



Mirka® AutoChanger

Quick Start Guide

The Mirka® AutoChanger is a revolutionary modular solution designed for the automated replacement of abrasive discs in various industrial sanding applications.

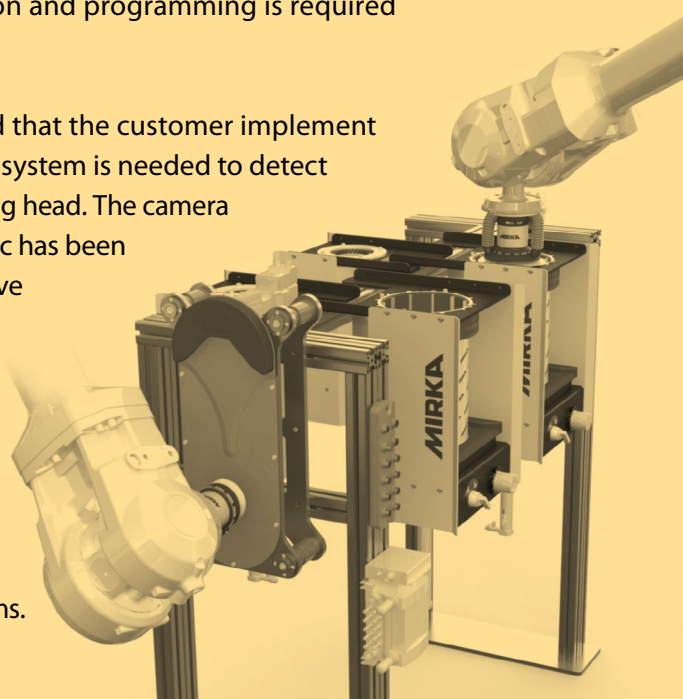


Mirka® AutoChanger

To install the AutoChanger system, the end customer should seek assistance from a qualified and experienced integrator. An understanding of automation and programming is required to setup the AutoChanger system safely and correctly.

In addition to the AutoChanger modules, it is recommended that the customer implement its own camera identification system. A camera identification system is needed to detect whether or not an abrasive disc has been attached to the sanding head. The camera system should also be able to identify whether the abrasive disc has been located correctly onto the interface or pad. Whether the abrasive disc has folded or is offset on the pad for example.

It is a responsibility of the integrator to carry out all installation and programming in accordance with the instructions in the user manual, as well as the instructions of the relevant component manufacturer. Mirka cannot provide additional support regarding installation and programming because of the differences in the final build of the various customers' systems.



Technical Data

Abrasive disc size	77 mm (3"), 125 mm (5"), 150 mm (6")
Abrasive disc capacity (per cartridge)	Up to 250 pcs (depending on abrasive type and grit size)
Abrasive change time	≤10 s

Pneumatics

Fluid	Compressed Air, quality class [7:4:4] (ISO 8573-1)
Compressed air supply connection (regulator not included)	0.05 - 0.25 MPa
Recommended working pressure (regulator included)	0.2 MPa
Min. required air flow capacity	115 L/min(ANR) @20°C
Total air consumption/cycle*	5.5 L(ANR) @20°C
Supply air hose	10 mm (Push-in connector)
Additional air hose	4 mm (Push-in connector)

