

RTI INSTRUCTION AND OPERATING MANUAL

RTI Compressor unit with electric motor
SiloKing 1100 LS



(These pictures are only examples)

Preface

Carefully read these instructions and the compressor instruction before setting up and going into operation. These manuals contain essential information that must be read to ensure interference-free operation and to achieve longevity.

Repairs, maintenance or conversion work shall only be carried out by authorised, trained and qualified personnel that are familiar with the current safety regulations.

The technical details and images in these instructions are subject to changes.

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Contents

1 General

- 1.1 Purpose
- 1.2 Contact details
- 1.3 Identification
- 1.4 Service contacts
- 1.5 Technical data – compressor unit with electrical motor
- 1.6 Installation procedure
- 1.7 Electrical connection

2 Safety

- 2.1 General
- 2.2 Qualification and training personnel
- 2.3 Operating safety conscious
- 2.4 Safety instructions operator
- 2.5 Modifications and repairing spare parts
- 2.6 Modifications unit

3 Commissioning

- 3.1 Set-up
- 3.2 Operating elements and monitoring gauges
- 3.3 Start-up motor/compressor
- 3.4 Shut down motor/compressor
- 3.5 Monitoring motor operation
- 3.6 Monitoring compressor operation

4 Maintenance/Service

- 4.1 Maintenance intervals
- 4.2 V-belt drive

5 Malfunctions and remedies compressor

6 Malfunctions and remedies motor

1 General

1.1 Purpose

RTI builds and supplies the compressor unit with electric motor ready for operation. These units are used to handle bulk material pneumatically due to their ability to compress atmospheric air free of oil. They can either be installed as a stationary unit or mounted on silo-type trucks.

1.2 Contact details

Please mention the PO number when contacting us by phone or mail. You will find the PO number on the type plate of the installation.

Telephone number: (0031) 544-377050
Fax: (0031) 544-376499
Email: info@rti.nl

Address RTI Transport-Installaties BV
Albert Schweitzerstraat 29
NL-7131 PG Lichtenvoorde
Nederland

1.3 Identification

The identification number can be found on the identification plate.

Machine No. :

1.4 Service contacts

For addresses of service/technical support facilities, please visit our website www.rti.nl

1.5 Technical data – compressor unit with motor

CVS SiloKing 1100 LS with 55/75 kW electrical motor

Technical data compressor

Manufacturer	CVS
Type	SiloKing1100LS
System	Screw
Quantity	1
Volume flow	980 m ³ /h at 2 bar and 2930 rpm
Suction conditions	1 Bar -20° C
Speed	2930 rpm
Maximum pressure	2,5 bar
Type drive	V-belt
Machine	Air cooled, absolute and staying oil free
Power	52 kW at 2 bar and 2930 rpm
Driven by	55/75 kW electrical motor



Technical data electrical motor

Power	55 kW 400 Volt	75 kW 400 Volt
Manufacturer	Elsto	Elsto
Type	250 L 2 A	280 L 4 B
Building type	B3 IP55 F	B3 IP55 F
Speed	3000 rpm	3000 rpm
Material	Cast iron	Cast iron
	IEE3	IEE3

Technical data switch box

Dimensions (mm)	600 x 600 x 230
Star/Delta connection	55/75 kW
Relay	Phase order relay/Star Delta relay
Switch	Emergency switch
	Start/stop compressor
Warning lights	Phase order, thermal, on/off
Protection	Control circuit/thermal protection

Important!!

The compressor unit is equipped with additional oil cooler therefore, after an oil change, the oil level may vary from the oil quantity specified in the operating instructions.

Important!!

The function of the non-return valve installed in the compressor unit is to prevent the compressor, after having been switched off, from running in reverse at high speed for a long time as a result of residual pressure that exists in the discharge lines of the pneumatic system.

To avoid an unintended return blow of material into the compressor, it is mandatory that at least one further non-return valve is installed in the pneumatic system of the silo arrangement.

