

User Manual
Roller conveyor RDC
Version 1.1 - 30/03/2020

Qimarox
Nobelstraat 43
3846 CE Harderwijk
The Netherlands

Tel: +31 341 436 700
Fax: +31 341 436 701
E-mail: info@qimarox.com
Internet: www.qimarox.com

Copyright © Qimarox B.V.

All rights reserved. No part of this publication may be reproduced, stored in a computer database or published in any form or in any way electronically, mechanically, by means of photocopying, recordings or in any manner without prior written permission from Qimarox.

Table of contents

1	About this manual	5
1.1	Introduction	5
1.2	Product documentation	5
1.3	Source language	5
1.4	Symbols used in the manual	6
1.5	Terminology list	6
1.6	Further support and information	6
2	General	7
2.1	Conveyor identification	7
2.2	Machine layout drawing and specifications	7
2.3	Warranty	8
2.4	Liability	8
2.5	CE Declaration of Conformity	8
3	Safety	9
3.1	Intended use of the conveyor	9
3.2	User types and qualifications	9
3.3	Safety instructions	9
3.4	Safety provisions	10
3.5	Potential risks	11
3.6	End of life and disposal	12
4	Description	13
4.1	General overview	13
4.2	Infeed conveyor	14
4.3	Outfeed conveyor	15
4.4	Tilting conveyor RDC3	15
4.5	Shuttle conveyor RDC4	17
4.6	Pneumatic shuttle conveyor RDC5	19
4.7	Usage specifications	21
4.8	Connection unit	22
4.9	Adjusting conveyor	23
4.10	Tensioning belt	24
5	Installation	25
5.1	Delivery	25
5.2	Unpacking	25
5.3	Location	25
5.4	On-site transport	25
5.5	Preparations for a Qimarox installation (optional)	27
5.6	Installing the conveyor	27
6	Maintenance	29
6.1	Specific safety regulations	29
6.2	Preventive maintenance schedule	29
6.3	Cleaning	31
7	Troubleshooting	32

8	CE declaration of conformity	34
9	Electrical drawings	35
9.1	RollerDrive EC310/EC5000	35
9.2	DriveControl DC20/DC54/DC2048	35
9.3	SEW 3PH (RDC4 only)	35
10	Pneumatic diagrams	36
10.1	Tilting roller conveyor RDC3	36
10.2	Pneumatic shuttle conveyor RDC5	36

1 About this manual

1.1 Introduction

This manual provides information about the RDC roller conveyors. These conveyors are installed on the Qimarox Prorunner mk5 (XL) and used as product infeed or outfeed of the Prorunner mk5 (XL). Henceforth the RDC roller conveyors will be referred to as the 'conveyor' and the Prorunner mk5 (XL) as the 'machine'.

This manual is intended for:

- Retailers/Original Equipment Manufacturers (OEM), project engineers and mechanics.
- Operators, installation and maintenance engineers and other users.

It is important to carefully read this manual as soon as possible after purchase of the conveyor. Before operating the conveyor this manual should be read by all users. This is necessary to make sure that all new users are familiar with the content of this manual.

System integrators/OEMs

This manual explains configurations that can be used to set up the conveyor. It also provides instructions on how to add or change the conveyors technical components.

Users

The conveyor may be supplied pre-assembled, if so, some chapters in this manual will not be applicable. To integrate the conveyor within a system, refer to the documentation of the Prorunner mk5 (XL).

1.2 Product documentation

Document	Reference
Conveyor manual ¹	UM Roller conveyor RDC v1.1 EN
Prorunner mk5 (XL) manual ²	UM Prorunner mk5 (XL)
Layout drawing ²	Layout drawing [serial number]
Specification sheet ²	Specifications [serial number]
Electrical drawings RDC2 ¹	Electrical drawings Prmk5 (XL)
Electrical drawings RDC3, RDC4 ¹	Electrical drawings Prmk5 (XL) Sorter conveyors
OEM parts of the conveyor	

1.3 Source language

This manual was originally written in the English language.

¹ Generic information

² Machine specific information

1.4 Symbols used in the manual

The following symbols are used in this manual.



WARNING

Risk of serious injury to the user if the instructions are not accurately followed.



CAUTION

Risk of damage to the conveyor if the instructions are not accurately followed.



Note

To provide additional information to the user about a task or issue.

1.5 Terminology list

The table below explains common terms used in this manual.

Term	Definition
Prmk5	Prorunner mk5 or Prorunner mk5 XL
Conveyor	RDC roller conveyor
Fenced area	Area around the conveyor that unauthorized personnel cannot enter for safety reasons.

1.6 Further support and information

Qimarox can supply additional expertise and support services, for:

- Training
- Global support
- Service contracts

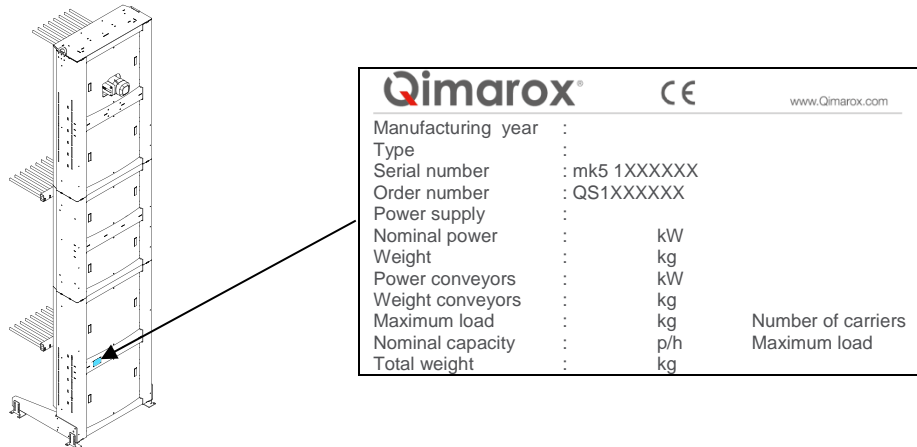
For more information please contact Qimarox.

2 General

The conveyor has to be identified by the Prmk5 on which it is installed. The layout drawing and specification of the conveyor are bundled in the documentation of the Prmk5.

2.1 Conveyor identification

The conveyor identification is given on the type plate of the Prmk5. The type plate is located on the back side of the Prmk5. Refer to the specification sheet of this serial number for specifications of this Prmk5 and conveyor.



2.2 Machine layout drawing and specifications

After a Prmk5 order is placed, a layout drawing and specification sheet is sent for approval. After approval the layout drawing and specification sheet are sent as a reference for this manual. The layout drawing and specification sheet include:

- Serial number
- Product dimensions and mass
- Prmk5 and conveyor dimensions and mass
- Configuration
- Speed and capacity
- Motor and sensor specifications

The conveyor can only be used according to the specifications given in this manual, the layout drawing and the specifications sheet. If you want to use the conveyor outside these specifications, you must contact Qimarox to check if this is possible. Inappropriate and/or modified use of the conveyor can result in dangerous safety issues and/or damage. You must obtain written confirmation from Qimarox before using the conveyor in a modified or unspecified manner. Qimarox cannot be held liable for any accidents and/or damages that may occur through inappropriate unauthorized use of the conveyor.

2.3 Warranty

The scope and duration of the warranty is agreed upon when an order is placed for the machine. The warranty only applies if the conveyor is used according to the specifications and if the user and maintenance instructions are observed. The warranty does not cover wear of the parts.

The conveyor warranty is null and void in cases of:

- Unskilled use.
- Inadequate maintenance.
- Unskilled maintenance.
- Modifications made to the conveyor without prior written permission from Qimarox.

2.4 Liability

Qimarox believes to the best of its knowledge that the information in this user manual is accurate. In the event that technical or typographical errors exist, Qimarox reserves the right to make changes to subsequent editions of this user manual without prior notice to holders of this edition. The reader should consult Qimarox if errors are suspected. In no event shall Qimarox be liable for any damages arising out of or related to this user manual or the information contained in it. Except as specified herein, Qimarox makes no warranties, express or implied, and expressly disclaims any warranty of non-infringement, merchantability or fitness for a particular purpose. Customer's right to recover damages caused by fault or negligence on the part of Qimarox shall be limited to the amount paid to Qimarox by the customer. Qimarox shall not be liable for damages resulting from loss of data, profits, use of products, or incidental or consequential damages, even if advised of the possibility thereof. This limitation of liability of Qimarox will apply regardless of the form of action, whether in contract or tort, including negligence. Any action against Qimarox must be brought within one (1) year after that cause of action accrues. Qimarox is not liable for damages, accidents, unsafe conditions, defects, malfunctions, or service failures caused by the following:

- Owner's or user's failure to follow Qimarox's installation, operation and maintenance instructions, including but not limited to neglecting warnings or regulations as shown on the machine or in this manual.
- Usage of the conveyor for other applications, or under other circumstances than indicated in this user manual. This includes abuse, misuse or negligent acts.
- Modifications of any kind to the conveyor. This includes the replacement of parts with parts that are not specified in this manual.
- Insufficient or improper maintenance.

2.5 CE Declaration of Conformity

A CE declaration of conformity is given of the Prmk5 including conveyors. Refer to the User manual of the Prmk5.

3 Safety

3.1 Intended use of the conveyor

The machine is exclusively intended to transport products horizontally into or out of a Prorunner mk5 (XL). Refer to chapter 4 for a detailed description of the specifications of use.

The machine and conveyor must always be set up within a larger transport system in which products are automatically loaded on and off the conveyors.

**WARNING**

Any other use of the conveyor is strictly forbidden.