Electrical Connections

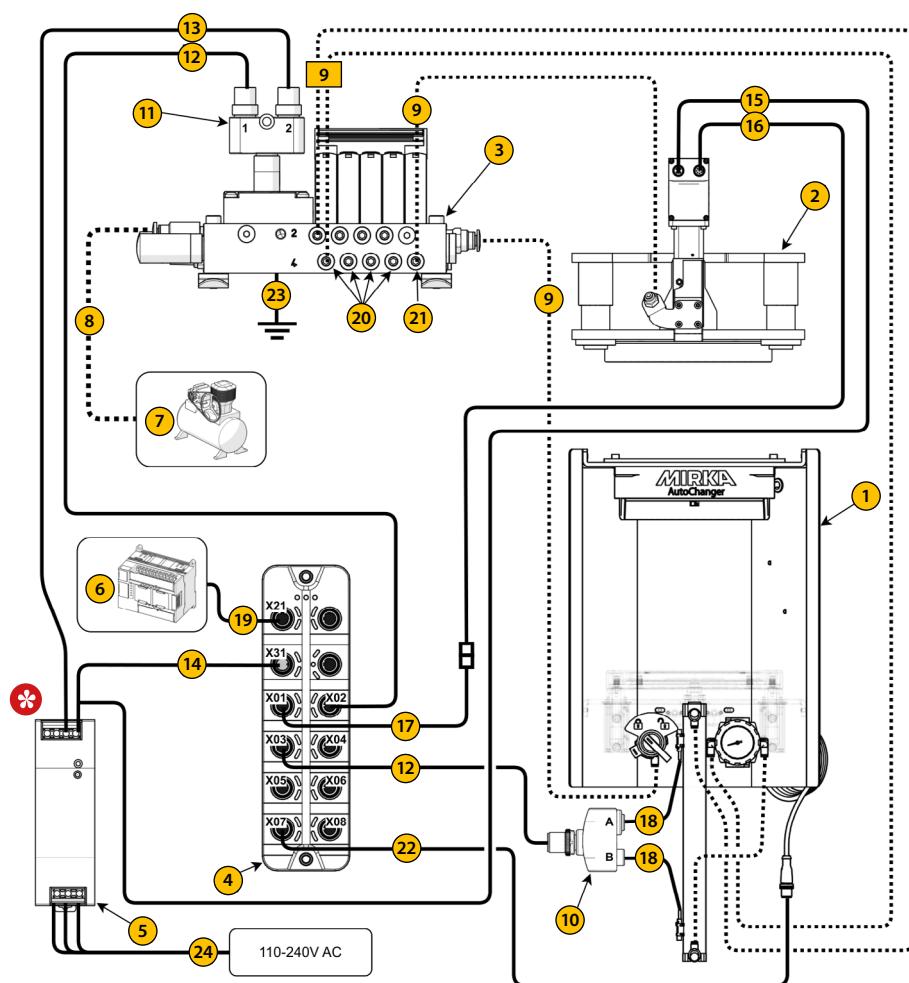
Input voltage	100–240 VAC
Power supply	24 VDC at 5 A
Communication protocol	Ethernet/IP, Modbus TCP, Profinet RT/IRT
Communication interface	IO-Link

Environmental

Ambient & fluid temp.	15 to 40°C
Ambient humidity	20 ~ 90% RH (non-condensing)
Storage temp.	-10 to +60°C

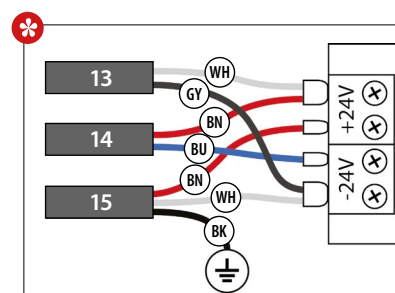
*One cycle is equivalent to changing one abrasive disc using one Remover and one Magazine

AutoChanger connection chart overview



The simplified connection chart gives the integrator an overview of how the AutoChanger modules are supposed to be connected.

Port	Connection
X21	FieldBus
X31	24V Power
X01	Remover (IO-Link)
X02	Valve manifold (IO-Link)
X03	Magazine 1 position sensors (digital input)
X04	Magazine 2 position sensors (digital input)
X05	Magazine 3 position sensors (digital input)
X06	Magazine 4 position sensors (digital input)
X07	Magazine 1 & 3 safety switch (digital input)
X08	Magazine 2 & 4 safety switch (digital input)



WH=White, GY=Grey, BN=Brown, BU=Blue and BK=Black.

