

Original operating instructions

RTS 1000

**Pressurisation System
with addressable compressor
monitoring unit ACS**



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Important!

It is imperative to read and observe the safety instructions prior to start up!

Technical specifications

Pressurization System Type	RTS 1000
Output power	1000 NI/h, 0 .. -20 %
Number of consumer load connection point	1
Compressor	PK 24/1
Number of cylinders	1
Engine RPM	1425 min ⁻¹
Operating voltage	230 V, 1 Phase
Frequency	50 Hz
Current consumption of of the system	approx. 2,4 A
Working pressure of compressors	max. 6,1 bar
Opening pressure safety valve "compressor"	7,0 bar ± 10 %
Working pressure On-Off	3,0 to 5,0 bar
Opening pressure safety valve "high-pressure"	7,0 bar
Output pressure is adjustable (customised)	0,6 - 0,8 bar
Opening pressure safety valve "output pressure"	0,9 bar + 10 %
Relative humidity output air (typical)	approx 1,5 %
Regeneration air mass	approx. 270-300 l/h ±10 %
Regeneration time drying agent container	60 s
Content - air storage tank	6 l
Ambient temperature limit	+1 °C bis +40 °C
Ambient humidity limit	0 .. 90 % rel. humidity, non condensing
Signal LEDs (standard)	Operation (DC) Fault (A)
Signal output (floating)	Accumulative Fault (A - humidity, runtime)
Workplace-related emission value	68 dB(A)
Measurement uncertainty dB(A)	± 2,3 dB(A)
Measuring system	DIN 45635 section 1
Measuring conditions	in the room
Measurements: Width x Depth x Height	600 x 400 x 880 mm
Weight	approx. 65 kg

All pressure specifications are seen as gauge pressure specifications.

Ordering data

Pressurisation System RTS 1000

with addressable compressor monitoring unit ACS, 230 V, 50 Hz

Order no. 073241.024

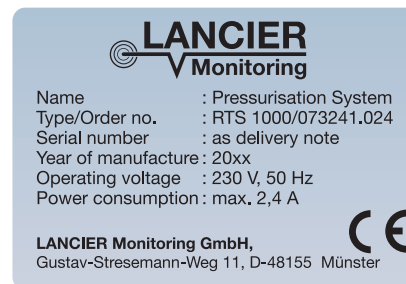
Scope of supply

- Pressurization system RTS 1000D, consisting of
 - 1 solid metal cabinet with the following mounting parts:
 - 1 compressor
 - 1 air storage tank
 - 1 air dryer system
 - various control, measuring and display elements
- Condensate diffuser with hose
- Operating instructions
- CE Declaration of Conformity

Marking

The pressurisation system is clearly marked by the content of the name plate including technical specifications and manufacturer's instructions. The name plate is found inside at the bottom of the cabinet.

The compressor on the mounting console is marked by the content of the name plate including technical specifications and manufacturer's instructions. The name plate is found on the compressors housing.



Accompanying Documents

Documents delivered with this operating instructions are intended to assist for safe and secure operation of the system.

- Certificate for safety valve and air storage tank
- A3 wiring diagram
- A3 circuit diagram

The system should be put into operation only if all documents have been read and understood by the operator.

Symbols used



Attention Danger!

This symbol warns of the health risks up to threatening injuries or death.



Warning Danger of electric voltage!

This symbol warns of the health risks up to threatening injuries or death caused by electric voltage.



Turn power off!

This symbol indicates that electrical components and systems must be disconnected prior to maintenance and repair work and also protected against resetting.



Wear protective gloves!

This symbol indicates that protective gloves must be worn during the works described.



Wear safety glasses!

This symbol indicates that safety glasses must be worn during the works described.



Note for disposal!

This symbol indicates that the resulting waste must be disposed ecologically and not become domestic waste.



Risk of injury!

Take caution with heated components!

Legal provisions

Liability

The information, data and references specified in this operating instruction were up-to-date on the day of print. Claims on systems already supplied can only be asserted conditionally from details, illustrations and descriptions.

LANCIER Monitoring GmbH assume no liability for damages and disruption of operations, which may result from:

- Non compliant use
- Arbitrary change to the equipment
- Improper work on and with the equipment
- Operating and setting error
- Disregarding existing standards, directives and accident prevention regulations
- Disregarding operating instruction

Warranty

- Warranty takes place according to the general terms and conditions of LANCIER Monitoring GmbH.
- Warranty claims must be asserted to LANCIER Monitoring GmbH immediately upon detecting a fault or failure.
- The warranty terminates in all cases where also no liability claims can be asserted.

General

This operating instruction is valid for the the pressurization system RTS 1000 and its variants.

It shall help you to get to know the product and contains important information to operate the system safely, properly and economically, to make use of the range of functions, to lessen repair costs and down times, as well as to increase the reliability and service life of the equipment.

Furthermore, this manual will enable you to carry out maintenance and repair work on the pressurization system yourself for daily use.

It contains safety instructions, which must be observed.

During operation, other instructions must be observed if necessary for components to be installed optionally, such as flow meter, distribution devices etc.

The operating instruction is supplemented with instructions on the basis of current national regulations on accident prevention and environmental protection.

The operating instruction must always be on hand at the point where the equipment is used, complete and in legible condition.



The operating instruction shall be read and applied by anyone assigned to work with/on the system, e.g. during

- **operation, including installation, setting up, fault repair in the production flow, removal of production waste, care, disposal of materials.**
- **Maintenance (servicing, inspection, repair)**
- **Transportation**

Besides the instruction manual and the accident prevention regulations applicable in the country and site of use, the recognised specialised rules for safe and professional work shall also be observed.

This documentation was compiled with the utmost diligence, taking the existing regulations into consideration. However, variations cannot be excluded. LANCIER Monitoring reserves the right to make technical modifications to the pressurization system without prior notification and assumes no legal responsibility or liability for damages, which may arise.

Any necessary changes are promptly incorporated into the current versions of this operating instruction.

Conventional use

- is solely fit for compressing and drying purified air to be supplied to cables.
- shall only be used for the purposes validated by LANCIER Monitoring.
- shall only be operated under the conditions stipulated in this operating instruction.
- shall only be operated with the settings and variants stipulated in this operating instruction.

The automatic operation of the system permits unsupervised, steady use.

Any other use is not classed as conventional. The manufacturer takes no responsibility for any resulting damages. The operator alone bears the risks!

Arbitrary changes in design or system rebuild are prohibited without the written consent of the manufacturer, as are modifications and interventions in the control programme, the compressors and settings of the drying process, as well as the pressures used.

Compliance with the stipulated operating, servicing and repair conditions also form part of conventional use.

Safety instructions



Important!

It is imperative to read and observe the safety instructions prior to start up.

The operating instruction must always be stored within reach.

For the safety of persons in charge

Operator

Operator is any natural or legal person, who uses the equipment or on whose instructions the equipment is used.

The operator or his safety officer must guarantee, that

- all relevant regulations, references and laws are adhered to.
- only qualified employees work on and with the equipment
- employees have the operating instruction available during all works and abide by this.
- non-qualified employees are forbidden from working on and with the equipment, as well as installation and servicing. The necessary accident prevention and safety instructions must be adhered to.

Qualified employees

Qualified employees are persons who are authorised by the person in charge for equipment safety based on their training, experience, instruction and knowledge on relevant standards and provisions, accident prevention regulations and operating conditions, to carry out operations required and be able to identify and prevent possible dangers.

Staff qualification

Operations	Briefed person	Briefed person with technical training	Electro specialists
Initial commissioning	-	-	✓
Operation	✓	✓	✓
Fault repair			
- mechanic	-	✓	✓
- electrical	-	-	✓
Cleaning	✓	✓	✓
Servicing	-	✓	✓
Work on the electrics	-	-	✓
Packaging / transportation	✓	✓	✓

General safety instructions

These safety instructions are not exhaustive. For questions and problems please contact the customer service department at LANCIER Monitoring.

- Always store the operating instruction within reach!



Accident prevention! Risk of damage!

- The system is classed as state-of-the-art at the time of start-up and essentially reliable.
- The system must only be operated in technically-sound condition, with the protective devices enabled. The operating instruction should be observed properly, conscious of risks and safety.
- The area surrounding the system shall be kept clean and tidy. Contaminations and obstructions of the equipment's function, as well as restrictions in the freedom of movement of operating personnel, can lead to operational faults and accidents.
- The operating personnel are obliged to check the equipment and its function groups at least once a week for damages and faults. Changes, including those to the operating behaviour, which affect the safety, shall be reported and corrected immediately.
- Risks for persons, the equipment itself and for other material assets emanate from the equipment, if
 - non-qualified personnel work on and with the equipment
 - the equipment is not used conventionally
 - the equipment is set or connected incorrectly
- The equipment must be set and fitted so that it fulfils its function for proper and conventional use in fail-safe operation, representing no danger.
- Suitable measures must be taken so that an equipment breakdown does not result in any damage to persons or property.
- Specific faults which may compromise safety have to be corrected immediately!
- The pressurization system RTS 1000 must only be installed, operated, serviced and repaired by persons who have been briefed on the potential dangers.
- Refittings, modifications or rebuilds of the equipment are strictly prohibited! Always consult LANCIER Monitoring in any case.
- The electricity supply and other works/repairs to the system's electrical fittings must only be carried out by electric specialists.
- Keep all safety instructions and danger warnings on the system in legible condition!
- Do not undo or open screw connections and tank, before the system is depressurised. Open to bleed the safety valve "high-pressure".
- Do not operate, service or repair the system with wet hands!
- Do not touch the drying agent with wet hands - heat build-up!
- Do not open the drying agent container before it is depressurised!
- Adhere to the terms stipulated or specified in the operating instruction for periodic inspections/maintenance.
- After any maintenance and repair work check all unfastened screw connections.
- Disconnect the operating voltage main switch prior to maintenance and repair works.
- After connecting electricity: Take caution with live components!
- For works on opened system: Take caution with heated components!
- Only use original LANCIER Monitoring replacement parts!



Accident prevention!

- Use personal protective equipment and wear close-fitting work clothes and work safety footwear!
- When using drying agents wear work gloves and safety glasses!
- Always tie back long hair, do not wear loose clothing or jewellery including rings!



Note for disposal!

Dispose of used drying agents in accordance with the regulations applicable in the country and site of use.

Safety instructions for electrical works



Deadly risk!

The operating voltage necessary for the system can have fatal consequences if live parts are touched!

- If a short circuit occurs there is the risk of sparking and fire.
- The system connection shall be dimensioned adequately to avoid overload.
- The operating voltage supply line must be equipped with a main switch with emergency switch-off function according to IEC/EN60204-1, VDE 0113 Part 1 and 16 A back-up fuses by the customer.
- In the event of failure in the electrical power supply the system must be disconnected immediately.
- Active live parts of the electrical system must not be worked.



Deadly risk!

Before commencing work with system parts, which are supplied with electrical power, switch system to zero potential on the main control switch and safeguard against unexpected resetting! Otherwise there is danger through electric voltage!

- Only use original fuses with stipulated current.
- The electrical system must be in sound condition and checked regularly. Defects, such as loose connections etc. shall be reported and remedied immediately.
- The switching cabinet as well as all connection and terminal boxes shall always be kept closed. Access for the purpose of inspection and maintenance of electrical equipment is only permitted to authorised personnel (see chapter "qualified personnel")
- The active parts of the electrical equipment must be protected against direct contact according to their voltage, frequency, usage category and place of operation by insulation, position, arrangement or permanent fittings.
- The electrical equipment must feature protection in direct contact according to its voltage, frequency, type of use and place of operation, so that in the case of a fault, there is protection available against dangerous touch voltage.

Safety instructions for works on compressed air lines and pressure tanks



Deadly risk!

The pressures necessary for the equipment can lead to injuries. During repair works on compressed air components, pressure lines and tanks to be opened shall be depressurised.

- The lines to be connected must be marked clearly and permanently, in order to rule out the dangers caused by a mix-up.



The air storage tank must be inspected at regular intervals. This inspection must take place according to customary regulations.

Safety instructions for working with drying agents



Deadly risk!

The pressures necessary for the equipment can lead to injuries. During repair works on compressed air components or drying agent containers, pressure lines to be opened shall be depressurised.



Risk of injury!

- The drying agent has an absorbing effect and can lead to shrinkage after long contact with skin.
- In contact with water the drying agent generates heat, which can lead to mucosa and skin burns.



Risk of injury!

Wear protective gloves when working with drying agents.



Risk of injury!

Wear safety glasses when working with drying agents.

Safety devices



Safety devices are put in place for the health and safety of employees employed on the equipment and protects the equipment against damage. The devices must be inspected regularly.

- The equipment may only be operated with functioning protective devices.
- The electrical components shall be provided with a cover plate. This must be mounted during operation.
- The safety devices must protect all moving and electrical parts and may not be handled or cancelled.



Before starting up equipment, ensure that the safety devices are mounted and functional.

The safety devices may only be removed

- After complete shutdown of equipment
- With safeguarding against warm restart of equipment

Remaining dangers



The dangers emanating from the equipment, occur during work inside the metal cabinet and within the actual boundaries of the equipment, if the equipment has to be started up, e.g. for

- maintenance
- refitting
- fault diagnostics and remedy



In maintenance and refitting work, for which the equipment has to be started up, a second person should always be present to disconnect the equipment in an emergency situation. Always carry out work with greatest care and attention!

Watch out for the following dangers:

- Risk of injury by getting caught in the movement area of the compressor.
- Risk of injury caused by squashing and shutting in upper and lower limbs when assembling and disassembling the equipment.
- Risk of injury caused by squashing and shutting in upper and lower limbs when transporting equipment.

Service conditions

Temperatures

- Ambient temperature limit: +1 °C to + 40 °C
Sound function is guaranteed in this temperature range.
- Temperatures outside of this range do not guarantee the functionality of the equipment.

Ambient conditions

- Environmental media, especially chemically aggressive, can corrode seals, hoses, cables and plastics.
- Ambient media, especially chemically aggressive ones, might affect seals, hoses, cables and other plastic elements.

Installation conditions

- The equipment should be installed in a dry, dust and frost-free room, while adhering to the general guidelines for work places.
- Furthermore, the equipment must be installed on a firm, load-bearing and level ground.

Transportation



Accident prevention!

The equipment may only be transported with sufficient means of transportation. It must be fixed securely during transportation. Avoid knocks to the equipment.

The equipment can be moved on a pallet to in-plant transport via an elevating platform truck or forklift truck. When moving the equipment mind the weight to prevent it from tipping or rolling.

- When moving the equipment keep the lifting height as low as possible.
- When moving the equipment pay attention that all electrical and pneumatic connections (also to the wiring harness and if required, reserve air storage tank) are disconnected.
- Observe the safety regulations for handling the elevating platform truck or forklift truck when moving equipment.

Storage

General information on storage

- If the equipment is not installed and started up immediately, it must be stored under appropriate storage conditions in a dry, dust and frost-free indoor area, protected from sunlight.
- The equipment should be wrapped in plastic or foil packaging.
- The storage time should not exceed one year.

Functionality of pressurization system RTS 1000

The compressors draw in external air and compress this to approx. 6 bar. Then the compressed air is channelled in the air dryer, alternatively by two drying agent containers, in which the air is dehumidified. In doing so, the air is only dried in one drying agent container, while at the same time in another drying agent container the existing drying agent is regenerated by a branch current of the already dried air. The humid regeneration air blows out through the diffuser.

The air dried in this way is stored in the air storage tank with a pressure between 3.0 and 5.0 bar. A pressure monitor ensures sufficient compressed air in the air storage tank, in which it switches the compressors on and off. The existing air pressure in the air storage tank can be read on the "high pressure" manometer. A built-in air regulator reduces the stored compressed air from the air storage tank to the required cable pressure. This can be read on the "cable pressure" manometer.

This pressure-reduced air reaches the distribution device of the connected cable network via an shut-off valve and an injector. In order to guarantee proper operation the dried compressed air is constantly checked for its humidity content in the MFR unit. If the relative air humidity rises over approx. 4%, the compressor is switched off.

The pressure in the air storage tank is constantly monitored. If this rises to 7.0 bar, the pressure is blown off via a safety valve.

The equipment runs fully automatically after startup. Operational upsets are displayed on the mult functional relay (MFR) and the ACS unit at the instrument panel. In addition these fault signals are relayed to an external control centre.

The MFR distributes the drying and regenerating processes evenly to both drying containers by means of the solenoid valves. So none of them will be flooded, when only little amounts of air are produced. The solenoid valves also allow for unpressurised compressor starts.