3.2 User types and qualifications

The following user types are referred to in this manual:

- The operator
- The mechanical installer
- The electrical installer
- The maintenance engineer

The maintenance engineer must be familiar with the full content of this manual.

Before any person operates, sets up, electrically installs or maintains the conveyor, permission to carry out these tasks must be obtained from Qimarox. Qimarox determines if the person is qualified for carrying out the given task. The machine should only be operated by qualified personnel.

An electrical installer is only qualified if a person has attended appropriate training and/or attained appropriate industry standard recognized qualifications. Qimarox can provide training if required.

Qimarox can also give advice about actions and tasks to be carried out on the conveyor.

3.3 Safety instructions

3.3.1 General

- Comply with the safety regulations given in this manual. Deviation from these regulations can lead to unacceptable risks.
- Never close doors (if present) in the fenced area of the machine, when a person is inside this area.
- Switch off the conveyor and secure the main power supply switch in the off position with a padlock to prevent the conveyor from being switched on while personnel is working within the fenced area.
- Comply with all relevant local legislation and regulations

3.3.2 Set up

- Connect the conveyor in accordance with the local laws and regulations concerning health and safety.
- Before putting the conveyor into use, check if the conveyor has been set up in accordance with the instructions in this manual and with the layout drawing of the machine.

- Make sure that the transport system complies with all relevant health and safety directives and regulations.

3.3.3 Starting the conveyor

- Do not switch the main power supply on when persons are in contact with the conveyor.
- Do not start the conveyor when persons are in contact with the conveyor.
- Do not start the conveyor when persons are present in the fenced area of the conveyor or machine.
- Before the conveyor is put into operation, all conveyor parts must comply with all relevant health and safety directives and regulations.

3.3.4 During conveyor operation

- Keep your hands and feet away from danger zones.
- Make sure you do not wear loose clothing and secure long or loose hair.
- Make sure that no persons or objects are within the range of any moving parts of the conveyor.
- Make sure that users know and observe all safety rules with regard to the conveyor and the environment in which it operates.

3.3.5 Maintenance and repair

- Turn off the power supply to the conveyor and machine with the main power supply switch before starting any maintenance or repair tasks. Secure the main power supply switch in the off position with a padlock.
- Replace damaged or defective parts before putting the conveyor back into operation.
- Changes and modifications that may affect the safety of the conveyor can only be carried out when these changes and modifications comply with the relevant regulations, legislation, directives and recognized industry standards.
- If changes and modifications are outside the scope of specifications given by Qimarox in this manual and Qimarox has not granted permission changes and modifications, then the changes and modifications will entirely be the responsibility of those persons responsible for carrying out the changes and modifications.
- Electrical installation tasks must only be carried out by qualified personnel.

3.4 Safety provisions

3.4.1 Safety equipment

The conveyor can be equipped with information and warning labels.



Note

Replace labels on the conveyor if they become unreadable or damaged.

Qimarox requires a protection fenced area around the conveyor. Refer to 3.4.2 for more information.

In case of non-compliance with the required safety measures, the CE Declaration of Conformity will become null and void.

3.4.2 Safety fence

Qimarox requires a protection fenced area around the conveyor. Any access doors must be secured with (interlock) door switches. These switches must be included in the emergency

stop and safety circuit. The fenced area must comply with EN ISO 13857 and EN 619 standards.

Openings in the fenced area must be designed such that they protect persons against reaching the danger zone. When this is not possible, these openings must be equipped with a light curtain.

Make sure that the fenced area complies with local law and rules for protection against danger. If the fenced area is fitted with a door, it must have a safety switch to shut down the system when opened.

If Qimarox supplies the safety fencing, the specifications will be included in the machine layout drawing.

3.4.3 Safety controls

The provisions must be designed according to a so-called Performance Level (PL) corresponding with the current standard for safety functions of a machine or a machine control in compliance with EN ISO 13849-1:2008.

Emergency stop circuit

The conveyor must have an emergency stop circuit. When one of the emergency stop buttons is pressed, the main power and the control current of the machine are switched off immediately.

Motor protection relay

Motor protection devices must be set to the nominal motor current. A relay set too low prevents optimum use of the motor. A relay set too high does not guarantee full thermal protection.

Thermistor protection (TF contact)

For motors that are frequently started and stopped, intermittently operated, use a high switching frequency or power controller, it is essential to use a motor protection relay and thermistor protection. This is to avoid prematurely switching the motor protection relay or overheating of the motor winding in these operational conditions.

3.5 Potential risks

The machine is intended to be integrated into a conveyor system. Qimarox has attempted to protect against as many hazards as possible. The following potential risks should be addressed before machine and assembled parts are put into operation:

- Risk of injury caused by moving Poly-V belt or timing belt.
- Risk of injury as a result of moving frame (does not apply for RDC2).
- Risk of injury at places where moving parts of the Prmk5 cross the conveyor.
- Hazards occurring at places where the conveyor connects to other parts of a production line.

3.6 End of life and disposal

Proper use and maintenance of the conveyor will not involve any environmental risks. When the conveyor is no longer useable, the conveyor should be dismantled and disposed of in an environmentally responsible manner.



WARNING

Observe all relevant legislation, regulations, instructions and precautions with regard to health and safety when dismantling the conveyor.

Observe all relevant legislation, regulations, instructions and precautions with regard to the disposal of products in the environment.

4 Description

The conveyor must be attached to the column of the Prmk5 and is designed to transport a product horizontally to or from the Prmk5. It must be installed as part of a larger transport system in which products are automatically transported to and from the conveyor.

For the description of the Prmk5 and the system, refer to the user manual of the Prmk5. For the description of an RDC infeed conveyor, refer to 4.2. For the description of an RDC outfeed conveyor, refer to 4.3.

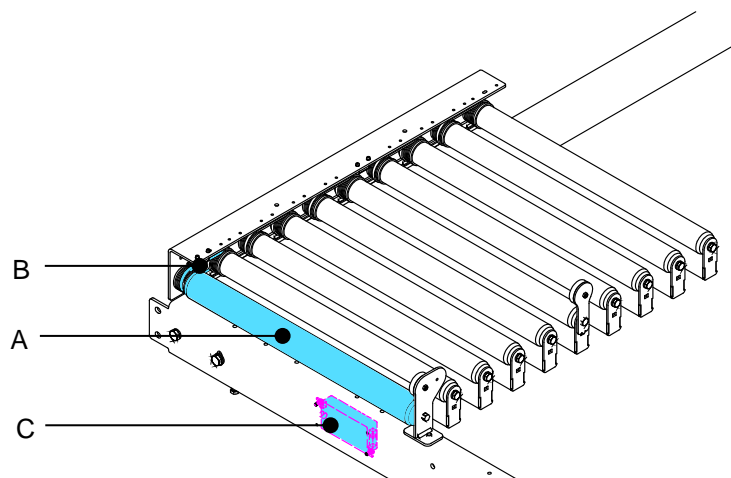
The conveyor is available in different forms:

- RDC2 – Fixed conveyor
- RDC3 – Tilting conveyor
- RDC4 – Shuttle conveyor
- RDC5 – Pneumatic shuttle conveyor

The default infeed and outfeed conveyor are static. Optionally, the conveyor can be moved out of reach of the Prmk5. This is necessary when the Prmk5 is used in sorter applications.

4.1 General overview

The conveyor consists of a number of rollers over which the product is transported. The rollers are driven by a RollerDrive (A), which is a drum-motor built in a roller. The rollers are link using Poly-V belts (B). The RollerDrive is powered by the DriveControl (C). The speed of the conveyor can be adjusted in the Drive control using DIP switches or digital input. Refer to the datasheet of the manufacturer for detailed information.



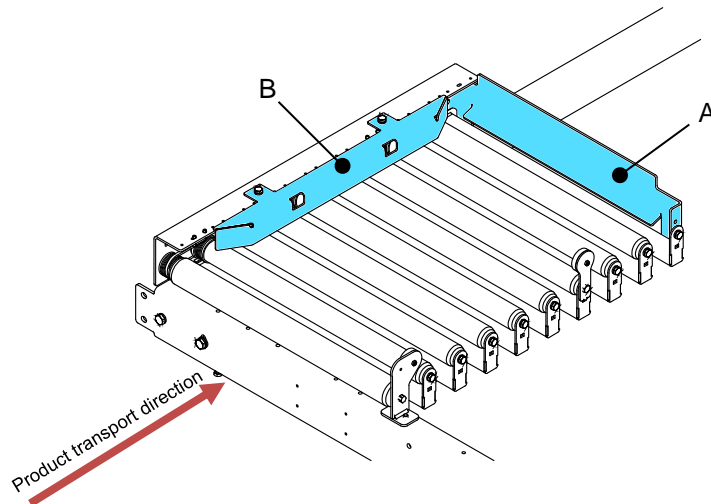
Note

The actual conveyor speed is 20% lower than displayed in the documentation of the DriveControl manufacturer. This is due to a 50:40 gear ratio in the transmission between the RollerDrive and other rollers.