1.6 Installation procedure

In addition to the general technical operating instructions per the regulations of the local authorities, special attention is drawn to the following guidelines:

- Use suitable hoisting equipment which fulfils the local safety regulations for the handling of the compressor unit. Securely fasten all loose or winging parts prior to handling. Do not stand in the area of danger of a lifted load.
- Remove all blank flanges, plugs and caps prior to installation of the piping. Ensure that the distribution pipes and pipe connections are of the correct size and suitable for the respective operating pressure.
- Install the unit in a place where the ambient air is as cool and clean as possible. If needed, provide for a suction duct. Never block the air inlet. The sucked-in air must not contain any flammable vapours or gases which might cause a fire or an explosion.
- Do not remove or modify any safety devices, protective covering or lagging. Protect any pressure tanks or accessory installed outside the compressor unit for storing compressed air by means of separate safety valves.
- The electrical connections must fulfil the local regulations. The compressor units must be grounded and protected against short circuits by means of fuses.
- If operation by remote control is provided for, a clearly visible sign must be attached to the unit reading the following:

Caution !!

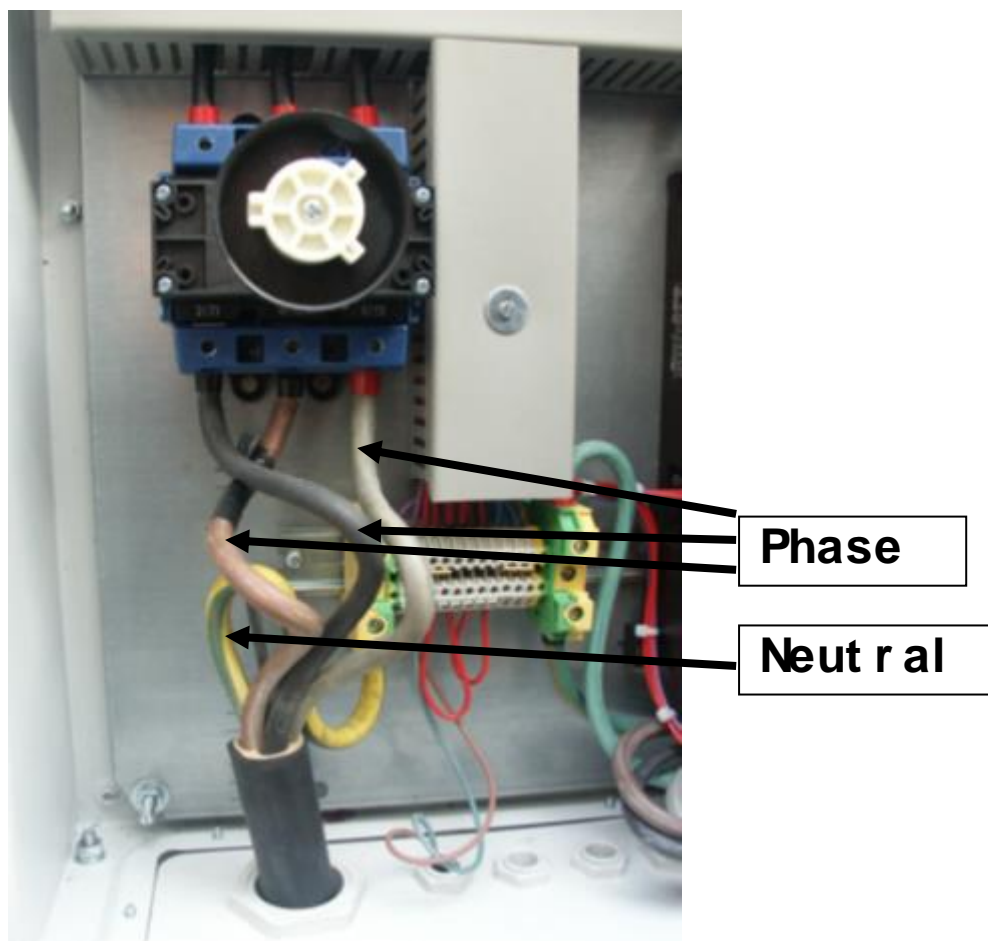
This unit is operated by remote control and might start without prior warning.