Product description

Product marking, connection and operation

- | | |
|--|---|
| <p>1 Pressurisation system RTS 1000</p> <p>2 Instrument panel with ACS</p> <p>3 Product marking
The name plate is found inside at the bottom of the cabinet</p> <p>4 Product marking compressor
The name plate is found on the compressor housing.</p> <p>5 Electrical connecting block with MFR and switches</p> | <p>7 Pneumatic/dryer panel</p> <p>8 Compressor [2.1] condense the air drawn in at approx. 6,0 bar.</p> <p>9 Front door</p> <p>10 Condensate discharge hose with diffusor</p> <p>11 Connecting cable AC</p> <p>12 Pneumatic connection „Cable Pressure“</p> <p>13 Connection-plug for the monitoring-line</p> <p>14 Connecting block cover</p> |
|--|---|

Front view

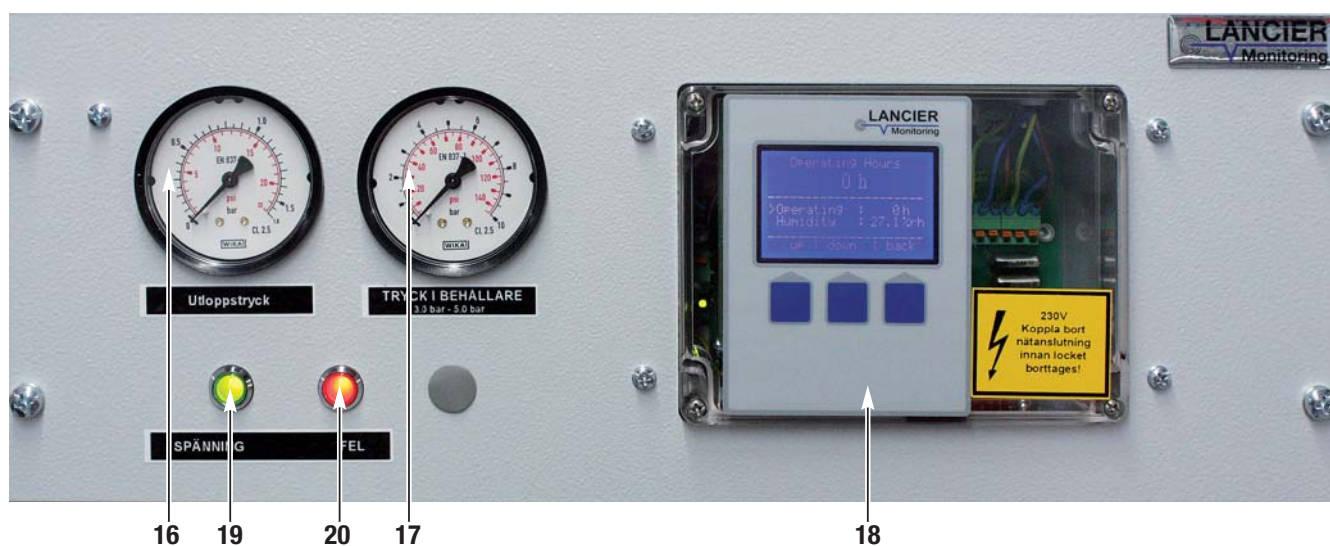


Top view



Instrument panel

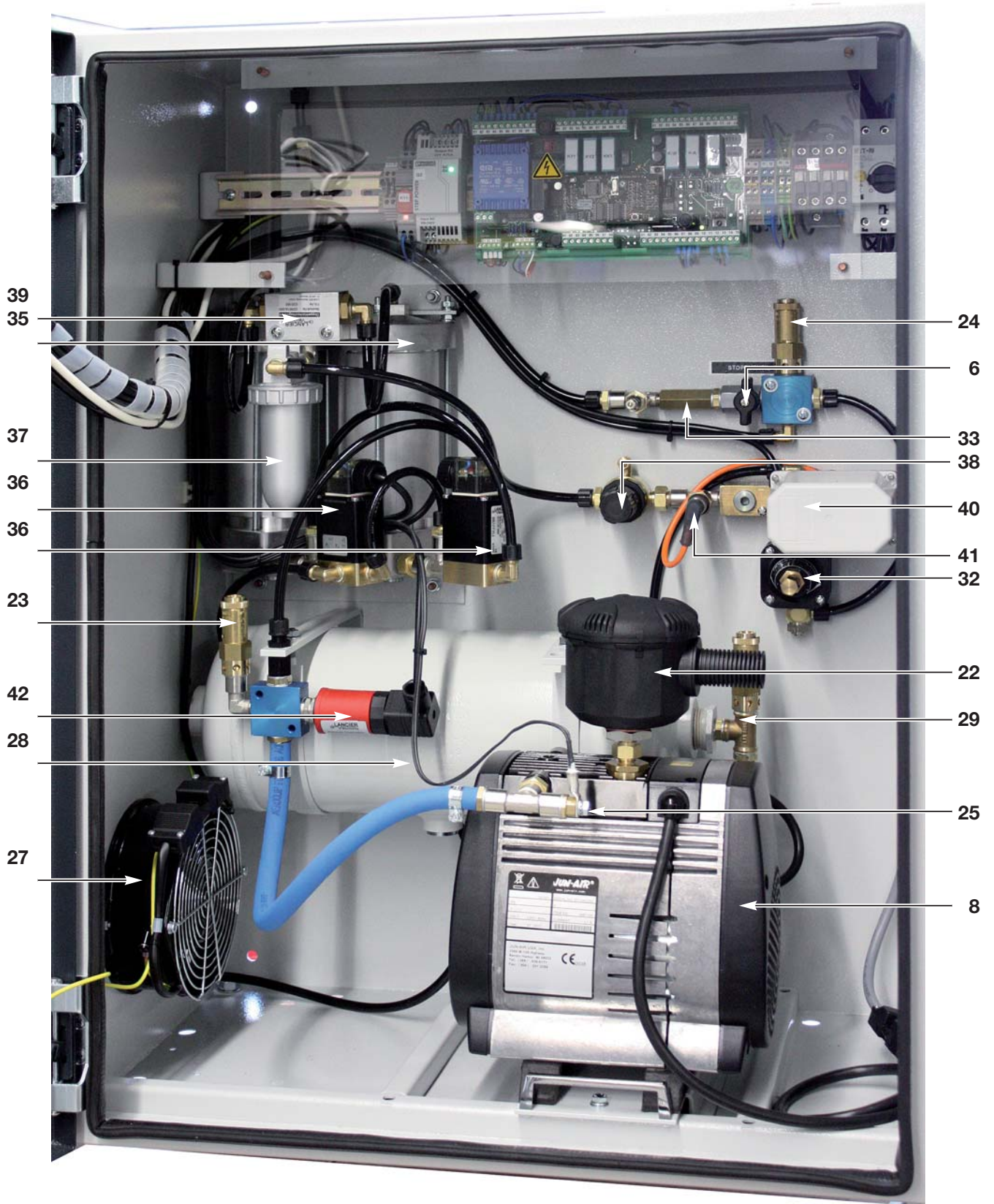
- 16 "Cable pressure" manometer [11.2]** displays the pressure of the air that flows to the outlet.
- 17 "High pressure" manometer [11.1]** displays the pressure in the air storage tank [9.1].
- 18 ACS addressable compressor monitoring unit** captures 10 physical parameters of the pressurisation equipment and triggers an alarm when indicated:
- contact,
 - system voltage,
 - compressor runtime and operating hours,
 - relative humidity of output air,
 - temperature of output air,
 - ambient temperature (option),
 - compressor temperature,
 - compressor pressure and
 - amount of compressed air flow.
- 19 LED operating voltage**
(AC, illuminates if 230 V mains is on).
- 20 LED Fault**
(illuminates if the unit has a fault)



Pressurised air supply, storage, drying and monitoring

- 6 Shut-off valve**
- 8 Compressor [2.1]** condenses the air drawn in at approx. 6,0 bar.
- 22 Compressor air intake filter [1.1]**
- 23 Safety valve compressor**
- 24 Safety valve "cable pressure" [10.5]** protects the pressurised air consumer load against excessive pressure.
- 25 Compressor temperature sensor** for ACS
- 27 Fan [E1]** vents the compressor area.
- 28 Air storage tank [9.1]**, stores the dried pressurised air..
- 29 Safety valve "high pressure" [10.4]** protects the air storage tank (28) [9.1] against excessive pressure.
- 32 Pressure reducer [12.1]** reduces the high-pressure to the designated output pressure. Preset.
- 33 Non-return valve [4.1]** prevents a reversed flow of pressurised air from the distribution device.
- 35 Air dryer [5.1]**
dries the pressurised air alternatively in one of the two containers, while the drying agent is regenerated in the other container.
- 36 Solenoid valves for air dryer [left:Y1, right: Y2]**
control the air flow alternatively by one of the two drying agent containers and lead the regeneration air flow from the passive drying agent container outside (to condensate surge tank).
- 37 Micro filter [1.5]** protects the control and measurement devices from contaminations.
- 38 Pressure limiting valve [8.1]**
opens when the air flow has reached a pressure of 5.5 bar after leaving the air dryer (35) [5.1].
- 39 Double non-return valve [6.1]**
routes the dried pressurised air in the active drying agent container to the air storage tank (28) [9.1] and returns a part of the air flow for regeneration of the drying agent into the passive drying agent container..
- 40 Pressure monitor [F6]** monitors the pressure in the air storage tank (28) [9.1] and switches the compressors on and off once the upper and lower pressure value is reached.
- 41 Humidity sensor for MFR** monitors the relative humidity of the output air. When reaching the upper limit, the MFR activates fault „F“ and shuts the system down.
- 42 Pressure sensor „compressor pressure“ [10.1]** for ACS.
Measures the common output pressure of both compressors.

The code designations specified in squared brackets [] correspond to the pneumatic and electrical plans in the annex.



Electrics

43 Motor protective switch [Q4]

to manually switch the compressors on and off, features a built-in protective relay to protect the motor from excessive current consumption.

44 Motor contactor [K1]

switches the compressor (8) [2.1] on and off after the switching of the pressure monitor (40) [F6].

45 Multifunctional relay MFR

controls all workflows of the pressurisation equipment, among others:

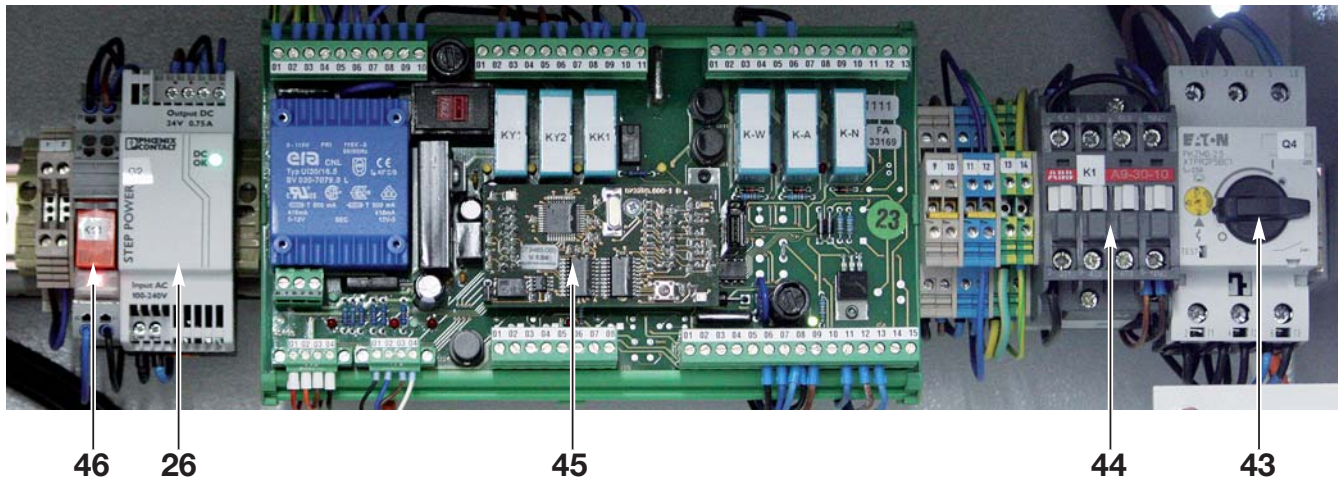
- redirects the solenoid valves (36) [Y1 and Y2] to change the drying agent container in the clock pulse.
- switches off the compressor via the motor contactor (44) [K1] and activates the signal "F" when the humidity content of the dried air is inadmissibly high.
- activates the output common signal "A" (fault) in potential free form, when the faults "F" is pending, or if the systems AC power broke down. The individual signals of the output common signal are dependent on equipment.

46 Signal relay „A” [K11]

switches in case of exceeding the alarm thresholds of „A” (local common alarm).

26 Power pack 24 V DC [G1]

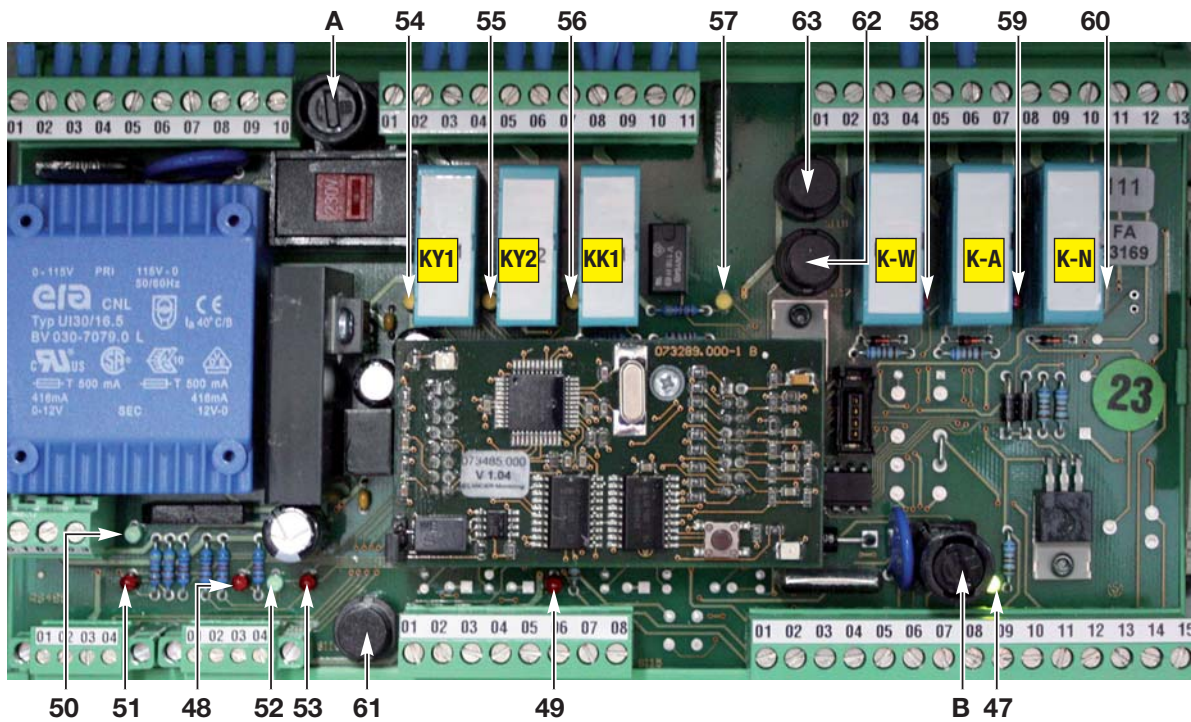
supplies 24 V direct current for control elements and indicators.



Multifunctional Relay MFR

The MFR controls and monitors the pressurisation equipment. It is placed in the switch box.

- | | |
|--|---|
| 47 Signal-LED „DC“ | 57 Signal-LED „State Comp in“ |
| 48 Signal-LED „F“ | 58 Signal output-LED „W“ (not active) |
| 49 Signal-LED „N“ (not active) | 59 Signal output-LED „A“ |
| 50 Signal-LED „AC“ | 60 Signal output-LED „N“ (not active) |
| 51 Signal-LED „Remote“ | 61 Button „F-Off“ |
| 52 Signal-LED „F-On“ | 62 Button „Reset maintenance“ [S10] |
| 53 Signal-LED „T-Runtime“ (not active) | 63 Button „Test“ W Signal, A Signal [S9] |
| 54 Signal-LED „Y1 state“ | A Fuse „AC“ |
| 55 Signal-LED „Y2 state“ | B Fuse „DC“ |
| 56 Signal-LED „Comp OK“ | KY1 Relay with labeling acc. to wiring diagram |



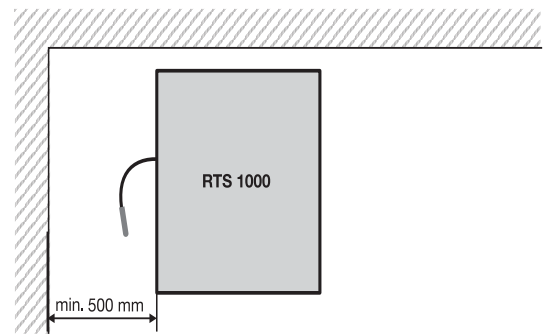
Mounting

The pressurisation system RTS 1000 is designed to be located at floor level or mounted to a wall. The floor must be constructed for exposure to dynamic stresses and strains. LANCIER Monitoring assumes no liability whatsoever for wall mounting.