4.2 Infeed conveyor

4.2.1 Overview

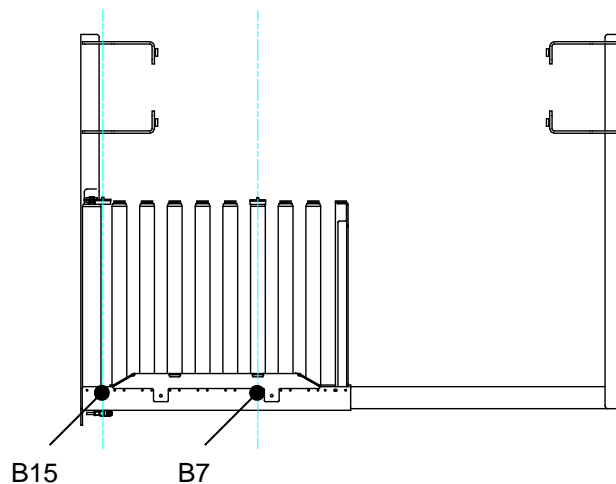
The infeed conveyor is equipped with a product stop (A) to limit the end position of the product on the conveyor. The conveyor is also equipped with a guide to prevent the product from moving too close to the conveyor support beam. Products must be supplied from a feeding conveyor (not included) one by one with spacing between them.



4.2.2 Sensors

On the infeed conveyor two sensors are mounted:

- B7 Product on infeed
- B15 Product position monitor



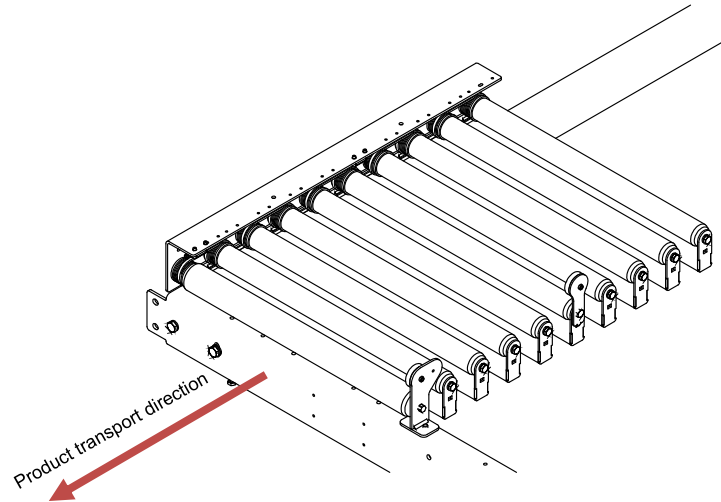
4.2.3 Application

When the infeed conveyor is empty and ready to receive a product, start the feeding conveyor (not included) and the infeed conveyor simultaneously. Stop the feeding conveyor before a second product is fed on the infeed conveyor. Keep the infeed conveyor running until sensor B7 is covered and sensor B15 is uncovered. The product is now by approximation centered on the conveyor.

4.3 Outfeed conveyor

4.3.1 Overview

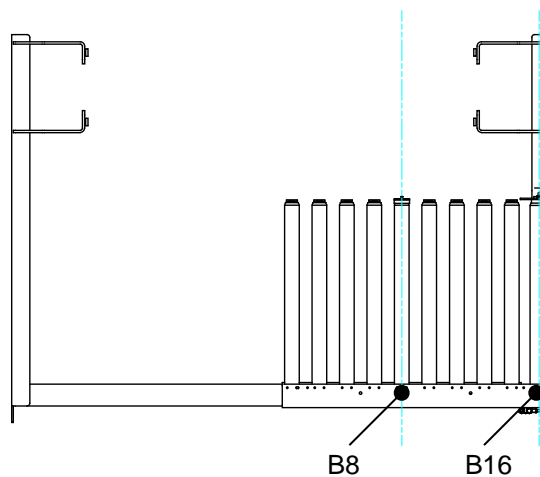
Products placed on the outfeed conveyor are transported to the discharge conveyor (not included).



4.3.2 Sensors

On the outfeed conveyor two sensors are mounted:

- B8 Product on outfeed
- B16 Product position monitor



4.3.3 Application

When a product is placed on the outfeed conveyor, sensor B8 is covered. Start the outfeed conveyor and discharge conveyor simultaneously. Keep the conveyor running until sensor B8 is uncovered and sensor B16 is uncovered after it has been covered.

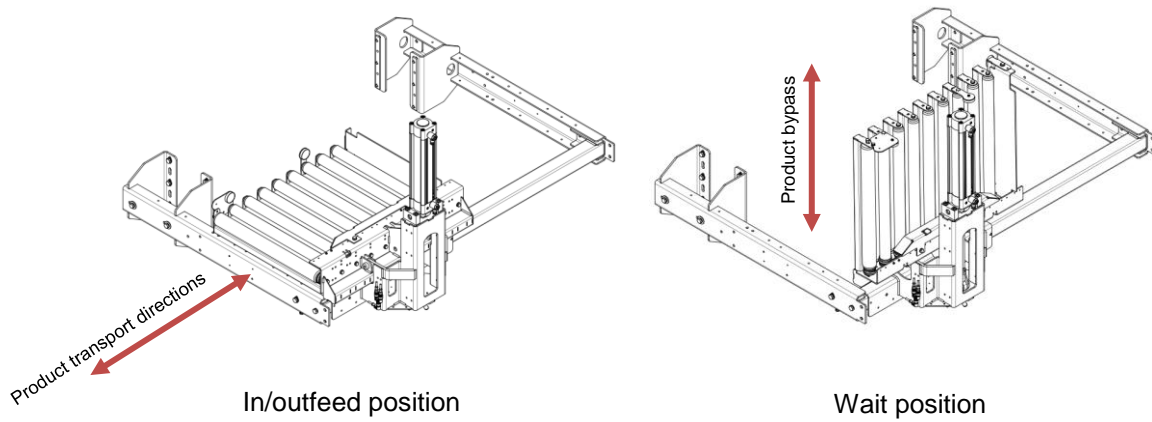
4.4 Tilting conveyor RDC3

4.4.1 Overview

A tilting conveyor is an infeed or outfeed conveyor that can be tilted to allow products in the Prmk5 to bypass the conveyor. In this section a description is given of the tilting functionality. Refer to section 4.2 and 4.3 for the description about conveying.

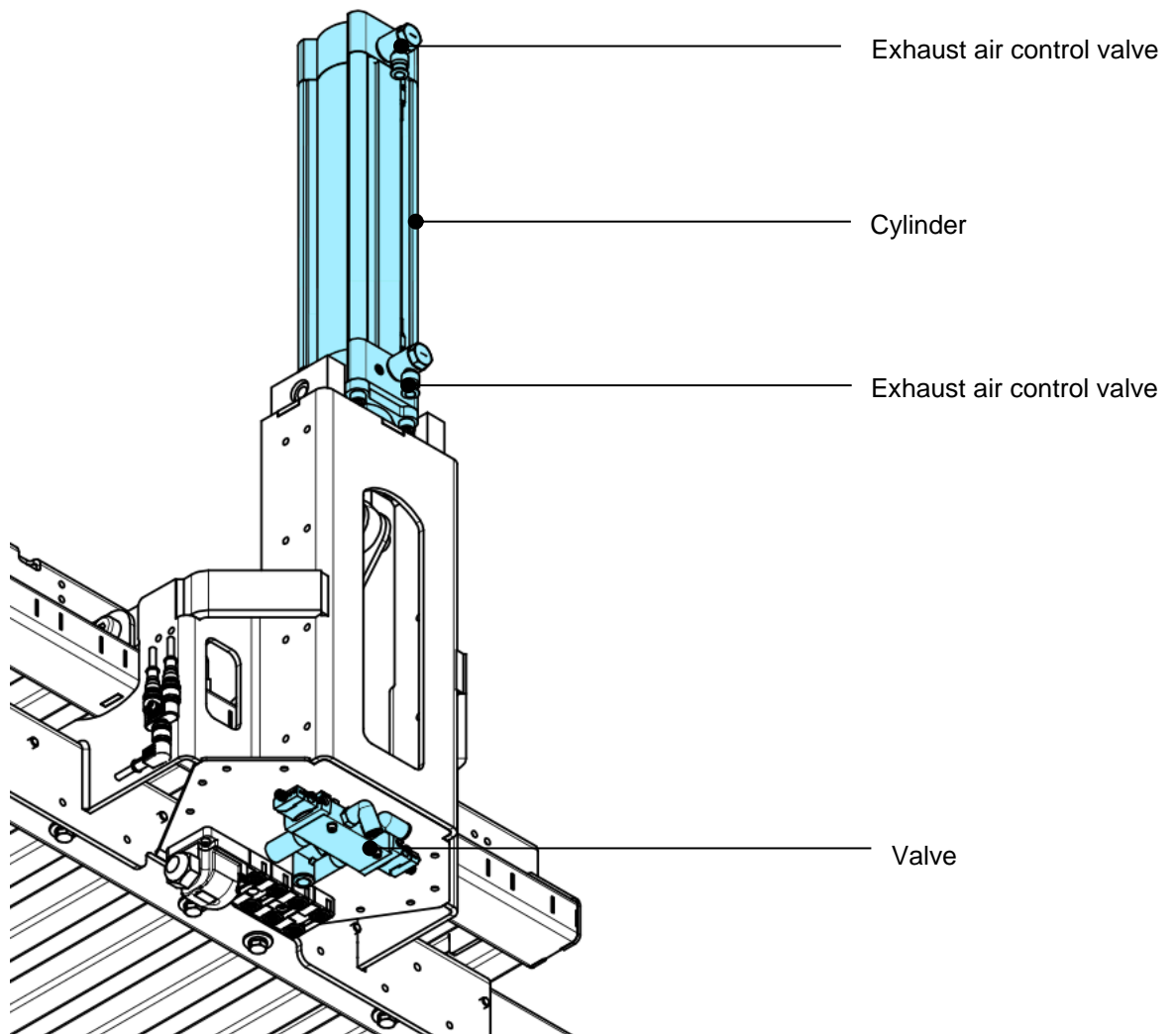
The tilting conveyor has two positions:

- In/outfeed position - Conveyor can be used as either infeed or outfeed
- Wait position - Products in Prmk5 can bypass the conveyor



4.4.2 Actuators

The tilting movement is driven by a pneumatic cylinder. The cylinder is controlled with a mid-closed valve. For the pneumatic diagram, refer to section 10.1.



