ● General Information<br>– about the operating manual<br>– the use, and<br>– personnel requirements. |
| 1 | ● Explanation of the symbols used<br>● Basic safety instructions |
| 2 | ● Description and functioning of the machine |
| 3 | ● Operation of the machine |
| 4 | ● Maintenance instructions |
| A(xy) | ● Appendix / Appendices |

### Page numbering

The pages are numbered consecutively per chapter.
Example: 3-2
means: Chapter 3, *Page 2*
Example: AS-1
means: Appendix - Control, *Page 1*

*Continued overleaf*

## 0.2 Layout and use of the Operating Manual (continued)

### Abbreviations

The following abbreviations are used in the operating manual : verwendet:

| Abbreviation | Meaning |
|---|---|
| Fig. | Figure |
| O.K. | Okay |
| Chap. | Chapter |
| n.O.K. | not okay |
| Tab. | Table |
| Exp. | Explanation |
| s.a. | stated above |
| No. | Number |
| Item | Item |
| u. C. | under certain circumstances |

## 0.3 Proper and improper use

**Contents**

The proper use of the compressor is described here.

**Definitions**
**Authorised person**

A person is an authorised person if you have assigned certain work on or with the compressor to that person and given instructions. The key to the safety guards may be made accessible to authorised persons only.

**Proper use**

The compressor shall be deemed to be used properly once the following points have been observed:

- The compressor may only be used to compress technically pure air without harmful or explosive admixtures or impurities at ambient temperatures below 40° C.
- Only authorised persons may work at the machine.
- The machine may only be operated with the installed safety devices.
- The safety instructions as well as the instructions for use of this manual must be observed.
- The operating instructions of the operator must be observed.
- The statutory accident prevention regulations must be observed.

**Improper use**

Improper use is deemed to include the following:

- Operation by persons not authorised to do so.
- Operation while disregarding the safety regulations.
- Operation without additional preparation / cleaning of the compressed air in areas where there are foodstuffs or breathing air.
- Use that is not proper (see above)□□ and
- operation with deactivated, modified or defective safety devices.

## 0.4 Operator's duty of care

**Contents**

This section outlines the tasks and duties of the operator when handling the machine.

**Safety of the plant**

The operator must ensure that

- the machine is only used for proper use,
- the machine is operated only in a fault-free, properly functioning condition,
- integrated safety devices are maintained regularly and checked to ensure that they are functioning properly and
- only qualified and authorised personnel operate, maintain and repair the machine.

**Protection for personnel**

The operator must in particular ensure that the required personal protective equipment for

- operating personnel,
- maintenance personnel and
- repair personnel

is available and used.

**Education and training**

The operator must ensure that

- the personnel is educated in all the pertinent issues relating to occupational safety and environmental protection before taking up work for the first time and also at least once per year thereafter,
- the operating manual is always in a legible condition and available in full at the installation location of the machine.
- the personnel is familiar with the operating manual and in particular the safety instructions contained therein and
- the safety and warning instructions affixed to the machine are not removed and remain legible.

## 0.5 Personnel requirements

**Contents**

The requirements of operating and maintenance personnel are set out below:

**Tasks of the operating personnel**

The operating personnel must fulfil the following tasks:

- Check the compressor for fault-free and safe functioning.
- Operate the compressor at the permitted operating locations (see Chap. 2.1).
- Identify and - to the extent possible and permitted - rectify or report any faults or irregularities.

**Requirements of the operating personnel**

In order to be able to fulfil the tasks, the operating personnel must meet the following requirements:

- The operator must have received an orientation to the machine in accordance with the German Labour Protection Act.
- The operator must have sufficiently understood the orientation and follow the work instructions of the operator.

**Tasks of the maintenance personnel**

The maintenance and repair personnel must fulfil the following tasks:

- Undertake cyclical inspections and maintenance work on the compressor.
- Carry out repair work
- Conduct test runs on and with the machine, and
- check the integrated safety devices

**Requirements of the maintenance personnel**

Only specialists or persons properly instructed may conduct any maintenance work.

- For conducting the "large SCROLL maintenance" the specialist must attend a special technical course at RENNER.
- The personnel must follow the maintenance documentation.

# Chapter 1
# Safety Instructions

## Contents

This chapter covers the following:

- Explanation of the symbols used
- basic instructions for the safe handling of the compressor as well as
- instructions for conduct in the event of accidents.

**Important Note!**
The following safety instructions are to be regarded as a supplement to the already applicable national accident prevention regulations and laws.

Any existing accident prevention regulations and laws must in all cases be adhered to.

## Overview

This chapter is subdivided into the following sections:

## 1.1 Symbols

**Contents**

This section explains the symbols used.

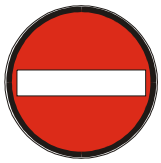
**Danger!**

This symbol indicates that the life and health of persons is in danger.

For any danger to life, the words
**Danger to Life** will be used.

**Danger!**

This symbol indicates that the life and health of persons is in danger due to electrical voltage.



**Warning!**

This symbol indicates that there is danger to the machine, material or environment.

**Note!**

This symbol denotes important instructions and information which contribute to your safety as well as a better understanding of the machine processes.

**Disposal!**

This symbol indicates instructions for the disposal of machine components or operating materials.

## 1.2 Basic safety instructions

**Contents**

This section details the basic safety instructions for safe handling of the machine

**Danger!**

You must follow the safety instructions below in order to avoid the following dangers:

| Possible Threat | Preventive Measures |
|---|---|
| **Residual hazards**<br>The SCROLL compressor is constructed in accordance with state of the art technology and recognised safety regulations and is furnished with safety devices.<br>Despite this, residual hazards cannot be excluded.<br>The dangers are explained in this chapter.<br>Persons can be put into danger due to lacking qualifications and/or operating errors made by the operating personnel.<br><br>**Explanation:**<br>Operating errors can cause damage to persons or property. | You may operate the machine only if you<br>● have the necessary qualification<br>and<br>● have received a full orientation to the machine from the operator<br>and<br>● have fully read and understood this operating manual.<br>● Before all maintenance / cleaning work, press the switch off button<br>, switch off the machine and protect the machine from being switched on again by a third party. |

**Protective gloves and glasses must be worn for some maintenance work - please follow the respective instructions!**

## 1.2 Basic safety instructions (cont.)

**Danger!**

You must without fail follow the safety instructions below in order to avoid the hazards associated with electric voltage:

| Possible Threat | Preventive Measures |
|---|---|
| **Danger to Life!**<br>Danger to persons due to electric shock<br><br>**Explanation:**<br>The machine operates at a voltage of 400 V at correspondingly high current. As currents from 44 mA can be fatal, it is necessary to take relevant safety precautions. | • Do not touch any live parts.<br>• Report any damaged lines immediately to the maintenance personnel.<br>• Keep all the access doors to the electrical devices closed.<br>• Maintenance work may only be carried out by trained personnel.<br>• Wear isolating safety shoes for maintenance work.<br>• Secure the main switch during maintenance work against switching on of the machine again by third parties. |

**There may be no open flames and no sparks at the installation site.**

## 1.2 Basic safety instructions (cont.)

**Warning!**

Follow the instructions below in order to prevent threats to personnel and/or damage to the machine.

| Possible Damage | Preventive Measures |
|---|---|
| Injury to personnel and damage to the compressor by removing or circumventing safety devices | • Do not remove safety devices and do not make them ineffective!<br>• Remedy any identified defects of the devices immediately.<br>• Repairs to the electrical equipment may only be carried out by a qualified electrician! |
| Damages to the compressor because of overload | • Never exceed the permitted technical thresholds |
| Burns due to hot compressor components | • Do not touch any compressor components directly after opening the casing walls |
| Burns to the eyes and/or skin due to possible hot, oily condensate water spurts | • Wear **safety glasses** when removing the compressed air system. Allow the compressor to cool sufficiently or carry out these activities with the utmost caution. |
| Danger from compressed air<br>**Danger to Life!**<br>Compressed air can severely injure or kill people and house pets. | • Never direct compressed air at living beings! |

## 1.3 Conduct in case of accidents

**Contents**

This section explains which measures need to be taken in the event of accidents or disasters (e.g. fire, explosions).

**Preparation for professional first aid**

Carry out the following measures at regular intervals to ensure that you are prepared in the event of an accident:

- Attend a first aid course on a regular basis to refresh your knowledge.
- Regularly inform yourself of which first aid options and rescue institutions are available in your industry.
- Keep a list of the necessary telephone numbers and contact persons at your workplace.

**Conduct in case of accidents**

Proceed as follows (in this order) in the event of an accident:

| Step | If | Then |
|---|---|---|
| 1 | People are injured | always administer first aid in the first instance. |
| 2 | there is injury to life or damage to property | state the degree of severity of the injury of persons or damage to property for the targeted use of emergency vehicles. |
| 3 | A disaster (fire) has occurred | ● immediately leave the machine<br>● use only the designated escape facilities and routes.<br>● Do not use the elevators! |
| 4 | People are injured or buildings or equipment are damaged | immediately inform your superior or a contact person from the list of first aides<br>(this list is easily visible in the work area). |

# Chapter 2
# Machine Description

**Contents**

This chapter covers the following:

- Definition of the safe access points for operating the compressor
- Overview of the compressor and its control instrumentation
- Technical data.

**Overview**

This chapter is subdivided as follows:



## 2.0 Operating conditions

The SCROLL compressor must be set up in a cool, frost-free, well ventilated room on an even foundation.
The permitted ambient temperatures range from 0° to 40°C
The optimum operating temperature for a SCROLL compressor of type SL-S 1,5 and SL-S 2,2 is at 160°C. For SCROLL and multiple SCROLL systems, models SL-S 3,7 to 4,5 up to 220°C and SL-S 5,5 up to 230°C.

## 2.1 Permitted Access Points

**Contents**

This section defines the safe access points for operating the compressor and for carrying out minor inspection and maintenance work.

**Important Note!**

Other access points are not intended for operating the compressor and are therefore not permitted as operator stations! Safe operation can only be guaranteed from the operator terminals specified. Work on the switch box and electrical installations may only be carried out by qualified electricians.

**Figure Access points**


*Continued overleaf*

## 2.1 Authorised access points (cont.)

**Description of the Access points**

The following access points only are provided for the operation of the machine:

| No. | Operation ... | Actions permitted |
|---|---|---|
| **1** | ... of the control panel | • Check working pressure<br>• Check operating temperature<br>• Read operating hours<br>• Switch compressor on<br>• Emergency stop or shut-down of compressor |
| **2** | ... of the safety devices | • Carry out inspection and minor maintenance work |

## 2.2 Overview of safety devices

**Contents**

This section provides an overview of the major compressor elements and their functions.

**Figure: safety devices**

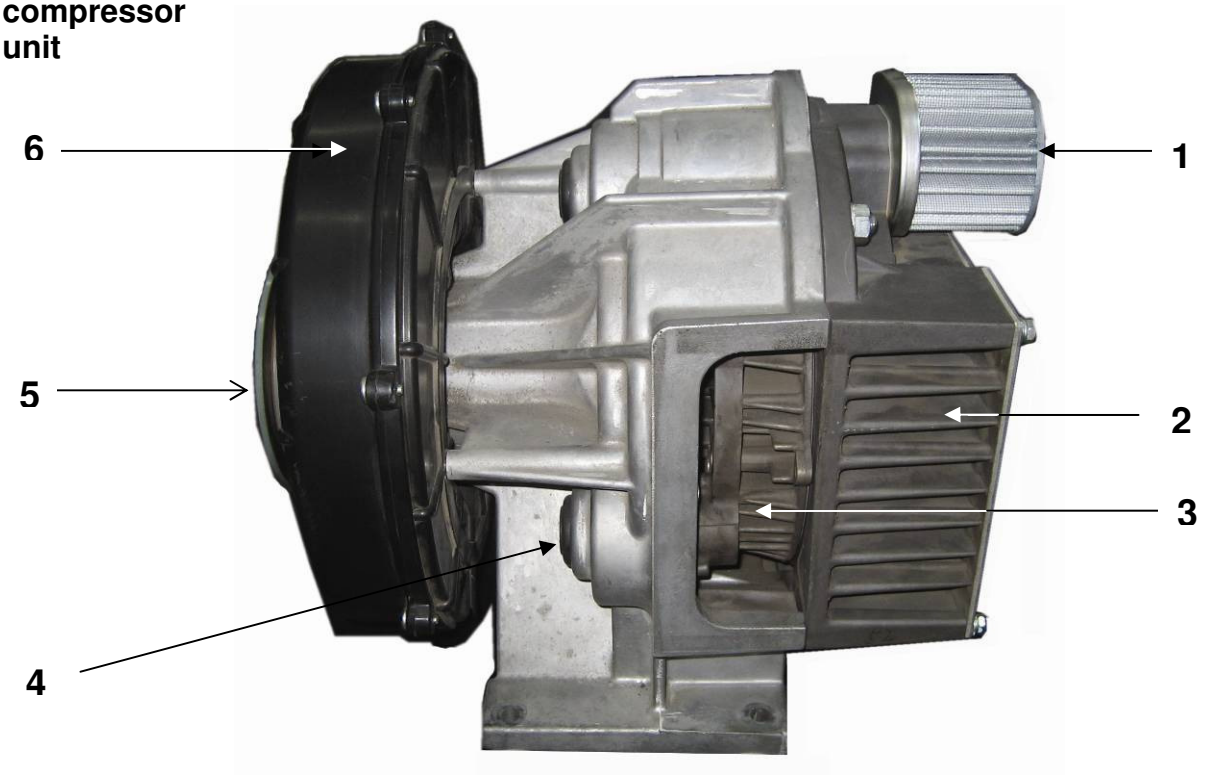

**Description of the safety devices**

The following safety devices are fitted to the outside of the compressor:

| Item | Description | Function |
|---|---|---|
| **1** | STOP button | Stops compressor immediately in emergency |
| **2** | E-box door | Guard door on switch box.<br>To be opened by qualified electricians only Access to the pressure switch and the electrical components.<br>CAUTION: Danger to life!Electrical voltage! |
| **3** | Instrumentation panel | Start - stop - button, operating temperature display, operating excess pressure display, operating hour meter |
| **4** | Doors (front and rear) | Access to the air filter, motor, drive belt, relief valve. |

## 2.3 Overview of the aggregate

**Figure compressor unit**




**Description of the compressor unit**

| Item | Description | Function |
|---|---|---|
| 1 | **Suction air filter** (for compressor unit SRL 5,5 - exists 2 x) | Is used to filter intake air |
| 2 | **Cooling air outlet** | Cooling the SCROLL spiral |
| 3 | **Rotating SCROLL worm** | Generate air pressure |
| 4 | **Supports for "maintenance base frame"** | Maintenance |
| 5 | **Drive belt pulley** | Power transfer |
| 6 | **Cooling air ventilator** (positioned inside) | Intakes cooling air |

## 2.3 Compressor unit (cont.)

**Description aggregate components**

**Compressor unit (Fig. aggregate)**
RENNER SCROLL compressors are oil-free sealing, stationary, electrically driven compressors.
The SCROLL principle consists of two scrolls, in which the moving scroll continuously seals the sucked-in air through a rotational movement against the fixed scroll. This creates a constant oil-free compress air flow up to 10 bar excess pressure.
The SCROLL compressor withdraws the control air needed for operation directly from the installed cooler.

**Intake Air Filter (item 1)**
The intake air filter filters rough dirt particles from the ambient air that is needed for the compressed air processing. For the service life of a SCROLL compressor the best quality of suction is of utmost significance.

**Cooling air outlet (item 2)**
From the cooling air outlet on the compressor unit, the sucked-in cooling air will travel through the after-cooler and this way cools the compressed air.
Please note: always keep the cooling fins clean.

**Rotating SCROLL-scrolls (Item 3)**
These are moving scrolls that ensure a continuous build-up of compressed air.

**Openings for the maintenance base frame (item 4)**
One of the three openings (with cover) for the maintenance base frame (special tool) that is needed to replace the SCROLL seals (maintenance at 5000 operating hours 10 bar and 10000 operating hours for 8 bar systems) is needed.

**Drive belt pulley (item 5)**
Power transfer from the electro motor to the compressor in the respective design using one or two drive belt(s).

## 2.3 Compressor unit (cont.)

**Cooling air ventilator (item 6)**
The cooling air ventilator is used to suck-in the required quantity of air needed for cooling the compressor and compressed air, and is delivered through the compressor and cooler.

**Electro-motor**
The electro-motor (from 1.5 to 5.5 kW) drives the compressor using the corresponding speed increased and one or two drive belt(s).