Make sure that the electrical connection is interrupted when conducting maintenance and/or repair work.

Important!!

Two U-locks are provided for the catches of the hinged sound cover as protection against rotating components. Keep the keys of the U-locks in a safe place. Trained and authorized staff only should be allowed to unlock and open the sound covers during standstill of the compressor unit.

1.7 Electrical connection



Important !!

Any work on the compressor such as operation and maintenance shall only be carried out by authorised, skilled and qualified personnel, who are familiar with the applicable safety regulations.

2 Safety

2.1 General

This operating manual provides important information concerning operation and maintenance of the installation that must be observed. Authorised personnel/the operator must read the manual carefully before going into operation and the manual must be kept in direct proximity of the installation.

2.2 Qualification and training personnel

Any work on the compressor such as operation and maintenance shall only be carried out by authorised, skilled and qualified personnel, who are familiar with the applicable safety regulations. Repairs, maintenance and conversion work shall only be carried out by authorised personnel.

2.3 Operating safety conscious

Essential safety regulations relating to the setting up, operation and maintenance of air compressors are covered by the following publications:

- Regulations for the prevention of accidents, in particular:
 - VBG 16 compressors
- Standards, in particular:
 - DIN EN 12100 Safety of machines
 - DIN EN 1012-1 Compressors and vacuum pumps, safety requirements

The latest edition of each of these regulations shall be applicable. Any special official codes and regulations, particularly safety regulations applicable to your operation in view of the local conditions shall be observed likewise. In the event of competing regulations, the most severe requirements shall apply.

2.4 Safety instructions operator

Securing the compressor's operational safety is the responsibility of the operator. Damaged or non-functioning parts must be replaced immediately. If combustible materials are to be handled by the compressor, it shall be ensured that the spontaneous-ignition temperature of any dust/air mixture will not be reached. VBG 16 prescribes that a temperature limit of max. 120°C should not be exceeded (measuring point prior to contact with the conveyed product).

2.5 Modifications and repairing spare parts

Unauthorized repair work and modifications are not permitted. Warranty doesn't apply to installations with a damaged seal. Original spare parts and accessories approved by the manufacturer contribute to safety. Using foreign spare parts and accessories may entail the loss of any liability for the consequences arising therefrom.

2.6 Modifications installation

Without approval from RTI, it is not permitted to make any alterations to the installation.

3 Commissioning

3.1 Set-up

Mount the compressor unit in horizontal position, if possible. If the unit is not mounted horizontally, please observe the specified limit values.

Important!!

Maximum permissible angles of tilt during operation:
 forward and backward: 10°
 to the right and left: 10°

3.2 Operating elements and monitoring gauges

- Start button
- Stop button
- Phase switch
- Operation control lamp (direction of rotation)
- Compressor oil pressure gauge
- Maintenance indicator of compressor air filter

3.3 Start-up motor/compressor

- Provide for electrical power connection
- Check phase circuit/direction of rotation (control light “green” ok – “red” set main switch to 2)
- Press start button “green”
- Check start procedure

Important!!

