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DK50 4x2VT/M
DK50 6x2VT/M

EN User manual

November 2018

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COMPRESSOR

DK50 4x2VT/M
DK50 6x2VT/M

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IMPORTANT INFORMATION

1. CONFORMITY WITH REQUIREMENTS IN EUROPEAN UNION DIRECTIVES

This product conforms to the requirements of the MDD93/42/EEC and 2006/42/EEC directives and is safe for its intended use if all safety instructions are followed.

2. INTENDED USE

The compressor is used as a central source of clean, oil-free compressed air to power individual devices and equipment with compressed air used in large dental clinics and laboratories, in hospital wards and in other settings where the parameters and properties of the compressed air are suitable for the specific application.

The compressed air supplied by the compressor is unsuitable for use with artificial lung ventilation devices without further filtration.

Any use of the product outside the framework of its intended use is considered improper use. The manufacturer is not liable for any damages or injury resulting from misuse.

3. CONTRAINDICATIONS AND SIDE-EFFECTS

There are no contraindications or side-effects known.

4. WARNINGS AND SYMBOLS

The following symbols are used in the user manual, device and its packaging to denote important details and information:


General warnings


Danger, electric shock hazard


Read the user manual!


CE-marking


Compressor is controlled automatically and may start without warning


Caution! Hot surface


Ground connection


Terminal for ground connection

Alternating current


Handling mark on package – FRAGILE


Handling mark on package – THIS SIDE UP


Handling mark on package – KEEP DRY


Handling mark on package – TEMPERATURE LIMITATIONS


Handling mark on package – LIMITED STACKING


Mark on package – RECYCLABLE MATERIAL


Manufacturer

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5. WARNINGS

The product is designed and manufactured to be safe for the user and its surrounding environment when used in the defined manner. Keep the following warnings in mind. This keeps risks to a minimum.

5.1. General warnings

READ THE USER MANUAL CAREFULLY BEFORE USING THE DEVICE AND KEEP IT FOR FUTURE USE!

- The user manual aids in the correct installation, operation and maintenance of the product. It is included with the product and must be kept close to it at all times. Careful review of this manual will provide the information necessary for the intended use and correct operation of the product.
- Only the original packaging ensures the protection of the equipment during transport. Save this packaging should you ever have to return the equipment. The manufacturer is not liable for damages caused by faulty packaging when returning a product for transport during the warranty period.
- Use a fork lift truck or similar hoisting equipment for any movement or handling of the product.
- This warranty does not cover damages originating from the use of accessories or consumables other than those specified or suggested by the manufacturer.
- The manufacturer only guarantees the safety, reliability and function of the equipment if:
  - installation, new settings, changes, modifications and repairs are performed by the manufacturer or its representative, or a service provider authorized by the manufacturer.
  - the product is used pursuant to the user manual.
- The user manual corresponds to the configuration of the product and its compliance with the applicable safety and technical standards at the time of its printing. The manufacturer reserves all rights for the protection of its configuration, methods and names.
- The translation of the user manual is performed in accordance with the best available knowledge. The Slovak version is to be used in the event of any uncertainties.

5.2. General safety warnings

The manufacturer designed and manufactured the product to mitigate all risks when used correctly for the intended use. The manufacturer considers it its duty to describe the following general safety measures:

- The use and operation of the product must comply with all local codes and regulations. The operator and user are responsible for following all appropriate regulations in the interests of performing work safely.
- Only the use of original parts guarantees the safety of the operating personnel and the reliable operation of the product itself. Only use accessories and parts mentioned in the technical documentation or expressly approved by the manufacturer.
- The manufacturer assumes no liability for any damages or other risks if any accessories or parts other than those mentioned in the technical documentation or expressly approved by the manufacturer are used. This warranty does not cover damages originating from the use of accessories or consumables other than those specified or suggested by the manufacturer.
- The user must make sure that the equipment is functioning correctly and safely every time it is used.
- The user/operator must be capable of safely using and properly operating the product. The user must be trained to operate the product and must be experienced.
- Create operating regulations for the persons operating the product

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- Wear hearing protection when starting the product, during operation and any time it is in operation.
- Operating the product in operating premises that may contain mixtures of flammable gases or in areas that may contain mixtures of particulate, such as coal dust, is prohibited.
- Attention, explosion hazard!
- The use of the product in wet or damp environments is prohibited.
- The user must inform the supplier immediately if any adverse event occurs during the use of the equipment.

5.3. Safety warnings on protection from electric current

- The equipment may only be connected to a properly installed socket connected to the earth (grounded).
- Before the product is plugged in, make sure that the mains voltage and frequency stated on the product are the same as the power mains.
- Check for possible damage to the product and the connected air distribution system before use. Replace damaged pneumatic and electrical conductors immediately.
- Immediately disconnect the product from the mains in hazardous situations or when a technical malfunction occurs.
- During repairs and maintenance, ensure that:
  - the product is disconnected from the mains
  - the pressure is released from all lines
- Only the manufacturer, or a qualified specialist trained by the manufacturer, may install, modify or upgrade the product itself.
- Only a qualified electrician may install electrical components!

6. STORAGE AND TRANSPORT

The compressor is shipped from the manufacturer in transport packaging. This secures the equipment from damage during transport.



The original compressor packaging must be used for transport whenever possible. The compressor is shipped in a vertical position and must be secured using transport straps.



Protect the compressor from humid and dirty environments and extreme temperatures during transport and storage. Compressors in the original packaging may be stored in a warm, dry and dust-free area. Do not store near any chemical substances.



Keep the packaging material, if possible. If not, please dispose of the packaging material in an environmentally-friendly way. Packaging cardboard can be recycled with old paper.



The compressor must be transported only when all air has been vented. Before moving or transporting the compressor, release all the air pressure from the tank and hoses and drain the condensed water.

<u>Ambient conditions for storage and transport</u>

Products may only be stored and transported in vehicles that are free of any traces of volatile chemicals under the following conditions:

Temperature : +0°C to +50°C,
Max. relative humidity.: 90%,

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7. TECHNICAL DATA

The compressors are designed for dry and well-ventilated indoor environments with the following conditions:

Temperature: *+5°C to +40°C,*
Max. relative humidity.: *70%,*
Max. absolute humidity.: *15 g/m³.*

Tab.1

Type		DK50 4x2VT/M	DK50 6x2VT/M
Compressor output at 6 bar with dryer	l/min	440	660
Voltage / frequency	V/Hz	3 x 400 / 50	3 x 400 / 50
Power (max.)	A	14.5	22
Main circuit protection device rating	A	50	50
Main electrical feeder	mm^2	10	10
Enclosure		IP10	IP10
Air tank capacity	l	220	330
Working pressure	bar	**6 ÷ 8**	**6 ÷ 8**
Safety valve	bar	12	12
Noise level	dB	73	74
Weight	kg	330*	420*
Weight with dryer	kg	360	450
Dimensions (W x L x H)	mm	2315* x 1740 x 500	2315* x 1740 x 500
Dimensions with dryer (W x L x H)	mm	2475** x 1740 x 500	2475** x 1740 x 500
Operating mode		S1 – 100%	S1 – 100%
Dryer performance with refrigerated dryer (M5) (PDP***)		+3°C	+3°C
Time to fill air tank from 0 to 7 bar	s	50	50
Required cooling air changes in space	m^3/h	1000	1500
Electrical class		Class I.	Class I.

(*) - without the dryer
(**) - dimensions without accessories
(***) - apply the correction factor for the M5 dryer

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Tab.2

Type		DK50 4x2VT/M	DK50 6x2VT/M
Compressor output at 8 bar with dryer	l/min	320	480
Voltage / frequency	V/Hz	3 x 400 / 50	3 x 400 / 50
Power (max.)	A	15.5	25
Main circuit protection device rating	A	50	50
Main electrical feeder	mm^2	10	10
Enclosure		IP10	IP10
Air tank capacity	l	220	330
Working pressure	bar	**8÷10**	**8÷10**
Safety valve	bar	12	12
Noise level	dB	73	74
Weight	kg	330*	420*
Weight with dryer	kg	360	450
Dimensions (W x L x H)	mm	2315* x 1740 x 500	2315* x 1740 x 500
Dimensions with dryer (W x L x H)	mm	2475** x 1740 x 500	2475** x 1740 x 500
Operating mode		S1 – 100%	S1 – 100%
Dryer performance with refrigerated dryer (M5) (PDP***)		+3°C	+3°C
Time to fill air tank from 0 to 7 bar	s	50	50
Required cooling air changes in space	m^3/h	1000	1500
Electrical class		Class I.	Class I.