**Discharge pressure switch (electric)**
The end pressure switch is connected to the compressed air outlet of the system. It controls switching the compressor on and off, depending on the set end pressure. The values for $p_{max}$ and $p_{min}$ are set at the discharge pressure switch: $p_{max}$: upper limit of operating pressure at which the unit cuts out in normal mode. $P_{min}$: lower limit of operating pressure at which the unit cuts in again in normal mode.

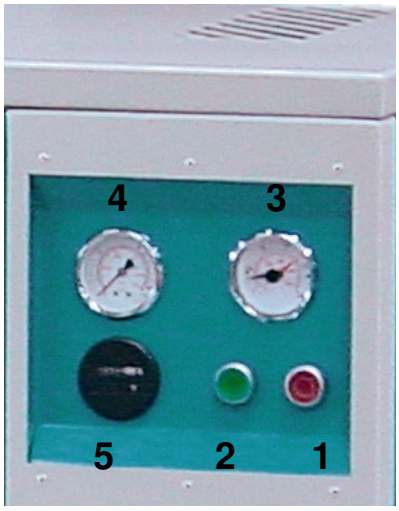
The discharge pressure switch is adjusted to the correct setting at the factory. The end pressure switch may only be adjusted by personnel authorised by the manufacturer!

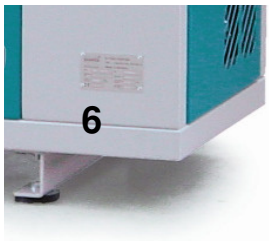
**Combistat**
The Combistat is a temperature indicator and control unit. It is integrated in the instrument panel. It monitors the permitted maximum operating temperature of the system (red marking). When this temperature is reached the circuit is broken and the unit cuts out automatically. The line (capillary) connecting the Combistat to the compressor unit must not be kinked as this will break the contact.

**Safety valve**
The safety valve is installed after the cooler. It limits the maximum pressure occurring in the unit to 1-2 bar above the relevant operating pressure (end pressure). The safety valve blows off if the end pressure is exceeded due to a fault in the system.

## 2.4 Overview Operator Panel

**Figure Instrumentation panel**




**Description of the Instrumentation panel**

The following controls are found on the instrumentation panel:

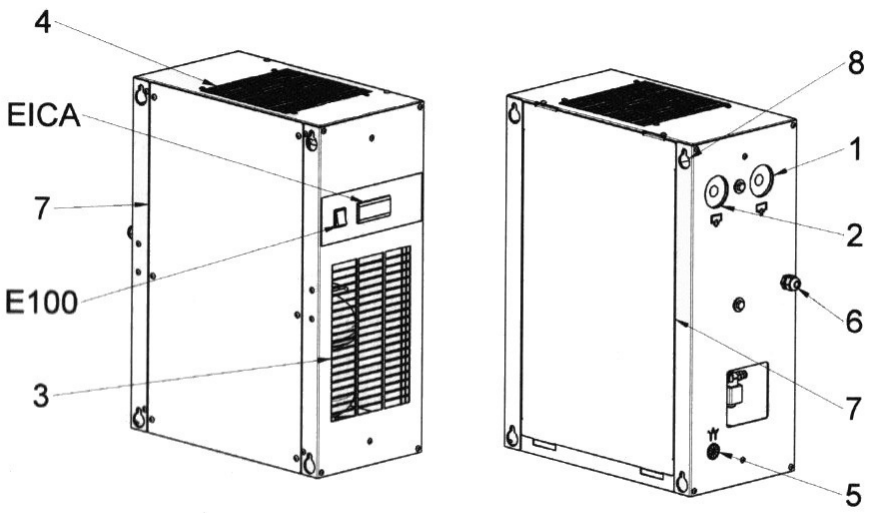
| Item | Description | Function |
|---|---|---|
| 1 | **Stop button** | Switches the compressor off |
| 2 | **Start button** | Switches the compressor on |
| 3 | **CombistatTemperature indicator** | Indicates operating temperature and overheating |
| 4 | **Pressure gauge: Working pressure** | Indicates pressure ratios and excess pressure |
| 5 | **Operating hour meter** | Counts the number of hours operated by the compressor |
| 6 | **Type plate** | Summarises the main performance data and compressor model |

## 2.5 Overview refrigerant drier (optional - model SLDK-S)

**Contents**

In this chapter you receive a brief overview for the optionally installed refrigerant drier (5).

**Figure**
**Refrigerant drier**




1.) Compressed air inlet
2.) Compressed air outlet
3.) Cooling air inlet
4.) Cooling air outlet
5.) Steam trap
6.) Electrical connections
7.) Maintenance access
8.) Fixing holes
E100.) Switch-on
EICA.) Electronic regulator

**Description of the Refrigerant drier**

The refrigerant air drier contains a cooling system for cooling the compressed air. The compressed air is also de-humidified. The condensate created here is discharged through a condensate separator.

Danger!

Please follow the refrigerant drier safety instructions found in the separate operating manual. It is particularly dangerous to breath-in the cooling steam or get in contact with the cooling agents. Smoking when working on the refrigerant drier is prohibited, since the cooling agent will develop poisonous vapours when getting in touch with the glowing end of a cigarette or other open flame (e.g. welding work).

**Note!**
Please see the explanations in Chapter 4 and Appendix KT and also the manufacturer's operating manual.

# Chapter 3
# Installation and commissioning

**Contents**

This chapter contains the most important information on transporting, installing and storing the compressor.

**General Information**

The installation plan and the technical data of this specific compressor model can be ordered from RENNER GmbH.
The compressor is delivered on a wooden pallet, packaged in a carton and labelled.

**Danger of tipping!**
The machine can tip over at an inclination of more than 10°!
Use suitable transport means such as a forklift, lifting gear or loading harness. Support it from the side.

Unpacking the machine has no special requirements and the (interim) storage in the transport packaging is also not problematic. Protect the compressor against tilting over by storing it on level, firm ground.

Dispose of the packaging material (carton / marked sheets) separately.

**Overview**

This chapter is subdivided into the following sections:

## 3.1 Compressor installation

**Contents**

This section contains important instructions which you need to observe in order to safely install the compressor and to prevent damage or malfunction.

**Warning**
**Follow the safety instructions!**
Always remain outside the danger zone of a raised load!

**Compressor installation**

| Key word | Ensure that |
|---|---|
| **Installation site** | • Surface: Flat, level, firm<br>• Building ceilings: Check load bearing capacity<br>• Air: As cool as possible, clean, frost-free, as little damp as possible<br>Temp.: +-0°C (32°F) - +40°C (104°F)*<br>• Sufficient ventilation in the room<br>• Air intake must be sufficiently unobstructed<br>• Arrange the air intake opening in such a way that no loose items can be sucked in<br>• The installation site is illuminated (to read off the instruments, carry out maintenance work…) |
| **Lifting work** | • Secure any loose, swinging or pivoting parts before lifting the compressor<br>• Use suitable lifting gear (weight acc. to data sheet)<br>• Always remain outside the danger zone of a raised load |
| **Conduits, pressure pipes** | • Remove all protective stoppers - covers and possible bags with drying agents before mounting conduits<br>• Please ensure that the connection from the aftercooler to the compressed air system can expand as a result of heat and must be connected by means of a flexible hose. |
| **Exhaust air** | • Exhaust ducts must have a diameter at least equal to that of the cooler surface and should be 3m in max. length with one bow of 90°; for longer ducts, use an additional fan with a capacity 20% greater than the compressor ventilator<br>• When installing several compressors please ensure that no compressor sucks in the heated exhaust air from another compressor |

* Please ask your retailer in the event of higher temperatures.

## 3.2 Connections

**Contents**

This section covers important instructions which you need to observe in order to safely connect the compressor to the compressed air system as well as the electrical supply.

**Warning!**

Before connecting the machine to the compressed air system, all conduits and hose connections inside the compressor must be checked and, if necessary, retraced.

For plants with pressure tanks, an acceptance check of the air collection tank must be made by a compressed air tank expert before commissioning.
Start an inspection log!

**A Compressed air connection**

The system has all the required conduits and is ready for operation.
The following must be observed when connecting to the compressed air system:

**Compressed air connection**

| Key word | Ensure that |
|---|---|
| **Pressure** | • Suitable screws and conduits are used for the operating pressure<br>• The end pressure of the system is not higher than stated on the rating plate.<br>• A non-return valve between the machine and the compressed air system is not required as it has already been integrated in the machine. |
| **Connection** | • Connect the machine without voltage and isolated against vibrations to the compressed air system e.g. by using a flexible hose |
| **Shut-off valve** | • The additional installation of a shut-off valve is recommended to facilitate maintenance tasks at the compressor without de-pressurising the compressed air system. |
| **Condensate** | • An automatic steam trap can be integrated behind the after cooler for improved condensate separation from the compressed air |

## 3.2 Connections (cont.)

**B Electrical connection**

Only the connection to the electricity supply is now required for the machine which is now ready to use with all conduits installed.

**The machine must only be connected by an electrician!**

The following must be observed when connecting to the mains supply:

**Electrical connection**

| Key word | Ensure that |
|---|---|
| **Voltage** | • Tthe machine is only connected to the voltage stated on the engine rating plate |
| **Rotation** | • The rotational direction is observed under all circumstances! See corresponding direction of arrows: (Not necessary for 230 volt systems with plugs)<br>• Checking the rotational direction see chap. 3.3/3.4 |
| **Fuses** | • Customer to install the fuse and separator with the EMERGENCY OFF function; these must be able to switch at least 1.1 times the motor output and must be clearly allocated to the machine<br>• Make sure that the system has an adequately dimensioned power supply available (selection of the supplies and fuses, see also system data sheet). |
| **Connection** | • The power cable must be arranged mechanically without voltage so that there is not risk of tripping<br>• Connect the cable with the individual wires according to the valid VDE guidelines form the connection box provided factory side. |

## 3.3 Compressor start-up

**Contents**

This section covers important information which you need to observe in order to start up the compressor safely.

**General points**

Each component of the machine is tested at the factory in continuous operation after the final assembly. The test ensures that the components indicate the data given and operate fault-free. During the initial hours of operation the machine must be watched to determine any possible malfunctions.

**Important!**

The respective operating manuals must be read and observed for machines with additional optionally installed components (refrigerant drier).

**Preparation**

The following points must be observed and carried out before the first start-up:

| Step | Task to be carried out / Points to be observed: |
|---|---|
| **1** | Have an electrician tighten all screw and terminal connections in the control cabinet |
| **2** | The motor bearings of compressors, without permanent greased motor bearings, that are unused longer than 6 month have to be regreased before putting into operation |
| **3** | A clearly visible sign must be affixed to machines with remote control with the following wording:<br>**Warning! This machine is remote controlled and may start without warning!**<br><br>During remote control of the system, safety precautions must be followed that prevent<br>the system from starting when it is being checked or maintained. (Main switch of the system must be turned off!) |

## 3.3 Compressor start-up (cont.)

### Checking the rotational direction INFO

When first starting up the machine, as well as after each change to the electrical feed line, the rotation of the SCROLL compressor must be checked.
Rotation is anticlockwise seen from the shaft. The rotation of the V-belt pulleys must be in the direction of the attached arrow! If necessary, reconnect the connecting cable (qualified electrician).

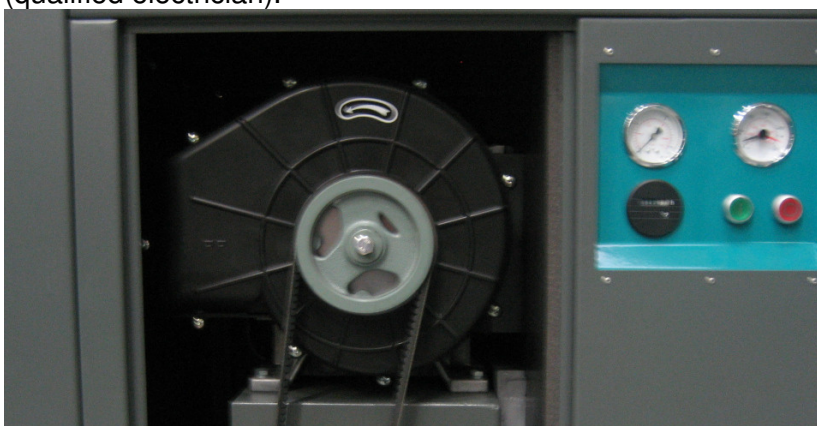
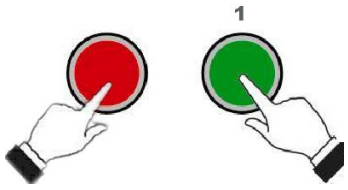
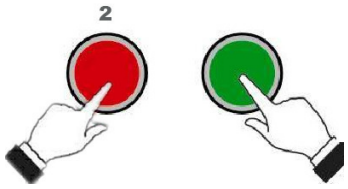


Fig. Rotational direction of arrow

**WARNING!**
There is a danger from moving parts when checking the rotation with the cover open!

Proceed as follows when checking the rotation:

| Step | Operation: | Figure / Expl. |
|---|---|---|
| **1** | Open cover and secure from falling, if necessary remove and put aside | |
| **2** | Start the compressor by tapping the green start button once with the one hand; immediately let go of the button |   |
| **3** | Within 2 seconds stop the compressor by pressing the red stop button with the other hand . |   |

Once you determined the correct rotational direction, you can operate the compressor. The phase must be replaced if the rotational direction is incorrect.

# Chapter 4
# Normal Mode Operation

**Contents**

This chapter covers the information required for normal operation of the compressor.

**Overview**

This chapter is subdivided into the following sections:

## 4.1 Control instrumentation

**Contents**

This section provides an overview of the instrumentation controls.


**Figure Instrumentation components:**

The control components have the following function(s):

**Function Instrumentation components:**

| Item | Description | Function/Use |
|---|---|---|
| **1** | Pushbutton (red) *Stop* | Switch on compressor |
| **2** | Pushbutton (green) *Start* | Starts the compressor<br><br>**Note:**<br>The main switch must be switched on. The main switch is installed by the customer. |
| **3** | *Combistat* temperature indicator | Display the operating temperature. Shut-off when exceeding the permitted maximum temperature. |
| **4** | Pressure gauge *Working pressure* | Display the current working pressure |
| **5** | Operating hour meter | Counts the number of hours the compressor has actually run |

## 4.2 Starting normal operation

**Contents**

The following section explains how to start the compressor and contains essential points for normal operation.

**Danger!**
There are moving parts inside the compressor housing which can cause serious injuries.
Never operate the compressor with the housing open!

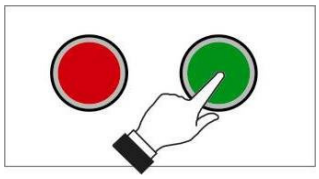
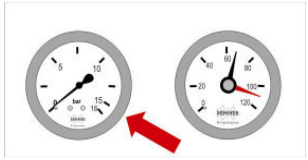
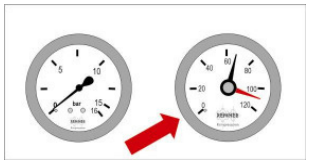
**Before starting the compressor**

Check the following points before starting the compressor:

- Was the rotational direction checked?
- Is the main switch on?
- Are any existing shut-off valves open?

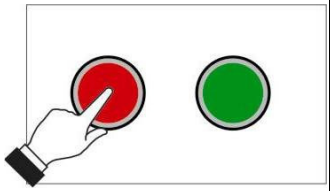
**Start compressor and monitor in normal operation**

Press the *Start* button to start the compressor.

| Step | Operation | Figure / Expl. |
|---|---|---|
| 1 | Press the *Start* button to start the compressor. |  |
| 2 | Monitor the following points at regular intervals during operation: | |
| 2a | **Working pressure**<br>The working pressure displayed must not exceed the maximum permissible value specified on the type plate. If this is the case, switch off the compressor immediately. |  <br>**Pressure gauge** |
| 2b | **Operating temperature**<br>For SL-S 1,5 - SL-S 2,2 the operating pressure may not exceed 160° and for SL-S 3,7 and SL-S 4,5 220°C.<br>(SL-S 5,5 up to 240°C).<br>The compressor is automatically shut off if there is an excess temperature. |  <br>**Combistat** |

## 4.2 Starting normal operation (contd.)

**Monitor normal operation (contd.)**

| Step | Operation | Figure / Expl. |
|---|---|---|
| **2b (cont.)** | **Important!** Should the compressor fail to cut out automatically it must be switched off immediately by hand! |  |
| **2c** | **Operating hour meter** Various maintenance work must be carried out after a specified number of operating hours. The exact maintenance intervals and relevant servicing work are listed in the maintenance schedule. Appendix W 1 |  |

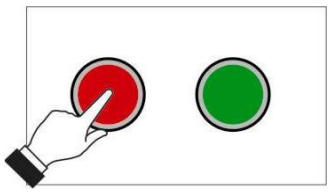
## 4.3 Switching off the compressor

**Contents**

This section explains how to switch off the compressor in normal operation and/or at the end of operations.