The place of mounting should be dry and swept clean.

Minimum distance to adjacent walls and equipment = 500 mm

The pressurisation system RTS 1000 must be placed in a way that avoids moving around due to vibrations.



Connect the diffuser condensate discharge hose (10)

- discharges the condensate of the air dryers (35)
- the diffuser at the end of the hose sprays the condensate into the ambient air.
- At normal conditions a condensate storage tank is not needed.



10

Electrical connection

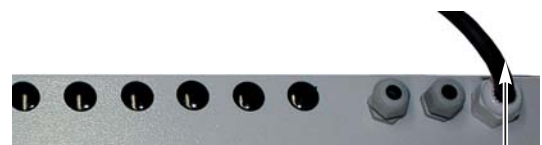


Deadly risk!

Electrical connection must only be made by electrical specialists!
After connecting electricity: Take caution with live components!

Operating voltage 230 V AC

- Before connection to the mains supply mind that the power supply voltage complies with the operating voltage of the compressor (8) (see compressors name plate)!
- The following security relevant elements must be supplied for electrical connection:
 - **main switch with emergency stop function** according to IEC/EN60204-1, VDE 0113 Part 1
 - **nominal voltage** 230 V one phase / 400 V three phases, neutral and grounding conductor
 - **overcurrent protection device** for each phase maximum 16 A (lead fuses or circuit breaker characteristic B)
 - **residual-current-operated protective device (RCD)**
- Plug in electrical plug (11) into power socket



11

Compressor maintenance

Compressor maintenance and servicing operations are described on pages 40 - 41.

Compressor spare parts

Compressor spare parts are listed on page 50.

Fault remedy

Compressor faults and their remedies are listed on page 44.

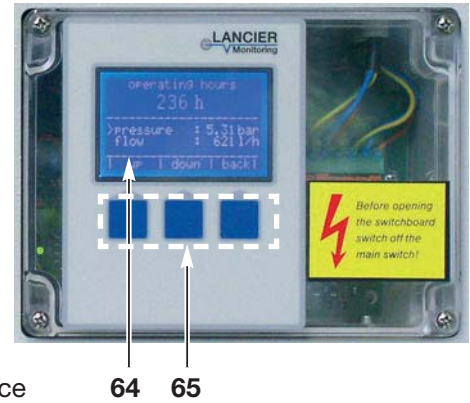
Operation of the Compressor Monitoring Unit ACS

The compressor monitoring unit ACS (18) captures 10 physical parameters of the pressurisation equipment and triggers an alarm when indicated: contact, system voltage, compressor runtime and operating hours, relative humidity and temperature of output air, ambient and compressor temperature, compressor pressure and amount of compressed air flow are monitored. The measured values can be indicated at the internal LC-display.

The ACS can be integrated as an addressable sensor into a connected monitoring system and trigger automatic alarms when indicated.

It also can display all values and alarm conditions of the MFR (45).

Some parameters of the pressurisation equipment can be adjusted via the ACS. To do so it is necessary to log-in into a special protected service mode (see page 26). Specially skilled personal only is authorized to execute the adjustments.



Start the ACS

The ACS starts automatically when the pressurisation equipment is switched on. The last display contents that has been shown longer than 10 seconds is automatically stored and will be shown after the re-start. At first start it will display **D1** shown on the opposite page.

Operating the ACS

The ACS operation is menu-driven. Menu items are selected by soft keys (65). The assigned functions of the soft keys are indicated in the display (64) directly above the respective key (65).

The active menu item is marked „>“.

The marker „>“ can be moved „up“ and „down“ by the adequate keys.

Pressing the soft key „select“ chooses the menu item.

To return to a higher menu level choose menu item „back“ or press soft key „back“.

All menus and submenus are shown at the diagram on the opposite page.

Read ACS values

Menu selection:

Menu D1 >Disp. Device : ACS press soft key „select“

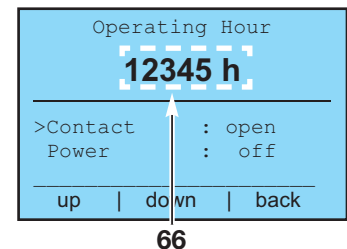
Menu D2.1 >ACS - Current Values press key „select“

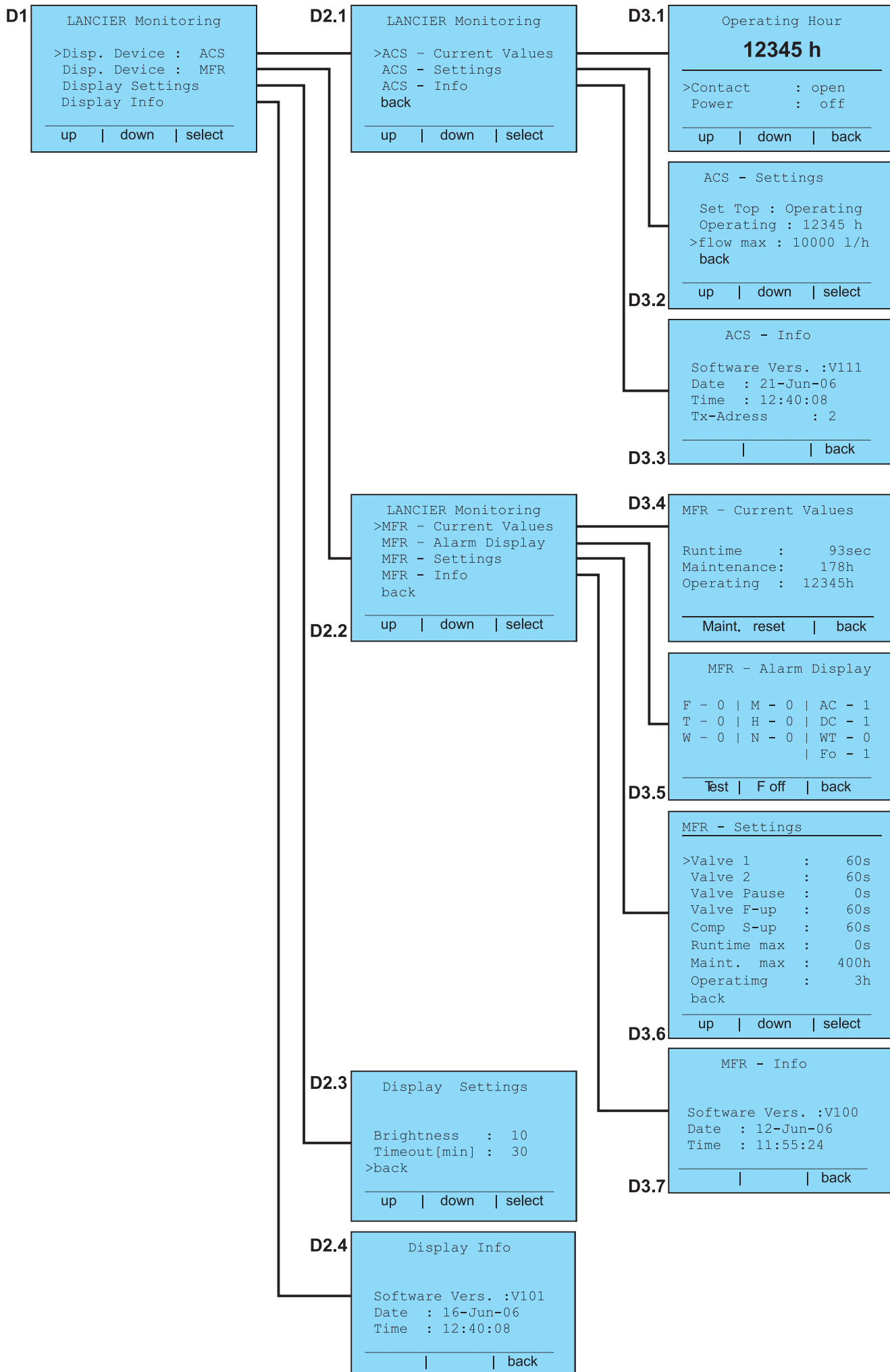
The display shown right hand **D3.1** appears:

Large reading = Top Value (66) (refer to chapter „set top value“), here „Operating Hour“ = total operating hours of the pressurisation equipment,

2 smaller readings below: by scrolling with the soft keys (65) „up“ and „down“ the following readings appear consecutively in the display:

- | | | |
|---------------|------------------------|--|
| - Contact | : <i>open or close</i> | state of a floating contact, open or closed (e. g. door contact, water level indicator etc.) |
| - Power | : <i>on or off</i> | operating voltage on or off |
| - Compressor | : <i>on or off</i> | compressor on or off |
| - Runtime | : <i>value sec</i> | last compressor runtime in seconds |
| - Operating | : <i>value h</i> | total operating hours of the pressurisation equipment |
| - Humidity | : <i>value %rh</i> | rel. humidity of the output air in % |
| - Air Temp. | : <i>value °C</i> | temperature of the output air in °C |
| - Ext. Temp. | : <i>value °C</i> | ambient temperature in °C (option „external temperature sensor“ must be installed) |
| - Comp.Temp.: | <i>value °C</i> | compressor temperature in °C (due to the position of the temperature sensor in the airstream, the real compressor temperature is about 20 °C higher than the indication) |
| - Pressure | : <i>value bar</i> | pressure of the output air in bar (option „external pressure sensor“ must be installed) |
| - Flow | : <i>value l/h</i> | amount of the output air in liters/hour |





Read ACS-Info

Menu selection:

Menu D1 >Disp. Device : ACS press soft key „select“
Menu D2.1 >ACS - Info press soft key „select“

```
ACS - Info
Software Vers. :V111
Date : 21-Jun-06
Time : 12:40:08
Tx-Adress : 2
| | back
```

Display **D3.3** „ACS - Info“ appears:

Version, date and time of the ACS software release and the first Tx bus address of the ACS are displayed. The ACS uses 10 addresses on the Tx bus (the one indicated on the display and the next following 9). So the LANCIER monitoring system can allocate all readings explicitly.

Read MFR values

Menu selection:

Menu D1 >Disp. Device : MFR press soft key „select“
Menu D2.2 >MFR - Current Values press soft key „select“

```
MFR - Current Values
Runtime : 93sec
Maintenance: 178h
Operating : 12345h
| | back
```

Display **D3.4** „MFR - current values“ appears:

- Runtime : *value* sec last compressor runtime in seconds
 - Maintenance: *value* h remaining runtime period until maintenance must be carried out in hours
 - Operating : *value* h total operating hours of the pressurisation equipment

Reset maintenance counter

The counter for the remaining maintenance time of the MFR can be reset by the ACS. Go to display **D3.4** as described in the previous chapter „Read MFR values“.

Press down both soft keys „Maint.“ and „reset“ for 5 seconds at the same time.

The value „Maintenance“ will rise to „400 h“. **This action is irreversible!**

Poll MFR alarm conditions

Menu selection:

Menu D1 >Disp. Device : MFR press soft key „select“
Menu D2.2 >MFR - Alarm Display press soft key „select“

```
MFR - Alarm Display
F - 0 | M - 0 | AC - 1
T - 0 | H - 0 | DC - 1
W - 0 | N - 0 | WT - 0
| Fo - 1
| | back
```

Display **D3.5** „MFR - alarm display“ appears:

Alarms	Signalisation
F = humidity	AC = operating voltage
T = compressor runtime	DC = signal voltage (option)
W = maintenance	WT = door contact open (option)
M = motor protection	Fo = humidity monitoring

0 = no alarm 0 = off 1 = on
 1 = alarm

Test of MFR alarmdisplay

Pressing of the soft key „Test“ in Display **D3.5** activates all alarm relays. All alarm values of the ACS (**16**) turn to „1“.

The LEDs „F“ (**48**), „N“ (**51**) and „T-Runtime“ (**55**) as well as the signal output LEDs „W“, „A“ and „N“ (**63-65**) illuminate on the MFR (**36**).

The responding alarms must emerge in the remote control station.

Deactivating humidity monitoring of the MFR

Pressing of the soft key „F off“ in display **D3.5** deactivates the humidity monitoring of the MFR (see chapter „leave the equipment to run dry“, page 31). The indication of „Fo“ in the ACS (**16**) turns to „0“.

The LED „F-on“ (**54**) on the MFR (**36**) goes out.

To reactivate the humidity monitoring immediately press the soft key „F off“ for about 5 seconds. If the reactivation of the humidity monitoring is not executed manually, it will activate itself after approximately 2 operating hours.

Read MFR settings

Menu selection:

Menu D1 >Disp. Ddevice : MFR press soft key „select“

Menu D2.2 >MFR - Settings press soft key „select“

Display **D3.6** „MFR - Settings“ appears:

By scrolling with the soft keys (45) „up“ and „down“ the following fixed values appear consecutively in the display:

MFR - Settings	
>Valve 1	: 60s
Valve 2	: 60s
Valve Pause	: 0s
Valve F_up	: 60s
up down select	

Display	Parameter	Value range
- Valve 1	: <i>value</i> s runtime of solenoid valve Y1 in seconds	0 .. 250 sec
- Valve 2	: <i>value</i> s runtime of solenoid valve Y2 in seconds	0 .. 250 sec
- Valve Pause	: <i>value</i> s runtime rest of the solenoid valves (- = overlap, + = rest in seconds)	-125 .. +125 sec
- Valve F-up	: <i>value</i> s solenoid valve stopping time after switch-off of the compressor in seconds	0 .. 250 sec
- Comp S-up	: <i>value</i> s opening time (+) resp. closing time (-) of both valves in seconds, to prevent the starting of the compressor against counter pressure	-125 .. +125 sec
- Runtime max	: <i>value</i> s maximum compressor runtime in seconds	0 .. 10.000 sec
- Maint. max	: <i>value</i> h maintenance interval in hours	0 .. 10.000 h
- Operating	: <i>value</i> h total operating hours of the pressurisation equipment (set-up see service mode, page 26)	0 .. 99.999 h

Read MFR info

Menu selection:

Menu D1 >Disp. Device : MFR press soft key „select“

Menu D2.2 >MFR - Info press soft key „select“

Display **D3.7** „MFR - Info“ appears:

Version, date and time of the MFR software release are displayed.

MFR - Info	
Software Vers. :	V100
Date :	12-Jun-06
Time :	11:55:24
up back	

Display settings

Menu selection:

Menu D1 >Display Settings press soft key „select“

Display **D2.3** „Display Settings“ appears:

Choose the value to edit by scrolling with the soft keys (45) „up“ and „down“:
Brightness = brightness of the display (value 0 - 15)

Timeout (min) = time period in minutes after which the display goes out if not used (value 0 - 250 min.).

Pressing the soft key „select“ chooses the value.

Pressing the soft keys (45) „up“ and „down“ raise or lower the value.

Pressing the soft key „set“ stores the set value.

Display Settings	
Brightness	: 10
Timeout [min]	: 30
>back	
up down select	

Read display info

Menu selection:

Menu D1 >Display Info press soft key „select“

Display **D2.4** „Display Info“ appears:

Version, date and time of the display software release are displayed.

Display Info	
Software Vers. :	V101
Date :	16-Jun-06
Time :	12:40:08
up back	

Service mode

System parameters of the MFR and the operating time counter of the ACS can be edited in the service mode.



WARNING!

These tasks must be accomplished by qualified personnel only.
The functionality of the pressurisation equipment may be damaged.

Menu selection:

Menu D1 >Display Settings press soft key „select“

Display **D2.3** „Display Settings“ appears:

Pressing both soft keys (45) „up“ and „down“ at the same time activates the service mode for 10 minutes.

The text „Service : active“ appears on the display above the line „Brightness“.

```

Display Settings

Brightness : 10
Timeout[min] : 30
>back
-----
up | down | select

```

ACS settings

Menu selection:

Menu D2.3 >back press soft key „select“

Menu D1 >Disp. Device : ACS press soft key „select“

Menu D2.1 >ACS - Settings press soft key „select“

Display **D3.2** „ACS - Settings“ appears.

The amount of total operating hours can be set here (e. g. after substitution of the ACS or a compressor).

Use soft keys (45) „up“ and „down“ to choose the value „Operating“.

Press soft key „select“.

Pressing the soft keys (45) „up“ and „down“ raise or lower the value.

Pressing the keys for a longer time increases the speed of alteration of the values of „runtime“, „maintenance“ and „operating hours“.

Pressing the soft key „set“ stores the set value.

```

ACS - Settings

>Set Top : Operating
Operating : 12345 h
flow max : 10000 l/h
back
-----
up | down | select

```

MFR settings

Menu selection:

Menu D2.3 >back press soft key „select“

Menu D1 >Disp. Device : MFR press soft key „select“

Menu D2.2 >MFR - Settings press soft key „select“

Display **D3.6** „MFR - Settings“ appears.