(*) - without the dryer
(**) - dimensions without accessories
(***) - apply the correction factor for the M5 dryer

7.1. Free air delivery (FAD) correction due to elevation

FAD correction table

Elevation [MASL]	0 - 1500	1501 - 2500	2501 - 3500	3501 - 4500
FAD [l/min]	FAD x 1	FAD x 0,8	FAD x 0,71	FAD x 0,60

FAD reference conditions:

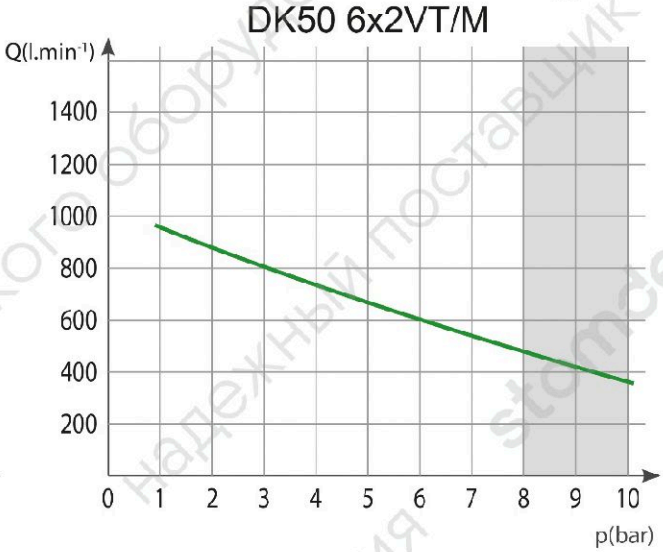
Elevation: 0 MASL
Temperature: 20°C
Atmospheric pressure: 101,325 Pa
Relative humidity: 0%

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8. PRODUCT DESCRIPTION

8.1. Variants

(Fig.1a, Fig.1b)

The **DK50 4x2VT/M compressor** (Fig. 1a) is composed of:

- Compressor section - 4 x 2V air pumps
- Air tank section - 2 x 110 l
- Adsorption dryer

The **DK50 6x2VT/M compressor** (Fig. 1b) is composed of:

- Compressor section - 6 x 2V air pumps
- Air tank section - 3 x 110 l
- Adsorption dryer

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Fig. 1a DK50 4x2VT/M compressor

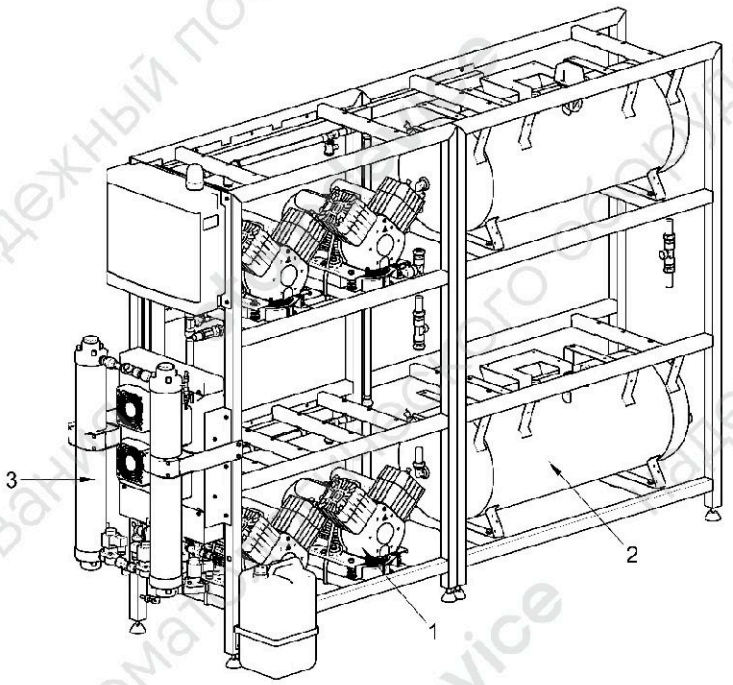
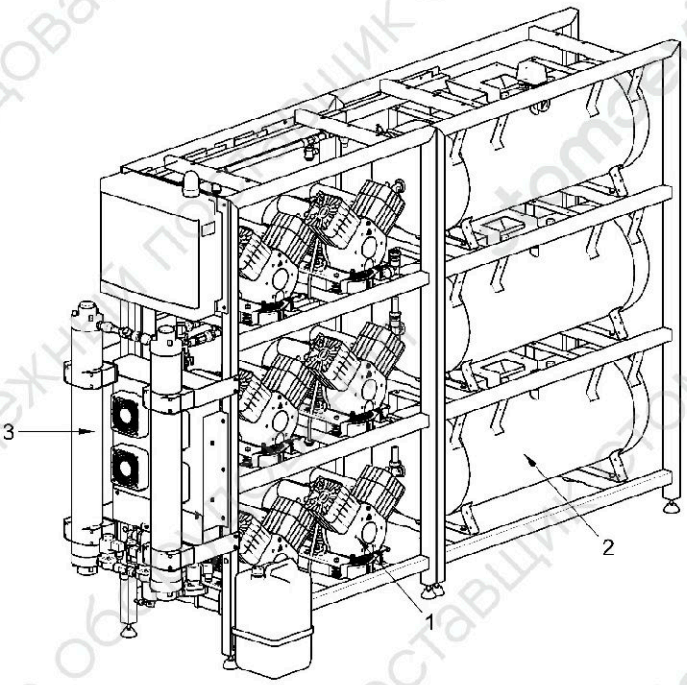


Fig. 1b DK50 6x2VT/M compressor



1. Compressor air pumps
2. Air tank
3. Dryer

8.2. Accessories

Every compressor may be added-on/extended directly by the manufacturer or by placing an order for air regulation and filtration accessories (specified in an order) at a later period of time.

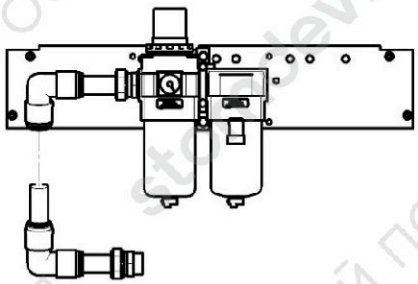
Accessories not included in the standard order must be ordered separately!

Accessories included with the product (filter/regulator, filter and micro filter) are mounted to the compressor frame using the bracket on the air outlet side, downstream of the drain/blow down valve on the air tanks.

8.2.1. Set of compressed air outlet filters

The compressor may be equipped with a set of filters, if specified. The set of filters may be equipped with a pressure regulator. Sets of filters are suitable accessories for all of the compressors specified above.

If a different level of air filtration is required, this specification must be agreed upon with the supplier and specified in the order.



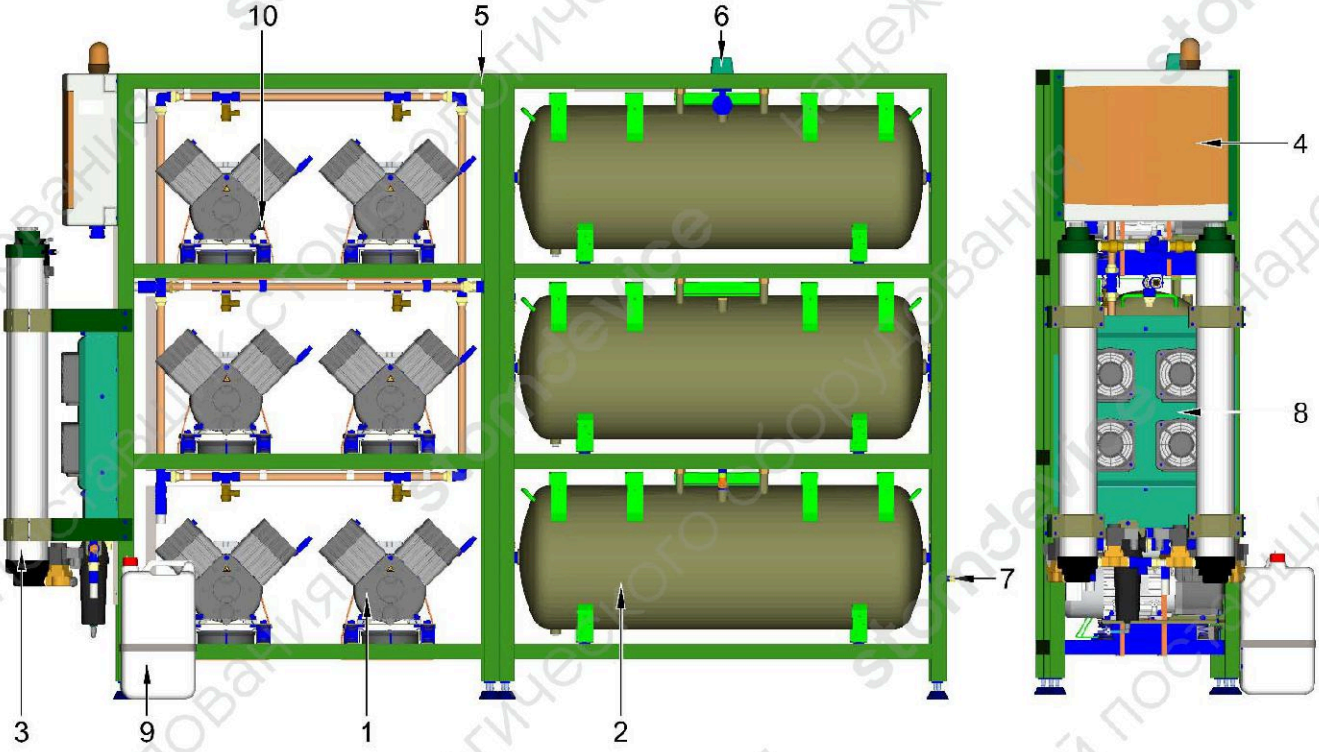
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	Level of filtration	Pressure regulator	Set component
SET OF FILTERS	5µm - 0,01µm	Yes	447000001-105
	5µm - 0,01µm		447000001-106
	5µm - 0,3µm		447000001-104

9. PRODUCT FUNCTIONALITY

(Fig. 2, Fig.3)
The compressor produces oil-free, dry, filtered compressed air to power pneumatic devices and equipment used in large dental clinics and laboratories, hospital wards, etc.
Compressor air pumps (1) draw in atmospheric air through the inlet filters and compress it through the check valves and into the compressed air system. From there, the compressed air proceeds to the cooler (8), in which the compressed air is cooled for the first time and condensate is produced. The air then passes through a water separator and into the dryer (3). This continues to lower the temperature of the air and produces more condensate. The temperature then rises to reduce the relative humidity. The clean, dry air then passes through a check valve and enters the air tank (2). Condensate from the water separator and the dryer is drained off into a vessel in the condensate drain kit (9). The dryer ensures the continuous and no-loss drying of the compressed air. The treated compressed air is then ready for additional use in the air tank.