**Stop normal operation**

If you want to shut off the compressor:

| | | |
|---|---|---|
| **1** | Press the button *Stop* |  |

**Completely shut off**

If you want to shut off the compressor completely:
(e.g. after completing the work), then in addition to the above steps, you must also turn off the main switch.

## 4.4 Remedying malfunctions in normal operation

**Contents**

This section contains advice on remedying malfunctions.

**Danger!**

Human error in remedying faults or lack of professional training can lead to serious damage to property or physical injury.
It is therefore essential that faults are rectified by duly qualified persons.

**Before removing faults**

Always take the following steps before starting any work:

- Switch the compressor and main switch off!
- Discharge all the compressed air from the compressor and air vessel!

**Malfunctions**

The following faults may occur during operation:

| Fault | Possible Cause | Remedy |
|---|---|---|
| System starts starting | • No power | ➢ Establish power supply |
| | • Loose cables or fuses | ➢ Retighten cables or fuses |
| | • Motor protection switch has cut out | ➢ Unlock motor protection switch (switch cabinet) |
| | • Combistat cut out / defective | ➢ Ensure correct cooling; install new Combistat if defective |
| | • Connecting lines to Combistat are kinked | ➢ Straighten out connecting cables |

*Continued overleaf*

## 4.4 Remedying malfunctions in normal operation (contd.)

**Malfunctions (contd.)**

| Fault | Possible Cause | Remedy |
|---|---|---|
| System starts with difficulty | • Time for star-delta connection is too long or too short (only for systems with star-delta connection) | ➢ Check and adjust time setting, correct setting is 3-6 seconds on relay K 1T<br>➢ Check solenoid valve and relief valve and change if necessary |
| | • The non-return valve on after-cooler is defective (only for Y -Δ connection)<br>• Voltage fluctuations in the grid | ➢ Change non-return valve |
| Compressor cuts out before reaching discharge pressure | • Motor overload tripping | ➢ Check and adjust overload setting; check and adjust discharge pressure switch setting; check supply lead for phase failure. |
| | • Combistat cuts out due to excessively high temperature | ➢ Ensure correct cooling; install new Combistat if defective |
| Motor overload tripping (therm. overcurrent relay) has stopped the system | • Seized air end<br>• Phase failure<br>• Motor overloaded | ➢ Eliminate reason for seizure<br>➢ Check supply line<br>➢ Check and adjust overload setting; check and adjust discharge pressure switch setting |
| | • Ambient temperature too high | ➢ Ensure adequate ventilation |

*Continued overleaf*

## 4.4 Remedying malfunctions in normal operation (contd.)

| Fault | Possible Cause | Remedy |
|---|---|---|
| Combistat cuts out due to excessively high temperature | • Compressor incorrectly installed<br>• Combistat defective or incorrectly set | ➢ Refer to recommendations for installation<br>➢ Adjust or replace Combistat |
| System does not cut out during intermittent operation | • Upper trigger point of discharge pressure switch set too high | ➢ Reset discharge pressure switch |
| low discharge capacity | • SCROLL seals are worn<br>• Intake filter clogged<br>• Leaks in the system | ➢ Conduct maintenance according to maintenance plan<br>➢ Cleaning the air filter |
| Compressor runs noisily | • V-belts not correctly tensioned<br>• V-belts are not compatible (as of SL-S 3,7)<br>• V-belt pulleys not aligned with each other<br>• Screw connections on compressor and/or motor are loose. | ➢ Check V-belt tension and tighten if necessary<br>➢ Replace with matching set of belts<br>➢ Check alignment of pulleys and adjust if necessary<br>➢ Tighten screw connections. |
| After turning off the system runs in reverse | • Non-return valve on compressor - outlet is defective. | ➢ Replace non-return valve. |

# Chapter 5
# Maintenance Notes

**Contents**

This chapter contains information on the maintenance work required.

**Overview**

This chapter is subdivided as follows:

## 5.1 Essential points

**Contents**

This section contains general information to be heeded during servicing and maintenance work.

**Personnel requirement**

Only specialists or persons properly instructed may conduct any maintenance and repair work. The "large maintenance" (5,000 hours at 10 bar SCROLL and 10,000 hours at 8 bar SCROLL systems) may only be completed by authorised* persons.
(* The corresponding qualifications can be obtained from RENNER in special technical courses)

An overview of the personnel requirements are found in Chapter 0.

Danger!

It is essential to adhere to the following safety instructions in order to avoid all risks of personal injury or death:

| Potential Source of Danger | Preventive Measures |
|---|---|
| Crushing from moving parts | • Always maintain a safe distance from all moving parts when carrying out test runs |
| electrical shock. | • Switch off all voltage sources before starting work.<br>• Take measures to prevent power sources from being switched on again by accident |
| Inappropriate spare parts | • Always replace self-locking nuts and screws<br>• Only use spare parts included in the approved lists |
| Unauthorised/premature approval of system. | • Do not release the unit for operation until the safety devices are fully functional. **Only then is the work completed!** |

## 5.1 Essential points (continued)

**Before starting the work**

Please note the following before starting the work:

- SCROLL systems of types SL-S 1,5 to SL-S 4,5 do not have a non-return valve after the compressed air outlet. Before maintenance work the access to the pressure vessel or compressed air system must be blocked in all cases. For SCROLL compressors of types SLD-S 1,5; SLD-S 2,2; SLDK-S 1,5 and SLDK-S 2,2 (with pressure vessel), the pressure vessel must be completely emptied before starting maintenance work.
- SCROLL systems of type SL-S 5,5 are equipped with a non-return valve. However, it is still recommended to depressurize the system before any maintenance work.
- For the "large maintenance" (see Chapter 5.5), the SCROLL compressor must be entirely cooled before starting the maintenance work (at least 12 hours).

**Once work has been completed**

The following steps must be carried out after completing the work:

| Step | Operation |
|---|---|
| 1 | Follow the maintenance schedule and complete the inspection sheets, activity logs, etc. (see Appendix W “Maintenance Check”). |
| 2 | Check that the safety devices are working correctly. Do not release the machine for operation if the safety devices are not in perfect working order. |
| 3 | Reinstall and secure any safety devices that have been removed. |
| 4 | Remove any tools, foreign objects and materials left lying around. |
| 5 | Carry out a test run and check the function of the serviced components. |
| 6 | Store and secure the key from unauthorised access if leaving the machine unattended. |

**Spare parts, accessories**

Only original spare parts may be used for the replacement components such as air filter, drive belts, etc.

**Repairs**

Only allow authorised dealers to carry out repair work.
A list of other persons authorised by the manufacturer to carry out repairs can be obtained from the manufacturer on request.

**Do not allow repairs to be carried out by any persons other than those authorised by the manufacturer!**

Servicing is carried out as agreed with the authorised dealer.

**General Notes**

Take the standard safety precautions and proceed with great care when carrying out any servicing work.
Please follow especially the points below:

- Servicing work to be carried out by qualified personnel only.
- Correct tools only to be used for servicing work.
- Unit and power supply to be switched off before any servicing work is carried out. Take measures to ensure that the unit cannot be switched on accidentally!
- Unit must be allowed to cool before carrying out servicing work to avoid risk of burns!
- Unit to be disconnected from all sources of pressure and all pressure removed before dismounting pressurised parts.
- Scrupulous standards of cleanliness to be maintained during servicing work; parts and exposed openings to be covered with a clean cloth, paper or masking tape.
- Motor, air filter, electrical components, control equipment, etc. to be protected from ingress of moisture, e.g. when being wiped.
- No tools, loose parts or rags to be left in or on the unit.
- Operating pressures, temperatures, time settings, control equipment and cut-out devices to be checked for perfect working order before unit is released for operation after servicing work.
- Doors on unit to be closed before switching on the unit (including for test run)!
- Sound-absorbing materials to be left in place and retained.

## 5.2 Rectifying faults

**Contents**

This section covers general points on troubleshooting and contains references to relevant sources of information.

Danger!

- Always take measures to ensure that the machine can be shut off in an emergency by a second person.
- You may only remove malfunction or complete checks if you have the respective technical qualification.
- Adhere to the general safety instructions contained in this operating manual for handling the machine.
- Follow the instructions given in this chapter and all other maintenance instructions issued by the operator and pay due regard to the documentation relating to the components included in the unit (e.g. pressure vessel, refrigerant dryer).

**List of faults**

The necessary action to be taken in the event of faults is outlined ...

... in Chapter 4.4. “Remedying malfunctions in normal operation” and
... in the operator’s internal servicing documents.

## 5.3 Cleaning work

**Contents**

The following section contains information on cleaning the compressor and the air filter.

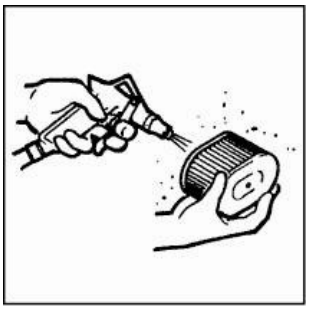
**General points**

In terms of general cleaning, vacuum the unit or wipe it with a damp cloth. Check the intake passage regularly, where necessary removing any leaves, dust, dirt or similar matter in the interests of an efficient air supply.

**Never direct compressed air at living beings!**
**Misuse of the compressed air unit can cause serious tissue damage or even fatal injuries.**

### 5.3.1 Cleaning the air filter

**Cleaning the air filter**



| Step | Operation |
|---|---|
| **1** | Disconnect system from power and compressed air system.<br>Secure from unintentional restart. |
| **2** | Remove doors and set aside. |
| **3** | Loosen winged nut of air filter. |
| **4** | Remove air filter and carefully blow out. |
| **5** | Reinstall filter in reverse order and tighten winged nut. |
| **6** | Carry out test run and functional check. |
| | Every 2500 operating hours or once a year completely replace the air filter. |

## 5.3.2 Clean Cooler

**Contents**

This section outlines the procedure for cleaning the cooler.

**General points**

If the cooler is not very dirty it can be left in the unit and blown with compressed air while the unit is switched off.
If the cooler is very dirty proceed as outlined below.

**Cleaning the cooler**

| Step | Operation |
|---|---|
| **1** | Disconnect system from power and compressed air system.<br>Secure from unintentional restart. Allow the system to sufficiently cool. |
| **2** | Remove cooler. |
| **3** | Steam clean the cooler. |
| **4** | Install cooler. |
| **5** | Complete a test run and function test and check system for leaks. |

## 5.3.3 Clean cooling air ventilator (in scroll compressor)

**Contents**

This section outlines the procedure for cleaning the cooler ventilator in the scroll compressor.

**Clean ventilator**

| Step | Operation |
|---|---|
| **1** | Disconnect system from power and compressed air system.<br>Secure from unintentional restart. Allow the system to sufficiently cool. |
| **2** | Remove doors and set aside. |
| **3** | Remove drive belt (see also 5.3.5) |
| **4** | Loosen screws of ventilator cover and remove cover (Fig. ventilator cover) |
| **5** | Check ventilator and clean, if necessary. |
| **6** | Reassemble in reverse order |
| **7** | Carry out test run and functional check. |

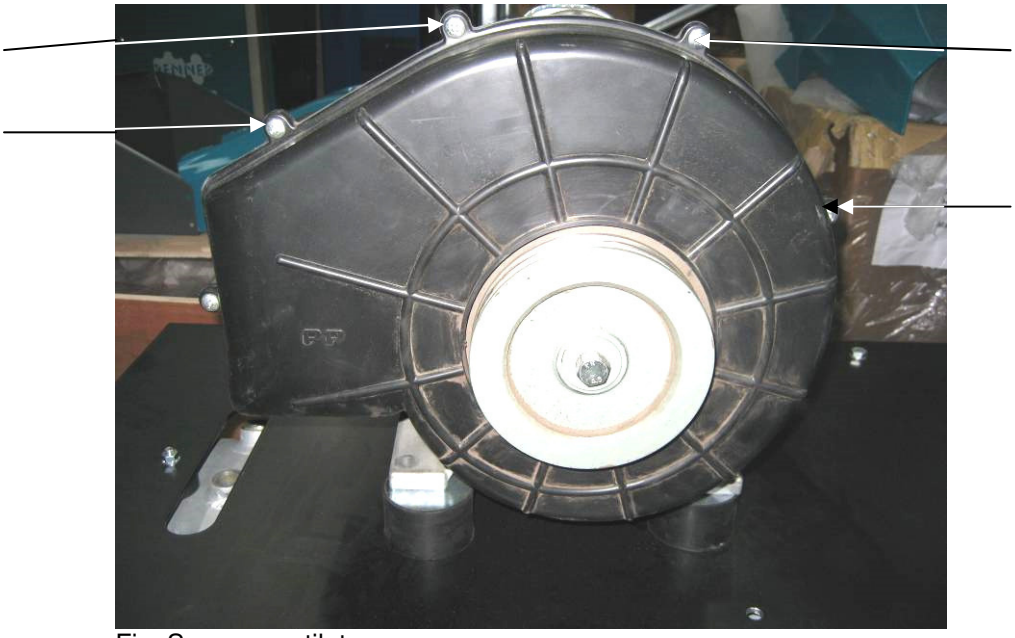


Fig. Screws ventilator cover

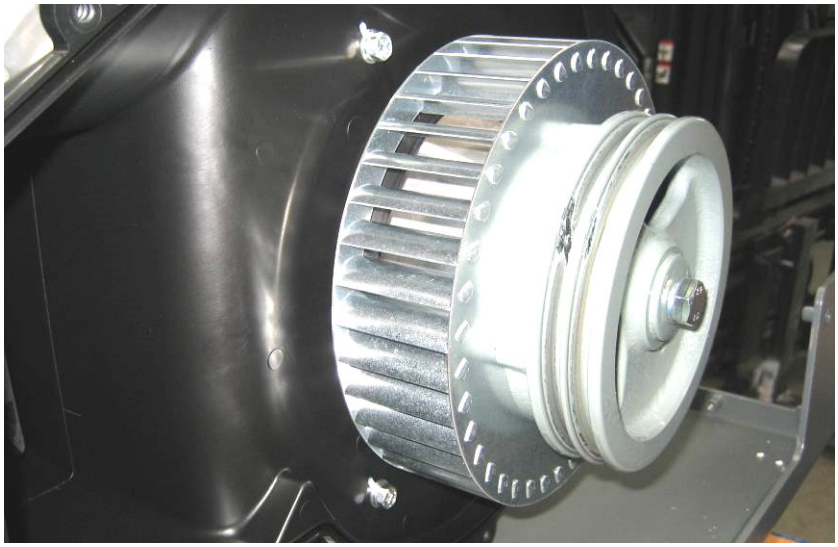


Fig. Ventilator / fan wheel

## 5.3.4 Cleaning the SCROLL cooling fins

**Contents**

This chapter provides information about cleaning the cooling fins in the SCROLL compressor

**General points**

The cooling fins of the SCROLL compressor are an integral part of cooling the compressor and must be checked and cleaned regularly. (see maintenance plan)

**Cleaning the cooler fins**

| Step | Operation |
|---|---|
| **1** | Disconnect system from power and compressed air system.<br>Secure from unintentional restart. Allow the system to sufficiently cool. |
| **2** | Remove the copper pipe connection between the compressor and cooler |
| **3** | Loosen the screws of the cooler fin cover and then remove the cover (fig. 3). |
| **4** | Loosen the lateral cover of the cooling fins (fig. 4) from the compressor block. |
| **5** | Thereafter, carefully blow out the cooling fins (fig. 5) or clean with a cloth. |
| **6** | Complete assembly in reverse order. |
| **7** | Carry out test run and functional check. |