All values of the MFR set-up can be changed here (e. g. after substitution of system components).

Use soft keys (45) „up“ and „down“ to choose the value to change.

Press soft key „select“.

Pressing the soft keys (45) „up“ and „down“ raise or lower the value.

Pressing the keys for a longer time increases the speed of alteration of the values of „runtime“, „maintenance“ and „operating hours“.

If no runtime monitoring is required, set parameter „Runtime max.“ to „0s“

Pressing the soft key „set“ stores the set value.

```

MFR - Settings

>Valve 1 : 60s
Valve 2 : 60s
Valve Pause : 0s
Valve F_up : 60s
-----
up | down | select

```

ACS set „top value”

Menu selection:

Menu D1 >Disp. Device : ACS press soft key „select“**Menu D2.1** >ACS - Settings press soft key „select“Display **D3.2** „ACS - Settings“ appears.

Choose value „Set Top“ using the soft keys (45) „up“ and „down“ .

Press soft key „select“.

By scrolling with the soft keys (45) „up“ and „down“ all values from the chapter „read ACS values“ appear consecutively in the display.

Pressing the soft key „set“ selects the chosen value as „top value“.

```

ACS - Settings
>Set Top : Operating
Operating : 12345 h
flow max : 10000 l/h
back
-----
up | down | select

```

Set up Air Flow Value

Menu selection:

Menu D1 >Disp. Device : ACS press soft key „select“**Menu D2.1** >ACS - Settings press soft key „select“

The air flow value must be set accordingly to the mounted flow module. Factory setting is already appropriate.

Display **D3.2** „ACS - Settings“ appears.

Choose value „flow max“ using the soft keys (45) „up“ and „down“ .

Press soft key „select“.

Use softkeys (45) „up“ and „down“ to change between 5000 and 10000 l/h

For RTS 1000 set value to 5000 l/h.

Press softkey „set“ to store the selected value.

```

ACS - Settings

Set Top : Operating
Operating : 12345 h
>flow max : 10000 l/h
back
-----
up | down | select

```

Service mode is closed automatically after 10 minutes.

Operation of multifunctional relay MFR

The MFR (45) controls and monitors the vital functions of the pressurisation equipment. Several alarm conditions are forwarded to external signal outputs for remote alarming purposes.



Deadly risk!

Electro specialists only are allowed to operate the buttons of the MFR.
Other users must use the ACS to operate the system.

Meaning of the LEDs

Normal operation

- 47 **Signal LED „DC“** illuminates, when signal voltage is on, fuse „B“ is intact.
- 50 **Signal LED „AC“** illuminates, when supply voltage is on: motor protective switch (5) is switched on, fuse „A“ is intact.
- 52 **Signal LED „F-on“** illuminates, when humidity monitoring is on.
Turns off, when humidity monitoring is bypassed (e. g. running dry of the system) by pressing the button „F-off“ (61).
- 54 **Signal-LED „Y1 state“** illuminates, when air dryer 1 is active (relay KY1 and solenoid Y1 are activated).
- 55 **Signal-LED „Y2 state“** illuminates, when air dryer 2 is active (relay KY2 and solenoid Y2 are activated).
- 56 **Signal-LED „Comp OK“** illuminates, when the compressor is ready for use and the system is fault-free.
- 57 **Signal-LED „State Comp in“** flashes as soon as the compressor is running.
- 51 **Signal-LED „Remote“** flashes during data exchange between MFR (45) and ACS (18).

Alarms

- 48 **Signal-LED „F“** illuminates, when the maximal admissible amount of humidity in the output air is exceeded.
- 59 **Signal output-LED „A“** illuminates, when a system signal is pending (generated by „F“-fault respectively breakdown of supply voltage) and the signal relay K-A is activated = external alarm is activated.

Buttons

61 Button „F-Off“ [S11] switches off humidity monitoring, e.g. to run dry the system (see page 31).

- Signal-LED „F-on“ (52) turns off.

Pressing the button for 5 seconds reactivates the humidity monitoring.

- Signal-LED „F-on“ (52) illuminates again.

62 Button „Reset maintenance“ [S10] must be pressed down for 5 seconds to reset the operating hour meter to the default value of 400 hours.

This process is irreversible!

- Signal-LED „W“ (58) turns off, if it has been already activated.

63 Button „Test“ A Signal [S9] may be pressed to check an optionally connected external signalisation.

- Relais „K-W“ activates and Relais „K-A“ deactivates.

- Signal LED „A“ (59) illuminates.

- Alarm „A“ must occur in the remote control center if a signal line is connected.

Fuses

A Fuse „AC“ safeguards the AC circuit (supply voltage).

Type: 0,315 A, medium time lag

B Fuse „DC“ safeguards the DC circuit (signal voltage).

Type: 2 A, medium time lag



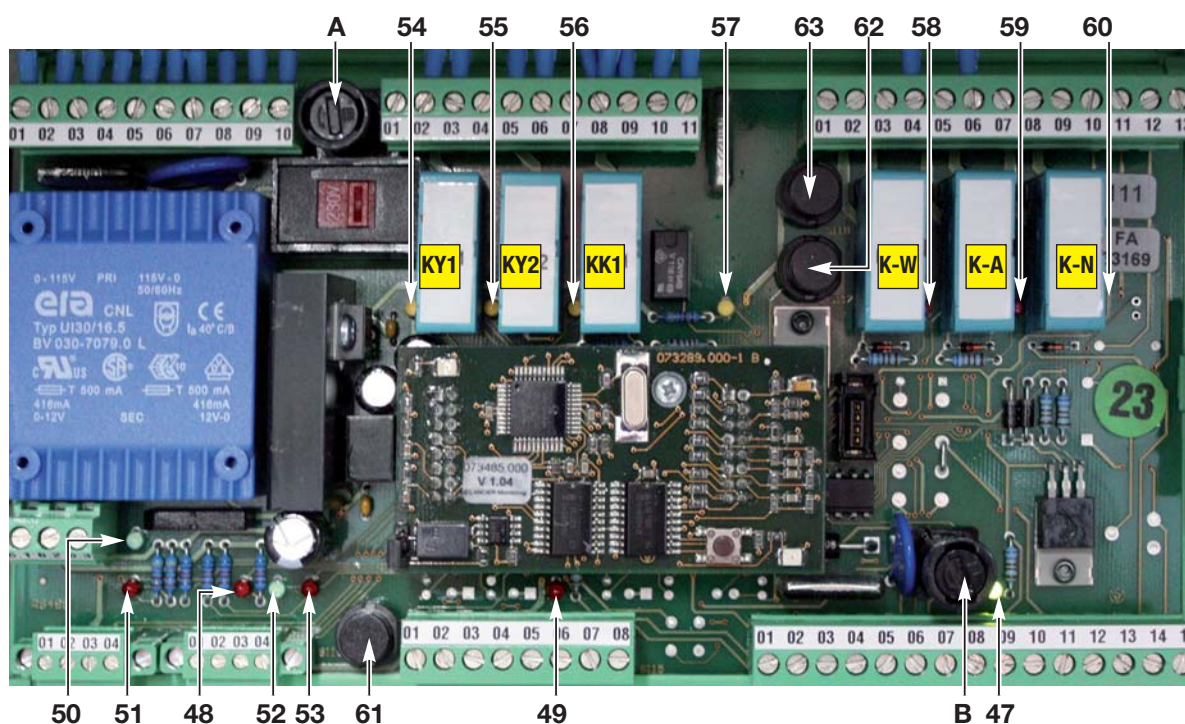
Warning!

Pressing the button „F-off“ overrides the humidity monitoring.

The button must be used only, if a fault occurred, the „high pressure“ safety valve (18) is open and the shut-off valve "cable pressure" (13) is shut.

Humidity monitoring must be reactivated immediately after trouble-shooting, to assure proper function of the pressurisation equipment.

KY1 Relay with labeling acc. to wiring diagram



Start-up



Deadly risk!
Do not operate the equipment with damp hands!
Take caution with live components!

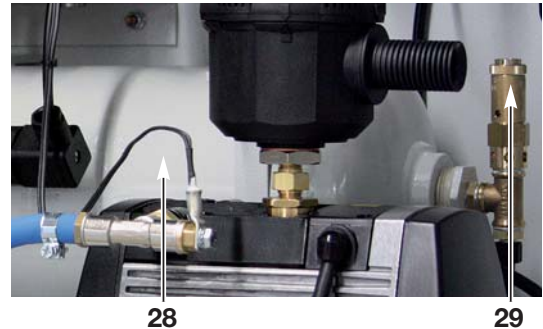


Risk of injury!
Take caution with heated components!

Before start-up

The connecting hose is not yet connected to the consumer load.

- Close safety valve "high pressure" (29) at air storage tank (28).
- Close **shut-off valve** (6).



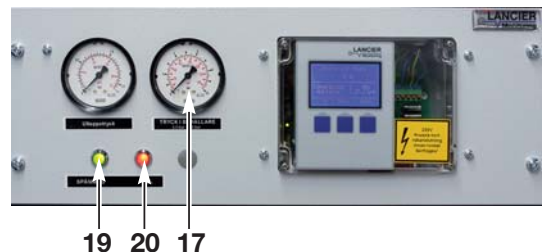
Connect and activate main power.

Check indications of MFR (45)

- Green Signal-LED „DC“ (47) illuminates..

Check indications at the instrument panel (2)

- The green Signal-LED „Operating voltage / Spänning“ (19) illuminates.
- The red Signal-LED „Fault / Fel“ (20) illuminates.



Set the equipment into operation / charge equipment

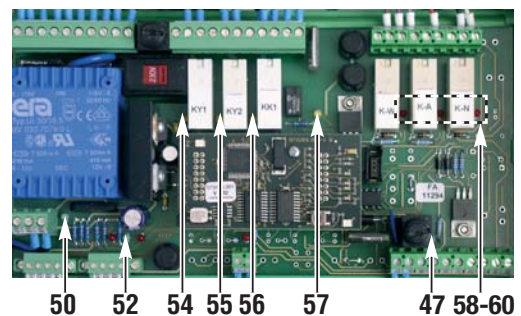
Main power is connected and activated.

Turn motor protective switch (43) to "I".

- The compressor starts.

MFR (45) indicates at the same time

- The yellow Signal-LED „State Comp in“ (57) flashes.
- The yellow Signal-LED „Comp OK“ (56) illuminates.
- The green Signal-LED „AC“ (50) illuminates.
- The yellow Signal-LEDs (58-60) illuminate, after a short time either LED „Y1 state“ (54) or LED „Y2 state“ (55) turns off (cylinder-head ventilation of the compressor is completed).
- The green Signal-LED „F-on“ (52) illuminates (humidity monitoring is active).



Check indications at the instrument panel (2)

- The green Signal-LED „Operating voltage / Spänning“ (19) illuminates.
- The red Signal-LED „Fault / Fel“ (20) turns off.

Observe "high pressure" manometer (17)

- at 5.0 bar the compressor switch off.
- The yellow Signal-LED „State Comp in“ (57) in the MFR turns off.

**Troubleshooting!**

If the compressor does not run, this may be due to an electrical fault or hose lines and air dryer becoming damp after long idle period.

- The green LED „**F-on**“ (52) illuminates in the MFR (45) = humidity monitoring is active.
- The red Signal-LED „**F**“ (48) **flashes** in the MFR = either the electrical connection to the humidity sensor or the humidity sensor (41) itself is broken.
In this case check the connection-line or change the humidity sensor (41) (see page 42 „Causes and remedy of faults”).
or
- The red Signal-LED „**F**“ (48) **illuminates** permanently in the MFR = pressurised air humidity is unadmissibly high.

In this case leave the equipment to "run dry": see page 43

Function testing / setting of components

After start-up always test the equipment for correct function!

In the case of function error, in spite of correcting the setting, see page 42 "Causes and remedying of faults".

For function testing or setting, in the case of some components the cabinet door must be open and the connecting block cover plate (14) unscrewed.

The inspections or settings shall partly be carried out when the equipment is on.



Deadly risk!
Do not operate the equipment with damp hands!
Take caution with live components!



Risk of injury!
Take caution with heated components!

Check and set reference value motor protective switch back-up fuse

Check setting

Reference value of setting screw (70):

RTS 1000 with one compressor: 230 V, 50 Hz: approx. 2,4 A.



70

Change setting



Deadly risk!
Switch off operating voltage,
Unscrew or disconnect back-up fuse!

- Then with a small screw driver turn the setting screw (70) approximately to the setting indicated above.
- Switch on operating voltage again.



Hint!
The motor protective switch must be set approx. 0.3 A above power consumption of the compressor motor (6) (see compressor name plate).

Check and set cable pressure (pressure reducer)

Setpoint value cable pressure

- is set according to the customer order.

Check cable pressure

- Switch on operating voltage.
- Close **shut-off valve (6)**.
- Manometer "cable pressure" (16) must display the required cable pressure.



16

otherwise :

Set cable pressure to the value in keeping with the order

- Operating voltage is already switched on.
- **shut-off valve (6)** is closed.
- Turn the setting screw of pressure reducer (32) with screw driver until the manometer "cable pressure" (16) displays the cable pressure according to the order.
- Open **shut-off valve (6)**.



32

Check clock pulse air dryer change-over



Deadly risk!

Working on open, live equipment!

- Do not operate the equipment with damp hands!
- Caution: live components!



Risk of injury!

Wear protective goggles when opening safety valve „high pressure” (29)!

Setpoint value

The clock pulse of the air dryer change-over is system-dependent factory preset in the MFR (45):

- 60 s ± 10 %

Check clock pulse

- Switch on operating voltage.
- Open safety valve "high pressure" (29).
- The compressor (8) must run.
- Measure clock pulse.

The MFR (45) controls the solenoid valves (36) of the air dryer in the clock pulse regarding the compressor run time. The change of the valves is visualised by the LEDs „Y1-State” (54) and „Y2-State” (55) on the MFR and the LEDs at the solenoid valves (36). It is also audible by the sudden escape of regeneration air into the condensate surge hose (10).



36

Set clock pulse

- The clock pulse is factory preset and can be altered by the manufacturer only.

Compressor runtime surveillance



Deadly risk!

Working on open, live equipment!

- Do not operate the equipment with damp hands!
- Caution: live components!

Setpoint value

The maximum admissible compressor runtime is factory preset according to the equipment's needs and stored in the MFR (45):

RTS 1000: 0 sec

Set runtime period

- The admissible runtime period is factory preset and can be altered by the manufacturer only

Check and set pressure monitor



Deadly risk!

Working on open, live equipment!

- Do not operate the equipment with damp hands!
- Caution: live components!



Risk of injury!

Wear protective goggles when opening safety valve „high pressure” (29)!

Setpoint value switching pressure

compressor **On** = 3.0 bar
 Off = 5.0 bar

Check switch values

- Switch on motor protective switch (43).
- Close **shut-off valve (6)**.
- Open safety valve "high pressure" (29) and observe manometer "high pressure" (17).
 - with a pressure drop below **3.0 bar** the compressor must start.
- Close safety valve "high pressure" (29) and observe manometer "high pressure" (29).
 - with a pressure increase to **5.0 bar** and furthermore the compressor must switch off.

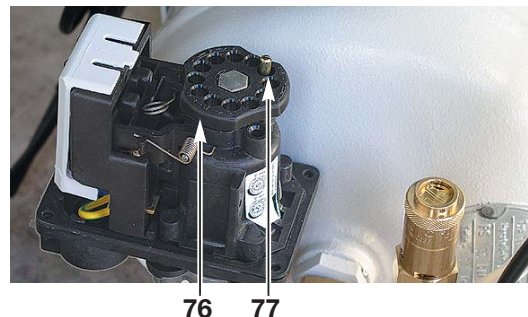


To set the switch values note the following:

- **Only set pressure monitor (40) under pressure!**
- **Rotating the hand valve (76) causes approx. 0.6 bar change of switching pressure.**
- **First set the cut-out pressure and then the cut-in pressure, because changing the cut-out pressure leads to a change in the cut-in pressure. This means the difference between cut-out and cut-in pressure stays the same.**
- **Once the hand valve has been pressed down (76) the cut-in pressure can be adjusted separately and the difference between the cut-out and cut-in pressure changed.**

Set the switch values

- Lift up the plastic cover of the pressure monitor after unfastening the four screws.
- Unscrew the lock pin (77) of the hand valve (76).