No.	Name	Incl.*	No.	Name	Incl.*
1	Magazine	Yes	13	M12 Power cable 10 m open end (IFM EVC072)	Yes
2	Remover	Yes	14	M12 Power cable 10 m open end (IFM EVC708)	Yes
3	Valve Manifold	Yes	15	M12 Power cable 10 m open end (Festo NEBL-T12W4-E-10-N-LE4)	Yes
4	IO-Link master	Yes	16	M12 Connecting cable (Festo NEBC-M12W8-E-10-N-M12G8)	Yes
5	Power supply	Yes	17	M12 Adapter cable (Festo NEFC-M12G8-0.3-M12G5-LK)	Yes
6	PLC/Robot	No	18	Position sensor 0.3 m	Yes
7	Air supply	No	19	M12 Ethernet cable 10 m (IFM EVF553)	Yes
8	Pneumatic air hose 10 mm	No	20	5/3-Valve	Yes
9	Pneumatic air hose 4 mm	No	21	5/2-Valve	Yes
10	Y-splitter (IFM EBC112)	Yes	22	M12 Connecting cable 10 m (IFM EVC 557)	Yes
11	Y-splitter (SMC EX9-ACY02-S)	Yes	23	Ground cable	No
12	M12 Connecting cable 10 m (IFM EVC108)	Yes	24	Power cable	No

NOTE! *Included in the scope of delivery for a complete order of a minimum of one of each module. If one module is left out of the order this list will not be accurate.

Pneumatic settings

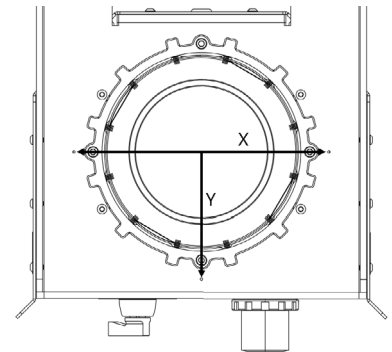
Important! The pressure differences between the inlet pressure and the magazine pressure should not be greater than 0.1 MPa. If the pressure differences are > 0.1 MPa, the cylinders will not operate properly.

PROGRAMMING INSTRUCTIONS

Programming guidelines

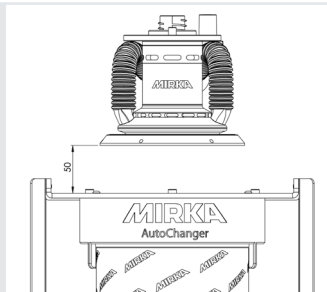
1. Avoid pressing the stack of abrasive discs against the bristles during extended pauses, as it can damage the bristles.

2. Utilize the three holes on the Magazine's top plate as coordinates to locate the center point easily. These instructions provide general guidance.



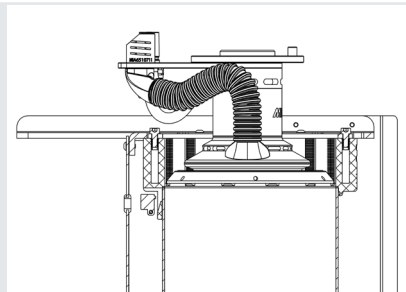
Step 1:

Position AIROS above the magazine opening, with the pad/interface about 50 mm from the Magazine's top surface. This is waypoint 1. No pressure in the cylinder.



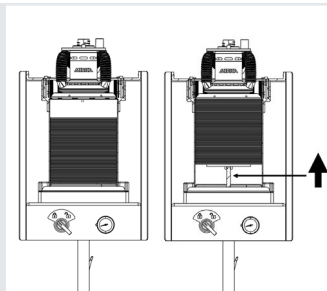
Step 2:

AIROS descends through the bristles until the pad/interface reaches the bottom. This is waypoint 2. Cylinder pressure remains off.