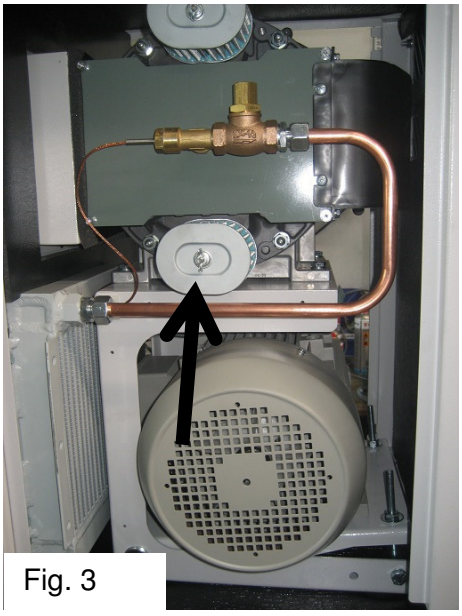


Fig. 3

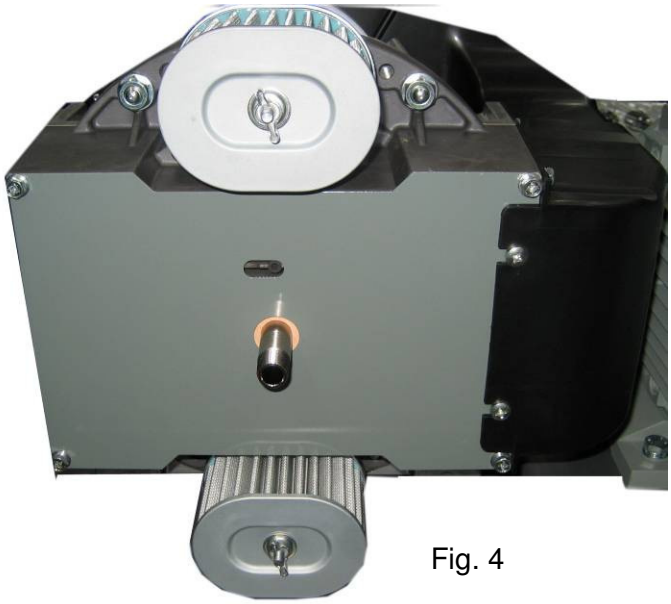


Fig. 4

## 5.3.4 Cleaning the SCROLL cooling fins (contd.)

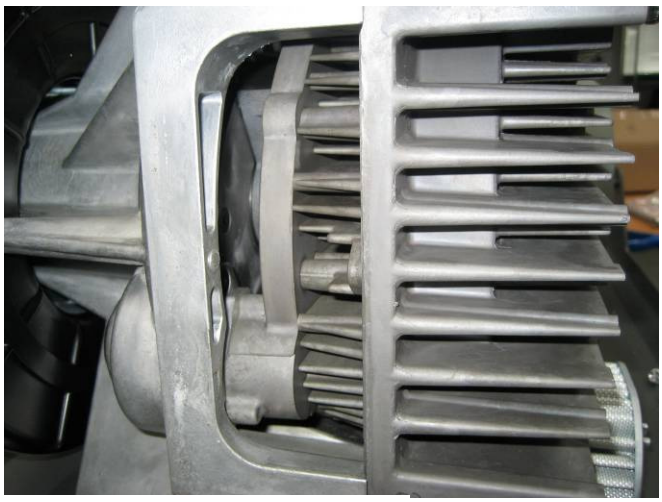


Fig. 5 Cooler fins

## 5.4 Tensioning / changing the V-belts

**Contents**

This section outlines the procedure for tensioning and/or changing the V-belt.

**General points**

The optimum tension of the V-belt has a significant influence on the operating characteristic and the noise level of the system. Additionally, the service life of the V-belt depends on the correct alignment. For SCROLL compressor with 2 belts it must be made sure that it is always replaced as a set.

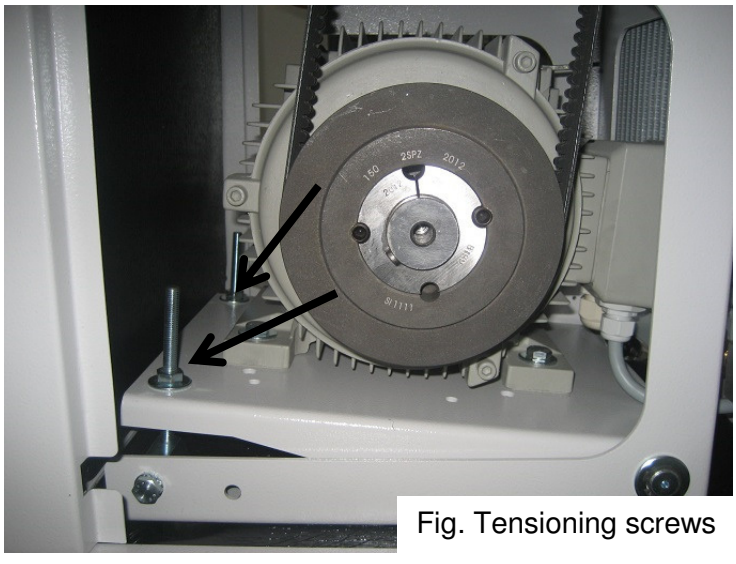


Fig. Tensioning screws

## 5.4 Tensioning / changing the V-belts (contd)

**Tighten belts**

| Step | Operation |
|---|---|
| **1** | Disconnect system from power and compressed air system.<br>Secure from unintentional restart. Allow the system to sufficiently cool. |
| **2** | Using the tensioning screws and the counter nut, bring belts to the correct tension* (see figure Tensioning screws) |
| **3** | Carry out test run and functional check. |

**Replace belts**

| Step | Operation |
|---|---|
| **1** | Loosen tensioning screws, remove old belts, attache new belts. |
| **2** | Tighten belt with the counter nuts above and under the motor plate, see above. |

* The belt tension is correct, if the belt(s) have an initial tension of about 130 – 150 Nm per belt.

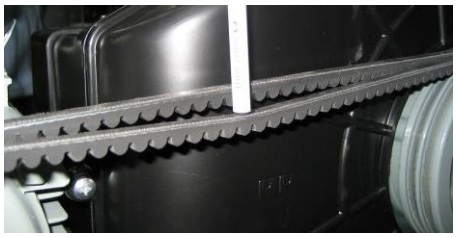


**Fig. Check belt tension**

# Chapter 6
# Decommissioning and disposal

**Contents**

This chapter provides important information on (temporarily) decommissioning or disposing of the compressor.

**Overview**

This chapter is subdivided as follows:

## 6.1 Decommissioning the system

**Contents**

Here you will find information which you will need to observe if you need to decommission the compressor for a longer period of time and the points you need to observe when re-commissioning the compressor after this period.

**Decommissioning the plant**

For longer periods of decommissioning the system prepare as follows:

| Step | Operation |
|---|---|
| **1** | Disconnect the system from the power supply to prevent accidental switching on of the machine by third parties (e.g. lock the power cable in the machine). |
| **2** | Relax the tension on the V-belt (see Chap.5 S-10 "Tighten/replace V-belt"). |
| **3** | Do not cover the unit in such a way so that there is no ventilation - this will expedite corrosion of various parts. |

## 6.2 Re-commissioning after storage

**Re-commissioning INFO**

Compressor units, which have been switched off, decommissioned or stored for longer than 3 months, must only be re-commissioned once the following measures have been taken.

**Re-commissioning after storage**

Proceed as follows to re-commission the compressor after a longer period of decommissioning:

| Step | Operation |
|---|---|
| **1** | Manually rotate the SCROLL compressor several times in the rotational direction. |
| **2** | Relax the tension on the V-belt (see Chap.5 S-10 "Tighten/replace V-belt"). |
| **3** | Connect the unit: see Chap. 3 S-3 "Connections”. |
| **4** | Commission system. |

## 6.3 Shut-down and disposal

**Contents**

This section covers the measures you need to take when decommissioning and disposing.

**Danger!**

- Follow the safety instructions of this operating manual as well as the relevant instructions contained in the supplied documentation and the accident prevention regulations.

**Danger to Life!**

There is danger to life from swinging loads when lifting the compressor. Never remain in the danger zone and check on persons present.

**Danger!**

There is also a possible danger of injuries due to cuts from sharp corners and edges of the compressor in the following dismantling work. Always wear work gloves for this work.

**Environment**

- The following instructions must be followed exactly to prevent possible environmental pollution. Even if disposal is carried out by an authorised specialist company, the operator of the compressor must ensure proper execution!

**Dismantling the compressor**

Proceed as follows to dismantle the compressor and observe the following points:

| Step | Operation |
|---|---|
| 1 | Find out how the individual components or the entire machine must be disposed of.<br>Ask your environmental officer, if available. |
| 2 | Remove all system connections. |

## 6.3 Shut-down and disposal (cont.)

**Material INFO**

The following materials were primarily used when manufacturing the compressor:

| Material | Used for / in |
|---|---|
| Batteries, NiCad / Li | • Control |
| Copper | • Motor / electr. supply lines |
| Steel | • Machine frame<br>• Side walls and doors<br>• Motor and components |
| Plastic, rubber, PVC | • Seals and gaskets<br>• Hoses<br>• Cables |
| Tin | • Boards |
| Polyester | • Boards |

**Toxic waste INFO**

The following parts and materials must be disposed of separately:

| Description | Applies to |
|---|---|
| LCD displays<br>**Note:**<br>LCD displays contain highly toxic liquids | • Display devices |
| Electronic scrap | • Electrical supply<br>• Controls (PLCs, etc.)<br>• Boards with electronic components |

**Environment:**

**Dispose of all parts of the compressor so that health and environmental damages are excluded.**

| Typ | Liefermenge free air delivery débit réel | | Leistung power puissance | Steuerung controller contrôle | Schallwert sound level niveau sonore 8 bar | Schallwert sound level niveau sonore 10 bar | Motor - Nennstrom nomial current intensité nominal | Spannung voltage tension | Betriebs-temp. operat. temp. temp. de fonctionne-ment | Kühlluft-bedarf cooling air required air de refroidisse-ment | Druckluft-anschluss air outlet sortie d'air | Sicherung Träge HRC fuse fusible retardée | Zuleitung section of elect. cable section du câble | Abmessung in mm dimensions dimensions | Gewicht weight poids | Druck-behälter air receiver résevoir d'air comp. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | m³/min | | kW | on/off | db(A) | db(A) | A | V | °C | m³/h | " | A | mm² | L x B x H | kg | L |
| | **8 bar** | **10 bar** | | marche/arrêt | | | | | **max.** | | | | | LxWxH / LxLxH | | |
| **SL-S 1,5** | 0,160 | - | 1,5 | ein/aus | 52 | - | 9,1 | 230 | 160 | 540 | ½" | 16 | 3 x 1,5 | 910 x 550 x 920 | 107 | - |
| **SL-S 2,2** | 0,238 | 0,195 | 2,2 | ein/aus | 55 | 53 | 4,6 | 400 | 160 | 540 | ½" | 16 | 5 x 2,5 | 910 x 550 x 920 | 110 | - |
| **SL-S 3,7** | 0,397 | - | 3,7 | ein/aus | 54 | - | 7,7 | 400 | 220 | 780 | ½" | 16 | 5 x 2,5 | 910 x 550 x 920 | 135 | - |
| **SL-S 4,5** | - | 0,405 | 4,5 | ein/aus | - | 54 | 10,5 | 400 | 220 | 780 | ½" | 16 | 5 x 2,5 | 910 x 550 x 920 | 150 | - |
| **SL-S 5,5** | 0,627 | 0,520 | 5,5 | ein/aus | 59 | 57 | 10,5 | 400 | 230 | 780 | ½" | 16 | 5 x 2,5 | 910 x 550 x 920 | 150 | - |
| **SLD-S 1,5** | 0,160 | - | 1,5 | ein/aus | 52 | - | 9,1 | 230 | 160 | 540 | ½" | 16 | 3 x 1,5 | 1060 x 550 x 920 | 143 | 2x20 |
| | | | | | | | | | | | | | | 1410 x 570 x 1550 | 192 | 250 |
| | | | | | | | | | | | | | | 1810 x 610 x 1680 | 257 | 500 |
| **SLD-S 2,2** | 0,238 | 0,195 | 2,2 | ein/aus | 55 | 53 | 4,6 | 400 | 160 | 540 | ½" | 16 | 5 x 2,5 | 1060 x 550 x 920 | 146 | 2x20 |
| | | | | | | | | | | | | | | 1410 x 570 x 1550 | 195 | 250 |
| | | | | | | | | | | | | | | 1810 x 610 x 1680 | 260 | 500 |
| **SLD-S 3,7** | 0,397 | - | 3,7 | ein/aus | 54 | - | 7,7 | 400 | 220 | 780 | ½" | 16 | 5 x 2,5 | 1410 x 570 x 1550 | 220 | 250 |
| | | | | | | | | | | | | | | 1810 x 610 x 1680 | 285 | 500 |
| **SLD-S 4,5** | - | 0,405 | 4,5 | ein/aus | - | 54 | 10,5 | 400 | 220 | 780 | ½" | 16 | 5 x 2,5 | 1410 x 570 x 1550 | 235 | 250 |
| | | | | | | | | | | | | | | 1810 x 610 x 1680 | 300 | 500 |
| **SLD-S 5,5** | 0,627 | 0,520 | 5,5 | ein/aus | 59 | 57 | 10,5 | 400 | 230 | 780 | ½" | 16 | 5 x 2,5 | 1410 x 570 x 1550 | 235 | 250 |
| | | | | | | | | | | | | | | 1810 x 610 x 1680 | 300 | 500 |
| **SLK-S 1,5** | 0,160 | - | 1,5 | ein/aus | 52 | - | 9,1 | 230 | 160 | 540 | ½" | 16 | 3 x 1,5 | 1165 x 550 x 920 | 137 | - |
| **SLK-S 2,2** | 0,238 | 0,195 | 2,2 | ein/aus | 55 | 53 | 4,6 | 400 | 160 | 540 | ½" | 16 | 5 x 2,5 | 1165 x 550 x 920 | 140 | - |
| **SLK-S 3,7** | 0,397 | - | 3,7 | ein/aus | 54 | - | 7,7 | 400 | 220 | 780 | ½" | 16 | 5 x 2,5 | 1165 x 550 x 920 | 165 | - |
| **SLK-S 4,5** | - | 0,405 | 4,5 | ein/aus | - | 54 | 10,5 | 400 | 220 | 780 | ½" | 16 | 5 x 2,5 | 1165 x 550 x 920 | 180 | - |
| **SLK-S 5,5** | 0,627 | 0,520 | 5,5 | ein/aus | 59 | 57 | 10,5 | 400 | 230 | 780 | ½" | 16 | 5 x 2,5 | 1165 x 550 x 920 | 180 | - |
| **SLDK-S 1,5** | 0,160 | - | 1,5 | ein/aus | 52 | - | 9,1 | 230 | 160 | 540 | ½" | 16 | 3 x 1,5 | 1315 x 550 x 920 | 168 | 2x20 |
| | | | | | | | | | | | | | | 1410 x 570 x 1550 | 217 | 250 |
| | | | | | | | | | | | | | | 1810 x 610 x 1680 | 282 | 500 |
| **SLDK-S 2,2** | 0,238 | 0,195 | 2,2 | ein/aus | 55 | 53 | 4,6 | 400 | 160 | 540 | ½" | 16 | 5 x 2,5 | 1315 x 550 x 920 | 171 | 2x20 |
| | | | | | | | | | | | | | | 1410 x 570 x 1550 | 220 | 250 |
| | | | | | | | | | | | | | | 1810 x 610 x 1680 | 285 | 500 |
| **SLDK-S 3,7** | 0,397 | - | 3,7 | ein/aus | 54 | - | 7,7 | 400 | 220 | 780 | ½" | 16 | 5 x 2,5 | 1410 x 570 x 1550 | 245 | 250 |
| | | | | | | | | | | | | | | 1810 x 610 x 1680 | 310 | 500 |
| **SLDK-S 4,5** | - | 0,405 | 4,5 | ein/aus | - | 54 | 10,5 | 400 | 220 | 780 | ½" | 16 | 5 x 2,5 | 1410 x 570 x 1550 | 260 | 250 |
| | | | | | | | | | | | | | | 1810 x 610 x 1680 | 325 | 500 |
| **SLDK-S 5,5** | 0,627 | 0,520 | 5,5 | ein/aus | 59 | 57 | 10,5 | 400 | 230 | 780 | ½" | 16 | 5 x 2,5 | 1410 x 570 x 1550 | 260 | 250 |
| | | | | | | | | | | | | | | 1810 x 610 x 1680 | 325 | 500 |

**SLD-S -** Kompressor montiert auf Druckbehälter, compressor on air receiver, compresseur sur réservoir
**SLK-S** - Kompressor mit Kältetrockner, compressor with air dryer, compresseur avec sécheur d'air par réfrigération
**SLDK-S -** Kompressor & Kältetrockner montiert auf Druckbehälter, compressor and air dryer on air receiver, compresseur avec sécheur sur réservoir