The valve has two inputs:

- Y2 Move to wait position
- Y3 Move to in/outfeed position

Activate input Y3 to tilt to conveyor to the in/outfeed position. Activate input Y2 to tilt the conveyor to the wait position.

**CAUTION**

Cylinder remains pressurized when the valve is in mid-closed position.

Adjust the exhaust air control valves on the cylinder until the conveyor tilts smoothly in both directions. Make sure the tilting time does not exceed the allowed tilting time of the system. Normally this is 3 seconds.

**Note**

For the specifications of the pressurized air, refer to section 4.7.2.

4.4.3 Sensors

The cylinder is equipped with two sensors:

- B1 Wait position
- B4 In/outfeed position

Sensor B1 is active when the conveyor is in wait position. Sensor B4 is active when the conveyor is in in/outfeed position.

4.4.4 Application

The conveyor can only be used when in in/outfeed position (sensor B4 active). To move the conveyor to in/outfeed position, activate input Y3. Deactivate input Y3 when the conveyor is in position to close the valve and fixate the conveyor.

The conveyor can only be bypassed when the conveyor is in wait position (sensor B1 active). To move the conveyor to wait position, activate input Y2. Deactivate input Y2 when the conveyor is in position to close the valve and fixate the conveyor.

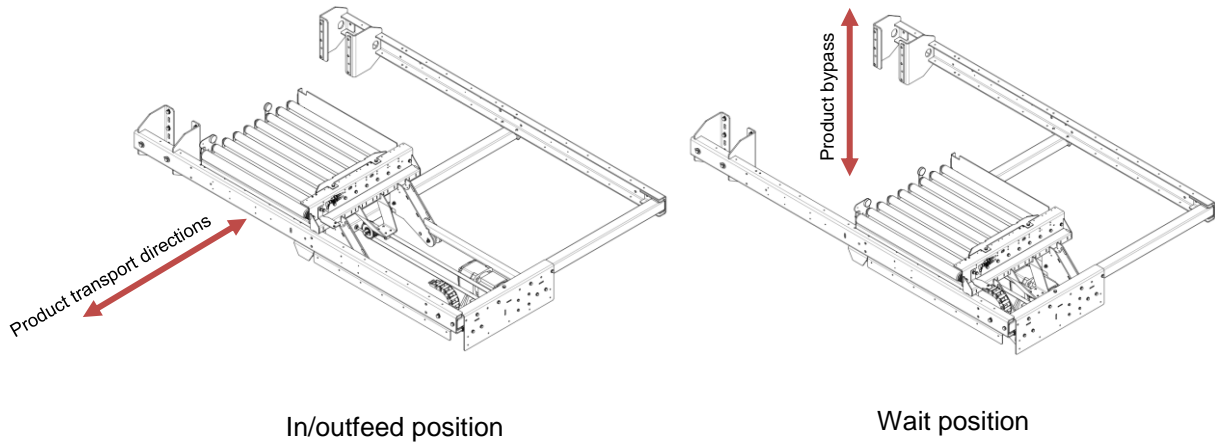
4.5 Shuttle conveyor RDC4

4.5.1 Overview

A shuttle conveyor is an infeed or outfeed conveyor that can be moved to allow products in the Prmk5 to bypass the conveyor. In this section a description is given of the movement. Refer to 4.2 and 4.3 for the description about conveying.

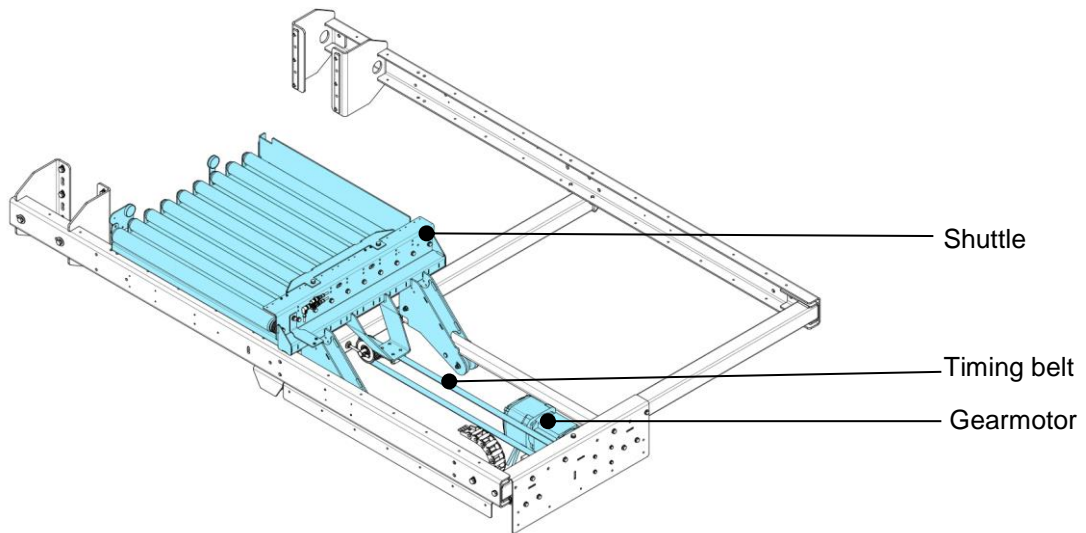
The shuttle conveyor has two positions:

- In/outfeed position - Conveyor can be used as either infeed or outfeed
- Wait position - Products in Prmk5 can bypass the conveyor



4.5.2 Actuators

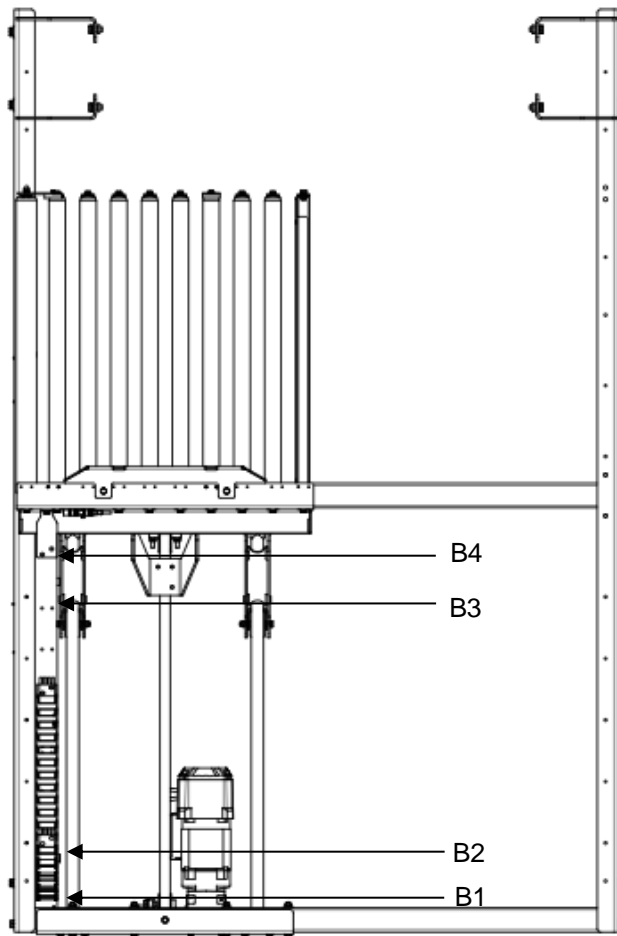
The movement of the shuttle is driven by a gearmotor. The gearmotor must be wired to a frequency inverter (optionally included). The rotation of the gearmotor is translated in the horizontal movement of the conveyor using a timing belt.



4.5.3 Sensors

The motor driven shuttle conveyor contains four additional sensors:

- B1 - Wait position
- B2 - Low speed to wait position
- B3 - Low speed to infeed position
- B4 - In/outfeed position



Sensor B1 is active when the conveyor is in wait position. Sensor B4 is active when the conveyor is in in/outfeed position.

4.5.4 Application

The conveyor can only be used when in in/outfeed position (sensor B4 active). To move the conveyor to in/outfeed position, use the gearmotor. Slow down to approximately 10% speed when sensor B3 is active. Stop the shuttle when B4 is active.

The conveyor can only be bypassed when the conveyor is in wait position (sensor B1 active). To move the conveyor to wait position, use the gearmotor in opposite direction. Slow down to approximately 10% speed when sensor B2 is active. Stop the shuttle when B1 is active.



Note

Refer to the specification sheet of the system for the correct acceleration, deceleration and speed of the shuttle.