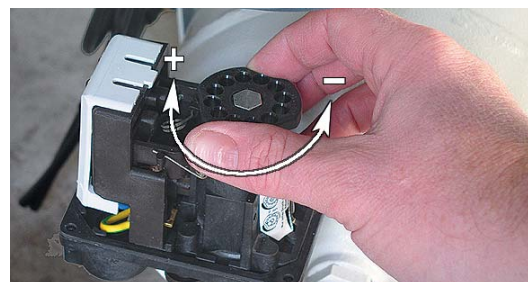
Set the cut-out pressure:

Raise cut-out pressure

- Turn hand valve (76) clockwise (pressure +)

Lower cut-out pressure

- Turn hand valve (76) anti-clockwise (pressure -)



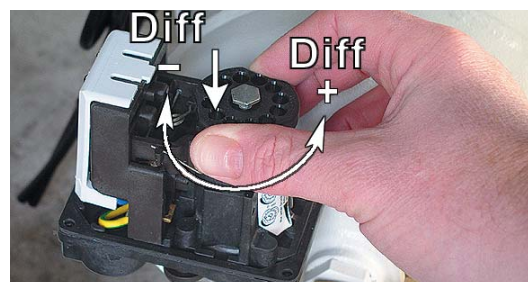
Set the cut-in pressure:

Raise cut-in pressure

- Press down hand valve (76) and then turn clockwise (difference -)

Lower cut-in pressure

- Press down hand valve (76) and then turn anti-clockwise (difference +)



After setting

- Screw in lock pin (77) in one of the two retainers.
- Put on the cover of the pressure monitor again and tighten.

Check and set pressure limiting valve



Deadly risk!

Working on open, live equipment!

- Do not operate the equipment with damp hands!
- Caution: live components!

Setpoint value opening pressure = 5.5 bar

Accomplish settings at operating temperature (warm equipment) only!



Risk of damage!

Dryer and humidity shut-off work reliably only, if the pressure limiting valve (38) is set properly.

Check opening pressure



Deadly risk!

Switch off operating voltage!



Risk of injury!

Prior to operation, depressurise the equipment by opening the safety valve "high pressure" (29)!



Risk of injury!

Wear protective goggles when opening safety valve „high pressure” (29)!

- Unscrew blind cover (78) from the pressure limiting valve (38).
- Unfasten hose connection from the manometer "high pressure" (17):
 - unscrew connecting nut.
 - pull out hose.
- Connect the supplied testing hose (80) to the pressure limiting valve (38) and the manometer "high pressure" (17) (so the manometer "high pressure" (17) can be used as a test gauge).
- Close safety valve "high pressure" (29).
- Switch on operating voltage
 - The manometer "high pressure" (17) must increase by 5.5 ± 0.1 bar.



38 78

otherwise:

Set setpoint value opening pressure of pressure limiting valve

- Pull setting knob (38) back and turn until the manometer "high pressure" (17) displays the setpoint value.
- Press on the setting knob (38) again and allow it to lock into place.

Restore operating status

- Switch off operating voltage!
- Depressurise the equipment by opening the safety valve "high pressure" (29)!
- Remove testing hose (80).
- Insert hose on manometer "high pressure" (17) again and screw in tightly.
- Screw on blind cover (78) on the pressure limiting valve (38).
- Close safety valve "high pressure" (29).
- Switch on operating voltage again
- Check all threaded hose coupling for impermeability.



29

Check humidity monitoring



Deadly risk!

Working on open, live equipment!

- Do not operate the equipment with damp hands!
- Caution: live components!

Check switching function



Deadly risk!

Switch off operating voltage and pull out electric plug!



Risk of injury!

Prior to operation, depressurise the equipment by opening the safety valve "high pressure" (29)!

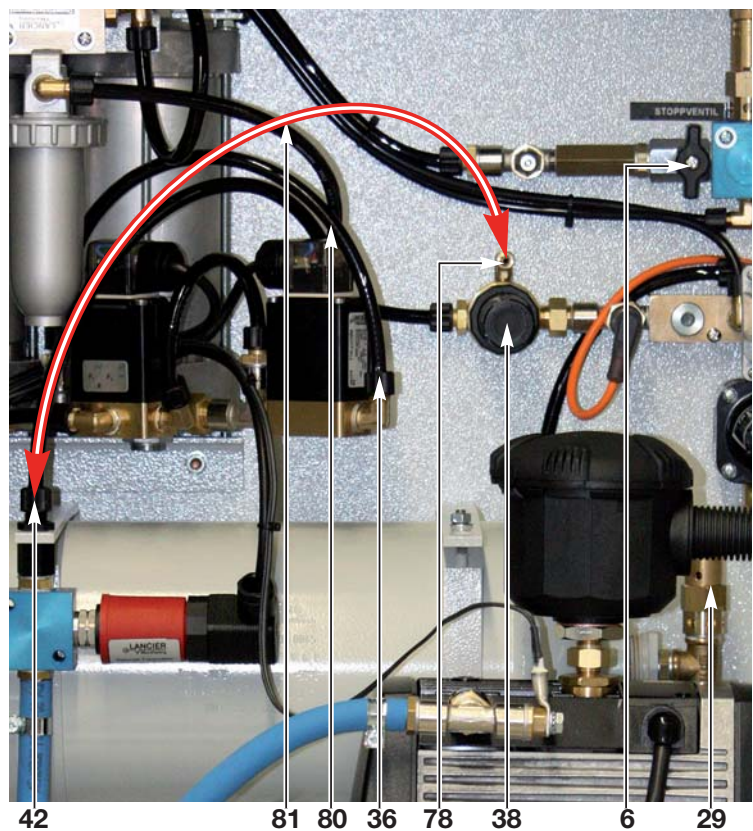


Risk of injury!

Wear protective goggles when opening safety valve „high pressure” (29)!

The air dryers must be bypassed for this operation.

- Close **shut-off valve (6)**.
- Unscrew blind cover (**78**) from the pressure limiting valve (**38**).
- Undo connecting hose (**80**) from compressor pressure sensor (**42**) and solenoid valve Y2 (**36**).
- Attach the test hose supplied (**81**) to compressor pressure sensor (**42**) and test nipple (**78**) of the pressure limiting valve (**38**) in order to bypass the air dryer.
- Open safety valve "high pressure" (**29**) and discharge tank. Close safety valve "high pressure" (**29**) after this.
- Switch on operating voltage:
- *after a few minutes the red signal-LED „F“ (**48**) illuminates on the MFR (**45**) and the system will be shut down and*
- *the red Signal output-LED „A“ (**59**) illuminates on the MFR.*
- If the humidity shut-down process is not executed, discharge tank again by opening safety valve "high pressure" (**29**), in order to start a new compressor run.
- Close safety valve "high pressure" (**29**) again.



Restore operating status



Deadly risk!

Switch off operating voltage!



Risk of injury!

Prior to operation, depressurise the equipment by opening the safety valve "high pressure" (29)!



Risk of injury!

Wear protective goggles when opening safety valve „high pressure” (29)!

- Undo and remove test hose (**81**) from pressure limiting valve (**38**) and compressor pressure sensor (**42**).
- Screw blind cover (**78**) on the pressure limiting valve (**38**) again.
- Screw connecting hose (**80**) to solenoid valve Y2 (**36**).
- Switch on operating voltage.

If the compressor fails to start, allow the equipment to "run dry":



Deadly risk!

Electro specialists only are allowed to operate the buttons of the MFR.
Other users have to use the ACS device (18).

- Open safety valve "high pressure" (29).
- Press button „F-Off“ (61) on the MFR (45) or ACS (18).
- The compressor starts.
- The green Signal-LED „F-on“ (52) in the MFR is turned off = no humidity monitoring.
- The red Signal-LED „F“ (48) illuminates in the MFR = pressurised air humidity is unadmissibly high.



29

After a while

- The red Signal-LED „F“ (48) on the MFR turns off = the pressurised air is dry.
- The green Signal-LED „F-on“ (52) on the MFR is still turned off = no humidity monitoring.



Warning!

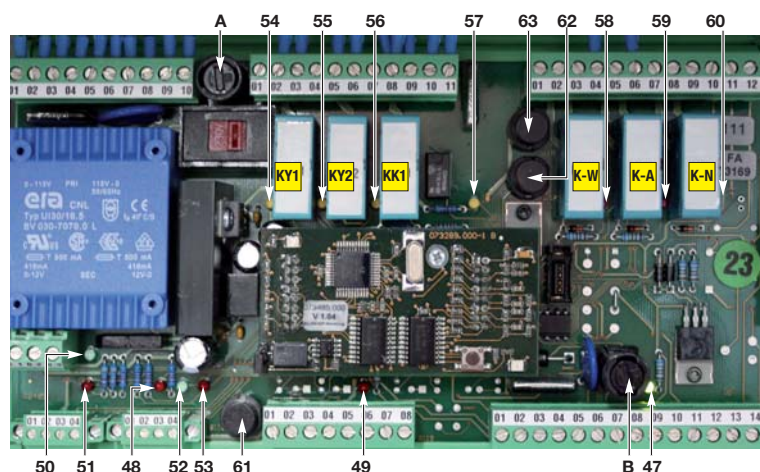
Pressing the button „F-off“ overrides the humidity monitoring.

The button must be used only, if a fault occurred, the „high pressure“ safety valve (18) is open and the shut-off valve "cable pressure" (13) is shut.

Humidity monitoring must be reactivated immediately after trouble-shooting, to assure proper function of the pressurisation equipment.

In order to get immediate humidity monitoring, the "F-off" operation must be overridden:

- Press button „F-Off“ (61) of the MFR or of the ACS for approx. 5 seconds.
- The green LEDs „F-On“ (52) on the MFR illuminate again.
- Close safety valve "high pressure" (29).
- Then carry out function testing.



MFR

The humidity monitoring activates itself automatically after approx. 2 operating hours of the compressor, if the „F-off“ operation is not determined manually.

Switching the motor protective switch (43) off and on again, terminates the „F-off“ operation also. This procedure resets the MFR by breaking its power supply.

Operation On - Off



Deadly risk!
Do not operate the equipment with damp hands!
Take caution with live components!



Risk of injury!
Take caution with heated components!

Connection equipment pneumatics

- Switch off operating voltage!
- Close **shut-off valve (6)**.
- Establish pneumatic connection to pressurised air consumers (**12**).

Normal mode

- Plug in power connection cable (**11**).
- Connect monitoring lines (**13**).
- Switch on motor protective switch (**43**).
- Wait until the equipment is charged.
 - The compressor switches off at 5.0 bar.
- Open **shut-off valve (6)**,
 - the compressor automatically switches on and off when reaching the lower and upper pressure values.



43

Shut down operation

- Turn off motor protective switch (**43**).
- Plug out power connection cable (**11**).
- Depressurise equipment!
 - Open all pneumatic connections for **cable pressure** for this.
- Remove connecting hoses from the equipment output (**12**).
- De-connect monitoring lines (**13**).
- If necessary, branch off electrical connections.



12

13

11

Emergency mode

If, during maintenance or repair works, the connected pressurised air consumer must continue to be supplied with pressurised air, a mobile pressurisation equipment (e.g. series LAM) can be connected to the pressurised air consumers.



Deadly risk!
Switch off operating voltage!



Risk of injury!
Prior to operation, depressurise the equipment by opening the safety valve "high pressure" (29)!

- Switch off operating voltage or pull out the mains plug!
 - Close **shut-off valve (6)**.
 - Depressurise the equipment by opening the safety valve "high pressure" (29).
 - Remove the pressure hose of the compressed air consumers from equipment output (12) at the equipments back side.
 - Attach pressure hose of the compressed air consumers to the equipment output of the mobile system.
-
- Set mobile system into operation while observing the respective instruction manual and safety instructions.



29

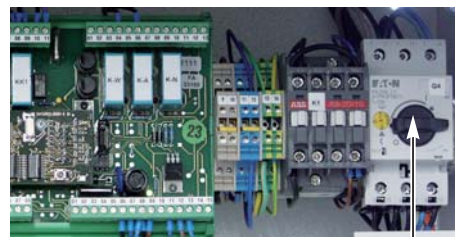


12

13

Shut down operation

- Turn off motor protective switch (43).
- Plug out power connection cable
- Depressurise equipment!
 - Open **shut-off valve (6)**.
- Remove connecting hoses from the equipment output (12).
- De-connect monitoring lines (13).
- If necessary, branch off electrical connections.



43

Servicing

General comments

- Follow the maintenance guidelines and intervals accurately, so that the equipment stays in sound operating condition.
- The terms specified for maintenance intervals must be adhered to!
- Maintenance works may only be carried out by skilled personnel!
- Test air storage tank regularly in accordance with the regulation on pressure tanks!
- Allow system testing to be carried out regularly in accordance with DIN/VDE 0701/0702, BGV A2 (this testing can also be commissioned at LANCIER-Monitoring).
- Only use original LANCIER Monitoring replacement parts!
- After maintenance works tighten all loosened screw joints again!

Maintenance

Cleaning or changing compressor air intake filters



Deadly risk!

Working on open, live equipment!

- Do not operate the equipment with damp hands!
- Caution: live components!



Deadly risk!

Switch off operating voltage!



Risk of injury!

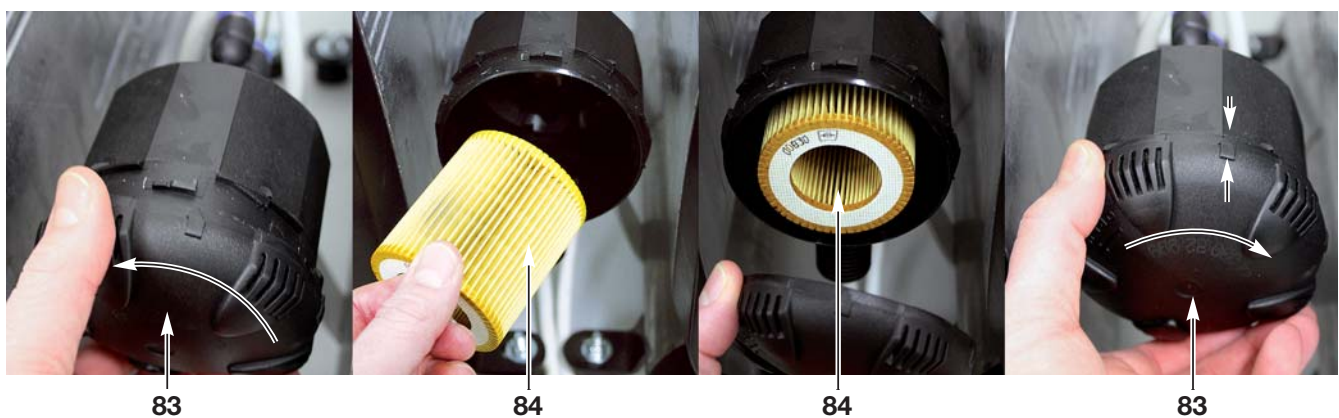
Caution with heated components!



Risk of injury!

Wear protective goggles when blowing out devices.

- Switch off operating voltage!
- Turn and pull filter cap (83) to the left (anti-clockwise).
- Pull out filter cartridge (84) and then blow with pressurised air.
- Renew filter cartridge (84) in the case of heavy contamination or damage.
- Insert filter cartridge (84) in the center of the housing.
- Put on filter cap (83) and turn right (clockwise) until the marks face each other.
- Carry out maintenance works on the second air intake filter.
- Switch on operating voltage!



Change micro filter element of micro filter



Deadly risk!
Switch off operating voltage!

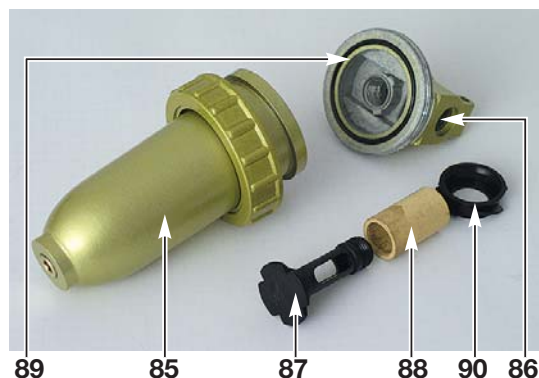


Risk of injury!
Prior to operation, depressurise the equipment by opening the safety valve „high pressure“ (29)!

Change micro filter element (88) of micro filter (37)

- when the UMS monitoring system indicates that the compressor's pressure is reaching the maximum admissible limit,
- after changing drying agent of the drying agent containers (35) (see page 40).

- Detach micro filter:
 - Remove filter cup (85) by loosening the connecting nut from the filter head (86).
- Unfasten hollow grub screw (87) with micro filter element (88).
- Remove micro filter element (88) and replace with new one.
- Clean seal (89), if necessary replace worn seal.
- Screw hollow grub screw (87) together with micro filter element (88) and seal (89) again into the filter head (86).
- Clean filter cup (85), keep dust-free.
- Attach filter cup (85) by tightening the connecting nut on the filter head (86).



Maintenance of air dryers



Deadly risk!
Switch off operating voltage,
Unscrew or disconnect back-up fuse!



Risk of injury!
Prior to operation, depressurise the equipment by opening the safety valve „high pressure” (29)!



Risk of injury!
Caution with heated components!