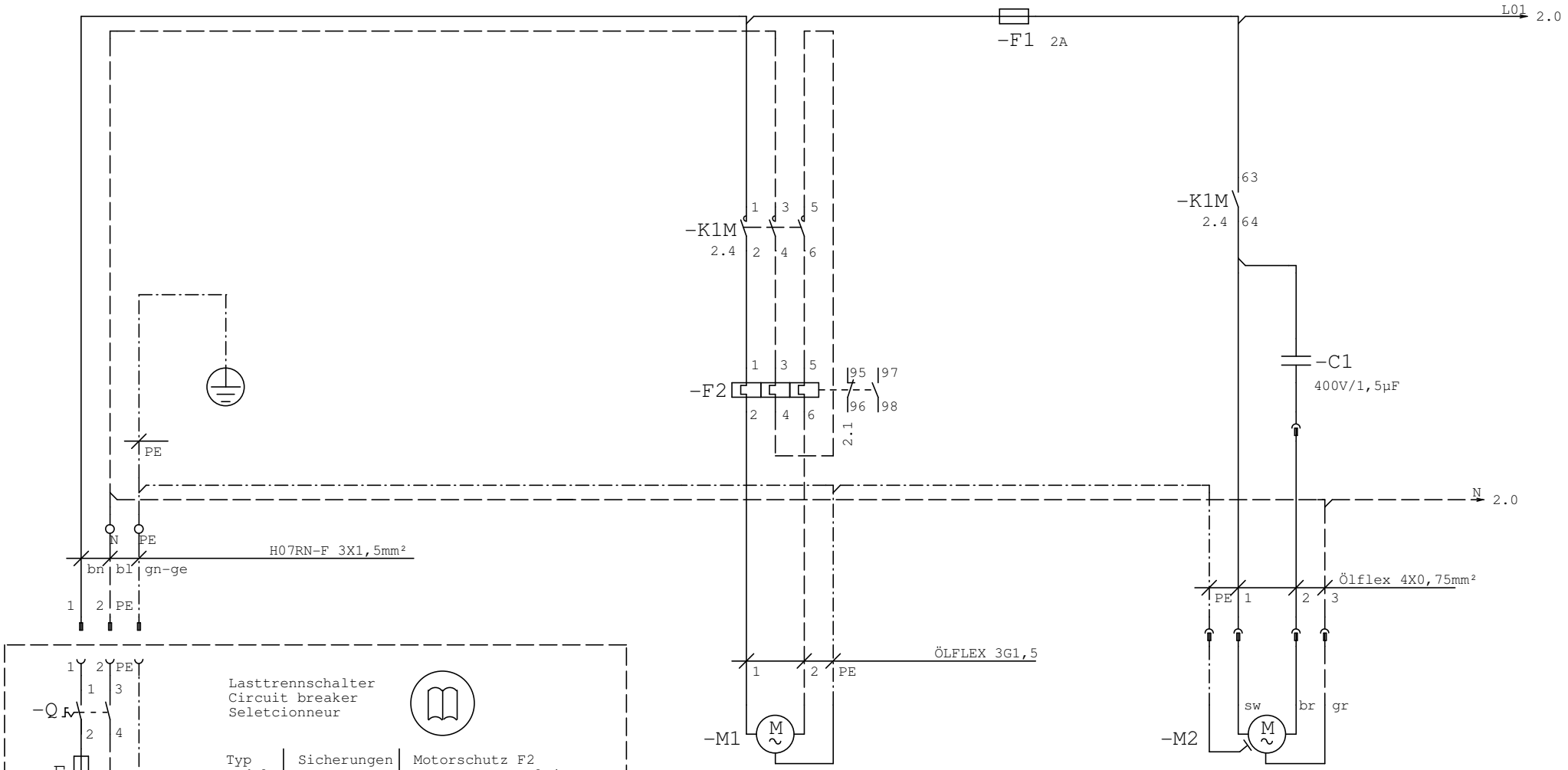
**RENNER GmbH Kompressoren - Emil-Weber-Straße 32 - 74363 Güglingen**
**Tel.: +49 (0) 71 35 / 93 193-0 - Fax: +49 (0) 71 35 / 93 193-50**
**e-Mail: info@renner-kompressoren.de - www.renner-kompressoren.de**

**D- E - F**

# Appendix St
# Wiring Diagrams

RENNER Scroll Compressors

Wiring Diagrams

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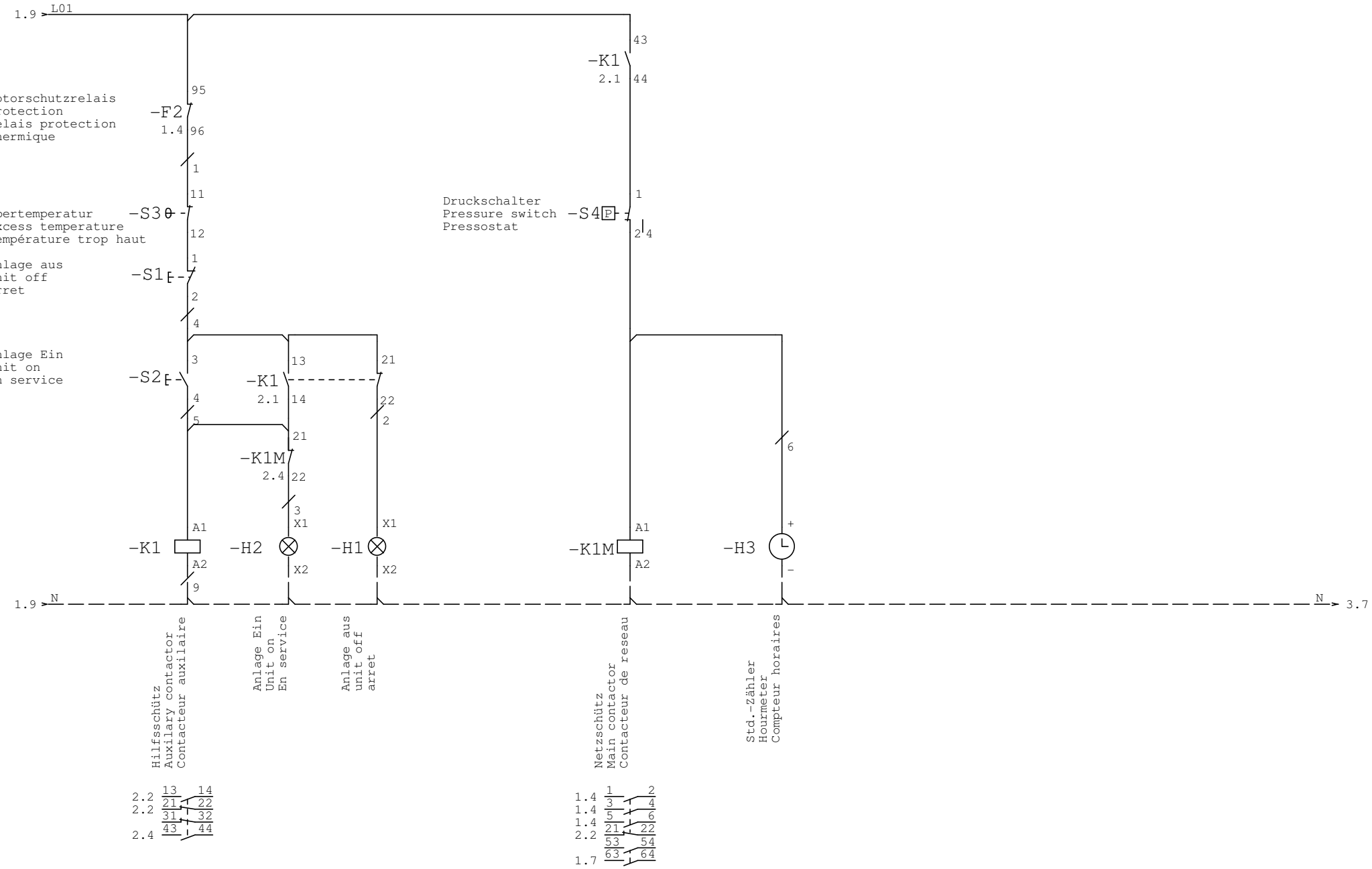
| | | | | Bearb. | Echle | | | | | + |
| | | | | Gepr. | | | | | 052010 | Blatt 1 |
| Zust. | Änderung | Datum | Name | Norm | | Urspr. | Ers. f. | Ers. d. | | von 3Bl. |

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| | | | | Datum | 07.05.2010 | SL_Silence_230V_1,5kW | | RENNER GmbH<br>Emil-Weber-Str. 32<br>D-74363 Güglingen | | 06052010 | = |
| | | | | Bearb. | Echle | | | | | | + |
| | | | | Gepr. | | | | | | | Blatt 2 |
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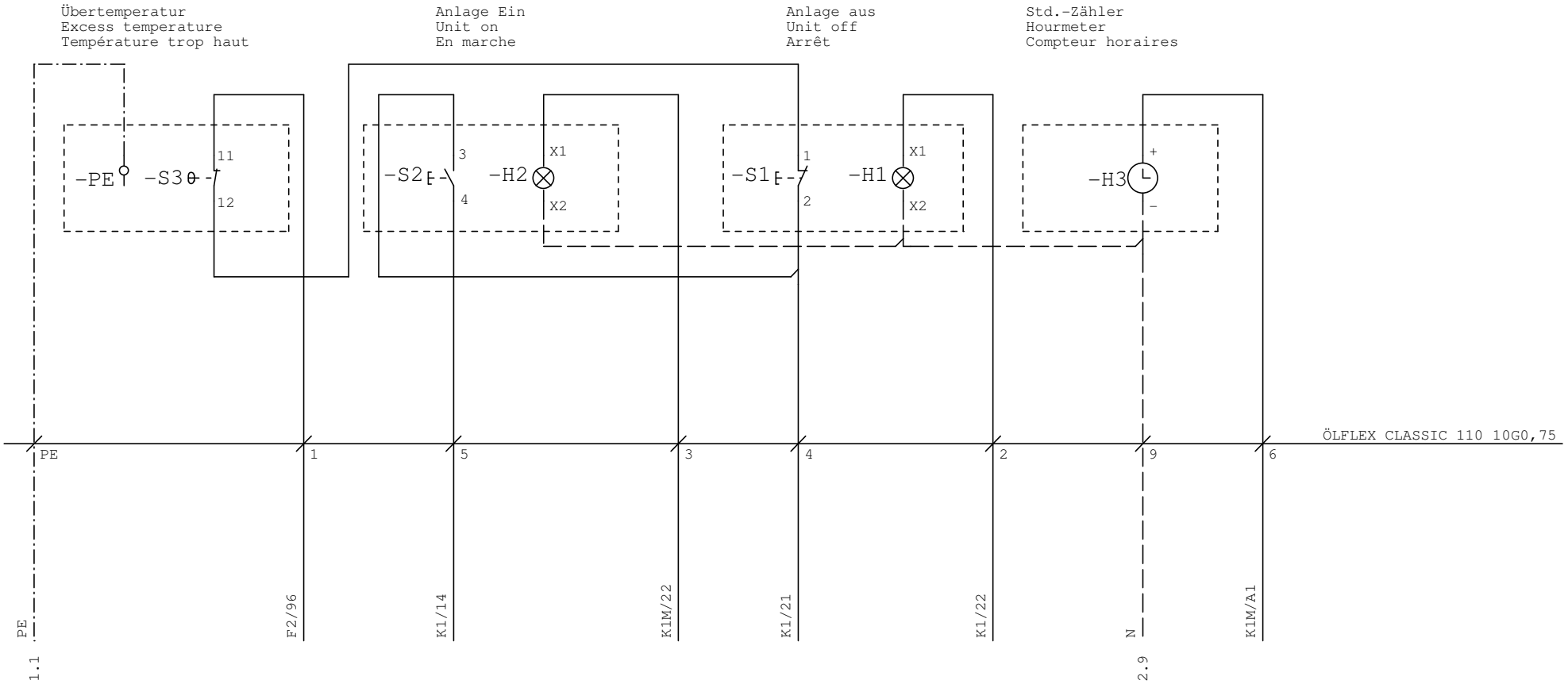


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| | | | | Bearb. | Echle | | | | | | + |
| | | | | Gepr. | | | | | | | Blatt 3 |
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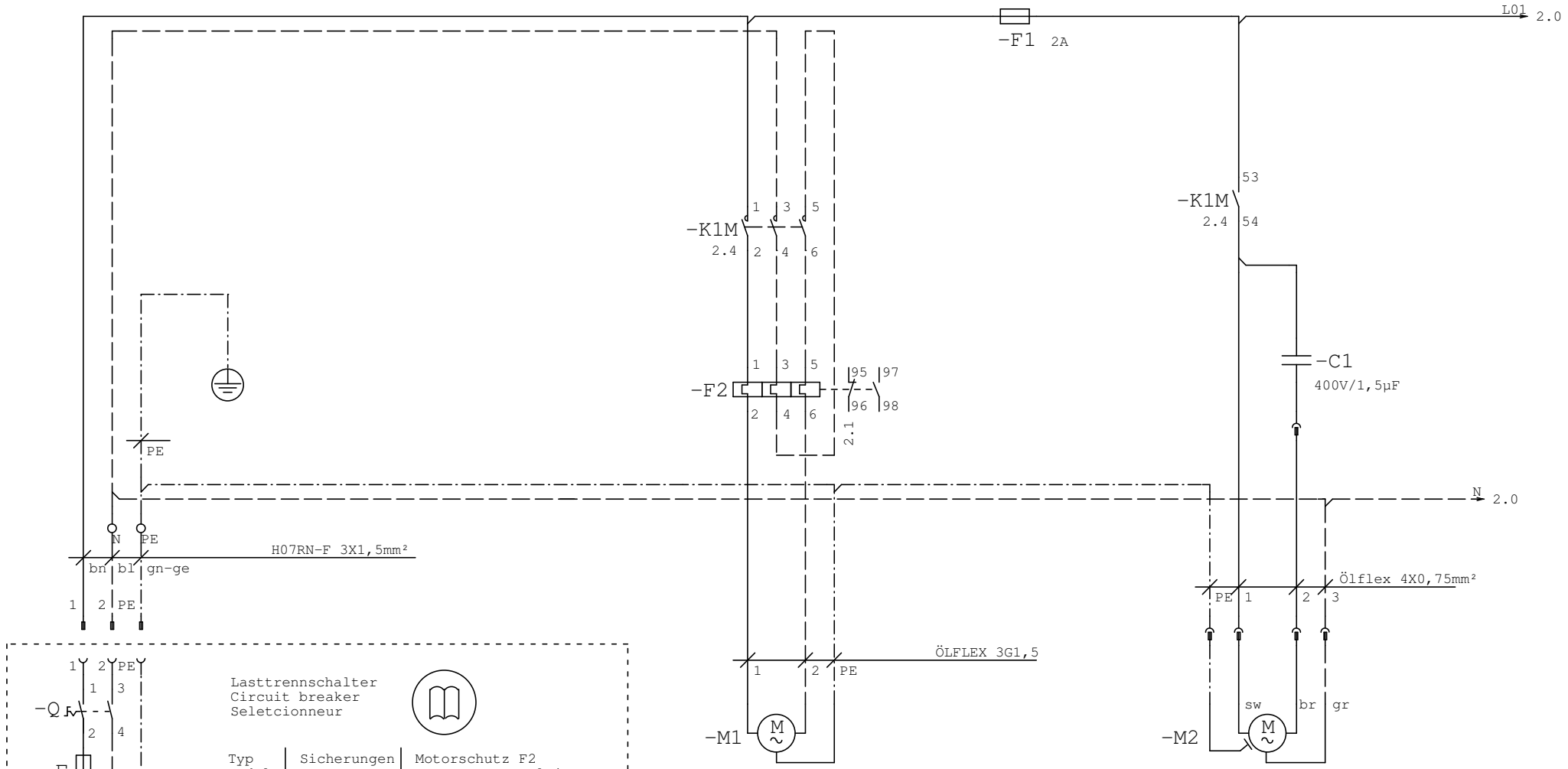