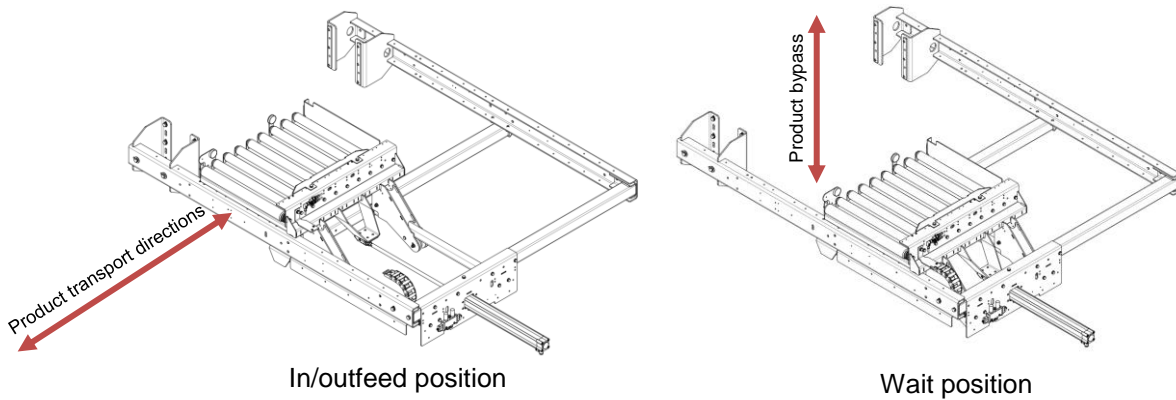
4.6 Pneumatic shuttle conveyor RDC5

4.6.1 Overview

A shuttle conveyor is an infeed or outfeed conveyor that can be moved to allow products in the Prmk5 to bypass the conveyor. In this section a description is given of the movement. Refer to 4.2 and 4.3 for the description about conveying.

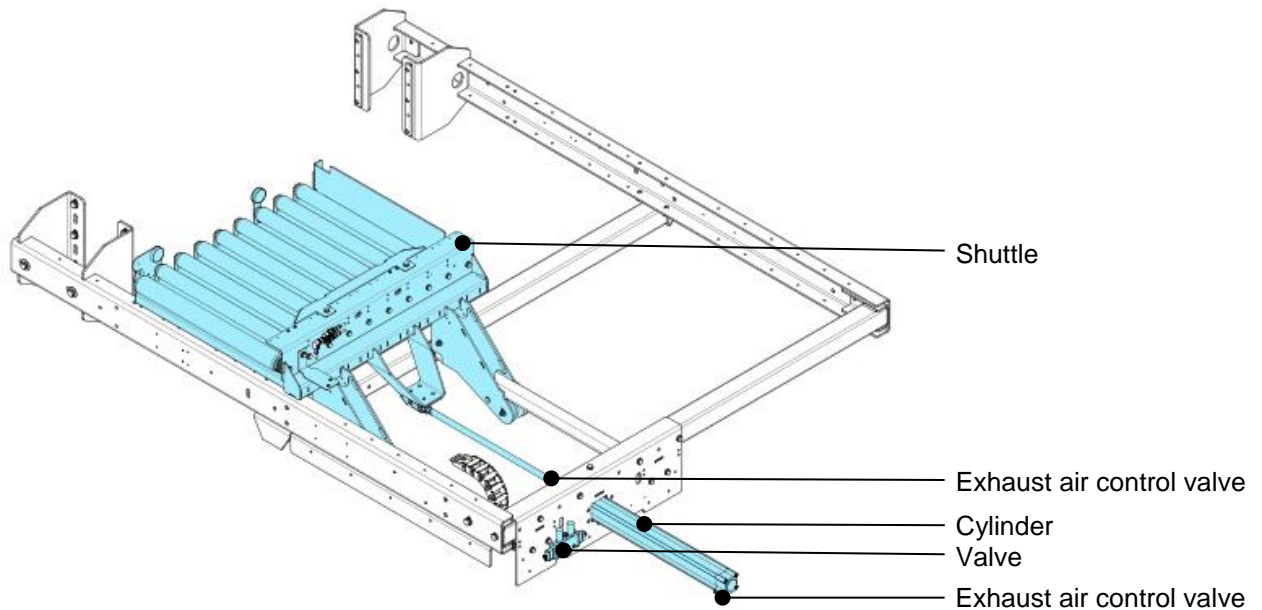
The shuttle conveyor has two positions:

- In/outfeed position - Conveyor can be used as either infeed or outfeed
- Wait position - Products in Prmk5 can bypass the conveyor



4.6.2 Actuators

The movement of the shuttle is driven by a pneumatic cylinder. The cylinder is controlled with a mid-closed valve.



The valve has two inputs:

- Y2 Move to wait position
- Y3 Move to in/outfeed position

Activate input Y3 to move to conveyor the in/outfeed position. Activate input Y2 to move the conveyor to the wait position.



CAUTION

Cylinder remains pressurized when the valve is in mid-closed position.

Adjust the exhaust air control valves on the cylinder until the conveyor moves smoothly in both directions. Make sure the moving time does not exceed the allowed time in the system.

4.6.3 Sensors

The cylinder is equipped with two sensors:

- B1 Wait position
- B4 In/outfeed position

Sensor B1 is active when the conveyor is in wait position. Sensor B4 is active when the conveyor is in infeed or outfeed position.

4.6.4 Application

The conveyor can only be used when in infeed or outfeed position (sensor B4 active). To move the conveyor to infeed or outfeed position, activate input Y3. Deactivate input Y3 when the conveyor is in position to close the valve and fixate the conveyor.

The conveyor can only be bypassed when the conveyor is in wait position (sensor B1 active). To move the conveyor to wait position, activate input Y2. Deactivate input Y2 when the conveyor is in position to close the valve and fixate the conveyor.

4.7 Usage specifications

Always comply with the specifications below, in the specification sheet, on the type plate and in the electrical drawings.

If a different product weight or dimension is required, the conveyor must be adjusted to accommodate this. These type of adjustments may only be carried out by Qimarox or after written permission from Qimarox has been obtained.

4.7.1 Specifications of the surrounding area

The surrounding area of the conveyor must have the following properties:

Property	Description
Surrounding	Inside and normally clean for operation. There must be sufficient space around the conveyor to carry out maintenance.
Relative air humidity	Maximum 80%
Temperature	Between +5°C (41 F) and 40°C (104 F)

When the specifications for the surrounding area deviate from the table above, the conveyor must be adjusted to this. Such adjustments shall always be carried out by Qimarox or after permission from Qimarox.

4.7.2 Compressed air

Compressed air must be supplied for the tilting conveyor and pneumatic shuttle conveyor. The air pressure must be between 5 and 7 bar. The air must be accordance with ISO 85731:2010 [7:4:4].

4.7.3 Electrical specifications

Refer to the type plate and specification sheet of the machine for the electrical specifications. For the electrical drawings of the RDC2, refer to the electrical drawings of the machine. For the electrical drawings of other conveyors, refer to “*Electrical drawings PRmk5 (XL) Sorter conveyors EN*”.

Motor

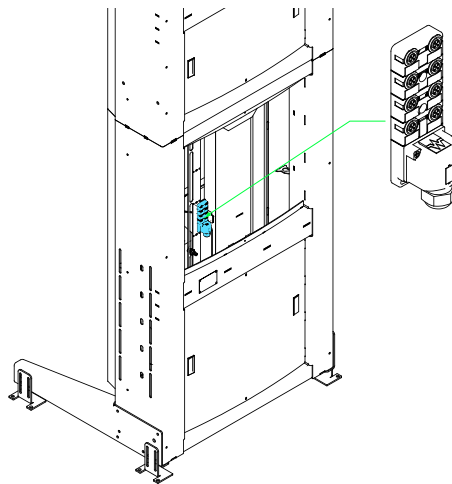
The shuttle conveyor (RDC4 only) must be controlled with a frequency inverter combined with motion control to ensure a smooth start stop movement and accurate positioning.

The motor safety relays must meet EN-IEC 60204-1 specifications. The setting range depends on the motor specifications.

4.8 Connection unit

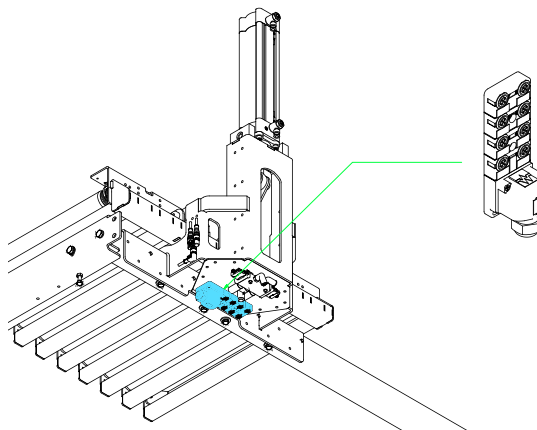
4.8.1 Roller conveyor RDC2

The sensors are wired to the connection unit of the machine. This connection unit is located at the back side of the bottom column.



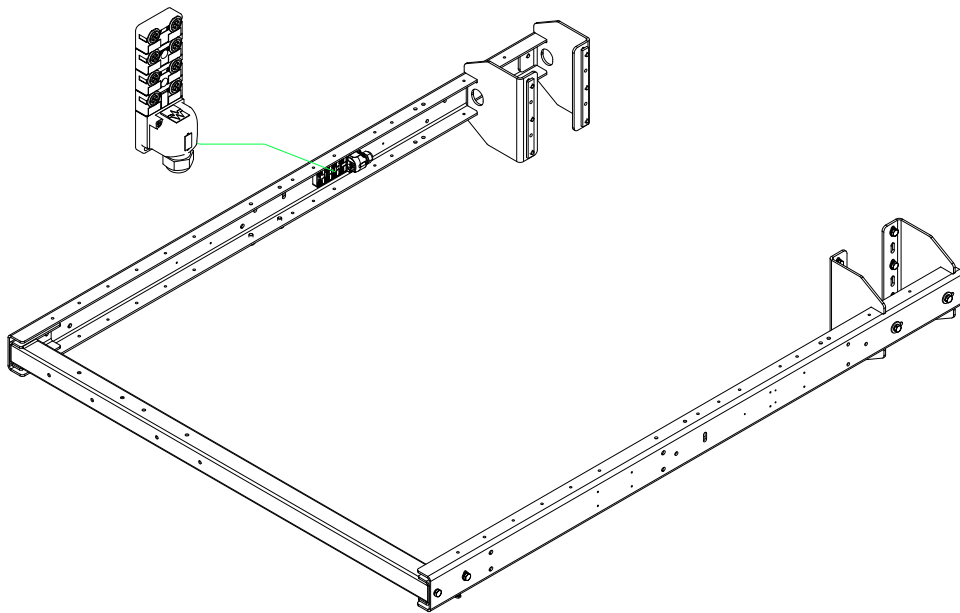
4.8.2 Tilting roller conveyor RDC3

The sensors and actuators are wired to the connection unit located at the bottom of the frame.