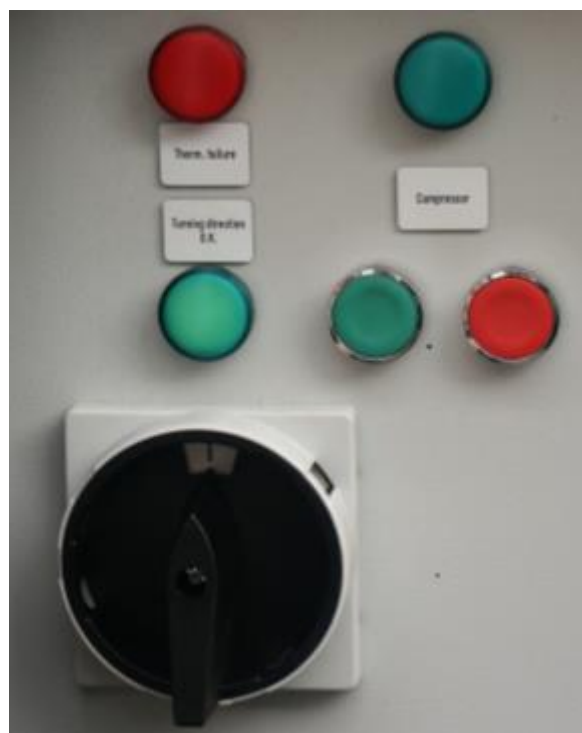
Start the compressor unit completely relieved of load only.
 Never start the unit trying to overcome any backpressure that may exist.

3.4 Shut down motor/compressor

- Relieve compressor discharge pipe
- Press stop button “red”
- Wait for shutdown
- “Emergency off” in case of failure

3.5 Monitoring motor operation

- Main switch position 0-1-2
- Phase control “green” ok, if “red” switch to position 2
- Temperature control “red” – unit switches off
- Compressor operation “green” ok



3.6 Monitoring compressor operation

Oil pressure gauge

The oil pressure is indicated on the oil pressure gauge.
The oil pressure must not fall below 0.3 bar.

Important!!

If the oil pressure does not build up within a short period of time, switch of the motor / compressor. Check the oil level, clean the oil suction strainer, if necessary (see operating instructions for compressor, chapter Maintenance).

Air filter indicator

Negative pressure is indicated on the air filter indicator of the compressor unit.

Important!!

If the 65-mbar indication is reached, the negative pressure has fallen below the permissible limit. Clean the filter element in the suction filter of the compressor unit or replace it if necessary.

Reset the air filter indicator.

(See operating instructions for compressor, chapter Maintenance)

Air filter indicator

Oil pressure gauge



4 Maintenance/Service

4.1 Maintenance intervals

Important!!

In case of compressor units with V-belt drive, re-tension the V-belts and the quick-lock taper bushes of the V-belt pulleys and the fastening screws of the discharge silencer after the first two hours of operation.

INSPECTION DURING OPERATION:

- A:** The oil pressure must not drop below the minimum value of 0.3 bar, (normally 1-3 bar). When outside temperature is low it may take a few seconds before the oil pressure is visible.
- B:** Check the air filter indicator.
If the red mark is visible, the air intake filter is soiled and poses a risk of overheating and damages.
- C:** The safety valve must open at maximum air pressure.
This valve must NOT be used as blow-off valve. To prevent overheating in the enclosure the valve at the silo tank must blow off before the compressor valve does. (blow-off pressure 2.5 bar)
- D:** Pay attention to any unusual sounds or peculiarities near the installation.

WEEKLY INSPECTION:

**ONLY CARRY OUT WHEN INSTALLATION IS COOL AND AT A STANDSTILL
WITH THE POWER CORD DISCONNECTED OR THE MAIN SWITCH OFF**

- A:** Check the level of lubricating oil weekly.
To achieve longevity of the compressor it is important the oil level remains between the indicated marks on the dip-stick (do not overfill).
- B:** Check the air intake filter at regular intervals. Clean or replace the air filter if necessary.
* Please note that the air filter is reinserted in the same position (paying attention to the front and back of the element). Also check the functioning of the air indicator.
- C:** It is important to check the airflow and cleanliness of the fan louvres to prevent overheating of the compressor.