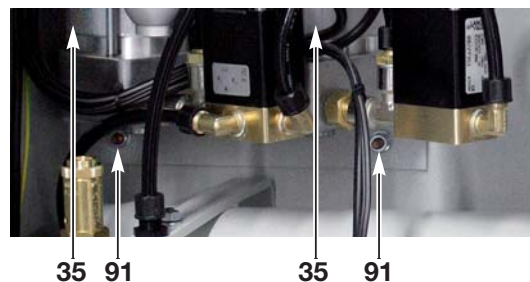
Risk of injury!
Wear safety glasses during cleaning filters with compressed air.

1. Service air dryers (35) when the UMS monitoring system indicates that the dew point is rising.

- Switch off operating voltage!
- Turn off motor protective switch (43).
- Close **shut-off valve (6)**
- Depressurise equipment!
- Open safety valve "high pressure" (29) for this.

2. Unscrew drying agent container (35)

- Unscrew all hose lines from the drying agent containers (35).
- Unscrew bolts (91) of lower assembly bracket with the drying agent containers (35) and take both out.



3. Disassemble drying agent container



Risk of injury!
Do not touch drying agent with wet hands, heat build-up!



Risk of injury!
Wear safety glasses when working with drying agents.

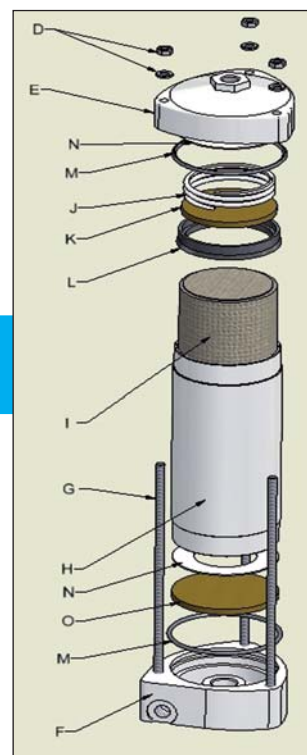
- Unscrew nuts (D) of upper cover (E).
- Place drying agent container on the head.
- Remove lower cover (F) with the mounting bolts (G) from the cylinder tube (H).
- Pour out drying agent (I).
- Remove upper cover (E) from the cylinder tube (H) and take out pressure spring (J).
- Press out upper filter disc (K) with sealing ring (L).
- Take out o-rings (M), PE sealing rings (N) and filter disc (O) from the covers.



Note for disposal!
Dispose of used drying agents in accordance with the regulations applicable in the country and site of use.

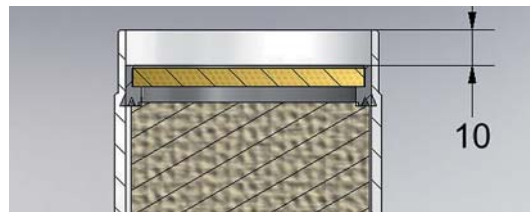
4. Clean drying agent container

- Dry clean all parts
- Replace worn o-rings (M).
- Replace filter discs (K) and (O).
- Replace worn sealing rings (L) and (N).



5. Assemble drying agent container

- Insert new filter disc (O), PE sealing rings (N) and O-rings (M) in the lower cover (F).
- Put cylinder tube (H) on the lower cover (F).
- Pour in new drying agent (molecular sieve) (I): approx. 500 g per drying agent container. Tap lightly on the cylinder tube with the shaft of a hammer, to avoid cavity formation.
- Insert new filter disc (K) with lubricated sealing ring (L) in the cylinder tube (H) and stand back from about 10mm (see fig.).
- Place pressure spring (J) on the filter disc (K).
- Place PE sealing ring (N) and O-ring (M) in the upper cover (E).
- Insert upper cover (E) on the cylinder tube (H) and tighten with the nuts (D) as much as possible.



6. Remount drying agent container

- Insert and screw lower assembly bracket with the drying agent containers (35) again on back panel of equipment.
- Screw all hose lines again onto the drying agent containers (35).

7. Check solenoid valves

Check solenoid valves (36) for proper operation and replace them at least after 8000 operational hours.

8. Replace double non-return valve (39)

Spare part order no.: 029814.000

9. Replace pressure limiting valve (38)

Spare part order no.: 029048.000

10. For the following operation start up the equipment again:

- Connecting hoses (13) are disconnected from air consumer.
- Close **shut-off valve (6)**.
- Connect power supply.
- Turn motor protective switch (43) to „I“.

11. Function testing

Carry out function testing, see pages 30 - 35.

12. Test impermeability

Test all hose connections of the whole system for impermeability.

13. After maintenance

- Open **shut-off valve (6)**.

Causes and remedy of faults

Signal on site	Fault	Cause	Remedy
Green LED "Operating voltage / Spänning" (19) does not illuminate and display of the ACS (18) is dark.	Equipment does not receive operating voltage.	Operating voltage is not switched on. Faulty wiring. Power plug is not fitted correctly. 24 V (26) power pack is defective.	Switch on operating voltage. Check wiring, retighten terminal screws. Check power plug. Replace power pack.
Green LED "Operating voltage / Spänning" (19) does not illuminate	Green LED „DC OK“ in 24 V (26) power pack does not illuminate.	24 V (26) power pack does not receive operating voltage. 24 V (26) power pack is defective. Green LED "Operating voltage / Spänning" (19) is faulty.	Check wiring, retighten terminal screws at power pack. Replace power pack. Replace LED.
Display of ACS (18) is dark.	ACS (18) does not work.	Screensaver is active. Faulty wiring, or 24 V (26) power pack does not receive operating voltage. 24 V (26) power pack is defective. Microfuse „DC“ (B) at MFR (45) is defective. ACS is defective.	Press any key of the ACS. Check wiring, retighten terminal screws at power pack. Replace power pack. Replace microfuse: type M 2.0 A Replace ACS.
Red signal-LED „Fault / Fel“ (20) on the instrument panel (2) illuminates. Red Signal-LED „F“ (48) on the MFR (45) illuminates.	Humidity fault = relative humidity of output air is unadmissibly high.	Maintenance of air dryers (35) was not carried out. Pressure limiting valve (38) is set incorrectly or defective. Double non-return valve (39) is defective. Condensate discharge hose (10) is bent or blocked, its diffusor is clogged. Electric triggering of solenoid valves (36) of air dryers (35) fails or is in wrong clock pulse. Solenoid valves (25) are defective or worn out.	Carry out maintenance of air dryer, see page 40. Set pressure limiting valve properly, see page 33, replace if necessary. Check amount of regeneration air (270 - 300 l/h), replace double non-return valve (39) if necessary, see page 41. Check hose, replace diffusor if necessary. Check cycle time, see page 31. Watch relay KY1 u. KY2, check wiring and plugs of solenoid valves. Replace solenoid valves
Red signal-LED „Fault / Fel“ (20) on the instrument panel (2) illuminates. Red Signal-LED „F“ (48) on the MFR (45) flashes.		Humidity sensor (41) of MFR is defective or wiring is defective.	Check wiring, replace humidity sensor if necessary.
Red signal-LED „Fault / Fel“ (20) on the instrument panel (2) illuminates. Red Signal-LED „T-runtime“ (53) on the MFR (45) illuminates.	Runtime alarm: compressors runs for a longer time than preset (see page 31)	Equipment is permeable. Pressure monitor (40) is defective or set wrong. Compressor safety valve (23) blows off. Safety valve „high pressure“ (29) blows off. Safety valve „cable pressure“ (24) blows off. Solenoid valves (36) of air dryer (35) do not close. Double non-return valve (39) is contaminated or blocked. Compressor or compressor hose is permeable. Compressor output is insufficient. Thermal protection in the coil of the compressor motor has initiated. Compressor's electrical connection is faulty.	Check hoses for permeability. Set pressure monitor or replace it (see page 32). Test opening pressure (7 bar, typical value at ACS display is 5.7 - 6.1 bar) and replace safety valve if necessary, Check hoses for clogging. Replace safety valve. Set cable pressure (see page 30), replace safety valve if necessary. Check solenoid valves, replace them if necessary. Check amount of regeneration air (270 - 300 l/h), replace double non-return valve if necessary, see page 41. Seal/replace permeable parts of compressor, hoses or connectors. Replace air-intake filter or compressor if necessary. compressor overheating: check fan (27) and aeration Check compressor pressure Replace compressor if its bearings are worn or defective. Check wiring, retighten terminal screws.
Red signal-LED „Fault / Fel“ (20) on the instrument panel (2) illuminates. Green Signal-LED „AC“ (50) on the MFR (45) is dark.		Microfuse „AC“ (A) at MFR (45) is defective.	Replace microfuse: type M 0.315 A

What to do after "humidity fault"?

The MFR (45) switched off the compressor (8), the humidity of the output air is inadmissibly high.

- The red signal-LED „F“ (48) illuminates on the MFR and the red signal-LED „Fault / Fel“ (20) on the instrument panel (2) illuminates.
- The red signal output-LED „A“ (59) illuminates on the MFR
- The ACS shows a humidity value of the output air that is inadmissible high (> 4%).

1. Search for faults, remedy faults

according to charts "Causes and remedying of faults", page 42.

2. Restart equipment and allow to run dry



Deadly risk!

Electro specialists only are allowed to operate the buttons of the MFR. Other users have to use the ACS device (18).

- Open safety valve "high pressure" (29).
- Press button „F-Off“ (61) on the MFR (45) or ACS (18).
- The compressor starts.
- The green Signal-LED „F-on“ (52) in the MFR is turned off = no humidity monitoring.
- The red Signal-LED „F“ (48) illuminates in the MFR = pressurised air humidity is inadmissibly high.



29

After a while

- The red Signal-LED „F“ (48) on the MFR turns off = the pressurised air is dry.
- The green Signal-LED „F-on“ (52) on the MFR is still turned off = no humidity monitoring.



Warning!

Pressing the button „F-off“ overrides the humidity monitoring.

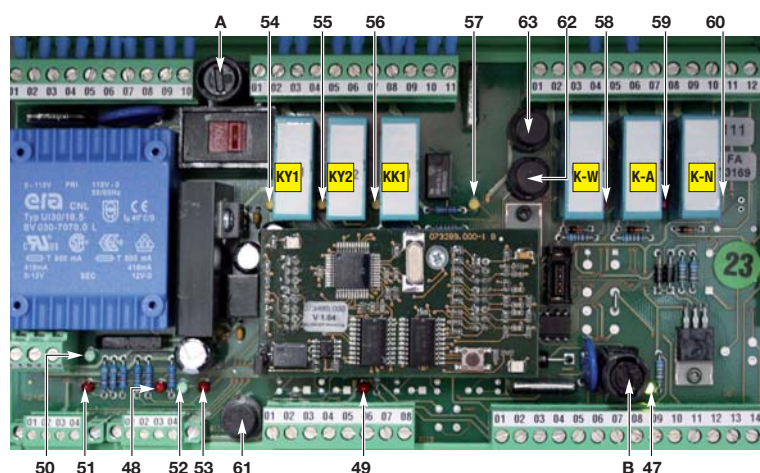
The button must be used only, if a fault occurred, the „high pressure“ safety valve (29) is open and the shut-off valve "cable pressure" is shut.

Humidity monitoring must be reactivated immediately after trouble-shooting, to assure proper function of the pressurisation equipment.

In order to get immediate humidity monitoring, the "F-off" operation must be overridden:

- Press button „F-Off“ (61) of the MFR or of the ACS for approx. 5 seconds.
- The green LEDs „F-On“ (52) on the MFR illuminate again.
- Close safety valve "high pressure" (29).
- Then carry out function testing.

MFR



The humidity monitoring activates itself automatically after approx. 2 operating hours of the compressor, if the „F-off“ operation is not determined manually.

Switching the motor protective switch (43) off and on again, terminates the „F-off“ operation also. This procedure resets the MFR by breaking its power supply.



Deadly risk!
Do not operate the equipment with damp hands!
Caution with live components!



Risk of injury!
Caution with heated components!

Normal mode

see page 37.

- Switch on operating voltage.
- Wait until the equipment is charged.
 - Signal-LED „**F**“ (48) on the MFR (45) turns off.
 - The compressor switches off at 5.0 bar.
- Open **shut-off valve (6)**.
 - the compressor automatically switches on and off when reaching the lower and upper pressure values.

Disposal

Disused LANCIER Monitoring pressurisation equipments must NOT be disposed as domestic waste or to the environment.

Please send the old depressurised system back to LANCIER Monitoring GmbH for professional recycling or disposal.

Contact:

LANCIER Monitoring GmbH

Phone: +49 (0) 251 674 999-0

Fax: +49 (0) 251 674 999-99

E-Mail: mail@lancier-monitoring.de

Shipping address:

LANCIER Monitoring GmbH

Gustav-Stresemann-Weg 11

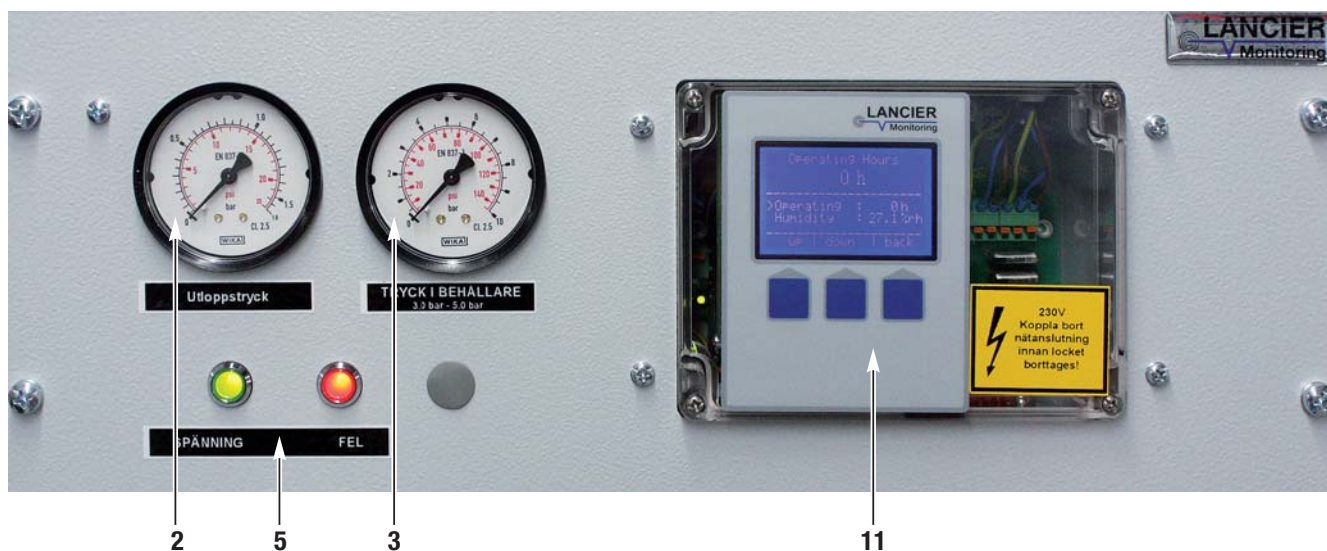
48155 Münster

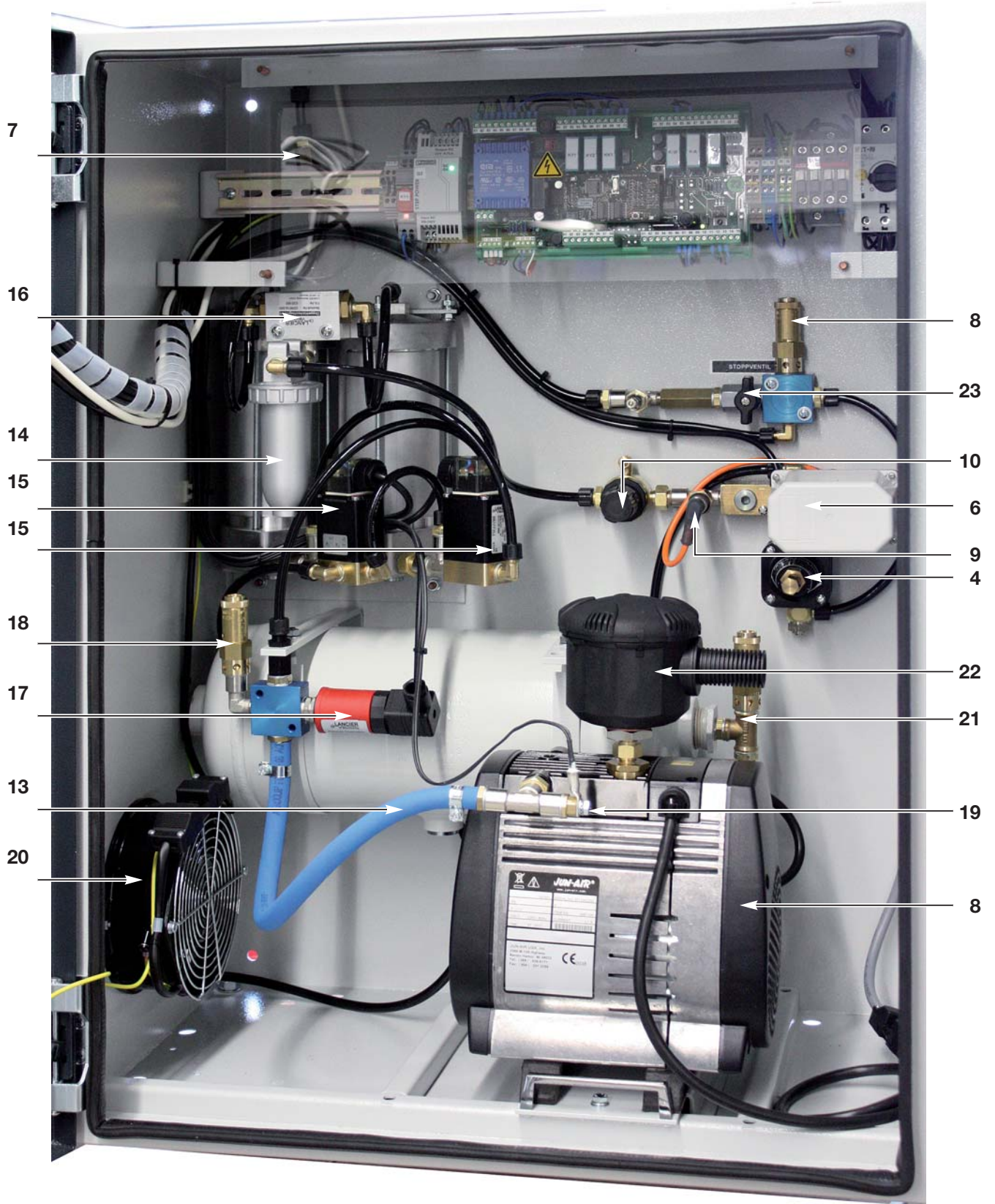
Germany

Replacement parts

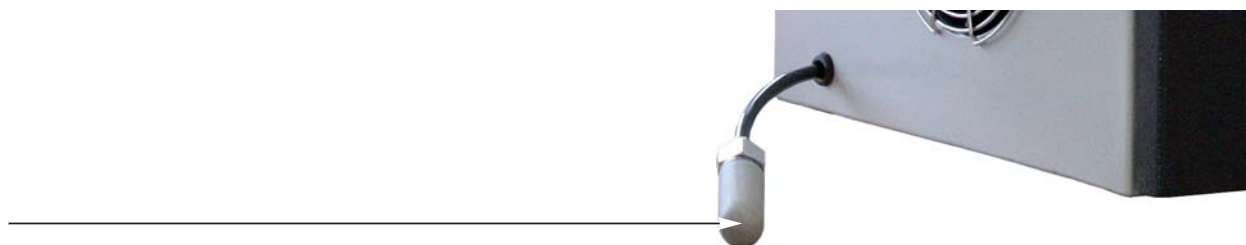
Display, operation

Item	Name	Order no.
1	Service packet for pneumatic system without compressor	071901.000
2	Manometer 0 - 1,6 bar	040445.000
3	Manometer 0 - 10 bar	048965.000
4	Pressure reducer	023385.000
5	Label replacement Svensk compl.	073901.024
6	Pressure monitor	006464.000
7	Non-return valve	053093.000
8	Safety valve "cable pressure" 0,9 bar	006467.000
9	Humidity sensor MFR	073351.000
10	Pressure limiting valve	029048.000
11	ACS addressable compressor monitoring unit	072891.010
13	Compressor hose	074515.000
14	Micro filter complete	056358.000
15	Solenoid valve 3/2 way (when ordering replacement part specify voltage and frequency!)	031538.000
16	Double non-return valve	029814.000
17	Pressure sensor "compressor pressure" for ACS device	073153.000
18	Safety valve "compressor"	023791.000
19	Temperature sensor "compressor temperature" for ACS device	073155.100
20	Fan	022343.000
21	Safety valve "high pressure" 7.0 bar	023791.000
22	Air intake filter	073871.000
23	Shut-off valve	049314.000
24	Condensate diffusor	074691.000
25	Door lock (no illustration)	040691.000
26	PE hose 6/4	006827.000
27	PA hose 8/6	018499.000





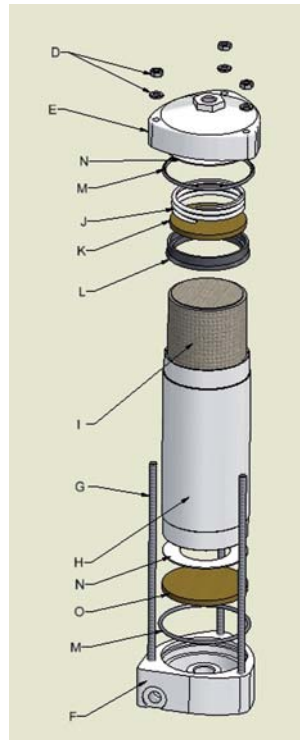
24



Air dryers

Item	Name	Order no.
35	Drying agent container compl.	029061.000
I*	Molecular sieve, approx. 2 x 500 g	022528.000
M*	O-Ring (2 pieces necessary)	002792.000
K*	Upper filter disc	056714.000
L*	Sealing ring for upper filter disc	056715.000
O*	Bottom filter disc	004445.000
N*	Sealing ring top, top/bottom	004173.000
J	Compression spring	011293.000

The components on this page marked with "*" are an integral part of the service package.



Compressor PK 24/1

Item	Name	Order no.
1	Compressor PK 24/1 komplett , 230V / 2.1 A	074508.001
2	Air intake filter	073871.000
3	Filter cartridge	073872.000



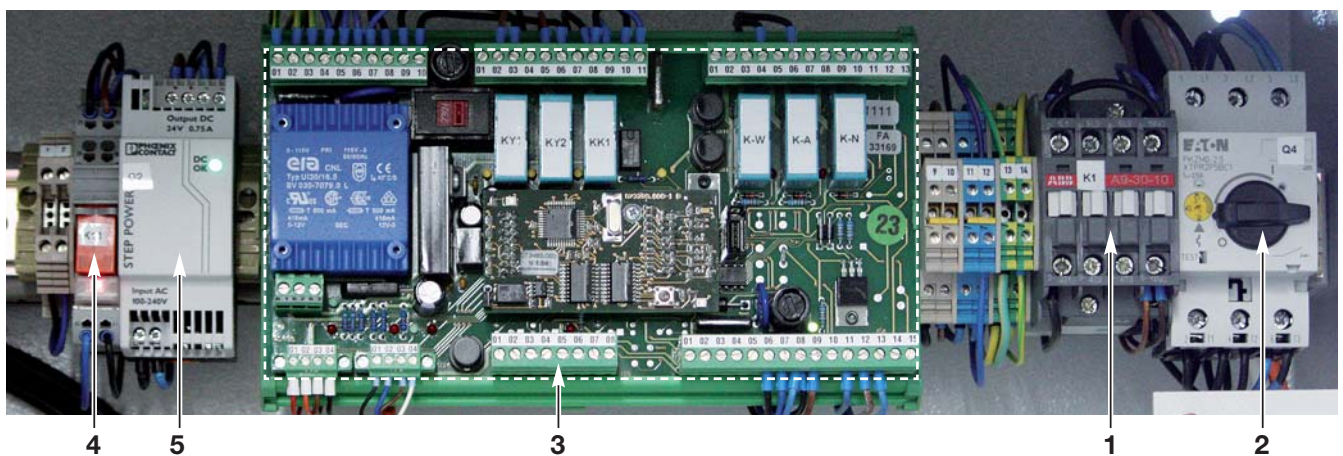
Micro filter

Item	Name	Order no.
	Micro filter compl.	056358.000
1	Micro filter element	056359.000
2	O-Ring	034390.000



Electric equipment

Item	Name	Order no.
1	Motor contactor [K1]	067950.000
2	Motor protective switch [Q4]	067951.000
3	Multifunktional relay MFR	073285.002
4	Signal relay „A” [K11]	074569.000
5	Power pack 230 V AC - 24 V DC	074009.000

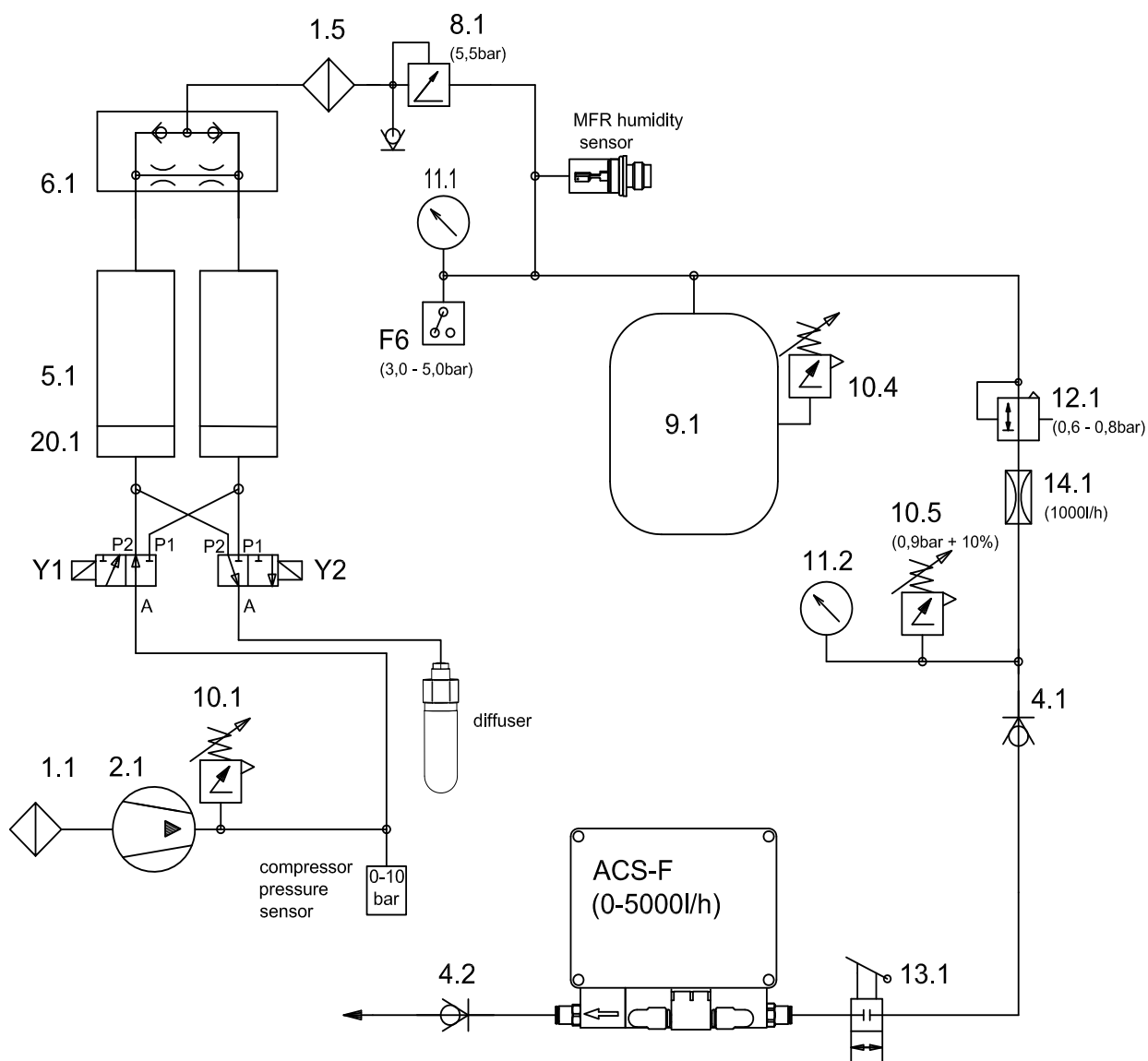


Plans

Equipment lists pneumatics

- | | |
|---|--|
| 1.1 Intake filter 1 | 12.1 Pressure reducer "Cable pressure" 1 |
| 1.2 Intake filter 2 | 12.2 Pressure reducer "Cable pressure" 2 |
| 1.3 Intake filter 3 | 12.3 Pressure reducer "Interim pressure" |
| 1.5 Micro filter 1 | |
| 1.6 Micro filter 2 | 13.1 Shut-off valve "Cable pressure" 1 |
| | 13.2 Shut-off valve "Cable pressure" 2 |
| 2.1 Compressor 1 | 13.3 Shut-off valve "High-pressure" |
| 2.2 Compressor 2 | 13.4 Shut-off valve "Kondensat" |
| 2.3 Compressor 3 | 13.5 3/2 way mini valve 1 |
| 2.4 Compressor with I.C.-engine | 13.6 3/2 way mini valve 2 |
| | 13.7 Shut-off valve "Interim pressure" |
| | 13.8 Shut-off valve of cable connection |
| 3.1 Cooling coil 1 | |
| 3.2 Cooling coil 2 | 14.1 Nozzle - output air „cable pressure“ 1 |
| 3.3 Cooling coil 3 | 14.2 Nozzle - output air „cable pressure“ 2 |
| | 14.3 Nozzle - output air „high-pressure“ |
| 4.1 Non-return valve 1 | 14.4 Pneumatic resistor |
| 4.2 Non-return valve 2 | 14.5 Injector "Aeration" |
| 4.3 Non-return valve 3 | |
| | 15.1 Total air flow meter "Cable pressure" (1) |
| 5.1 Drying agent container - Dryer 1 | 15.2 Air flow meter |
| 5.2 Drying agent container - Dryer 2 | 15.3 Air flow meter regenerated air |
| 5.3 Drying agent container - Dryer 3 | |
| | 16.1 Inspection glass |
| 6.1 Double non-return valve 1 | |
| 6.2 Double non-return valve 2 | 17 Condensate surge tank |
| 6.3 Double non-return valve 3 | |
| | 18.1 Hose coupling "Cable pressure" |
| 7.1 Testing valve "cable pressure" 1 | 18.2 Hose coupling "High-pressure" |
| 7.2 Testing valve "cable pressure" 2 | 18.3 Connection "Double equipment" |
| 7.3 Flange of test manometer | 18.4 Connection "Pressure transducer" 1 |
| | 18.5 Connection "Pressure transducer" 2 |
| 8.1 Pressure limiting valve 1 | 18.6 Connection "Test manometer" |
| 8.2 Pressure limiting valve 2 | |
| 8.3 Pressure limiting valve 3 | 19.1 Connecting hose |
| | |
| 9.1 Air storage tank 1 | 20.1 Cyclone separator |
| 9.2 Air storage tank 2 | 20.2 Cyclone-, water- and oil separator |
| 9.3 Air storage tank 3 | |
| 9.4 Reserve air storage tank | 21.1 Distributing regulator |
| | |
| 10.1 Safety valve "compressor" 1 | 22.1 Charcoal filter |
| 10.2 Safety valve "compressor" 2 | 22.2 Adsorber |
| 10.3 Safety valve "compressor" 3 | |
| 10.4 Safety valve "high pressure" | |
| 10.5 Safety valve "cable pressure" 1 | |
| 10.6 Safety valve "cable pressure" 2 | |
| 10.7 Safety valve "Interim pressure" | |
| | |
| 11.1 Manometer "High-pressure" | |
| 11.2 Manometer "Cable pressure" 1 | |
| 11.3 Manometer "Cable pressure" 2 | |
| 11.4 Manometer "Interim pressure" | |
| 11.5 Contact manometer "High-pressure" | |
| 11.6 Contact manometer "Cable pressure" | |

Pneumatics diagram Nr. 074891.000



Equipment list:

1.1	Intake filter	10.1	Safety valve "compressor"
1.5	Micro filter	10.4	Safety valve "high pressure"
2.1	Compressor	10.5	Safety valve "cable pressure"
3.1	Cooling coil	11.1	Manometer "High-pressure"
4.1	Non-return valve	11.2	Manometer "Cable pressure"
4.2	Non-return valve	12.1	Pressure reducer "Cable pressure"
5.1	Drying agent container	13.1	Shut-off valve
6.1	Double non-return valve	14.1	Nozzle - output air „Cable pressure“
8.1	Pressure limiting valve	20.1	Cyclone separator
9.1	Air storage tank		