4.8.3 Shuttle roller conveyor RDC4/RDC5

The sensors and actuators (RDC5 only) are wired to the connection unit located in the conveyor support at the transport side.



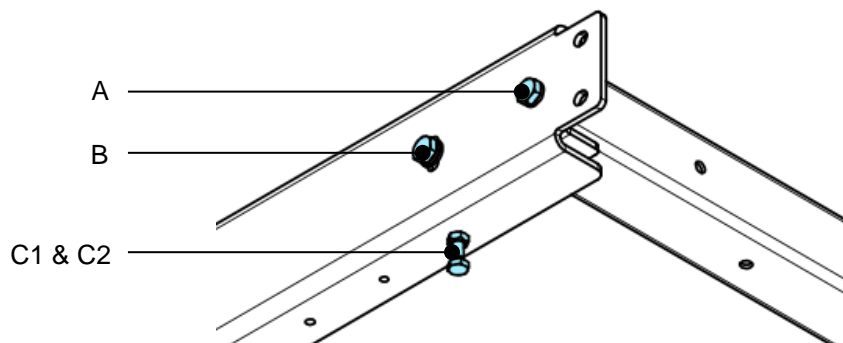
4.9 Adjusting conveyor

The rollers of the conveyor must be level. This section describes how to adjust the different conveyors.

4.9.1 Roller conveyor RDC2

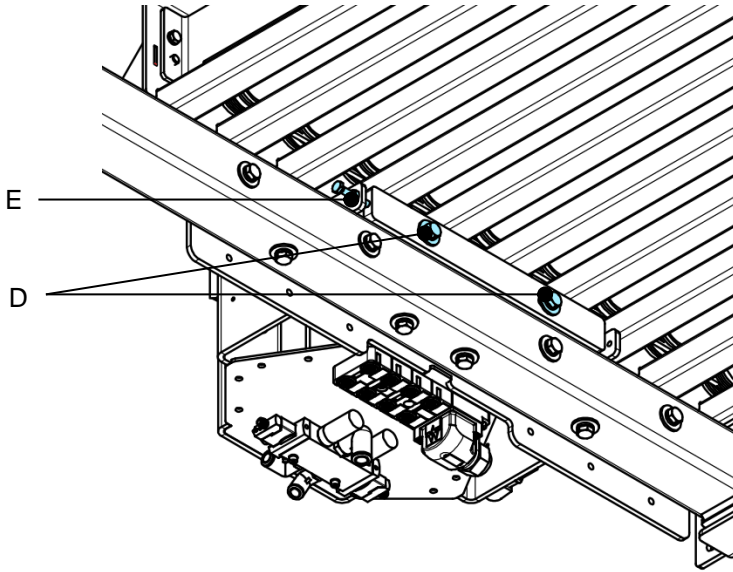
1. Untighten bolt A (2x), bolt B (2x) and nut C2 (2x).
2. Adjust conveyor with bolt C1 (2x).
3. Retighten bolt A (2x), bolt B (2x) and nut C2 (2x).

Use adjusting bolt on the conveyor support on both sides.



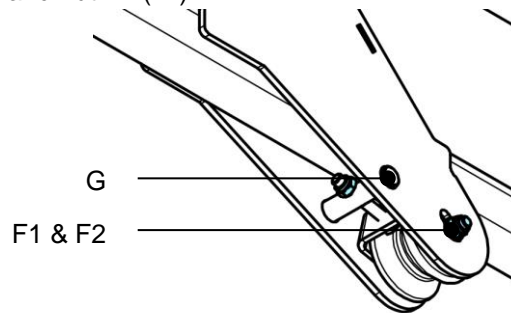
4.9.2 Tilting roller conveyor RDC3

1. Untighten bolt D (2x) and nut E2.
2. Adjust conveyor with bolt E1.
3. Retighten bolt D (2x) and nut E2.



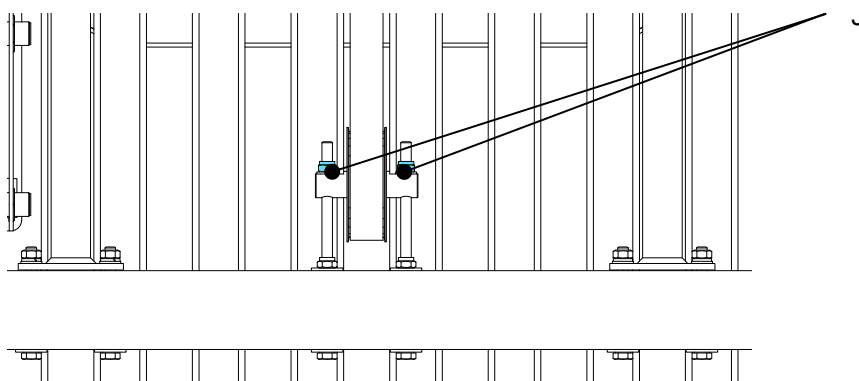
4.9.3 Shuttle roller conveyor RDC4/RDC5

1. Untighten bolt F1 and nut F2 (4x)
2. Adjust conveyor with nut G (2x)
3. Retighten bolt F1 and nut F2 (4x)



4.10 Tensioning belt

1. Adjust the RDC4 timing belt tension with nut J (2x)



5 Installation

This chapter describes installation instructions. Refer to the user manual of the machine for installation instructions of the conveyor within a system.

5.1 Delivery

The conveyor is delivered fully assembled.

5.2 Unpacking

1. Check the packing list when unpacking the conveyor.
2. Immediately report damaged or missing parts to Qimarox.

5.3 Location

Refer to the layout drawing for detailed information about the location of the conveyor.

5.4 On-site transport

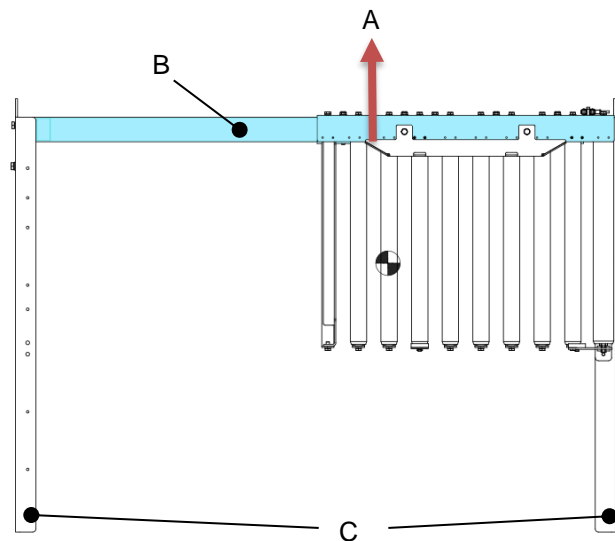
A shuttle conveyor must be moved in a horizontal position with the rollers at the top

General preparation include:

1. Check the floor load of the floor on which the hoisting system is placed.
2. Block the working area to ensure a safe environment during hoisting.

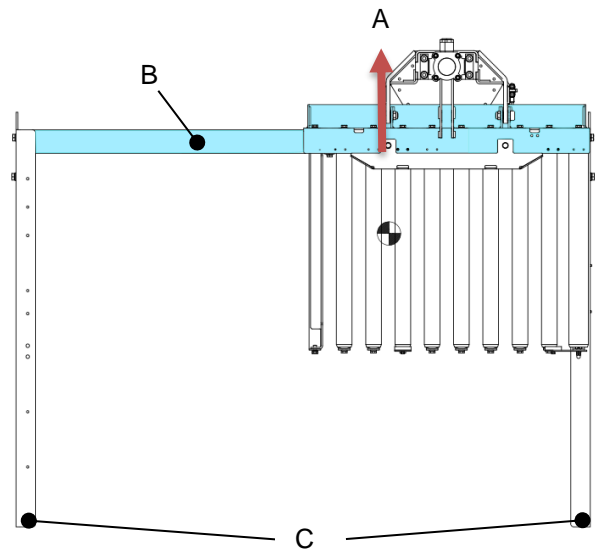
5.4.1 Lifting of roller conveyor RDC2

1. Attach a suitable hoisting belt (A) in the center of gravity around the main frame (B) of the conveyor (between rollers).
2. Lift the conveyor in vertical orientation
3. To position conveyor at end location: Manually lift the tip of the conveyor supports (C) to pivot the conveyor to a horizontal position.
4. Fix the conveyor to the Prmk5 before removing the hoisting belt. Refer to section 5.6.