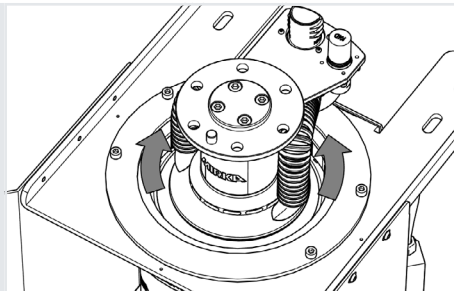
Step 3:

Open the 5/3-valve to pressurize the magazine cylinder and wait at waypoint 2 for the abrasive stack to reach the pad. Wait for 1-2 seconds.



Step 4:

Program a circular motion (clockwise/counterclockwise) for AIROS when paper reaches the pad, to ensure engagement. There is a 2 mm tolerance between the pad and magazine.

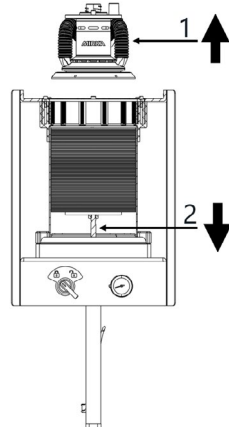


Step 5:

After completing the circular motion, AIROS moves back to waypoint 1 while sending a pulse to reverse the cylinder down for 0.01–0.1 s.

The solenoid valve returns to the closed position to prevent pushing abrasives out.

The AIROS now has an abrasive disc attached. To pick a new disc, start from step 1. Reduce waiting time in step 3 for faster disc changes.

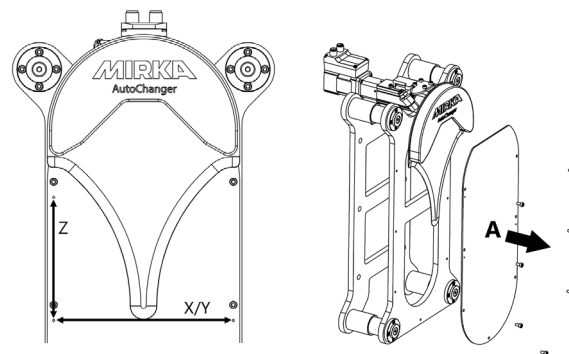


AIROS moving up, cylinder moving down (single puls).



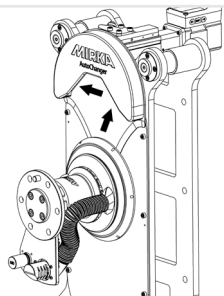
Removing abrasive discs

Important note! To reach knives closed position, follow Festo's "Homing" command. Before executing the homing command, remove the sliding plate (A) from the Remover. You can reapply it after completing the homing command. Failing to remove the sliding plate during homing, will prevent the knife from making contact during operation.



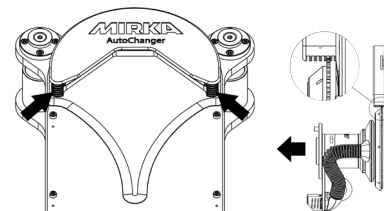
Step 1:

Center the AIROS orbit by pressing the pad against the bumper on the Remover – first on the right- and then on the left hand-side. Use the profiled edge of the bumper for alignment.



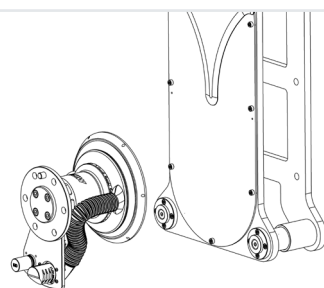
Step 2:

Ensure the edge of the abrasive disc makes contact with the grooves on the bumper to prevent folding.



Step 3:

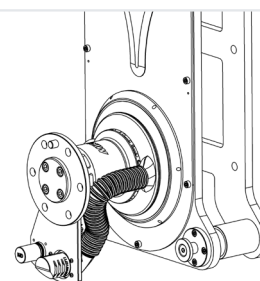
Center the orbit, fold the disc edge down, and position the AIROS pad parallel to the sliding plate. Ensure the knife is at position 1. This is waypoint 1.