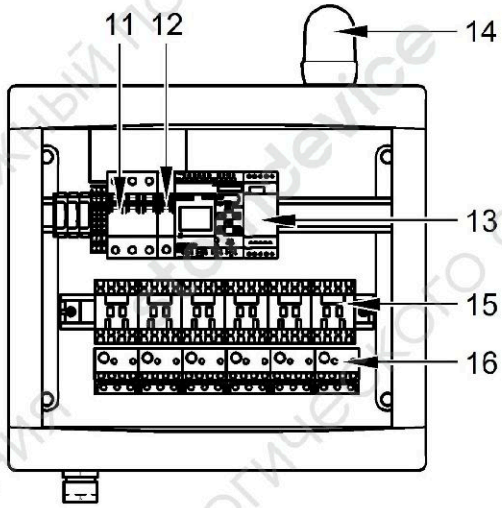
Fig. 2 Product functionality



1. Compressor air pumps
2. Air tanks
3. Adsorption dryer
4. Switchboard
5. Frame
6. Pressure switch
7. Outlet valve
8. Cooler
9. Condensate drain vessel
10. Temperature switches

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Fig. 3 Distribution box/switchboard



11. Three-pole circuit breaker
12. Single-pole circuit breaker
13. LOGO control electronics
14. Indicator
15. Thermal overcurrent relays

The range of the pressure switch on the configured assemblies may onlsy be adjusted after prior consultation with the manufacturer.

Adjusting the pressure setting of the safety valve is expressly prohibited!

The pressure relief valve automatically begins to vent air from the system if the pressure in the compressed air circuit exceeds its pre-set value. The pressure relief valve then closes as the pressure drops.

Pressure in the compressed air circuit can only increase because of an increase in flow resistance in the compressed air lines or as a result of a dryer malfunction (e.g. solenoid valve malfunction, an increase in flow resistance through the drying media, etc.), and therefore the repeated opening of the relief valve requires a dryer function check and repairs if necessary!

Consultation with the manufacturer is required before any adjustment is made to the relief valve!
The outlet openings on the relief valve may not be blocked and the egress of compressed air through them may not be restricted.

9.1. Adsorption dryer

Drying and air regeneration

Compressed air from the compressor units is cooled in a cooler and dried in the two-chamber adsorption M5 dryer in two cycles. Air filtration and drying occurs in the 1st chamber, while the regeneration of the drying media occurs in the 2nd chamber with the removal of condensed water. The regeneration uses a portion of the dry air from the 1st chamber. The order of activities in the chambers is reversed in the next cycle. The outlet valve on the regenerated chamber closes 5 seconds before the change in cycle to balance the pressure in the chambers. The cycle duration is 50 seconds.
Regeneration uses ~15% of compressor output, which reduces its overall output to the compressed air system.
Use the manual valve (Fig. 4) located on the right dryer chamber to vent off pressure for dryer maintenance.

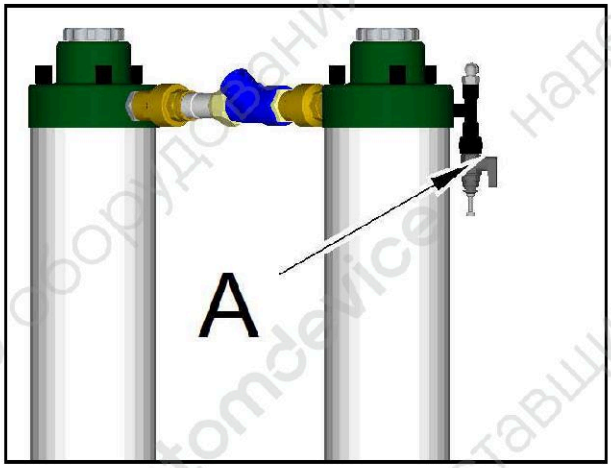
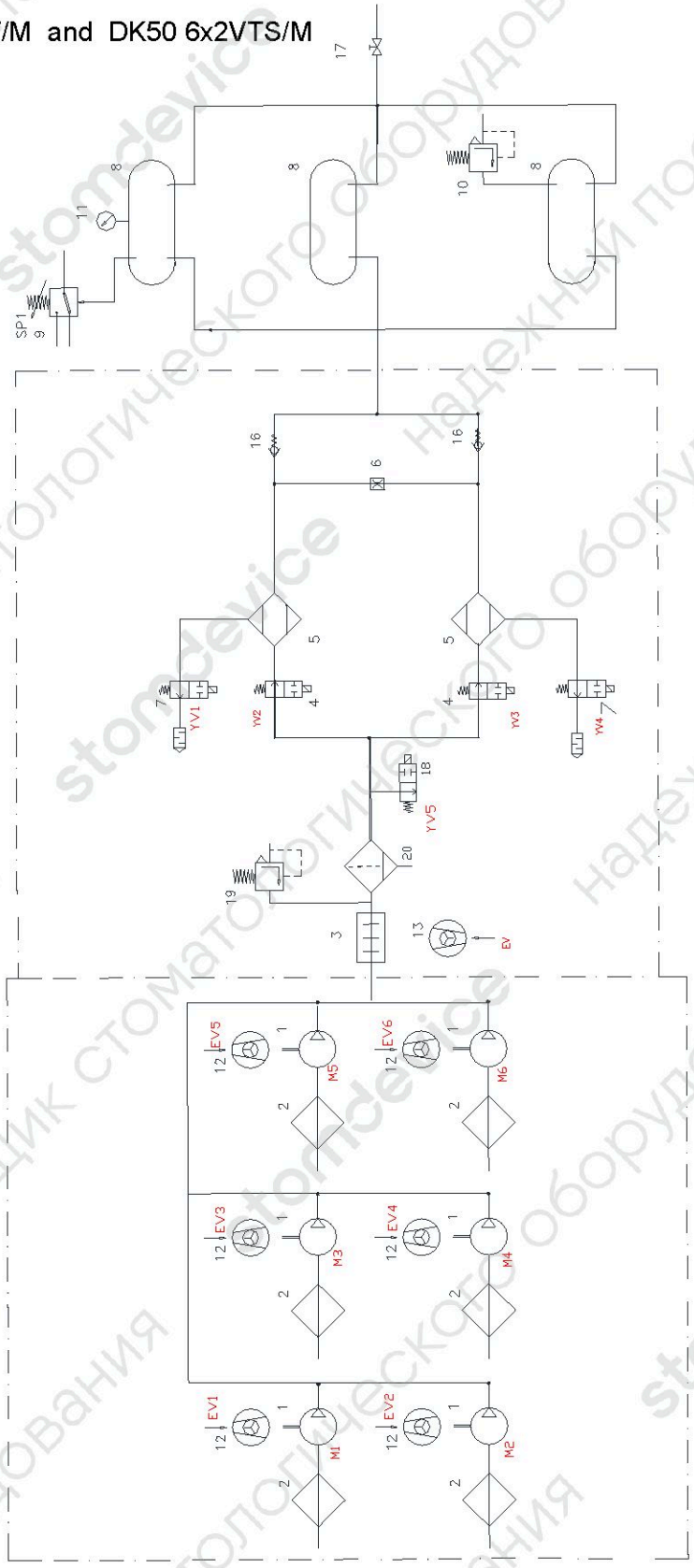


Fig. 4

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10. PNEUMATIC DIAGRAM

DK50 4x2VT/M and DK50 6x2VTS/M



1. Air pumps
2. Inlet filter
3. Cooler
4. Inlet solenoid valve
5. Adsorption dryer
6. Jet
7. Outlet solenoid valve
8. Air tank
9. Pressure switch
10. Safety valve
11. Pressure gauge
12. Compressor fan
13. Dryer fan
14.
15.
16. Check valve
17. Outlet valve
18. Solenoid valve
19. Pressure relief valve
20. Condensate separator

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INSTALLATION

11. CONDITIONS FOR USE

The compressor may only be installed and operated in dry, well-ventilated and dust-free areas.

The compressor must be installed so that it is accessible at all times for operating and maintenance. Please ensure that the nameplate on the device is readily accessible.

The compressor must stand on a flat, sufficiently stable base (be aware of the weight of the compressor, see Technical Data).

The compressor on the operator's side must be at least 50 mm from the wall to allow air flow for cooling purposes and to ensure the safety of the operator and maintenance personnel.

⚠ Operating the equipment in areas in which flammable mixtures may be present, such as in operating rooms, coal storage areas, etc., is prohibited. Flammable materials pose an explosion hazard.