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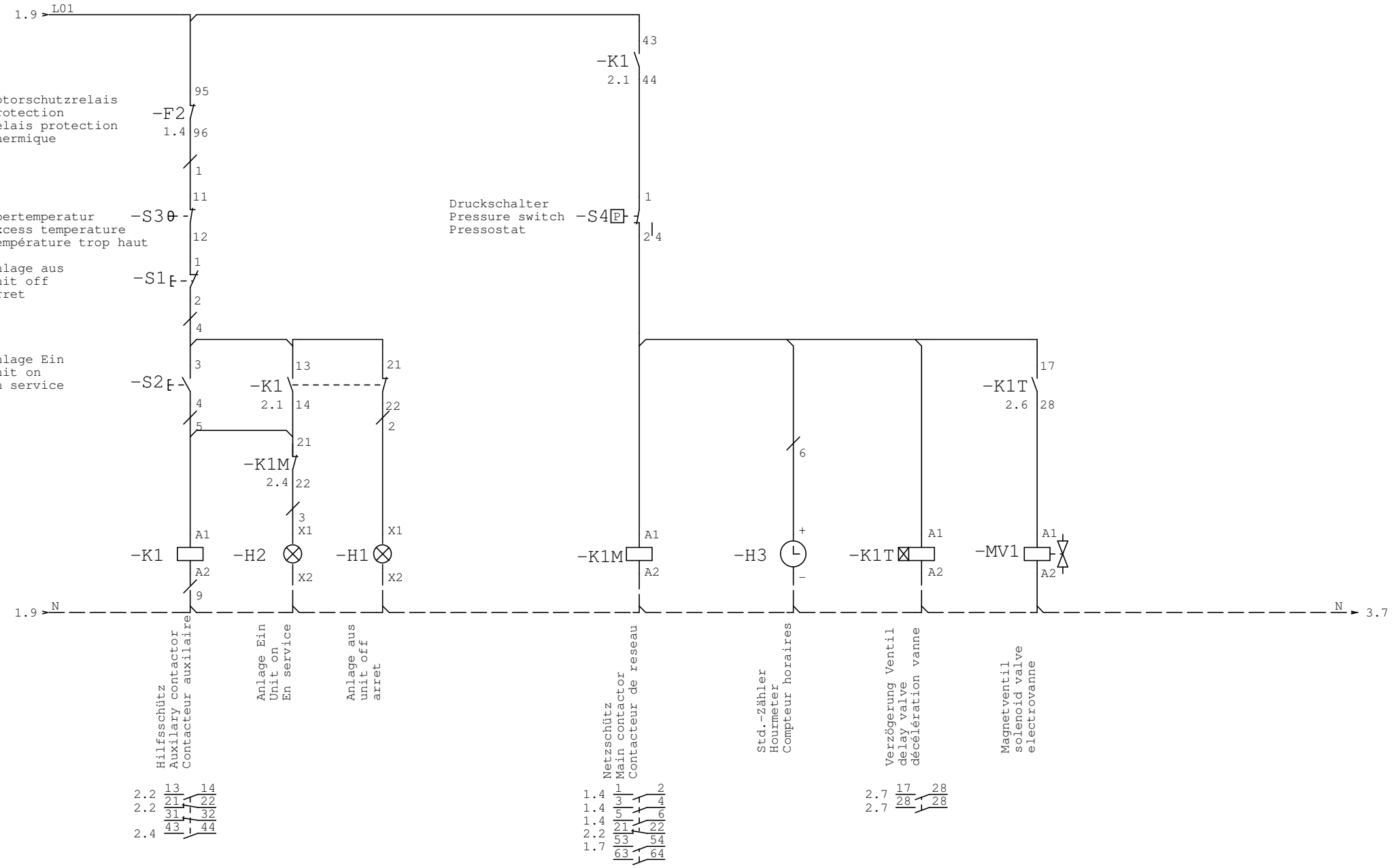
| | | | | Datum | 20.01.2012 | SL-S 2,2 | RENNER GmbH<br>Emil-Weber-Str. 32 | | 28102011 | = |
| | | | | Bearb. | Echle | | | | | + |
| | | | | Gepr. | | | D-74363 Güglingen | | | Blatt 1 |
| Zust. | Änderung | Datum | Name | Norm | | Urspr. | Ers. f. | Ers. d. | 102011 | von 3Bl. |

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| | | | | Gepr. | | | | | | | Blatt 2 |
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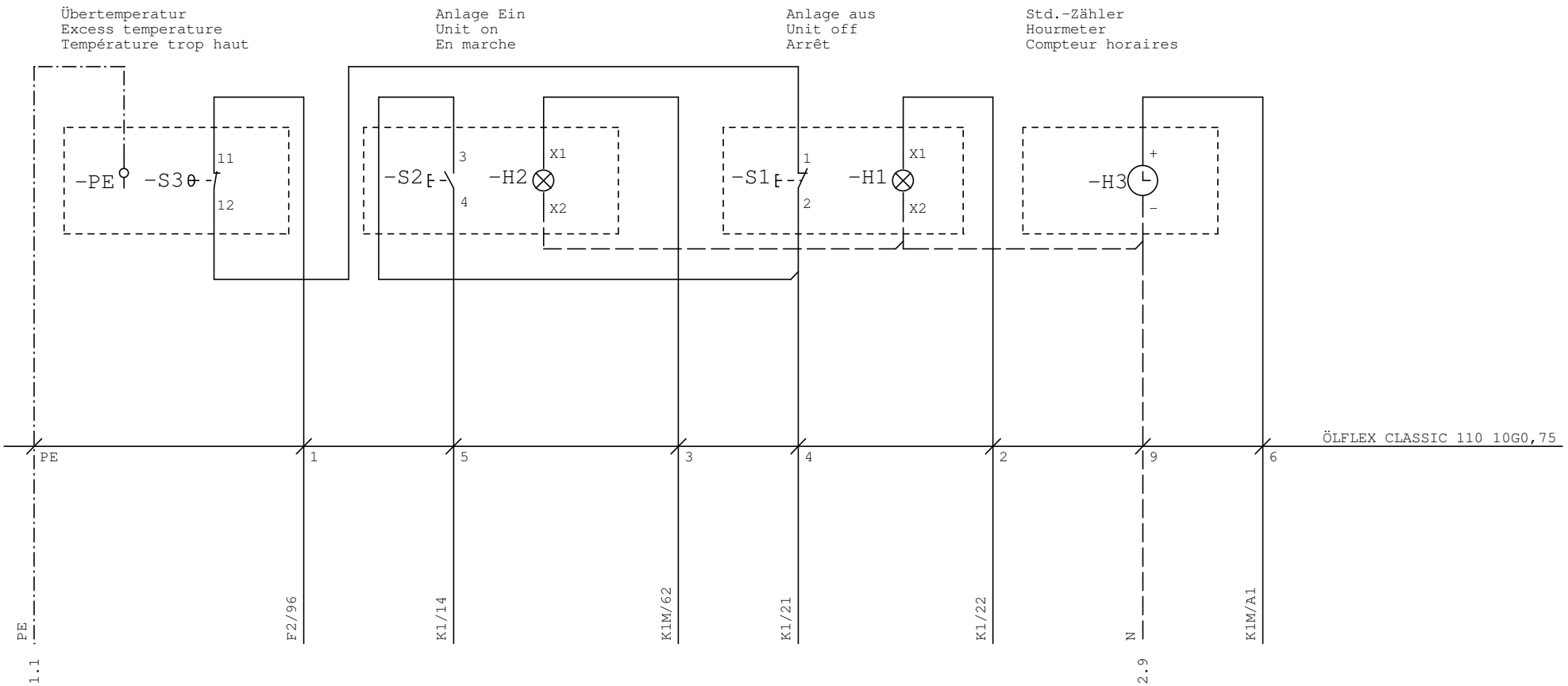


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| | | | | Bearb. | Echle | | | | | | + |
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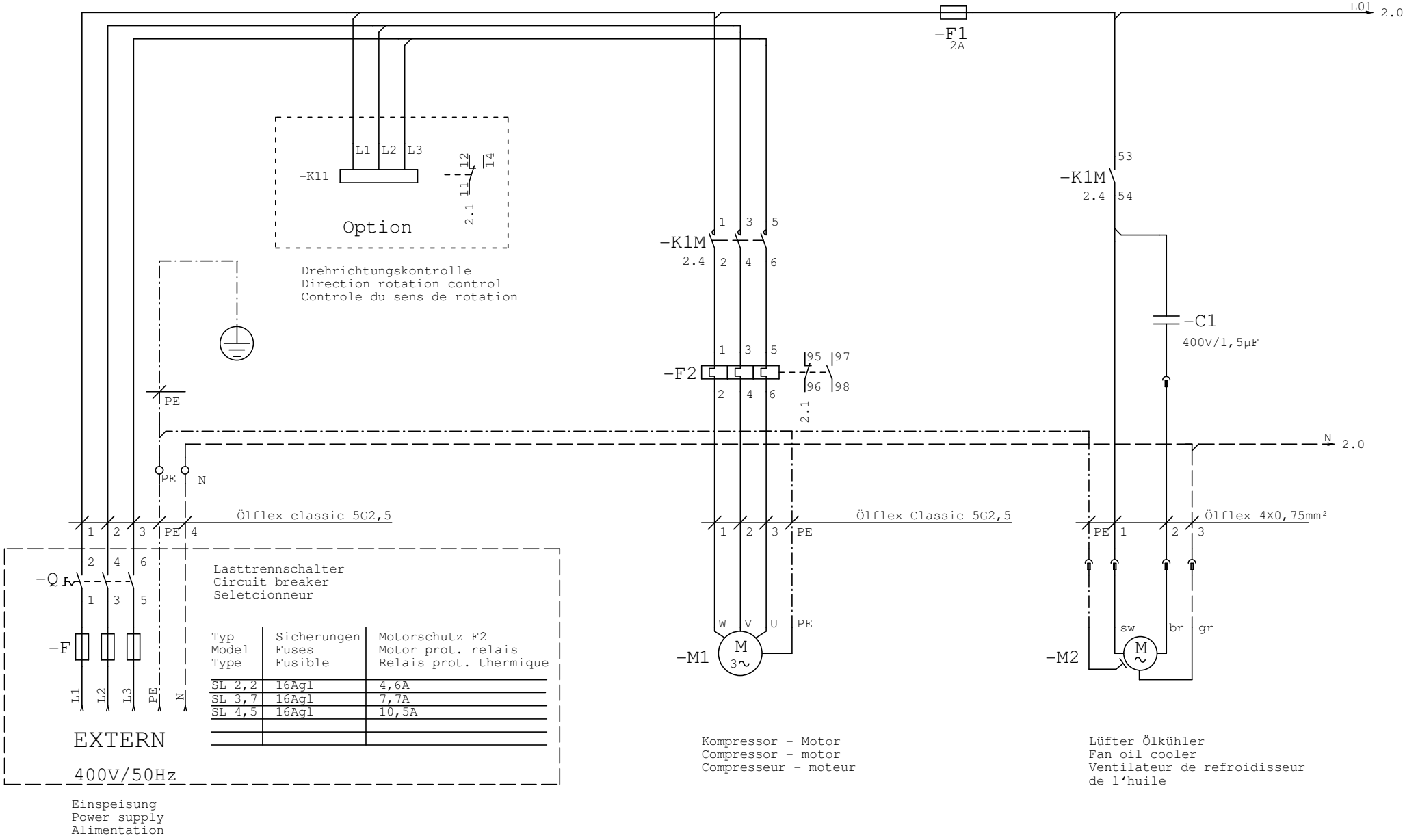


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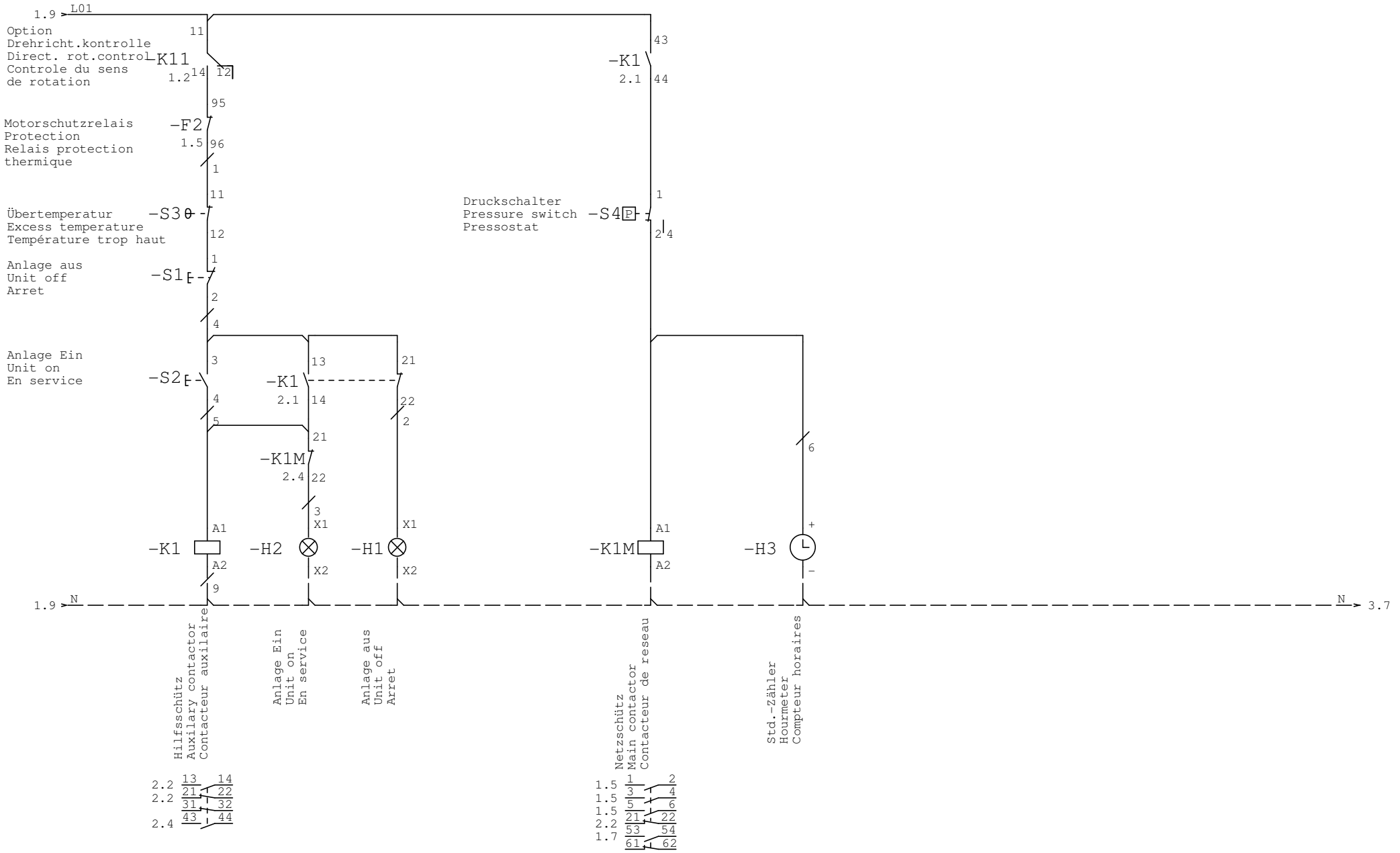


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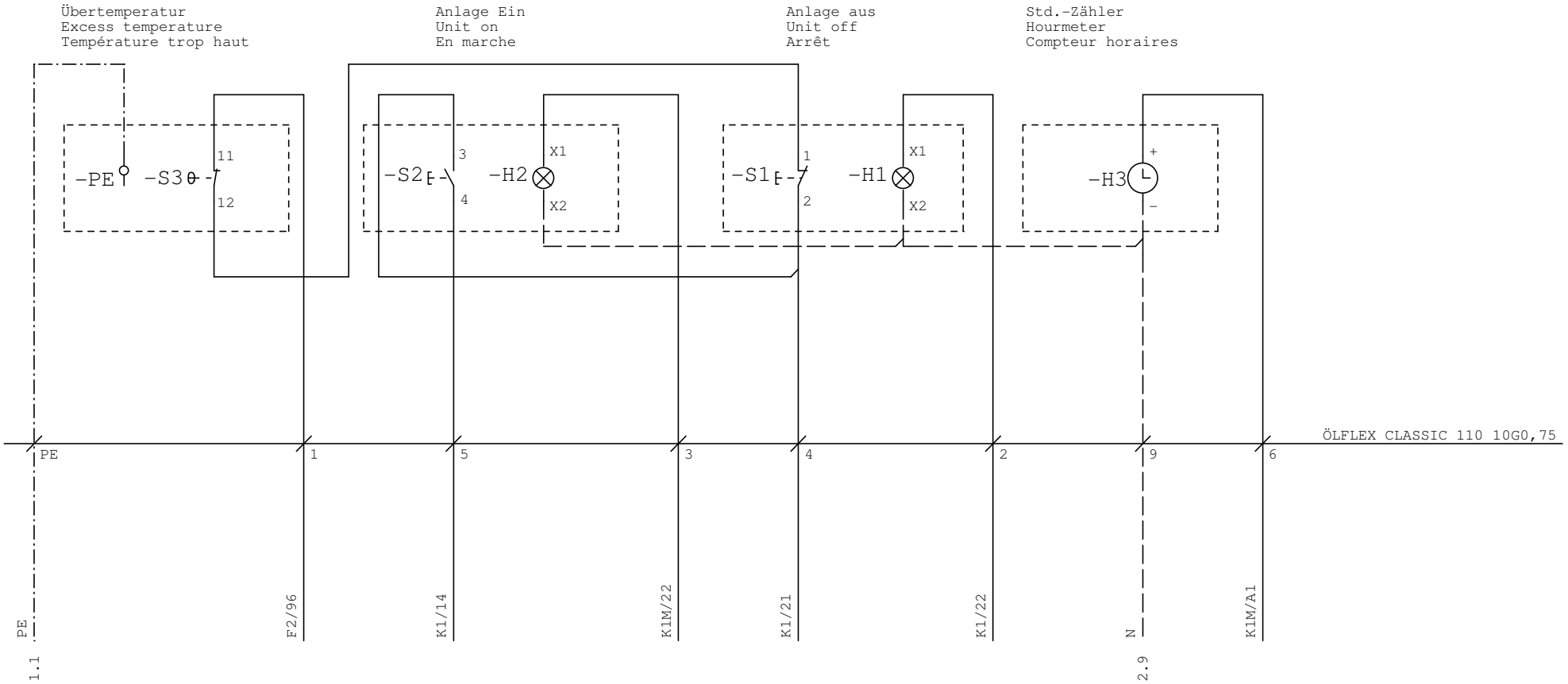