Step 4:

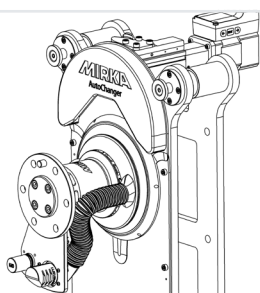
Press AIROS against the sliding plate, causing it to spring back about 10 mm. This is waypoint 2.

Important! When an interface is in use, approach the remover carefully at 20 degree angle.



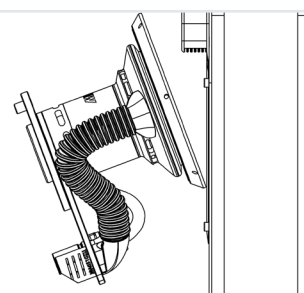
Step 5:

Move AIROS up to the knife; the disc separates from the pad, and the knife position changes to squeeze the disc in place (waypoint 3).



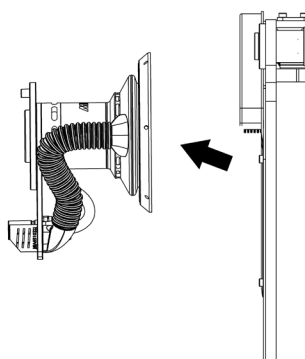
Step 6:

Tilt AIROS backwards 20 degrees to release the outer edges of the disc from the AIROS (waypoint 4).



Step 7:

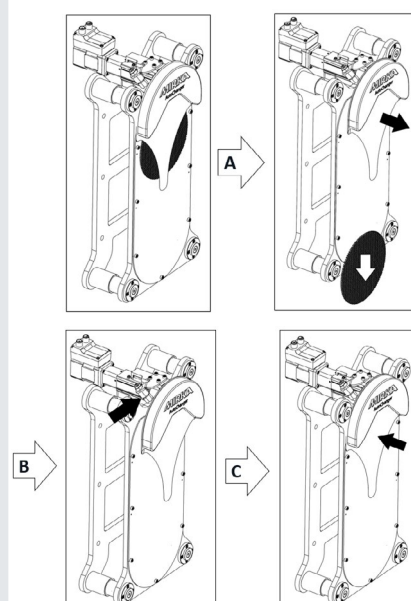
Move AIROS at an angle backwards and upwards to release the bottom part of the abrasive disc (waypoint 5).



Step 8:

While the AIROS is at waypoint 5, the knife position must first change from position 2 to position 3 (A). This sequence releases the abrasive paper from the Remover.

When the knife is at position 3, the solenoid valve for the air nozzle opens (B) and air is blown behind the knife to ensure that an abrasive disc that could have stuck to the rear of the knife is removed along with any dust left behind. After the nozzle has blown air for approximately 0.5 seconds, the knife can return to position 1 (C).



Step 9:

Re-center the orbit and follow the "Removing abrasive discs" process to pick a new disc.

OPERATOR INSTRUCTIONS

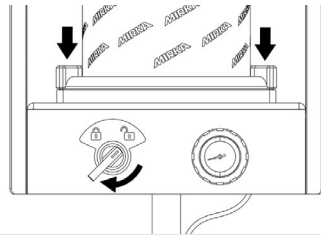
It is the responsibility of the customer to train operators in the AutoChanger system and provide them with sufficiently extensive training materials before they are allowed to operate the system.

Changing Cartridges:

When the system gives a warning that the Magazine is almost empty it is recommended to change the cartridge.

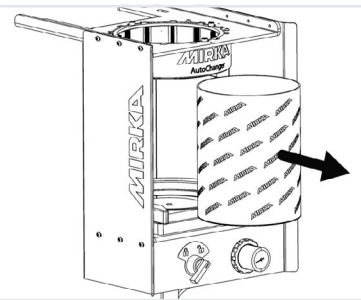
Step 1:

Switch the manual control on the front of the Magazine to the "unlock" position. This action will automatically lower and unlock the cartridge.