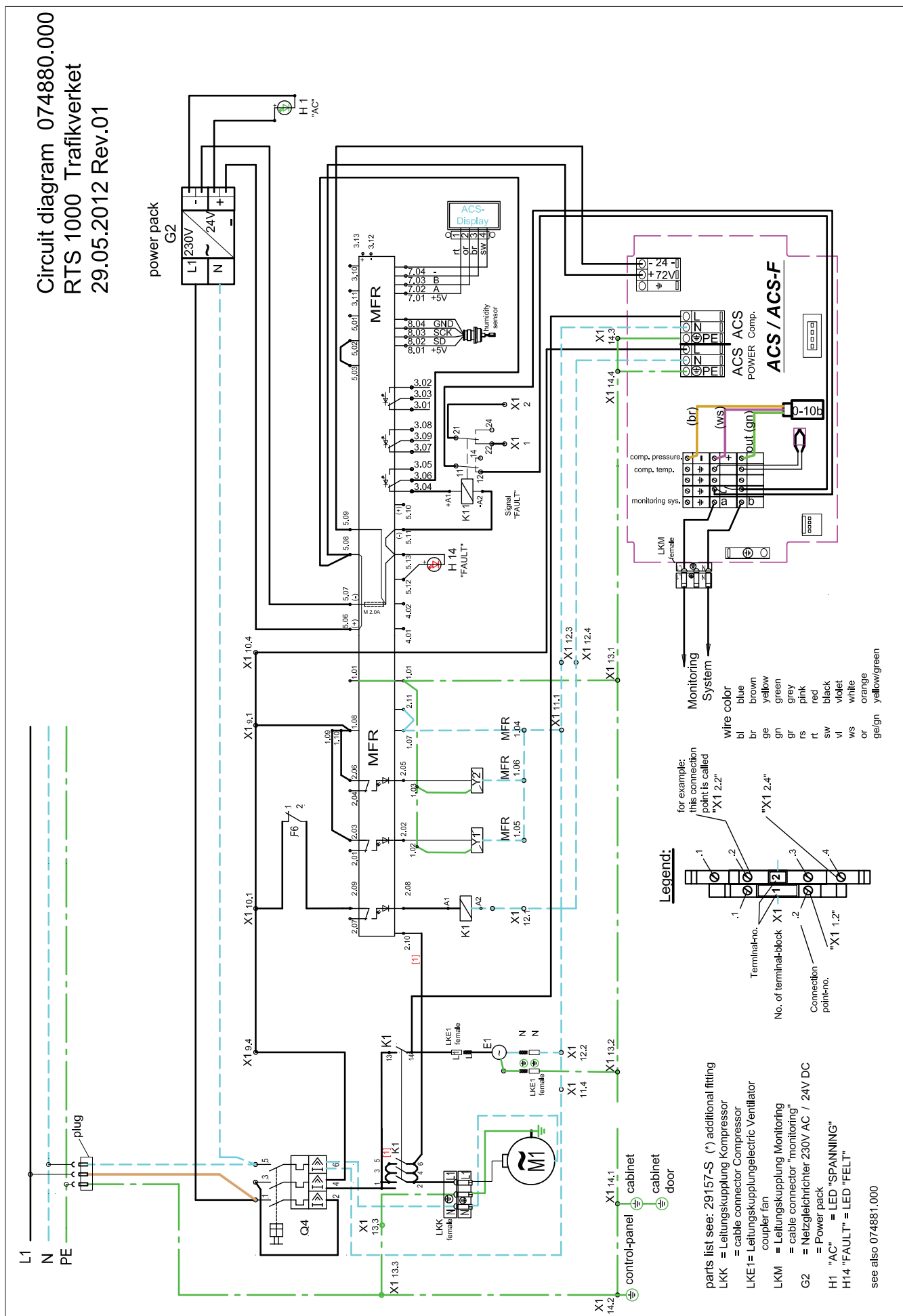
pneumatic diagram 074891.000
 RTS 1000 Trafikverket
 10.02.REV.0

Equipment list electrics

A1	Humidity monitoring unit 1	M1	Motor - Compressor 1
A2	Humidity monitoring unit 2	M2	Motor - Compressor 2
A3	Humidity monitoring unit 3	M3	Motor - Compressor 3
A4	Control unit	M4	I.C.-engine
A5	Flow meter - Printed circuit board RTS	P1	Counter of operation hours - Compressor 1
A6	Flow meter - Integral part	P2	Counter of operation hours - Compressor 2
B1	Pressure switch "high pressure"	P3	Counter of operation hours - Compressor 3
B2	Pressure switch "Cable pressure (1) too low"	P4	Hygrometer 1
B3	Pressure switch "Cable pressure (1) too high"	P5	Hygrometer 2
B4	Pressure switch "Cable pressure 2 too low"	P6	Hygrometer 3
B5	Pressure switch "Cable pressure 2 too high"	P7	Counter of operation hours 1 with maintenance signal
B6	Pressure switch "Add compressor 2"	P8	Counter of operation hours 2 with maintenance signal
C1	Capacitor	P9	Counter of operation hours 3 with maintenance signal
E1	Fan 1	P10	Voltmeter
E2	Fan 2	Q1	Main switch AC
E3	Fan 3	Q2	Main switch DC
F1	Motor protective relay 1	Q3	Fused DC main switch DC
F2	Motor protective relay 2	Q4	Motor protective switch 1
F3	Motor protective relay 3	Q5	motor protective switch 2
F4	Thermal protection	Q6	motor protective switch 3
F6	Pressure monitor	S1	Programme switch 1
F7	Fuse	S2	Programme switch 2
F8	Overvoltage suppressor	S3	Programme switch 3
G1	Power pack 1	S4	Switch "F-aus" 1
G2	Power pack 2	S5	Switch "F-aus" 2
G3	Power pack 3	S6	Switch "F-aus" 3
G4	Battery	S7	Change-over switch
G5	Battery charger	S8	Door switch
G6	Bridge rectifier	S9	Key "W-Test"
H1	Signal-LED "AC"	V	Diode
H2	Signal-LED "DC"	X1	Connecting block 1
H3	Signal-LED "F"	X2	Connecting block 2
H4	Signal-LED "H"	X3	Connecting block 3
H5	Signal-LED "M"	X4	Connecting block 4
H6	Signal-LED "T"	X5	Connecting block 5
H7	Signal-LED "N" (or "N1")	X6	Power socket
H8	Signal-LED "N2"	Y1	3/2 way solenoid valve - Dryer 1
H9	Signal-LED "W"	Y2	3/2 way solenoid valve - Dryer 2
H10	Signal-LED "K" (or "K1")	Y3	4/2 way solenoid valve - Dryer 1
H11	Signal-LED "K2"	Y4	4/2 way solenoid valve - Dryer 2
H12	Signal-LED "G"	Y6	Humidity stop solenoid valve
H13	Signal-LED "A"	Y7	Non-return solenoid valve block
H14	Signal-LED "Fault"	Y8	Solenoid valve - Aeration
H15	Signal-LED "Signal interruption"		
K1	Contactator - Compressor 1		Short symbol for signals
K2	Contactator - Compressor 2	AC	= Operation AC
K3	Contactator - Compressor 3	DC	= Operation DC
K4	Power failure relay AC	F	= Humidity
K5	Signal relay "K"	H	= High-pressure
K6	Humidity detector relay 1	M	= Compressor failure
K7	Humidity detector relay 2	T	= Running time
K8	Humidity detector relay 3	N (or N1)	= Cable pressure (1)
K9	Time relay "Running time"	N2	= Cable pressure 2
K10	Signal relay "T"	W	= Maintenance
K11	Signal relay "A"	A	= Fault
K12	Signal relay "F"	G	= Cable filled
K13	Signal relay "M"	K (or K1)	= Cable fault (1)
K14	Signal relay "H"	K2	= Cable fault 2
K15	Signal relay "N"	S	= Fuse
K16	Time relay "8 min" 1	V	= Power failure AC
K17	Time relay "8 min" 2		
K18	Switch clock		
K19	Switching relay		
K20	Signal relay "W"		
K21	Time relay "Backlash"		
K22	Switching relay		
K23	Signal relay "V"		

Circuit diagram Nr. 074880.000

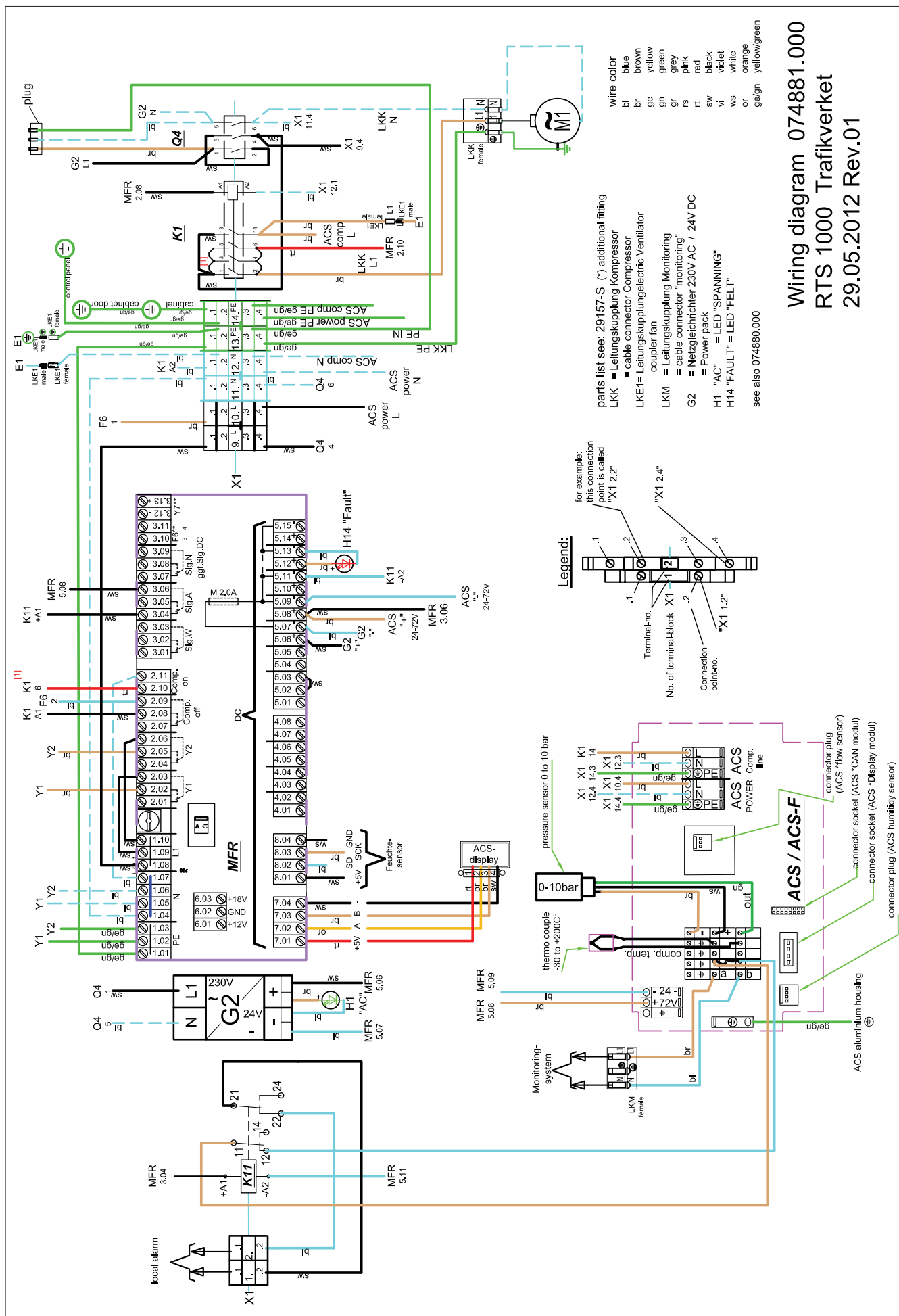
Circuit diagram 074880.000
 RTS 1000 Trafikverket
 29.05.2012 Rev.01



Equipment list electrics

A1	Humidity monitoring unit 1	M1	Motor - Compressor 1
A2	Humidity monitoring unit 2	M2	Motor - Compressor 2
A3	Humidity monitoring unit 3	M3	Motor - Compressor 3
A4	Control unit	M4	I.C.-engine
A5	Flow meter - Printed circuit board RTS	P1	Counter of operation hours - Compressor 1
A6	Flow meter - Integral part	P2	Counter of operation hours - Compressor 2
B1	Pressure switch "high pressure"	P3	Counter of operation hours - Compressor 3
B2	Pressure switch "Cable pressure (1) too low"	P4	Hygrometer 1
B3	Pressure switch "Cable pressure (1) too high"	P5	Hygrometer 2
B4	Pressure switch "Cable pressure 2 too low"	P6	Hygrometer 3
B5	Pressure switch "Cable pressure 2 too high"	P7	Counter of operation hours 1 with maintenance signal
B6	Pressure switch "Add compressor 2"	P8	Counter of operation hours 2 with maintenance signal
C1	Capacitor	P9	Counter of operation hours 3 with maintenance signal
E1	Fan 1	P10	Voltmeter
E2	Fan 2	Q1	Main switch AC
E3	Fan 3	Q2	Main switch DC
F1	Motor protective relay 1	Q3	Fused DC main switch DC
F2	Motor protective relay 2	Q4	Motor protective switch 1
F3	Motor protective relay 3	Q5	motor protective switch 2
F4	Thermal protection	Q6	motor protective switch 3
F6	Pressure monitor	S1	Programme switch 1
F7	Fuse	S2	Programme switch 2
F8	Overvoltage suppressor	S3	Programme switch 3
G1	Power pack 1	S4	Switch "F-aus" 1
G2	Power pack 2	S5	Switch "F-aus" 2
G3	Power pack 3	S6	Switch "F-aus" 3
G4	Battery	S7	Change-over switch
G5	Battery charger	S8	Door switch
G6	Bridge rectifier	S9	Key "W-Test"
H1	Signal-LED "AC"	V	Diode
H2	Signal-LED "DC"	X1	Connecting block 1
H3	Signal-LED "F"	X2	Connecting block 2
H4	Signal-LED "H"	X3	Connecting block 3
H5	Signal-LED "M"	X4	Connecting block 4
H6	Signal-LED "T"	X5	Connecting block 5
H7	Signal-LED "N" (or "N1")	X6	Power socket
H8	Signal-LED "N2"	Y1	3/2 way solenoid valve - Dryer 1
H9	Signal-LED "W"	Y2	3/2 way solenoid valve - Dryer 2
H10	Signal-LED "K" (or "K1")	Y3	4/2 way solenoid valve - Dryer 1
H11	Signal-LED "K2"	Y4	4/2 way solenoid valve - Dryer 2
H12	Signal-LED "G"	Y6	Humidity stop solenoid valve
H13	Signal-LED "A"	Y7	Non-return solenoid valve block
H14	Signal-LED "Fault"	Y8	Solenoid valve - Aeration
H15	Signal-LED "Signal interruption"		
K1	Contactactor - Compressor 1		Short symbol for signals
K2	Contactactor - Compressor 2	AC	= Operation AC
K3	Contactactor - Compressor 3	DC	= Operation DC
K4	Power failure relay AC	F	= Humidity
K5	Signal relay "K"	H	= High-pressure
K6	Humidity detector relay 1	M	= Compressor failure
K7	Humidity detector relay 2	T	= Running time
K8	Humidity detector relay 3	N (or N1)	= Cable pressure (1)
K9	Time relay "Running time"	N2	= Cable pressure 2
K10	Signal relay "T"	W	= Maintenance
K11	Signal relay "A"	A	= Fault
K12	Signal relay "F"	G	= Cable filled
K13	Signal relay "M"	K (or K1)	= Cable fault (1)
K14	Signal relay "H"	K2	= Cable fault 2
K15	Signal relay "N"	S	= Fuse
K16	Time relay "8 min" 1	V	= Power failure AC
K17	Time relay "8 min" 2		
K18	Switch clock		
K19	Switching relay		
K20	Signal relay "W"		
K21	Time relay "Backlash"		
K22	Switching relay		
K23	Signal relay "V"		

Wiring diagram Nr. 074881.000



Wiring diagram 074881.000
RTS 1000 Trafikverket
29.05.2012 Rev.01

EC Declaration of Conformity

We declare under our sole responsibility, that the product

Make: LANCIER Monitoring
Type: Pressurization System RTS 1000
with addressable compressor
monitoring unit ACS

to which this declaration refers, meets the relevant health and safety requirements of the following EC directives:

2006/42/EG	Machinery Directive
87/404/EWG	Simple pressure tanks
2006/95/EG	Low voltage directive
2004/108/EG	Electromagnetic compatibility

For proper implementation of the health and safety requirements named in the EC directives the following standard(s) and/or technical specification(s) have been consulted:

EN 12100-1 and 2	Machine safety
EN 286-1	Simple imitation pressure tank for air or nitrogen, part 1
EN 60204-1	Electrical fittings of machines
EN 61000-6-1	Interference resistance (fault-free operation)
EN 61000-6-3	Emitted interference

The declaration loses its validity should any change be made to the parts delivered.

The special technical documents may be requested subject to justified requirement on the part of any government office:

Name: Ulrich Siebeneck

Address: see above

Data transmission is either electronic or on paper.

Münster, 09.02.2012


Research and Development


Managing Director