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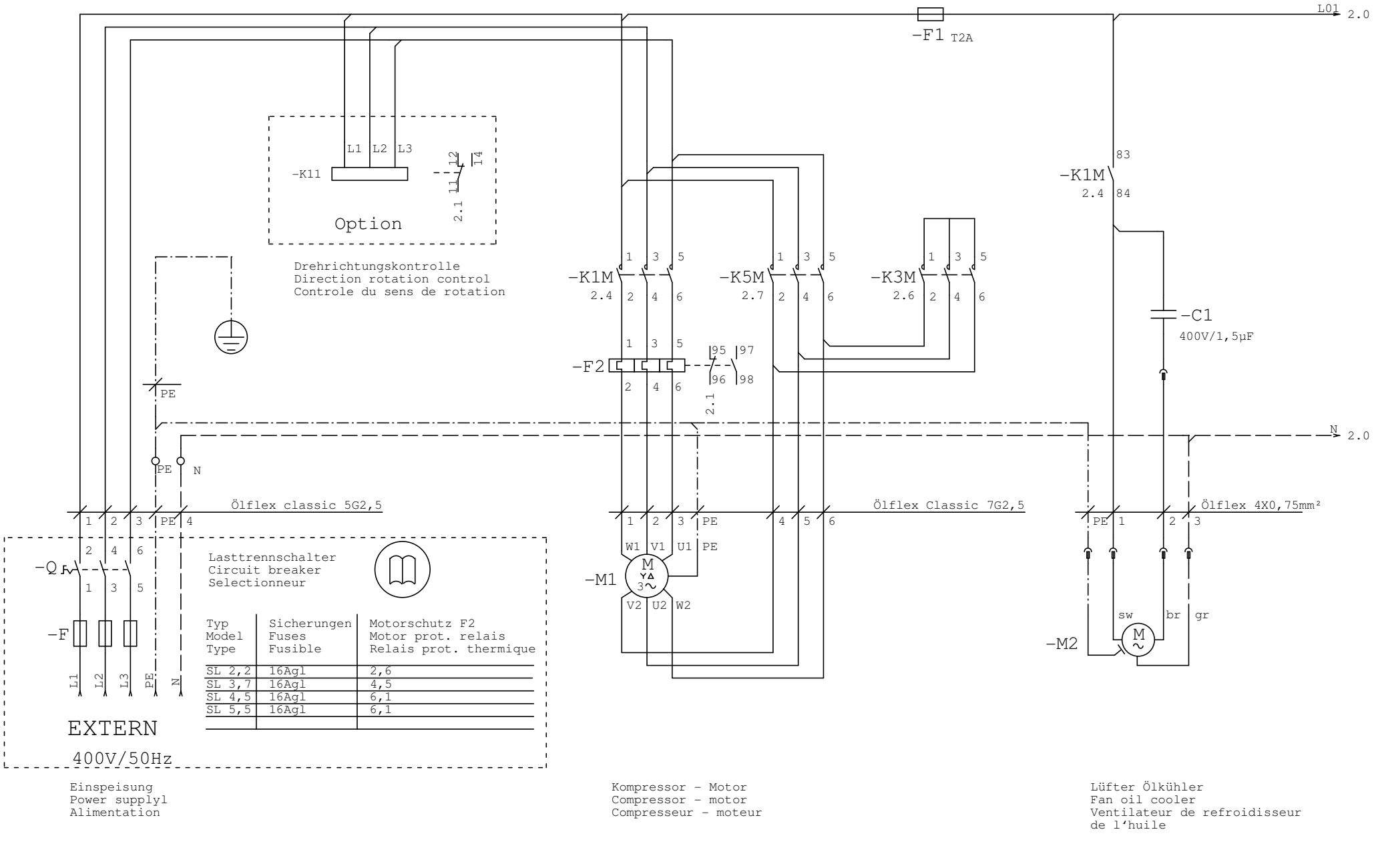


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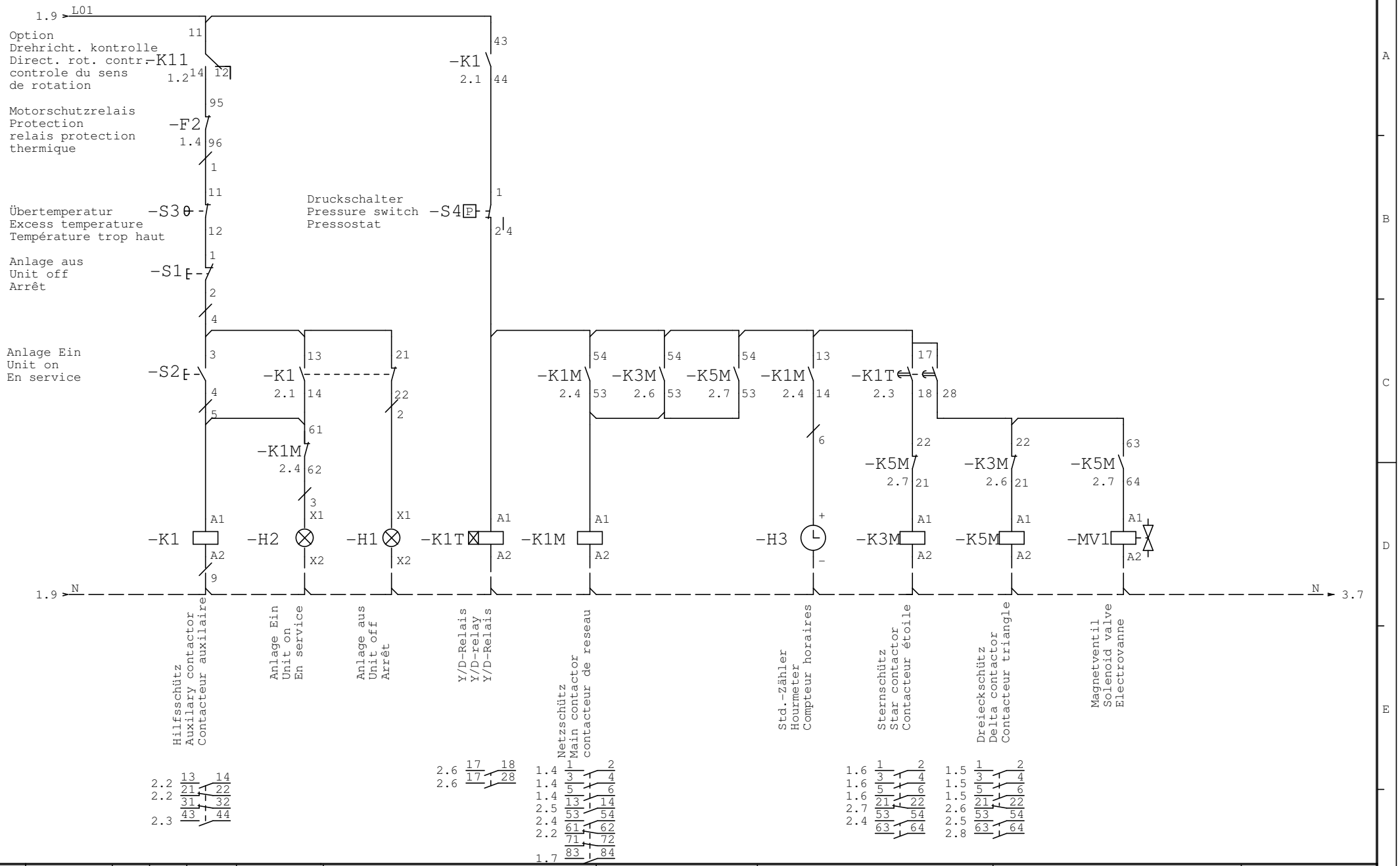


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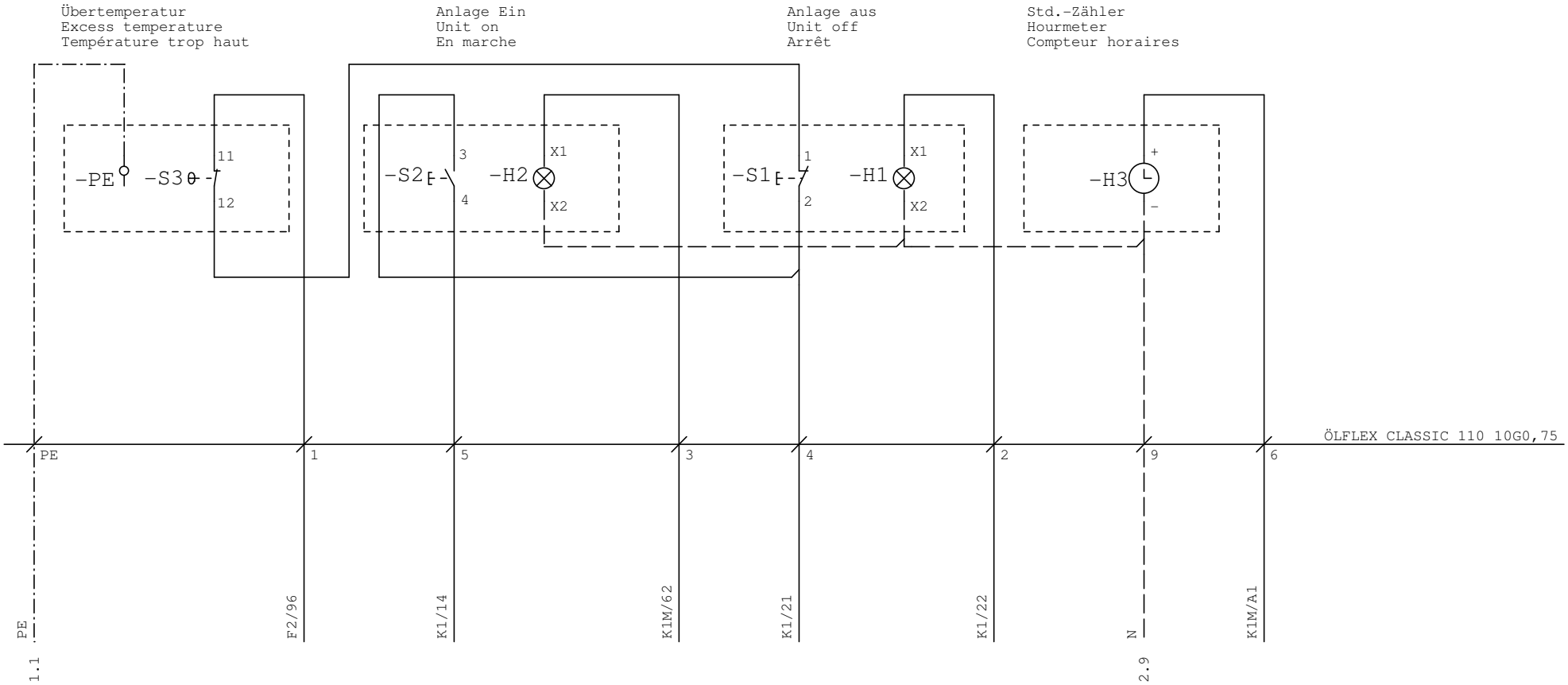


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# Appendix W - Maintenance check SCROLLs 8 +10 bar

| When due | 8 bar | 10 bar | Maintenance Work | Parts required |
|---|---|---|---|---|
| **Start-up** | x | x | Tighten electric terminals | |
| | | | Control/tighten pipe/hose connections | |
| | | | Control direction of rotation | |
| | | | Check V-belt tension | |
| **Daily** regularly | x | x | Drain condensate on air storage vessel (if any) | |
| every **250 h** or monthly | x | x | Control/clean air intake filter | |
| every **1000 h** or once every 6 months | x | x | Check condition of hoses for leaks, cracks etc. | |
| after **2500 h** or once a year | x | x | Tighten electric terminals | |
| | x | x | Check V-belt for wear and replace if necessary | V-belt |
| | x | x | Check alignment of pulleys and tension and adjust if required | |
| | x | x | Check all pipes, if well fitted and tight | |
| | x | x | Change suction filter cartridge | cartridge |
| | x | x | Change silencer at solenoid valve² | Solenoid valve |
| | x | x | Change non-return valve at compressed air outlet² | non-return valve |
| | x | x | Check correct setting of pressure switch and adjust if required | |
| after **5.000 h** or every 2,5 years | x | x | Clean suction fan | |
| | x | x | Clean cooling fins | |
| | x | x | Change solenoid valve² | Solenoid valve |
| | | x | SCROLL Maintenance I a* *(Seal kit)* *or* SCROLL Maintenance I b *(reconditioned bloc)* | MK I a MK I b |
| after**10.000 h** or every 5 years | x | | Clean suction fan | |
| | x | | Clean cooling fins | |
| | x | | SCROLL Maintenance I a* *(Seal kit)* *or* SCROLL Maintenance I b *(reconditioned bloc)* | MK I b |
| | | x | SCROLL Maintenance II *(contact your distributor or the manufacturer)* | MK II |
| after **15.000 h** | x | | Clean suction fan | |
| | x | | Clean cooling fins | |
| **after 20.000 h** | x | | SCROLL Maintenance II *(contact your distributor or the manufacturer)* | MK II |

*Only authorized and certified dealers by RENNER are allowed to carry through a "major maintenance".

² Required for YΔ- started motors and SL-S with 230V only

Only original RENNER parts and components must be used.

# Appendix AW2
# Motor Bearings

All SCROLL Compressor motors are equipped with so called continuously lubricated or closed motor bearings - calculated service life during level operation is between 10,000 and 20,000 operating hours (Oh).
The bearing may be replaced during other maintenance or service work.
The type descriptions of the bearings are listed in the below table

**Please note the following under all circumstances:**High ambient temperatures, dusty air or other adverse operating conditions markedly compromise the service life of the grease and the bearings. In this case, the re-lubrication intervals must, if necessary, be shortened. Watch for visual and acoustic (bearing noise) changes.

Here the details of the installed bearing:

| Model | Output kW | A side | B side |
|---|---|---|---|
| 90 L | 1,5 / 2,2 | 6205 | 6204 |
| 112 M | 3,7 / 4,5 | 6307 | 6206 |
| 132S | 5,5 | 6308 | 6207 |

| | | | |
|---|---|---|---|
| **Kompressor Typ / compressor type / modèle compresseur :** | | | |
| **Maschinen Nummer / serial number / numéro de serie:** | | | |
| **Verkaufsdatum / date of invoice / date d'achat** | | | |
| **Installationsdatum / date of installation / date de la mise en place** | | | |
| **Händlername / distributor / distributeur agrée** | | | |

| Betriebsstunden Operating hours Nombre d'heures de service | Wartungsdatum Date of maintenance Date d'entetien | Nächste Wartung Next maintenance Prochain entretien | Ansaugluft-filter Air filter Filtre à air | | Kühlluft - Ventilator Cooling fan Ventilateur | Kühlluft-rippen Cooling fins Ailettes | Magnet-ventil Solenoid valve Electrovanne | Rückschlag-ventil Non-return valve Soupape de retenue | Keilriemen Drive belt Courroie | | | SCROLL Dichtungen SCROLL seals Joints du SCROLL | Motor-Lager Motor-bearings Roulements-moteur | SCROLL-Lager SCROLL-bearings Roulements-SCROLL | andere Wartungsarbeiten other maintenance work autres travaux entretien | Unterschrift Signature Signature |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | gereinigt cleaned nettoyé | erneuert replaced remplacé | gereinigt cleaned nettoyé | gereinigt cleaned nettoyé | geprüft checked vérifié | geprüft checked vérifié | geprüft checked vérifié | nachgespannt re-tightened tendu | erneuert replaced remplacé | erneuert replaced remplacé | erneuert replaced remplacé | erneuert replaced remplacé | (z.B. Verdichter getauscht f.e. air end changed p.e. changement bloc) | |
| | | | | | | | | | | | | | | | | |
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Ausgeführte Arbeiten ankreuzen und durch Unterschrift bestätigen / Mark the operations done and confirm by signature. Cocher les traveaux effectués et confirmer par signature.