⚠ **Ensure the power cords and air hoses are not damaged. The power cord may not show signs of stress and must be kept without tension (putting any objects on it is prohibited) and subjecting the cord to external heat in any form is prohibited.**

Environmental requirements:

Temperature:	*+5°C to +40°C,*
Max. relative humidity:	*70%,*
Max. absolute humidity:	*15 g/m^3.*

Approximately 70% of the electrical energy used by the compressor air pumps is converted to heat, and therefore the rooms in which the compressor is installed must have additional ventilation to provide sufficient air exchange for cooling purposes (see the Technical Data)

⚠ **Caution! Hot surface!** Portions of the compressor may be hot and reach hazardous temperatures during compressor operations that may harm materials or operating staff.

Fire hazard!

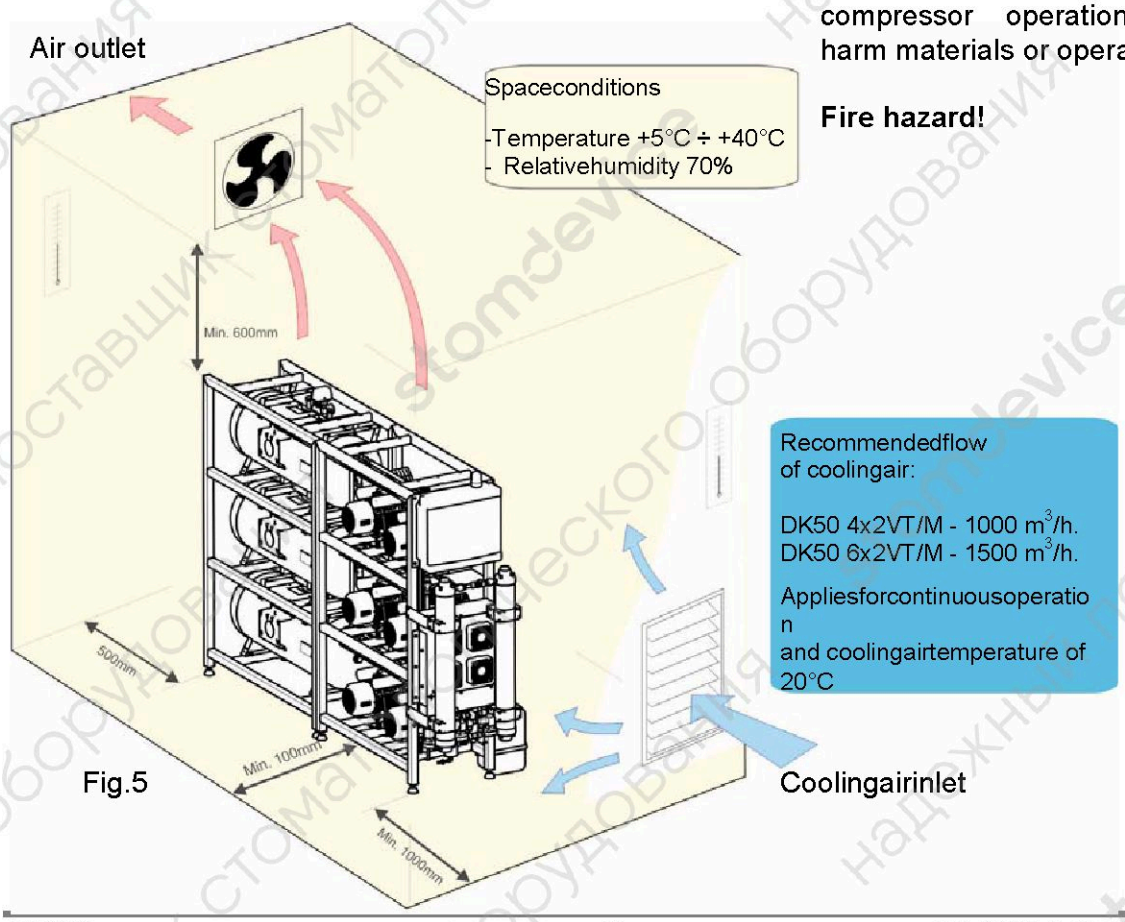


Fig.5

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12. PLACEMENT OF THE COMPRESSOR

Only a trained and qualified technician may install the product.

Remove the compressor from the packaging and remove the transport anchors from the pallet. Position the compressor at the site of installation.

12.1. Handling

Use a fork lift truck or similar hoisting equipment to handle and position the product.

Position the compressor at the site of installation. (Fig.6)

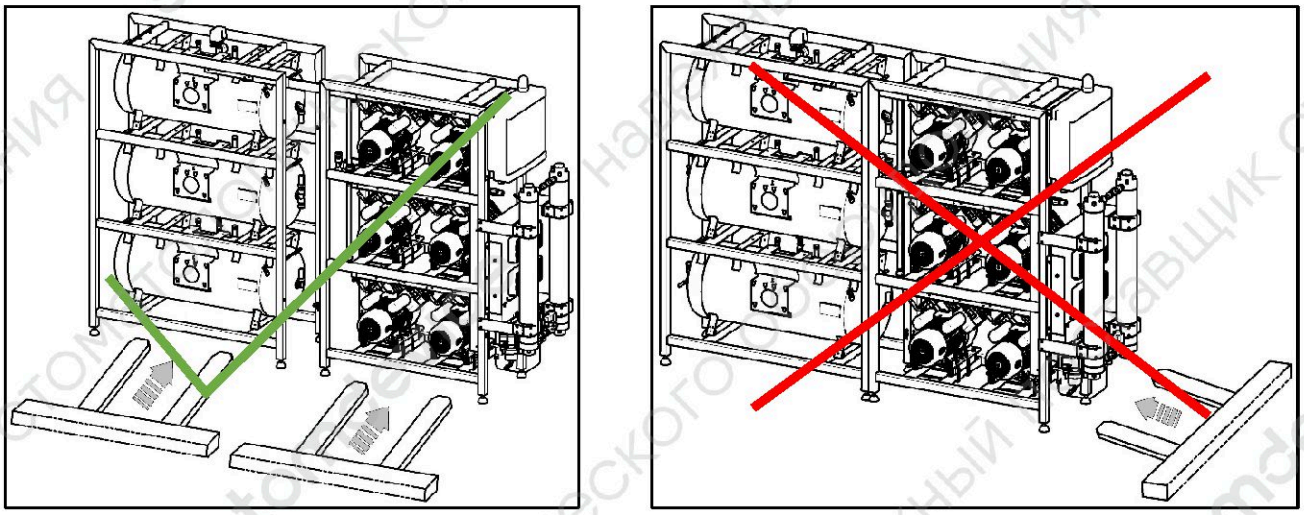


Fig.6

Level the compressor. (Fig.7)

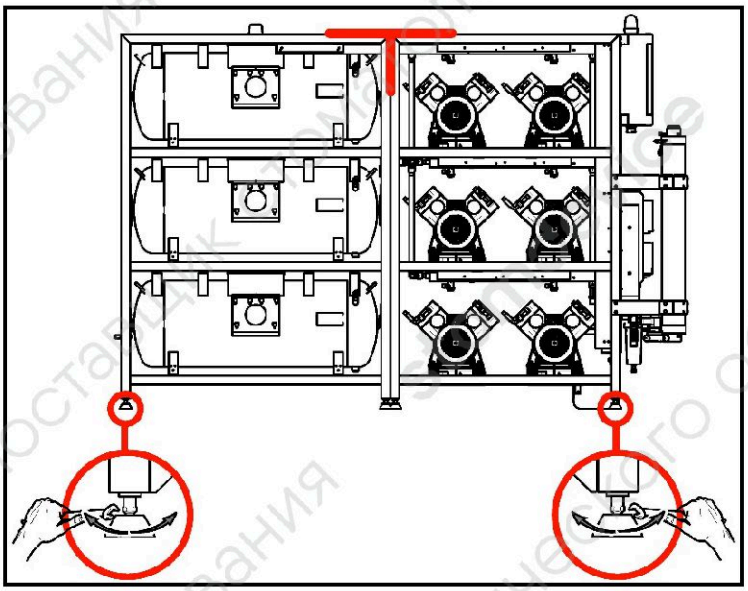


Fig.7

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Install the frame **(B)**. (Fig. 8)



Fig.8

Remove all devices used to secure the air pumps (X, Y and Z) only once the compressor set has been positioned and leveled at the site of final installation!

Releasing the air pumps
DK50 4x2VT/M - 8 mounts
DK50 6x2VT/M - 12 mounts

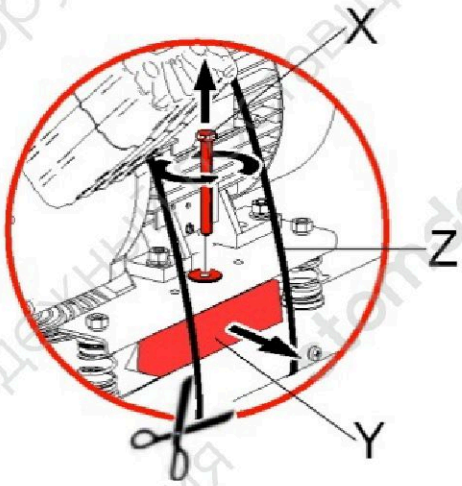


Fig.9

13. PNEUMATIC CONNECTIONS

(Fig.10)
Connect the compressed air lines at **(C)** and connect the equipment to the compressed air system from the G3/4" threaded outlet ball valve (Fig.10).