MONTHLY INSPECTION:

**ONLY CARRY OUT WHEN INSTALLATION IS COOL AND AT A STANDSTILL
WITH THE POWER CORD DISCONNECTED OR THE MAIN SWITCH OFF**

This check may only be carried out by skilled mechanics. Observe the safety very carefully, the enclosure must be removed and rotating parts will be accessible.

- A: Check the wear of the V-belts, replace if necessary.
- B: Lubricate latches and padlock and check their functioning.
- C: Preserve the compressor when it has been at a standstill for a longer period of time. (Lubricate the compressor's rotor with oil to prevent corrosion.)

To carry out the following inspections it is necessary to start the installation without enclosure. Please note the dangers that can occur as a result of access to:

- hot parts as compressor and silencer (150 °C)
- rotating parts such as the transmission and the fan
- high sound levels (> 85 dB)

HEARING PROTECTION OBLIGATED!!

- D: Check the functioning of the safety valve.
Air pressure measured at the discharge flange of the compressor may not exceed a maximum gauge pressure of 2.5.
Potential pressure loss between compressor and silo tank of 0.2 up to 0.3 bar.
- E: Check flanges/packing, rubber compensators etc. in the enclosure for air leakages to avoid loosening of the insulation material and overheating.
- F: Check pipes, cooler and connection joints for oil leakage.

HALFYEARLEY INSPECTION:

**ONLY CARRY OUT WHEN INSTALLATION IS COOL AND AT A STANDSTILL
WITH THE POWER CORD DISCONNECTED OR THE MAIN SWITCH OFF**

This check may only be carried out by skilled mechanics. Observe the safety very carefully, the enclosure must be removed and rotating parts will be accessible.

- A: Change the lubricating oil at least twice a year (oil type SAE 10W40).
- B: Replace oil filter.
- C: Demount the non-return valve installed in the discharge silencer and check for proper functioning also check the packings and replace if necessary.

NOTE:

The operating instructions provided by the compressor manufacturer should be read carefully.

Important!!

- Prior to conducting any work on the compressor unit with motor, make sure that the main switch is set to position “0” and that the main power cable is disconnected and that the power is off.
- Prior to opening the sound cover, remove the safety locks and open the sound cover only when the compressor is at standstill.

Caution!!

- Burning hazard due to hot machine parts.
- Wear protective gloves.

4.2 V-belt drive

Check the tension of the V-belts and assess the wear of the belts once a week (wear, dryness, cracks). Retighten the belt if you can press over 0.5 centimetres into the belt. (Loosen the fastening screws of the motor a few turns, tighten tensioning screws evenly, check the alignment and re-tighten the fastening screws of the motor.)

5 Malfunctions and remedies compressor

Malfunction	Possible cause	Remedy
Oil pressure below 0.3 bar at operating temperature	Drive speed to low	Check drive speed
	Oil filter soiled	Clean oil strainer
	Oil level to low	Top up oil
Oil pressure varies	Oil level to low	Top up oil
	Oil intake pipe leaking	Check screwed connection
Oil foams	Wrong oil grade	Top up with approved oil grade
	Water in the oil	Change oil
	Oil level to high	Reduce oil
Oil leakages	Screwed connection is leaking	Check screwed connection
Compressed air pressure to high	Drive speed to high	Adjust drive speed
	Defective non return valve	Replace non return valve
	Safety valve does not blow off	Check safety valve
Negative pressure gauge reading 65 mbar	Suction filter clogged	Clean/replace filter elements
	Speed to high	Adjust drive speed

6 Malfunctions and remedies motor

Malfunction	Possible cause	Remedy
Motor does not start	No power supply	Check fuses, connections and the power cable
	Phase monitoring	Set main switch to position "2"
Motor runs at half power	Phase missing	Check fuses
Motor does not switch to phase 2	Start delta connection defective	Have repair work conducted by an expert only

For immediate shut-down in case of an emergency/a malfunction, press the "emergency off" button on the compressor unit.