Step 2:

Carefully slide out the old cartridge from the magazine.



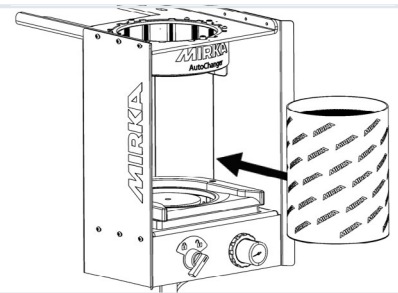
Step 3:

Remove the top lid of the new cartridge.



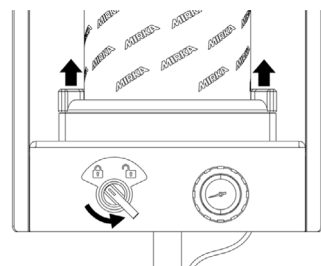
Step 4:

Insert the new cartridge into the Magazine. (Velour side up)



Step 5:

Rotate the manual switch to the "lock" position. The Magazine base will automatically rise upwards and secure the new cartridge in place.



Bristles:

- Magazine 77 mm: 2 circular bristles preinstalled.
- Magazine 125 mm & 150 mm: 1 circular bristle + 3 small straight bristles preinstalled. 9 additional straight bristles are supplied for adjustment possibilities.



MAINTENANCE & TROUBLESHOOTING

Maintenance:

During any kind of maintenance to the AutoChanger system it is very important that the whole robot cell is shut off, in order to NOT put any maintenance personnel at risk.

Condition check

At least once a month check the condition of all AutoChanger modules. Ensure that none of the linear bearings are seized or making excessive noise. Check bristles for wear. Ensure that none of the pneumatic hoses are damaged or loose.

Cleaning

Sand and dust should be cleaned from the Magazine and Remover using compressed air at least once a day to prevent the premature wear of moving components. It is also important to remove all dust on the micro switch in the Magazine to prevent it from sticking.

Lubrication

No additional lubrication should be applied to any of the AutoChanger modules.

Troubleshooting

Symptom	Recommended procedures
AIROS picking two discs	Add additional straight bristles (125/150 mm versions only). Change bristles to the coarser red type to add resistance. Check that the Magazine pressure is set according to the manual.
AIROS picking no disc	Remove a few bristles to reduce resistance (125/150 mm versions only). Replace the circular bristle with the supplied shim ring to reduce resistance (125/150 mm version only). Check that a circular motion is programmed in the picking process Check that the Magazine pressure is set according to the manual. Make sure only Mirka backing pads and pad savers are used.
Disc is still stuck to AIROS after removal	Program the AIROS to move closer to the bumper before ripping off the used disc Make sure that homing of the Remover has been made according to instructions in the manual
The disc is not centered on AIROS/backing pad	Check that the AIROS orbit is aligned with the bumper before removal Check that the pad is centered over the magazine opening before picking new disc
Discs tilting/dropping in cartridge	Check that the pressure difference between the valve manifold pressure and Magazine regulator is <0.1 MPa Check that the short downward pulse of the cylinder after picking does not retract the cylinder downwards more than max 10 mm.
Communication failure	Check that all wiring is done according to diagrams in the manual Check that all connections are secure and no cables are damaged Check respective component manufacturers manuals for further troubleshooting
AIROS gets stuck on edge of knife	Check that the edge of the disc is being straightened on the edge of the bumper before removal Make sure only Mirka backing pads and pad savers are being used If interface pads are being used, the AIROS should approach the knife at 20° angle Check that the AIROS orbit is aligned with the bumper before removal

**Read the manual
for further information!**



<https://brandfolder.com/s/mm685m2xtxc5xrbkg7qr7q9b>



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