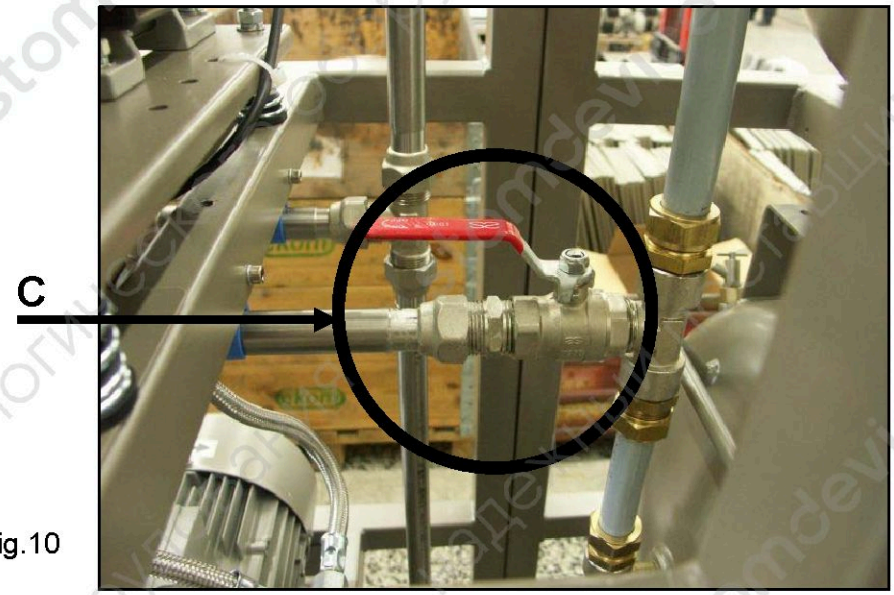


Fig.10

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Connect the hoses from the water separator and the condensate drain from the dryer to the connectors at the canister valves (Fig.11).

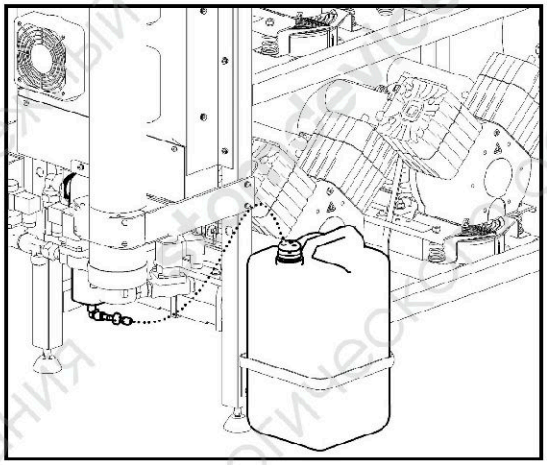


Fig.11

A G3/4" threaded ball valve is installed on the compressed air outlet from the air tank (Fig.12)

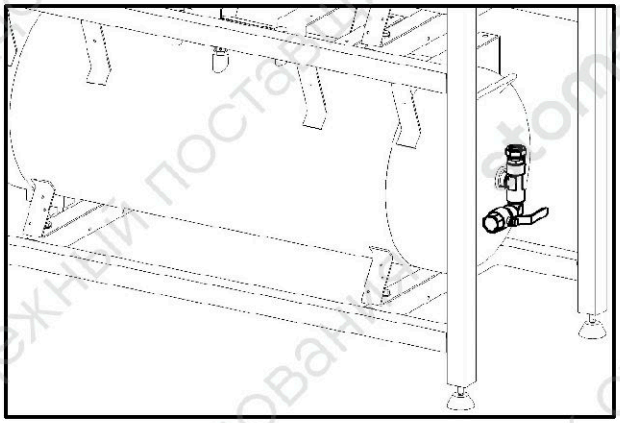


Fig.12

14. ELECTRICAL CONNECTIONS

Only a qualified electrician may install electrical components!

The operator is obliged to provide circuit protection for the equipment per the specifications in valid technical standards

The product is delivered without a power cord.

Cord type (minimum requirements) H05 VV-F_ 5G10

Connect the disconnected PE protective conductors and then the grounding wire after connecting **(D)**. (Fig.13)

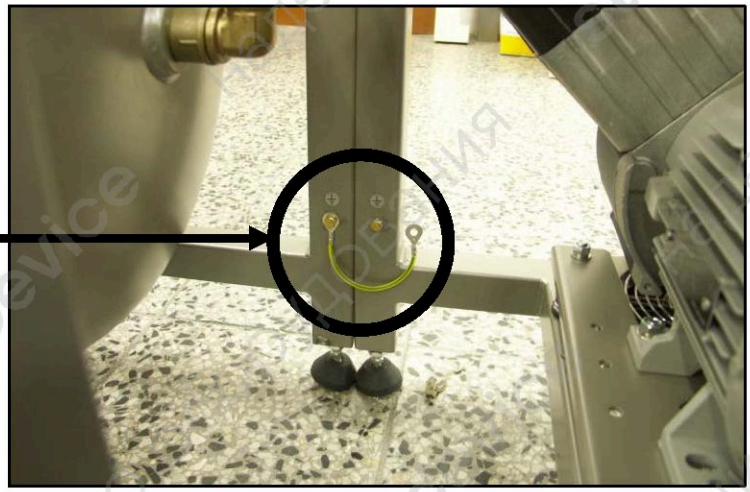


Fig.13

Connect the disconnected electrical cables **(E)** to the terminal strips in the electric motor boxes. Insert the cables into the electrical installation trays and enclose with a cover. (Fig.14)

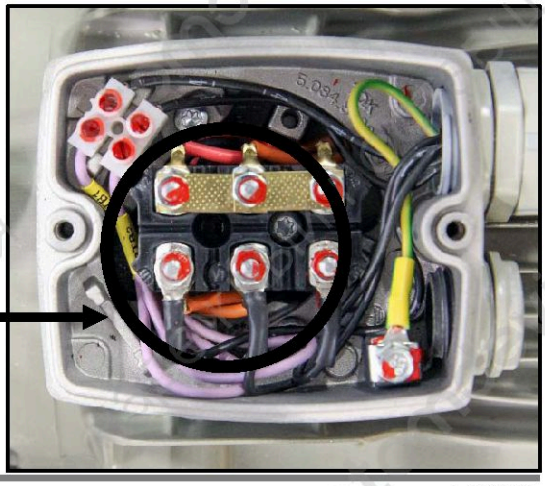


Fig.14

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Connect the loose cord to the pressure switch per the schematic, tighten the screws and secure with paint. Connect the TN-S mains to the power supply terminal in the equipment's junction box **(F)**. Connect the electrical components to the mains in accordance with the valid electrical standards and regional regulations. (Fig.15)

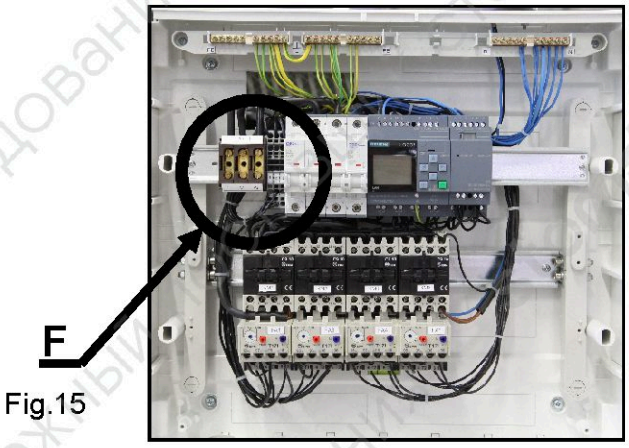


Fig.15

OBSLUHA

IN CASE OF EMERGENCY, DISCONNECT THE COMPRESSOR FROM THE MAINS (TURN OFF THE MAIN CIRCUIT BREAKER).

THE COMPRESSOR AIR PUMP HAS HOT SURFACES. BURNS MAY RESULT IF CONTACT IS MADE.

Automatic start: when pressure in the pressure tank decreases below the switch-on pressure, the compressor automatically switches on. The compressor automatically switches off when pressure in the air tank reaches the switch-off pressure.

15. COMMISSIONING

- Make sure all transport stabilizers were removed.
- Check that all compressed air hose connections are correct.
- Check to ensure the power cord is properly connected to the mains.
- Check to ensure the outlet valve is in the OFF position.

16. SWITCHING THE COMPRESSOR ON

(Fig. 2, Fig. 3)
After the pressure switch (6) is activated and circuit breakers FA13 (11) and FA14 (12) are turned to position I, the compressor air pumps sequentially come online (the air pumps in the second column or shelf react with a 2 s delay). Circuit breaker FA13 (11) functions as the main switch.
The air pumps switch on (at ≤6 bar) and off (at ≥8 bar) automatically and are controlled by the LOGO! (13) controller and the pressure switch (6) based on compressed air usage.
If the motor surface temperature exceeds 40°C, the temperature switches (10) automatically turn on the compressor cooling fans, switching them off once the temperature decreases to approximately 32°C.