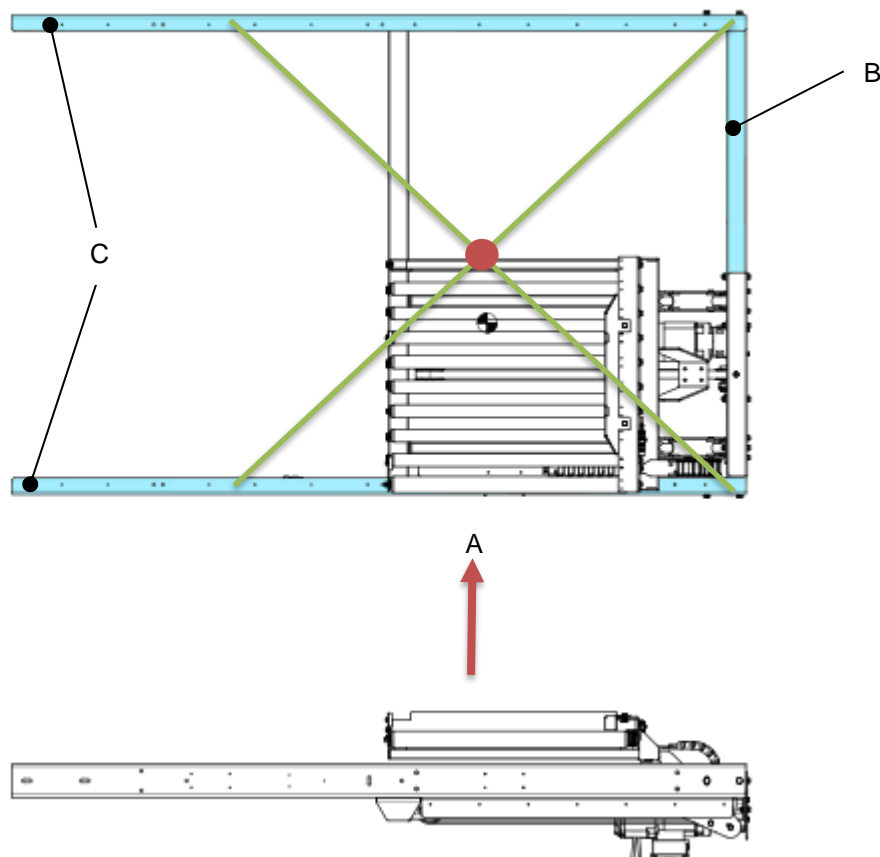
5.4.2 Lifting of tilting roller conveyor RDC3

1. Attach a suitable hoisting belt (A) in the center of gravity around the main frame (B) of the conveyor (between rollers).
2. Lift the conveyor in vertical orientation
3. To position conveyor at end location: Manually lift the tip of the conveyor supports (C) to pivot the conveyor to a horizontal position.
4. Fix the conveyor to the Prmk5 before removing the hoisting belt. Refer to section 5.6.



5.4.3 Lifting of shuttle roller conveyor RDC4/RDC5

1. Attach a suitable 4 way chain hoist(A) to each end of the front cross member (B) and the conveyor supports(C) so that the conveyor remains level.
2. Lift the conveyor in horizontal orientation
3. Position the conveyor.
4. Fix the conveyor to the Prmk5 before removing the hoisting chain. Refer to section 5.6



5.5 Preparations for a Qimarox installation (optional)

The preparations given below will need to be done before Qimarox can assemble the machine on site. All equipment listed below must be present before and during assembly.

1. Indicate the contact person to whom the mechanic of Qimarox must report when arriving or leaving before and after the installation.
2. Make sure that the mechanic of Qimarox is assisted by qualified mechanics of the client. Refer to chapter 3.
3. Make sure that the place where the assembly takes place:
 - is accessible, has sufficient light and is at room temperature.
 - has been laid out such that the mechanics can work safely and without interruptions.
 - is suitable for drilling and/or grinding, if necessary.
4. Provide hoisting equipment:
 - preferably a bridge crane, minimum carrying capacity 1.5 x the weight of the conveyor.
 - or a fork-lift truck combined with a hoist with a minimum capacity of 2 x the weight of the conveyor at a lifting height with a minimum height of the conveyor mounting height plus 2 meters.
5. Provide electric power (230 V AC) at a maximum of 5 meters from the place of assembly of the conveyor.
6. Provide the correct safety provisions:
 - Moveable scaffolding or an aerial work platform.
 - Personal protection equipment.

5.6 Installing the conveyor

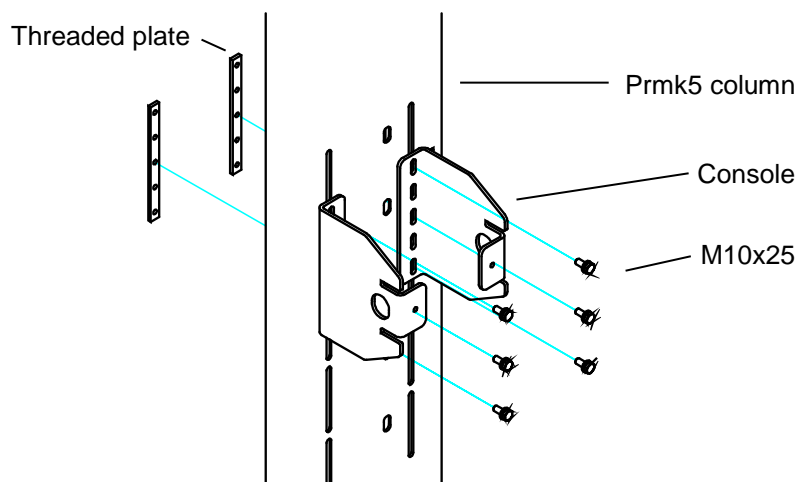


WARNING

The conveyor may only be set up by qualified personnel. Refer to chapter 3.

Preparation

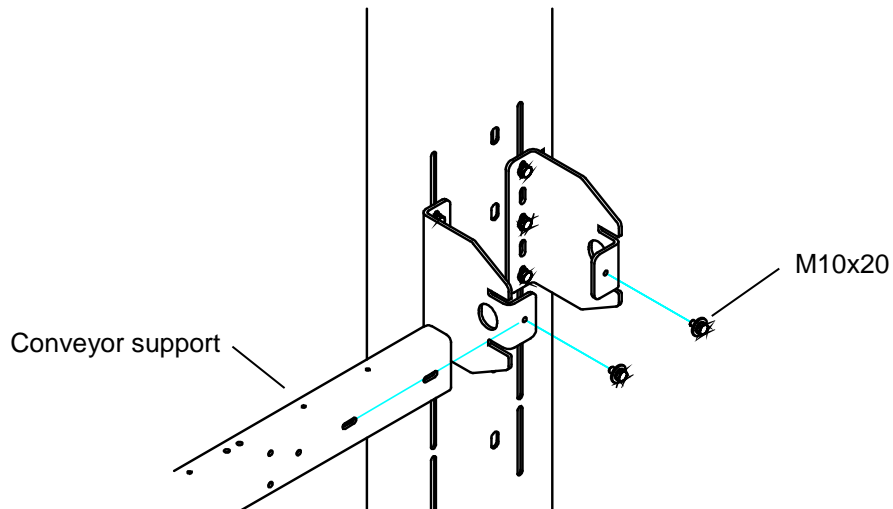
- Make sure that a hoisting system above the conveyor is available. Refer to section 5.4.
 - If Qimarox supplied support to floor: Make sure that the surface is level and meets the requirements for carrying the weight of the conveyor. Refer to the layout drawing.
1. Position the conveyor using a hoisting system. Refer to section 5.4.
 2. Use 12 M10x25 bolts and threaded plates to mount the consoles to the column of the Prmk5. Use the slots (130x10) provided in the column.



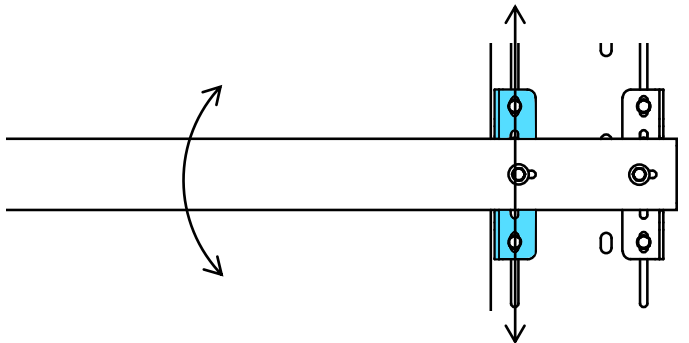
**Note**

If no slots are available at the desired position, drill 6 holes $\varnothing 10$ on both sides of the column. Refer to the manual of the Prorunner for the correct mounting position.

3. Attach both conveyor supports to the consoles.



4. Check that the conveyor supports are completely level. If necessary adjust by repositioning the consoles.



5. Disconnect the hoisting system
6. Check that the rollers of the conveyor are completely level. Refer to 4.9.

6 Maintenance



CAUTION

- The maintenance as described in this chapter is based on 2000 running hours per year. Adjust the maintenance frequency to the actual number of running hours per year.
- If required, Qimarox can carry out the maintenance activities.

6.1 Specific safety regulations

For the proper functioning of the conveyor the various conveyor parts must be regularly maintained. In this way defects and inaccuracies of the machine are prevented.



WARNING

- Only a qualified maintenance engineer is allowed to carry out maintenance activities on the conveyor. Refer to chapter 3.
- Turn off the power supply to the conveyor with the main switch before starting any maintenance or repair activities. Secure the main switch with a padlock.
- Cylinder remains pressurized when the valve is in mid-closed position.
- Do not use any corrosive and inflammable solvents or cleaning agents on the conveyor that contain TRI, PER, TETRA or FCHC. When you use chemical substances (cleaning agents), obey the instructions on the packaging.
- After having completed maintenance activities, always put all safety provisions that have been removed in place again.
- Make sure that the conveyor has always run empty before carrying out any activities. No products may be present on the conveyor.
- Take the appropriate measures for safely working at heights.