**RENNER GmbH Kompressoren - Emil-Weber-Straße 32 - 74363 Güglingen**
**Tel.: +49 (0) 71 35 / 93 193-0 - Fax: +49 (0) 71 35 / 93 193-50**
**e-Mail: info@renner-kompressoren.de - www.renner-kompressoren.de**

**D- E - F**

## EC Declaration of Conformity according to machine guideline 2006/42/EC Appendix II 1.A

The manufacturer / distributor

RENNER GmbH Kompressoren
Emil-Weber-Straße 32
74363 Güglingen

hereby declares that the following product

| | |
|---|---|
| Product description: | **RENNER SCROLL Compressor** |
| Manufacturer: | **RENNER** |
| Serial no.: | |
| Series / type description: | **SL, SLD, SLDK, SLM, SLDM, SL-S, SLM-S, SLK-S, SLD-S, SLDK-S** |

Description:
SCROLL Compressor for generating compressed air of 8 and 10 bar

meets all relevant provisions of the above stated guideline and the other applied guidelines (to follow) - including the changes applicable at the time of the declaration.

The following further EC guidelines were applied:

EMC guideline 2004/108/EC

Low tension guideline 2006/95/EC

Guideline 2009/105/EC.

The following harmonised standards were applied:

| | |
|---|---|
| EN 1012-1:1996 | Compressors and vacuum pumps - Safety requirements - Part 1: Compressors |
| EN 286-1:1998/A2:2005 | Simple unfired pressure vessels designed to contain air or nitrogen - Part 1: Pressure vessels for general purposes |
| EN 60204-1:2006 | Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2005 (modified)) |
| EN ISO 12100-1:2003 | Safety of machinery - Basic concepts - General principles for design - Part 1: General terminology, methodology (ISO 12100-1:2003) |
| EN ISO 12100-2:2003 | Safety of machinery - Basic concepts - General principles for design - Part 2: Technical leading records (ISO 12100-2:2003) |
| EN ISO 13849-1:2008 | Safety of machinery -Safety relevant parts of controls - Part 1: General principles for design (ISO 13849-1:2006) |
| EN ISO 13849-2:2008 | Safety of machinery -Safety relevant parts of controls - Part 2: Validation (ISO 13849-2:2003) |

Name and address of person who is authorised to compile the technical documentation:
Daniel Hallner
RENNER GmbH Kompressoren
Emil-Weber-Straße 32
74363 Güglingen

(Signature)
Managing Director

(Signature)
Contractor for documentation

# Appendix KT
# Operating instructions for the refrigerant drier

**Content**

In this chapter you receive a brief overview for the optionally installed refrigerant drier.

Please follow the refrigerant drier safety instructions found in the separate operating manual. It is particularly dangerous to breath-in the cooling steam or get in contact with the cooling agents. Smoking when working on the refrigerant drier is prohibited, since the cooling agent will developpoisonous vapours when getting in touch with the glowing end of a cigarette or other open flame (e.g. welding work).

**Function**

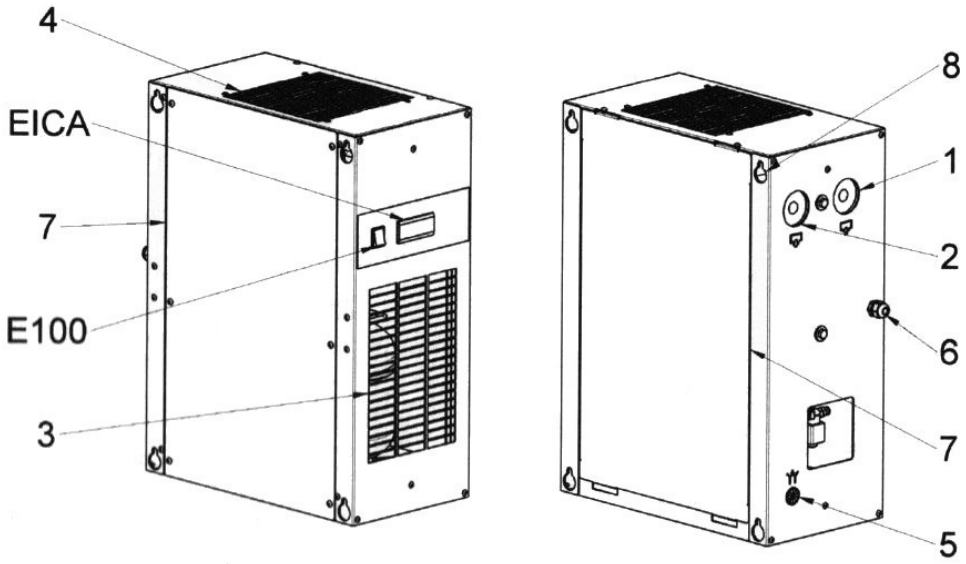
The refrigerant air drier contains a cooling system for cooling the compressed air. The compressed air is also de-humidified. The condensate created here is discharged through a condensate separator.

Make sure that the air inlet and outlet is never impaired or blocked. Adequate distance must be maintained between the ventilation grids and room walls.
Please follow the figure in Chapter 2.3 and the information in Chapter 2.3.1 of the Operating Manual of the refrigerant drier supplier.

After turning on the refrigerant drier, wait 5 minutes until the pressure has equalised. Only then, start the compressor.

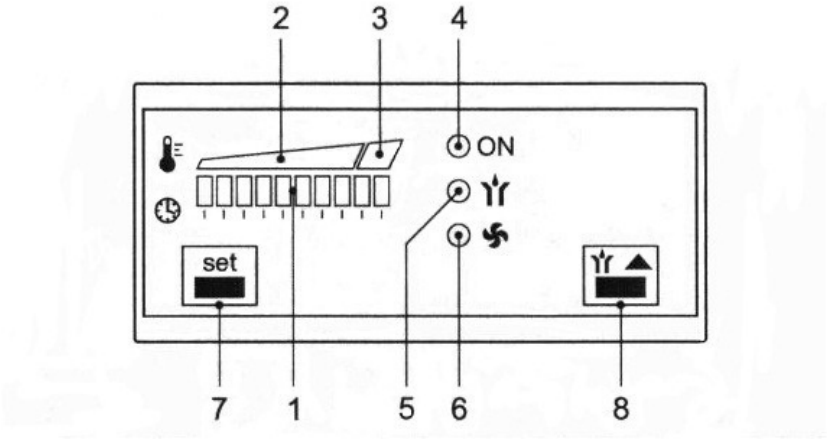
## Appendix KT refrigerant drier (cont.)

**Figure**
**Refrigerant drier**




1.) Compressed air inlet
2.) Compressed air outlet
3.) Cooling air inlet
4.) Cooling air outlet
5.) Steam trap
6.) Electrical connections
7.) Maintenance access
8.) Fixing holes
E100.) Switch-on
EICA.) Electronic regulator

**Figure**
**control panel**



## Appendix KT refrigerant drier (cont.)

**Electronic Regulator**

| Item | Description | Function |
|---|---|---|
| 1 | **10x green LED** | Pressure dew point indicator |
| 2 | **Green area** | Pressure dew point normal |
| 3 | **Red area** | Pressure dew point is too high |
| 4 | **Green LED** | Compressed air drier is turned on<br>In the setting mode the blinking LED shows which data will be displayed |
| 5 | **Yellow LED** | Condensate magnetic valve is active |
| 6 | **Yellow LED** | Ventilator is turned on |
| 7 | **Setting switch** | Multi-function key for editing the parameter.<br>**Press the button for 2 seconds:**<br>Switch from display to setting mode<br>**Briefly press the button:**<br>Switch between menues<br>**Press button together with up key:**<br>Current setting is changed |
| 8 | **Up key** | Up / deflector test<br>Pressing the up key will exit the setting mode |

# Appendix KT refrigerant drier (cont.)

## Maintenance

**Before completing any maintenance work, please follow all safety provisions for electrical systems and electrical devices (see Chapter 1 of the original operating manual).**

The compressed air refrigerant drier must be mainained at different intervals. The maintenance intervals heavily depend on the utilisation type and the conditions oft he installation site. The following maintenance work must be completed daily:

1. Check the function of the steam trap; check if water is drained; valve test (manual drain condensation):

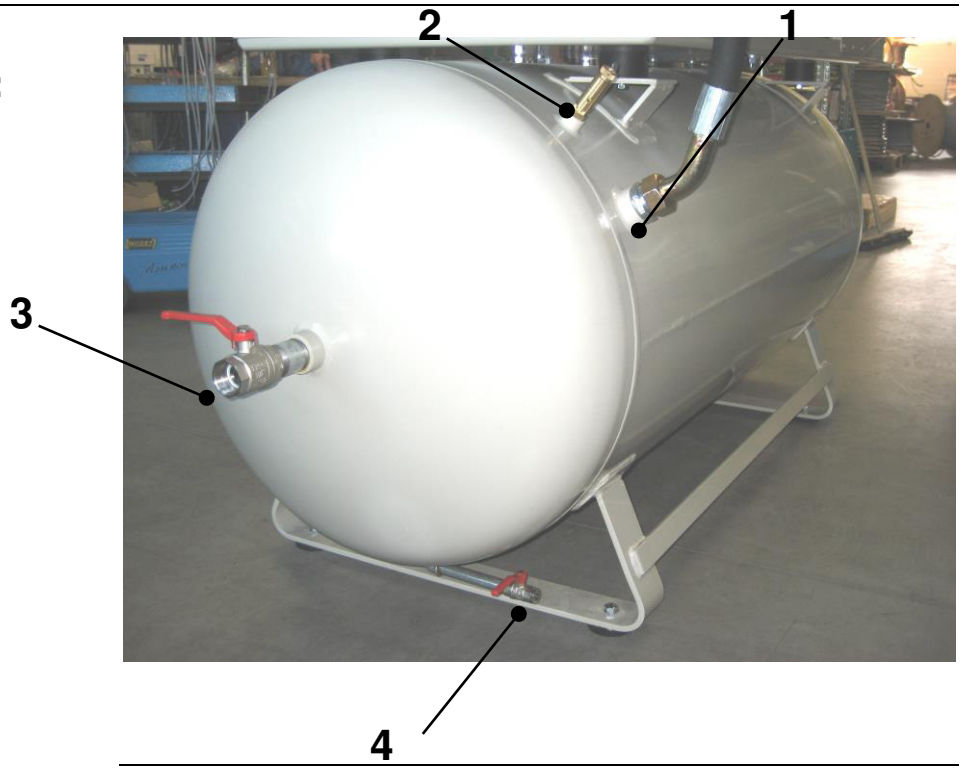
2. Check the pressure dew point display; for deviations from the normal range, see chapter 5.2.2 and 5.2.3 in the original operating manual

3. Check the compressor for contamination

**Specific notes about other maintenance intervals and work can be found in the manufacturer original operating manual under Point 5 Maintenance.**

# Appendix AD
# Compressed air receiver

## Illustration: air receiver




## Description of air receiver

| No. | Description | Function |
|---|---|---|
| 1 | **Connection from compressor** | Inlet of compressed air into the air receiver |
| 2 | **Safety valve** | Protects the air receiver against too high a pressure |
| 3 | **Compressed air outlet** | Outlet of compressed air to the c.a. system |
| 4 | **Condensate drain** | Drains the condensate for collection |

- Please observe the regional laws and regulations for the control of air receivers
- Please take care for a condensate drain system
- Please take the necessary mesures as to discharge the condensate if no automatic system

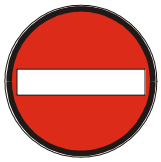
**Caution!**
To grant the functionality of the air receivers, all flexible hoses of the receivers have to be changed after 2 years at the latest.
This affects especially the 2 x 90l air receivers. Both receivers have to be able to be discharged separately.

# Appendix ADS
# End Pessure Switch

## Contents

This chapter provides a brief overview of all the pressure switch functions.

**Warning!**



From the factory side, the pressure switch is ideally adjusted to the respective machine configuration. Any change to the default settings can have serious consequences on the service life of your system. The legal warranty will expire if making changes that have not been discussed in advance with RENNER Kompressoren GmbH.

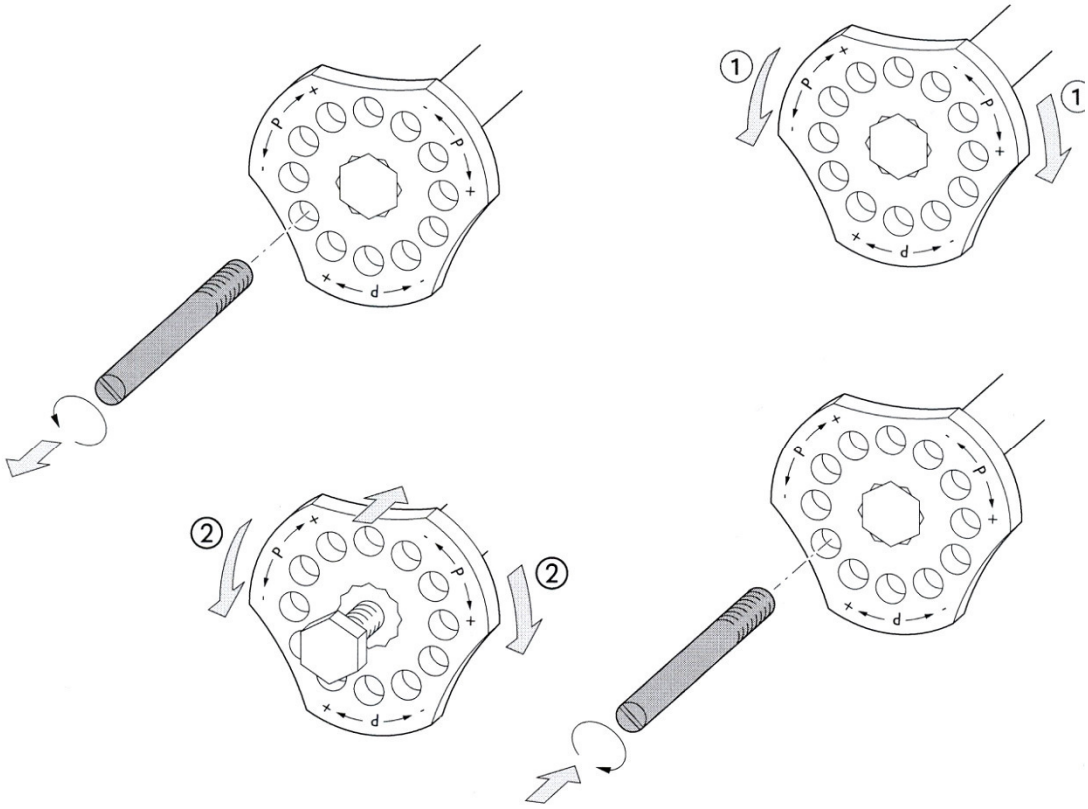
## Function

The pressure switch controls the switch-on and switch-off pressure applicable for the respective system. The difference between switch-on and switch-off pressure is generally 1.5 bar. For changes to the switch-off pressure settings made on the factory side, the safety valve is activated if the the permitted maximum pressure is exceeded.

*Continued overleaf*

# Appendix ADS
# End Pressure Switch

**Schaltdruck nur unter Druck verändern!**
**Adjust switching pressure only under pressure!**
**Modification de la pression de fonctionnement uniquement sous pression !**
**Modificare la pressione di funzionamento solo sotto pressione!**
**¡Modificar la presión únicamente bajo presión!**
**Настройку давления включения производить только под давлением!**
必须在受压的情况下改变压力




① Pmax. einstellen
Pmin. ändert sich mit

② Pmin. einstellen
Pmax. ändert sich nicht mit

① Set Pmax.
Pmin. is altered accordingly

② Set Pmin.
Pmax. does not alter

① Régler Pmax.
Pmin. se modifie

② Régler Pmin.
Pmax. ne se modifie pas

① Pmax.
Pmin.

② Pmin.
Pmax.

① Regolare Pmax.
Pmin. si modifica

② Regolare Pmin.
Pmax. non si modifica

① Ajustar Pmax.
Pmin. se modifica

② Ajustar Pmin.
Pmax. non se modifica

① Установить Pmax Pmin
изменяется также

② Установить Pmin Pmax не
изменяется

① 调整
改变 按

② 调整
改变 不按