16.1. LOGO! controller!

This controller controls the compressors and dryer valves, monitors and signals alarms (as described below) and displays the number of operating hours. It is composed of a base module and an expansion module. The base module includes a display and the cursor (control) buttons ▲, ▼, ►, ◄, OK and ESC. The expansion module has LED indicators for RUN and STOP.
The parameters of this unit do not require configuration or set up under normal circumstances. The LED indicator on the expansion module should be green once the equipment is connected to its power source

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and the display should show the current operating hours.

```
Operating
hour counter
          0 hours
```

The displayed hours are only illustrative.

Proceed in accordance with Chapter 18 if the indicator is not green.

If the operating hours are not shown, the compressor may have been disconnected from the power for an extended period of time and it must be restarted.

The controller is unable to archive time and data if it is disconnected from the power for more than 80 hours. This data must be configured when the equipment is first placed into service or after an extended period in which it has been placed out of service.

The display shows the main menu.

```
>Program
Card..
Setup..
 Start
```

- press▲ or ▼ to move the ">" cursor on the display to **Setup..** and press **OK** to confirm

The display shows the main menu

```
>Clock..
LCD..
 Menu lang
```

press▲ or ▼ to move the ">" cursor on the display to **Clock..** and press **OK** to confirm

A menu appears

```
>Set Clock..
 S/W time
 Sync
```

- press▲ or ▼ to move the ">" cursor on the display to **Set Clock..** and press **OK** to confirm

A menu appears

```
Set Clock
Su 00:00
YYYY-MM-DD
2003-01-01
```

- press ▲ or ▼ to select the day of the week
- press ► or ◄ to move the cursor to the next position
- press ▲ or ▼ to set the desired value
- repeat the previous two steps to set the date and time
- confirm by pressing **OK**

The following appears:

```
>Set Clock..
 S/W time
 Sync
```

Press **ESC** on the controller repeatedly until the main menu appears.

```
>Program
Card..
Setup..
 Start
```

Start the controller program as follows:

- press▲ or ▼ to move the ">" cursor on the display to **Start** and press **OK** to confirm

Never press OK if the cursor ">" is at Program! This menu provides access to windows with software functional blocks. Changes to the parameters in these blocks have a direct effect on the functionality of the equipment!

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15.1.1 Alarms and alarm signaling

The equipment automatically checks the functionality of specific parts of the equipment and indicates when maintenance service is needed. The controller determines an alarm as any situation in which the equipment functionality does not match the standard conditions.

The individual alarms are indicated by an alarm signal indicated by an activated HA beacon (10), with one or more alarm messages on the controller's display.

Alarms are classified based on their severity into

- **low priority alarms** – signal a maintenance interval I = n x 2000 hours (n = 1, 2, 3, ..) and the equipment **supplies** air to the central compressed air system using all air pumps; this status is indicated by an activated HA beacon and a message on the display.

- **medium priority alarm** – triggered by a malfunction in one or more air pumps and the equipment **supplies** air to the central compressed air system using only functional air pumps; this status is indicated by a flashing HA beacon and message on the display.

The equipment has an intelligent alarm system that generates an alarm signal based on its priority (medium priority alarms have a higher priority than low priority alarms).

15.1.2 Low priority alarm conditions

The equipment is equipped to monitor and signal maintenance intervals. Maintenance intervals are whole number multiples of 2000 operating hours I = n x 2000 hours (n = 1, 2, 3, etc.). The maintenance of specific components pursuant to the attached Table 2 must be performed once a maintenance interval is passed. This condition is indicated by an activated yellow HA beacon and an information message on the display.

MAINTENANCE TIME **CALL SERVICE**	**Press & hold Esc + ▼ 3 sec. for interval reset**

Maintenance intervals are counted from the moment the equipment is first started up.

This table must be inserted into the compressor maintenance log along with Table 3 in which maintenance work, inspections of the equipment during each maintenance interval and other records regarding the equipment will be recorded.

This signal from the controller must be cancelled once the maintenance work related to a service interval signal is completed by pressing and holding ESC and ▼ for 3 seconds. Cancelling this signal also resets the maintenance interval to a value of 2000.

15.1.3 Medium priority alarm conditions

The equipment is equipped to monitor and signal compressor malfunctions. Such a situation may occur for mechanical or electrical reasons in any of the compressors. This is frequently accompanied by an increase in the current draw. This trips the thermal over current protection in the FA device for the respective air pump or air pumps (the blue button is in position M and the yellow off indicator is not pressed).
Such alarm is signaled by a flashing HA beacon –P1 and an the following message appears on the display:

MOTOR FAILURE CALL SERVICE!	**Press & hold Esc + ▲ 3 sec. for alarm reset**

The beacon will continue to flash after the air pump malfunction is remedied. Turn off the alarm by pressing and holding ESC and ▲together for 3 seconds.
The flashing beacon function and alarm may be turned off during maintenance work by pressing and holding ESC and ▲together for 3 seconds. Malfunctions are temporarily

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indicated by a flashing display on the controller and the subsequent message

If display is flashing then motor failure still	remains! Check motors or relays FA

This message automatically disappears once the malfunction on the air pump is remedied and it is placed back into service.

Alarm signals have priority over maintenance interval signals. As such, the light will indicate an alarm from any of the air pumps. One the alarm is over, the service interval is indicated by the activated HA beacon.

17. COMPRESSOR SHUT-DOWN

Turn off the controller program for maintenance or other reasons that require the controller be shut down.

Repeatedly press ▼ until the display shows the current date and time

Su 12:00 2008-01-01

Press **ESC** to show the following menu

>Stop Set Param Set.. Prg Name

Use Set..to set the current time.

- Press▲ or ▼ to move the ">" cursor on the display to **Stop** and press **OK** to confirm

Never press OK if the cursor ">" is at Set Param! Switching to this menu opens windows with software functional blocks. Changes to the parameters in these blocks have a direct effect on the functionality of the equipment!

You will be asked if you really want to quit the program

Stop Prg >No Yes

- Press▲ or ▼ to move the ">" cursor on the display to **Yes** and press **OK** to confirm

Now turn off circuit breakers FA13 and FA14. Vent the air tanks by disconnecting from the central compressed air circuit and opening the outlet valve (Fig. 2) or the drain valves.

MAINTENANCE

18. DEVICE MAINTENANCE

Warning!

The operator shall ensure completion of repeated testing of the device at least once every 24 months (EN 62353) or at intervals defined by applicable national legal regulations. A record of these test results shall be completed (e.g. per EN 62353, Annex G) together with the measurement methods.

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The device has been designed and manufactured to keep maintenance to a minimum. The following work must be performed to retain the proper and reliable operation of the compressor.

Before starting compressor maintenance work, it is necessary to check it the compressor can be disconnected from the device to ensure that the person using the device is not at risk of health damage and there is no risk of any other material damages!

Air pump components (head, cylinder, pressure hose, etc.) are very hot during and shortly after compressor operation – do not touch these components!

Repair work beyond normal maintenance may only be performed by qualified personnel or the manufacturer's representative.
Only use manufacturer-approved spare parts and accessories.

WEAR EYE PROTECTION AND USE SAFETY GLASSES WHEN VENTING COMPRESSED AIR FROM THE COMPRESSED AIR CIRCUIT (AIR TANK).

The work below may only be performed by trained personnel as follows:

TURN OFF THE CIRCUIT BREAKERS AT THE SWITCHBOARD BEFORE STARTING ANY SUBSEQUENT MAINTENANCE WORK.

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18.1. Maintenance intervals

Maintenance intervals apply to equipment with a max. operating pressure of up to 8 bar!

Tab.3

Time interval	Once a day	Once a week	Once a year	Once every 2 years	2000	4000	6000	8000	10000	12000	16000	Chapter	Set of replacement parts	Performed by
Product function check	x											18.2		user
Check compressor fans operation		x										Visual check of rotation during air pump operation		user
Equipment inspection					x	x	x	x	x	x		18.3		qualified technician
Replace float in separator						x		x		x		18. 7.	025200146-000	qualified technician
Check compressor fans operation					x	x	x	x	x	x		Visual check of rotation during air pump operation		qualified technician
Compressor fan replacement										x			035300016-000	qualified technician
Filter element replacement (if included in product)														qualified technician
Inspection of electrical connections					x	x	x	x	x	x		18. 4.	-	qualified technician
Check operation of check valves						x		x		x		18.12.		qualified technician
Check the function of the pressure switch					x	x	x	x	x	x		18.13.		qualified technician

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Time interval	Once a day	Once a week	Once a year	Once every 2 years	2000	4000	6000	8000	10000	12000	16000	Chapter	Set of replacement parts	Performed by
Relief valve check					x	x	x	x	x	x		18.		qualified technician
Replace piston group with bearing								x			x		604013708-000	qualified technician
Checking the operation of temperature sensor switching					x	x	x	x	x	x		18.12.		qualified technician
Check safety valve operation			x			x		x		x		18. 6.		qualified technician
Check solenoid valve operation						x		x		x		18.11.		qualified technician
Air pump intake filter replacement					x	x	x	x	x	x		18.5	604031761-X00	qualified technician
Compressor performance check					x	x	x	x	x	x		18.9		qualified technician
Conduct the “Repeated test” per EN 62353				x								18.		qualified technician
Check pneumatic connections for leaks					x	x	x	x	x	x		18.3	-	qualified technician

)*data is presented in hours; if not possible, then the data is considered in years

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18.2. Functionality check

- Check air pump operation – the air pumps should be operating normally without excessive vibration or noise. Troubleshoot any problem or call in service personnel if trouble is detected.
- Check fan operation (visually) – the fans must be running as determined by air pump activity. Troubleshoot any problem or call in service personnel if trouble is detected
- Check to ensure the power cord, the cable for the pressure sensor on the air tank and the connecting compressed air hoses are undamaged. Replace damaged components or call in service personnel.
- Check the ambient temperature at the display – the ambient temperature must be below the temperature limit (40°C). Cool the space if the temperature is high.
- Check for alarm conditions on the display – troubleshoot and remedy all alarms.