6.2 Preventive maintenance schedule

The maintenance schedule is a general list for all conveyors described in this manual. Not all components are present in each conveyor.

6.2.1 Daily maintenance

Item	Definition	Action when required by the check
Entire conveyor	Check for visible damage.	Replace damaged parts.
	Check for visible dirt.	Clean the machine. Refer to section 6.3

6.2.2 Weekly maintenance

Item	Definition	Action when required by the check
Poly-V belts	Check for wear or visible damage.	Replace Poly-V belt.
Poly-V head	Check for wear or visible damage.	Replace roller.
Cabling	Check for visible damage.	Replace the cable.
Timing belt	Check tension of timing belt	Adjust timing belt tension by moving idler.

6.2.3 Monthly maintenance

Item	Definition	Action when required by the check
Gear motor	Follow the instructions in the manual of the manufacturer of the gear motor.	Follow the instructions in the manual of the manufacturer of the gear motor.
Bearings	Check for play or wear.	Replace bearing.
Sensors	Check for visible damage.	Replace the sensors if necessary.
	Check for loose parts	Fasten loose parts.
	Clean. Refer to section 6.3	
Cabling	Check if all cables are fastened tightly.	Reconnect cables if necessary.
Cable carrier	Check for play or wear.	Replace cable carrier
Roller sleeve (optional)	Check for excessive wear	Replace roller
Timing belt	Check for wear or visible damage.	Replace timing belt.

6.2.4 6-monthly maintenance

Item	Definition	Action when required by the check
Gear motor	Follow the instructions in the manual of the manufacturer of the gear motor.	Follow the instructions in the manual of the manufacturer of the gear motor.
All bolt connections	Check all bolt connections.	Tighten bolts using the correct tool and torque.

6.2.5 2-yearly maintenance or after 10,000 running hours, whichever comes first

Item	Definition	Action when required by the check
Gear motor	Follow the instructions in the manual of the manufacturer of the gear motor.	Follow the instructions in the manual of the manufacturer of the gear motor.

6.3 Cleaning



WARNING

- Do not use any corrosive and inflammable solvents or cleaning agents on the conveyor that contain TRI, PER, TETRA or FCHC. Read the instructions on the packaging when chemical substances (cleaning agents) are used.
 - Electrical components should not make contact with water or other liquids.
 - Do not clean the conveyor with compressed air or water under high pressure.
 - Avoid parts made of rubber or plastic, such as cables and gaskets, from making contact with oil, solvents or other chemicals.
-
1. Make sure there are no products on the conveyor.
 2. Switch off the machine.
 3. Secure the main power supply switch with a padlock.
 4. Remove deposit and dirt by hand.
 5. Report any damage to the technically responsible person or to Qimarox and make sure that any damage is remedied before restarting the conveyor.

7 Troubleshooting

Problem	Possible cause	Solution
Some rollers are not (fully) rotating	Worn Poly-V belt	Replace Poly-V belt
	Worn Poly-V head of roller	Replace roller
Incorrect conveying speed	Wrong settings in DriveControl	Set DIP-switches in DriveControl to match specification sheet
Tilting conveyor does not tilt	Air pressure too low	Fix air supply. Refer to 4.7.2.
Uneven movement of tilting conveyor	Air pressure too low	Fix air supply. Refer to 4.7.2.
	Wrong exhaust air control valve(s) setting	Adjust exhaust air control valves. Refer to 4.4.2.
Timing belt of shuttle is slipping	Timing belt tension too low	Tension timing belt
Shuttle hits mechanical limit	Worn timing belt	Replace timing belt
	Incorrect deceleration	Set shuttle deceleration according to specification sheet
	Speed too high	Set shuttle speed according to specification sheet
	Motor torque too low due to incorrect wiring	Connect motor in delta
The motor does not run.	Electrical failure.	Remedy the electrical failure.
	The operation or main switch is on "OFF".	Set the operation/main switch to "ON".
	The door switch or emergency stop is active.	Release the emergency stop switch after having checked if the situation is safe.
The motor does not run and makes a humming sound.	Mechanical or electrical failure.	An authorized qualified person should disconnect the motor. Refer to chapter 3
	No full power.	Check the power cable for a break or short circuit.
	Poor contact.	Check the terminal clamps.
	Defect in the motor.	Check the connection and the motor winding.
	Blown fuse.	Replace the fuse.
	Thermal safeguard triggered.	Investigate and remedy the cause of the heating.

	Motor protection triggered by short circuit or overload.	Investigate and remedy the cause. Then reset the motor protection.
	Defective power controller.	Investigate and remedy the cause. Replace the power controller.

8 CE declaration of conformity

The CE declaration of conformity of the Prmk5 including conveyors can be found in the User manual of Prorunner mk5. This manual is provided by Qimarox.

9 Electrical drawings

The drawings of this conveyor can be found in an external document. For the electrical drawings of the RDC2 refer to “*Electrical drawings Prmk5 (XL) EN*”. For the electrical drawings of the RDC3 and RDC4 refer to “*Electrical drawings Prmk5 (XL) Sorter conveyors EN*”.

Refer to the specification sheet of the machine for the required frequency and connection (star or delta) of the shuttle drive. Delta connection is used to make sure the torque of the drive does not decrease above 50 or 60Hz.

9.1 RollerDrive EC310/EC5000

Operating manual: EC310

<https://www.qimarox.com/download/interroll-rollerdrive-ec310-eng/>

Operating manual: EC5000

<https://www.qimarox.com/download/interroll-roller-drive-ec5000-eng/>

9.2 DriveControl DC20/DC54/DC2048

Refer to the specification sheet of the machine for the correct DIP-switch settings.

<https://www.qimarox.com/download/interroll-drivecontrol-instruction-manual-eng-2/>

9.3 SEW 3PH (RDC4 only)



CAUTION

Always power the shuttle drive by a frequency inverter. The correct frequency can be found in the specification sheet.

Connection main power:

<http://www.productliften.nl/media/text/240/247/680010306.pdf>

Connection TF:

<http://www.productliften.nl/media/text/240/247/681510306.pdf>

Connection BR:

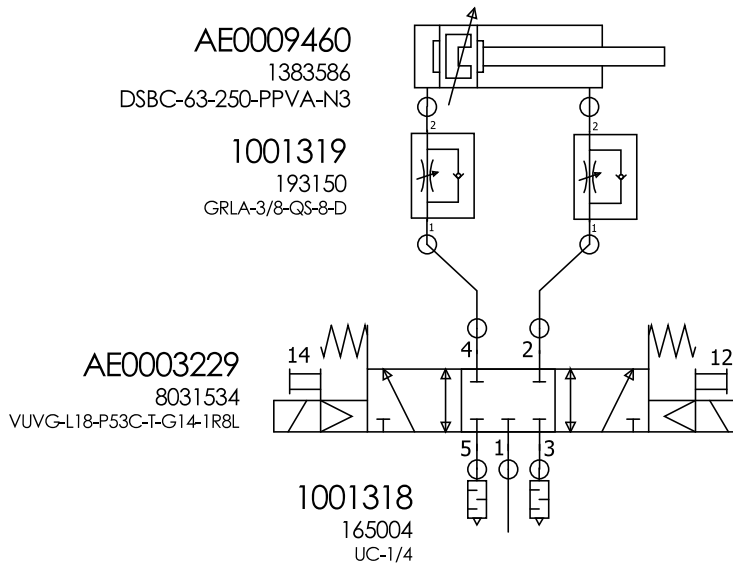
<http://www.productliften.nl/media/text/240/247/69001006.pdf>

Other connection diagrams DR:

<http://www.productliften.nl/media/text/240/247/9pd0058us.pdf>

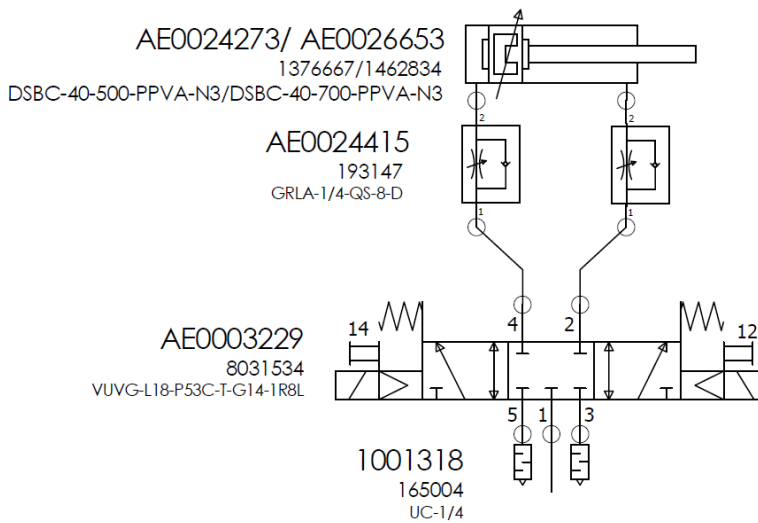
10 Pneumatic diagrams

10.1 Tilting roller conveyor RDC3



10.2 Pneumatic shuttle conveyor RDC5

Pneumatic diagram



Nobelstraat 43
3846 CE Harderwijk
Tel: +31 341 436 700
Fax: +31 341 436 701
E-mail: info@qimarox.com
Internet: www.qimarox.com