18.3. Check the compressed air connections for leaks and inspect the equipment

Leak testing:

- Check the compressed air lines for leaks during operation – pressure supplied by the compressor.
- Use a leak analyzer or soapy water to check all joints and connections for leaks. Tightenor reseal the connection where leaks are found.

Inspecting the equipment:

- Check the compressor air pumps for normal operation and noise levels.
- Fan operation check – the fans must be running during the defined compressor work cycles.
- Check the filter condition – clean dirty filters or replace with new filters.
- Call in service personnel if a malfunction is suspected.

18.4. Inspection of electrical connections

Inspect the product's electrical connections when the mains are disconnected!

Inspection

- Check the mechanical operation of main circuit breaker FA13.
- Check the power cord, conductors connected to the X1 terminal strip and the main circuit breaker FA13 to ensure they are undamaged. Inspect to ensure the connection terminals are properly supported to relieve tension.
- Check to ensure all threaded conductor terminals are tight (on motor circuit breakers FA1-6, contactors KM1-6, etc.). Tighten all loose terminals with a screwdriver.
- Visually inspect the connection of individual cables to the terminal strip X1 (spring clips) and the LOGO! control system (screw terminals).
- Inspect all screw terminals for the protective green and yellow PE grounding conductors in the switchboard, the motor section, the cooling unit and the pressure vessel. Tighten any loose terminals.

18.5. Air pumpintake filter replacement (Fig. 15)

The filters located in the compressor air pump enclosure cover must be replaced at defined intervals.

Inlet filter replacement:
- Pull out the rubber plug by hand (2).
- Remove the used filter (1).
- Insert a new filter and replace the rubber plug.

Pre-filter replacement:
- Pull out the pre-filter by hand (3).
- Replace the element and re-insert.

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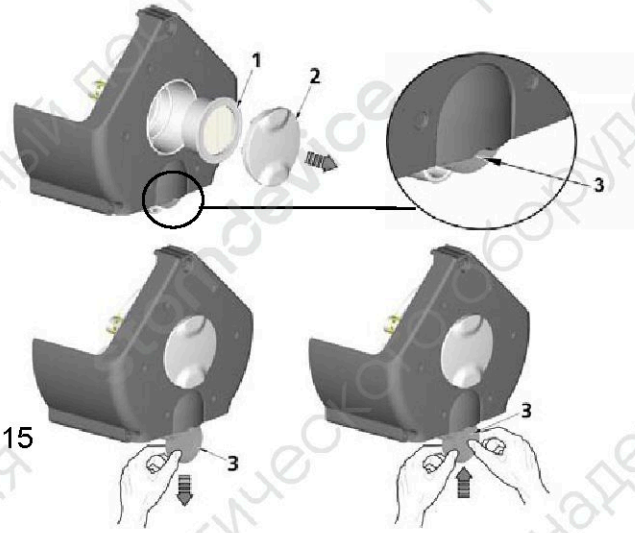


Fig.15

18.6. Check the safety valve operation (Fig. 16)

Never use the safety valve to release the air pressure in the air tank. It could damage the safety valve. The valve is set to the maximum permitted pressure by the manufacturer. Adjustments are not permitted!

Warning! Compressed air can be dangerous. Wear eye protection, i.e. safety glasses, when venting any air.

- Rotate the screw on the safety valve to the left a number of turns until the valve vents itself.
- Let the safety valve vent for only a few seconds.
- Rotate the screw back to the right (clockwise) to the stop and ensure that the valve is closed.

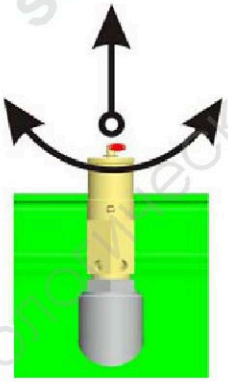


Fig.16

18.7. Float replacement

BEFORE PROCEEDING, VENT THE AIR TANK TO ZERO PRESSURE AND DISCONNECT THE EQUIPMENT FROM THE ELECTRICAL MAINS.

(Fig. 17)
Replace the float in the water separator at the defined interval.

A) Check to ensure that all pressure has been vented from the segment with the water separator.
B) Disassemble the separator vessel.
C) Remove the condensate separator.
D) Release the float nut on the bottom of the vessel.
E) Remove the worn separator float and replace with a new float.
F) Secure the float with the nut on the bottom of the vessel.
G) Reinsert the condensate separator as illustrated.
H) Reinsert the separator vessel and screw in place.
I) The vessel is locked in the position indicated by the symbol.

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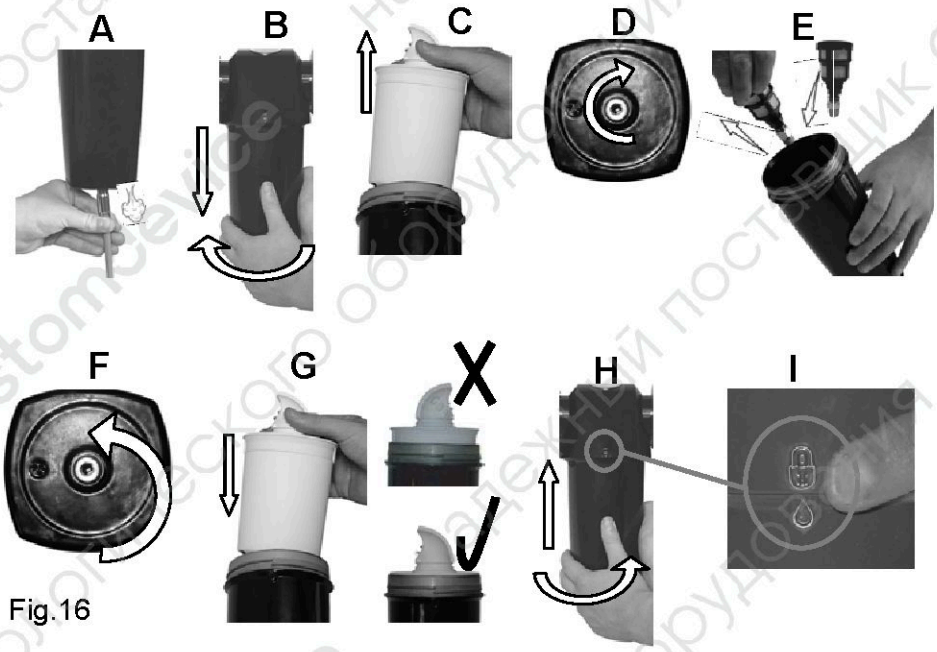


Fig.16

18.8. Replacement of the filter in the dryer

(Fig.18)

BEFORE PROCEEDING, VENT THE AIR TANK TO ZERO PRESSURE AND DISCONNECT THE EQUIPMENT FROM THE ELECTRICAL MAINS.

The dryer filter in the upper section must be replaced during regular dryer operation or when eliminating a fault caused by contamination.

- Remove the dryer plug (1) by unscrewing to the left from the dryer head (4).
- Replace the filter (2) and then clean the screen (3).
- After removing the screen, check and replace the desiccant in the dryer.
- Refit the dryer plug to the dryer head (4) and tighten it to the right.

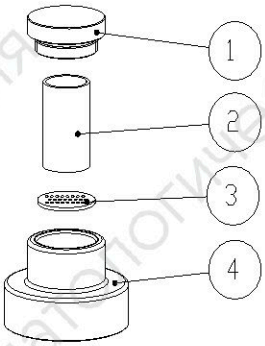


Fig. 18

18.9. Filter element replacement

(if included with the product) (Fig. 19)

Before proceeding, vent the air tank to zero pressure and disconnect the equipment from the electrical mains.

- Release the catch on the filter vessel by pulling down.
- Rotate the filter housing to the left and remove it.
- Rotate the filter bracket to the left and remove it.
- Replace the filter, install the new filter and secure with the filter bracket by turning it to the right.
- Then install the filter housing and secure by turning it to the right and locking with the catch.

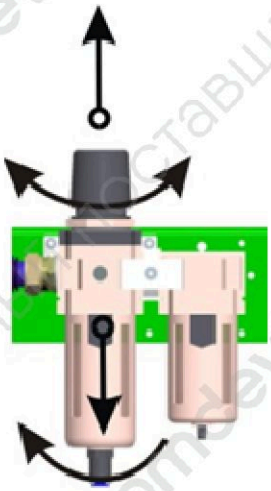


Fig.19

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18.10. Outlet pressure adjustment using the pressure regulator

(if included with the product) (Fig. 19)

Adjustments must be made when the air tanks are full and the compressors are shut down (e.g. immediately after the pressure switch has switched off the compressors).

Lift up the regulator control knob and rotate to set the compressor outlet pressure. Set the outlet pressure at 0.2 bar higher than is required (this is because of the design of the regulator itself) to operate the compressor.
Press the control knob on the regulator down to prevent accidental rotation upon impact

18.11. Compressor performance check

- Turn off the compressor using the STOP button
- Vent the air pressure in the air tank to zero
- Turn on the compressor using the START button
- Measure the time to fill the air tank from 0 to 7 bar
- The measured value must be less than the data provided in the “Technical Data” table

18.12. Check the operation of the check valves

Compressed air line:
Check for the proper operation of all check valves in the compressed air line and the disconnection of pressure hoses from air pumps.

One air pump must be running at all times, while the others may be shut off using the current protection device in the switchboard. No compressed air may leak from the check valves.

Air tank:
Check for proper operation of the check valve on the air tank by disconnecting the pressure hose from the valve.

Check the check valve operation once the air tank has come up to pressure and with the compressor off. No compressed air may leak.

18.13. Check the solenoid valve operation

(Fig.20)
A magnetic indicator is used to perform this test as follows: it is attached to the valve coil and if the motors are active at the valve coil, the indicator must rotate and if they are out of service, the indicator must not rotate.

18.14. Check the function of the pressure switch

Every pressure switch has a defined hysteresis of ~2 bar. Functionality is checked visually. If the air pumps reach the upper limit, the pressure switch must disconnect the motors from the power. The process is reversed and the motors started at the low pressure limit.



Fig.20

TROUBLESHOOTING AND REMEDYING PROBLEMS

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19. SOLVING COMMON PROBLEMS

Caution! Disconnect the equipment from the mains before starting work!

Troubleshooting may only be performed by trained service personnel!

Adjusting the pressure setting of the safety valve is expressly prohibited!

Pressure relief valve (PRV)

The pressure relief valve automatically begins to vent air from the system if the pressure in the compressed air circuit exceeds its pre-set value. The pressure relief valve then closes as the pressure drops.

The pressure in the compressed air circuit can only increase because of an increase in flow resistance in the compressed air lines or as a result of a dryer malfunction (e.g. solenoid valve malfunction), and therefore the repeated opening of the relief valve requires a dryer function check and repairs if necessary!

Consultation with the manufacturer is required before any adjustment is made to the relief valve!
The outlet openings on the relief valve may not be blocked and the egress of compressed air through them may not be restricted.

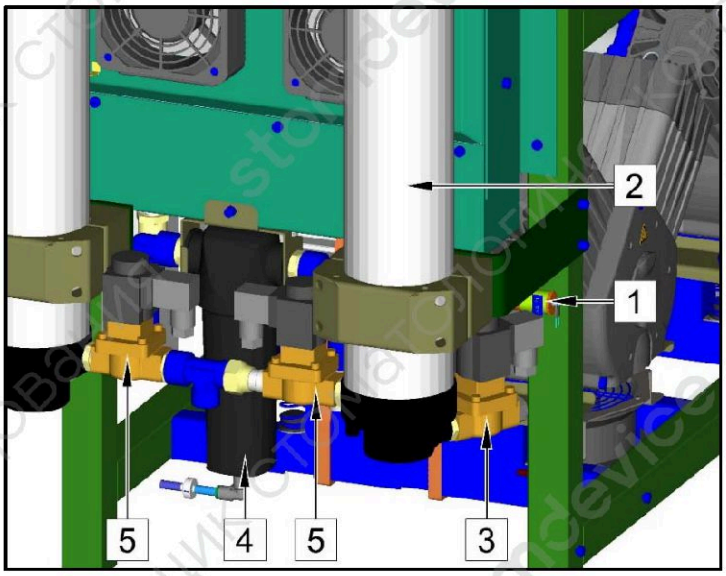


Fig. 21

1. Pressure relief valve
2. Dryer
3. Outlet solenoid valve
4. Condensate separator
5. Inlet solenoid valve

Tab.4

MALFUNCTION	POSSIBLE CAUSE	REMEDY

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No compressor air pump starts up	Problem with electrical power source	Main breaker is off
	Power loss	Check mains voltage
		Loose terminal in switchboard – tighten
		Check the primary power connection – replace if damaged
	Pressure switch does not switch on	Check terminals and operation of the pressure switch - replace if damaged
Any of the compressor air pumps does not start up (indicator is on)	Loss of power to motor	Check mains voltage
		Check the function of the contactor, and thermal relays – replace if damaged
		Loose terminals at the motor terminal strip – tighten or replace if damaged or broken
	Damaged motor winding, damaged thermal protection	Replace the motor
	Seized up piston or other moving component (mechanical damage to a moving part)	Replace damaged parts
	Controller malfunction	Check controller operation, check to ensure software is present – replace if damaged or upload the correct program
RUN/STOP indicator is not green	Loss of connection between controller and expansion module	Check connection – replace if damaged
	Power loss	Check mains voltage
		Loose terminal in switchboard – tighten
		Check the primary power connection – replace if damaged
	Problem with electrical power source	Main breaker is off
	Controller or expansion module malfunction	Replace failed controller or expansion module
Compressor air pumps switch on often, even without demand for air	Air leak in compressed air distribution system	Check compressed air distribution system – seal loose joints
	Leaky check valves	Test check vales and clean, or replace if damaged
	Leak through solenoid valves once regeneration is complete	Clean or replace as needed
	Leak at pressure sensor and safety valve	Test their function and clean, or replace if damaged
Output of certain compressor air pumps is reduced, extended run cycle	Compressor – air pump leaking	Check connections on the air pump for leaks – tighten leaking connections
	Worn piston rings	Replace worn piston rings
	Gasket between cylinder head and valve plate damaged	Replace gasket, tighten
	Inlet filter is plugged	Replace old filter with a new filter
One of the compressor air pumps is noisy (knocking, metal noises)	Damaged piston bearing, piston rod, motor bearing	Replace damaged bearing
	Failed (cracked) rubber mount spring	Replace damaged spring with new spring
High ambient temperature causes compressors to	Lack of ventilation in compressor room	Secure suitable ambient conditions
	Compressor air pump cooling fans	Defective fans – replace

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switch off in vertical stacks (overheating)	or cooler not running	Defective temperature switch – replace
Drying unit is not drying	Low operating pressure	Reduce air usage, check for source efficiency, leaks at joints, attached appliances and the adjustment of the pressure switch
	Solenoid valve not working	Repair or replace valve
	Air regeneration jet plugged/incorrect	Clean the jet or use the properly sized jet (e/g/ after reducing the number of air pumps on a shelf or in an expanded compressor with additional air pumps located on shelving)
	Cooling fan not working	Replace the fan
	Defective fan timer switch	Check electrical connections and valve switching times per the electrical schematics
	White liquid leaking from chamber	Replace drying media in the dryer and lower panel filter
		Seal and check for leaks (while operating at pressure)
	Dirty filters in the dryer	Replace inlet and outlet filters in the chamber or desiccant media if it disintegrates or is very dusty
Drying unit is noisy or emits an abnormal noise	Defective solenoid valve	Replace the valve
	Damaged spring damper on condensate tank	Replace damper or tank
	Damaged pressure hose	Replace pressure hose

Once a fault is cleared and after reassembling the dryer, the condensate must be drained from the air tank, then dry the air tank, and the dryer must be regenerated, best when using continuous compressor operation at a pressure of around 7.0 bar for a period of at least 1 hour. Then, check the dryness of the compressed air.

20. REPAIR SERVICE

Guaranteed and post-guarantee repairs must be done by the manufacturer, its authorized representative, or service personnel approved by the supplier.

The manufacturer reserves the right to make changes to the device without notice. Any changes made will not affect the functional properties of the device.

21. DISPOSAL OF THE DEVICE

- Disconnect the device from the mains.
- Release air pressure in the pressure tank by opening the drain valve (7) (Fig. 2).
- Dispose of the device following all applicable environmental regulations.
- Entrust a specialised company to sort and dispose of waste.
- Worn out components have no negative environmental impact

22. INSTALLATION RECORD

https://stomdevice.ru - стоматологическое и зуботехническое оборудование с доставкой по России и СНГ

1. Product: (model) **DK50 4x2VT/M** **DK50 6x2VT/M**			**2. Serial number**:		
3.1. User's name:					
3.2. Address of installation:					
4. Equipment connected to the compressor:					
5. Installation / Commissioning:			**6. Contents of operator training:**		
A. Product completeness check **	Y	N	A. Description of the product and functions**	Y	N
B. Documentation completeness check **	Y	N	B. Product operation: turning on/off, controls, control procedures, data on the display panel, alarms, operation in alarm conditions**	Y	N
C. Installation/connection to equipment **	Y	N	C. Product maintenance: maintenance intervals, maintenance procedure, service intervals, operating activities**	Y	N
D. Functional test **	Y	N	D. Safety measures, warnings – their meaning and compliance **	Y	N
Notes::					
7. Operator instructed on safety measures, operations and maintenance:					
Name :			Signature:		
Name:			Signature:		
Name :			Signature:		
8. Installation and instruction performed by – First name/Last name			Signature:		
Company:			Address:		
Phone:					
Email:			Date:		
9. Distributor:					
Company:			Address:		
Contact person:					
Phone:			Email: :		

** mark with an "X" in points 5 and 6 (Y - yes /N - no). Enter any observations from points 5 and 6 into the "Notes" section"

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