Dynamic Contouring Movers

Customer Product Manual
Part 7593729_01
Issued 01/20

For parts and technical support, call the Industrial Coating Systems Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

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NORDSON DEUTSCHLAND GMBH

Contact Us

Nordson Corporation welcomes requests for information, comments, and inquiries about its products. General information about Nordson can be found on the Internet using the following address: http://www.nordson.com.

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Change Record

Revision	Date	Change

EC DECLARATION OF CONFORMITY

ACCORDING TO CE DIRECTIVE 2006/42/ EC ANNEX II 1A

DESCRIPTION: **Dynamic Contouring Mover (DCM) for powder application**

FAMILY/MODELS: **DCM** All variants (6ft-Right/Left, 5ft-Right/Left)
p/n 7035280-7035283

APPLICABLE DIRECTIVES & STANDARDS USED TO VERIFY COMPLIANCE:

Directive 2006/42/EC (Machinery)
2014/34/EU Explosive Atmosphere
EN 60204-1 "Safety of Machinery - Electrical equipment of machines"
EN ISO 12100 "Safety of machinery - Basic concepts, general principles for design"

MARKING OF PRODUCT: CE

The equipment delivered is generally intended to be part of a powder coating system, and can be operated on its own or in conjunction with other equipment.
In order to be in full compliance with the CE machinery directive and its amendments, the customer is obliged to respect the applicable regulations for his powder coating system upon incorporation of the equipment in the powder coating plant and before starting operation.

We hereby declare that the product specified conforms to the directives and standards described above and that it has been provided with a CE label. Provided the product is installed and operated in line with the Nordson manuals, its operation is safe.

Name and address of the responsible person authorized to compile the technical file

Kai Flockenhaus
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Date: 12/12/2019

Table of Contents

Safety

Read and follow these safety instructions. Task- and equipment-specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to all persons operating or servicing equipment.

Qualified Personnel

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

Intended Use

CAUTION: Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings

Regulations and Approvals

WARNING: Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

All phases of equipment installation must comply with all local codes.

Personal Safety

To prevent injury, follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing any moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- Obtain and read Safety Data Sheets (SDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.
- Do not use the air blow gun to clean your body. Compressed air can pierce the skin and if directed towards the face it could cause a severe eye injury.

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Provide adequate ventilation to prevent dangerous concentrations of volatile materials or vapors. Refer to local codes or your material SDS for guidance.
- Do not disconnect live electrical circuits while working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

Grounding

WARNING: Operating faulty electrostatic equipment is hazardous and can cause electrocution, fire, or explosion. Make resistance checks part of your periodic maintenance program. If you receive even a slight electrical shock or notice static sparking or arcing, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.

Grounding inside and around the booth openings must comply with EN50050-2, EN50177, EN16985, latest conditions.

- All electrically conductive objects in the spray areas shall be electrically connected to ground with a resistance of not more than 1 ohm when measured with an appropriate instrument.
- Equipment to be grounded includes, but is not limited to, the floor of the spray area, operator working area platforms, hoppers, photoeye supports, and blow-off nozzles. Personnel working in the spray area must be grounded.
- There is a possible ignition potential from the charged human body. Personnel standing on a painted surface, such as an operator platform, or wearing non-conductive shoes, are not grounded. Personnel must wear shoes with conductive soles or use a ground strap to maintain a connection to ground when working with or around electrostatic equipment.
- Operators must maintain skin-to-handle contact between their hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If gloves must be worn, cut away the palm or fingers, wear electrically conductive gloves, or wear a grounding strap connected to the gun handle or other true earth ground.
- After servicing equipment, reconnect all disconnected equipment, ground cables and wires.

Action in the Event of a Malfunction

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

- Disconnect and lock out electrical power. Close pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the equipment.

Disposal

Dispose of equipment and materials used in operation and servicing according to local codes.

Description

Figure 1 **Dynamic Contouring Mover**

The Nordson DCM (Dynamic Contouring Mover) is designed to improve the coating operation by automatically adjusting the position of each automatic powder spray gun individually according to the product's geometry.

Using a heavy duty reciprocating arm, each DCM moves in a linear horizontal motion, to ensure it follows the profile of the product for optimal coating. This enables excellent coating for all products including those with complex contours.

Each DCM is equipped with a Nordson Encore Automatic Gun (Tube Mount version). Standard length is 5 foot (152,4 mm) however, there is also a 6 foot (182.8 mm) version available.

Function

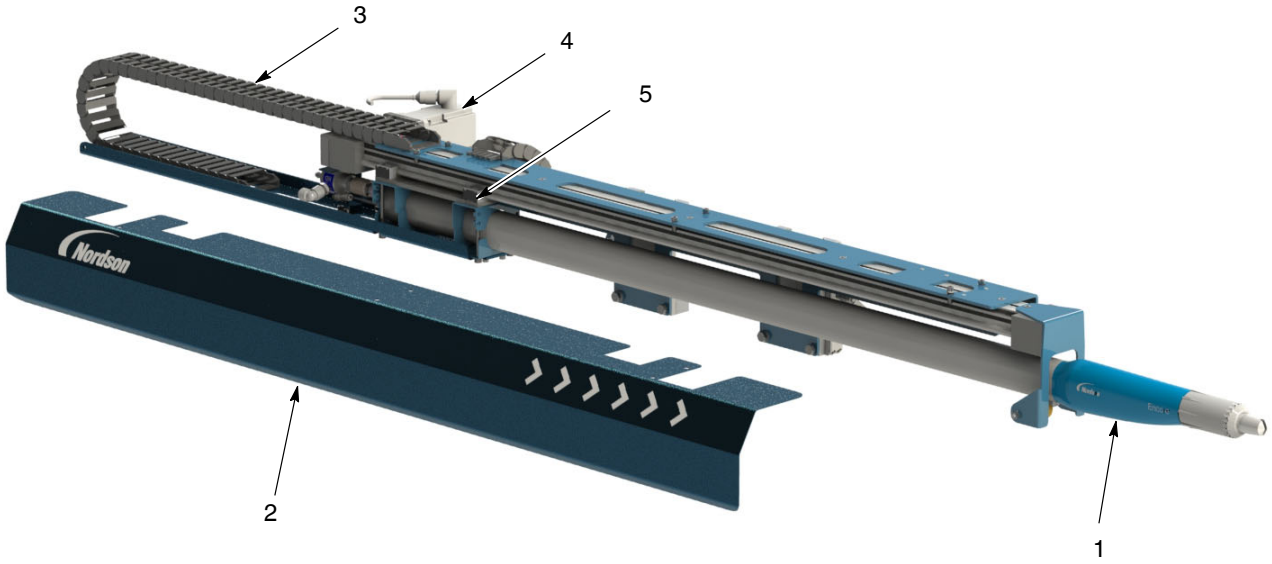

Figure 2 Identification of DCM Components

Item	Component	Function
1	Encore Automatic Gun	Charges the powder electrostatically and applies it to the product
2	Cover	Protective shroud to cover the mechanics of the DCM
3	Energy Chain	Supports the cable and tubing supply to the gun
4	Motor Assembly	Drives the gun and reciprocates along the horizontal plane
5	Carriage	Mounting point for the automatic gun

See Figure 2

The Encore automatic powder spray gun is mounted to the carriage of the DCM which enables horizontal reciprocation with its drive belt structure. Inductive sensors are fitted to determine the start and stop positions. All electrical connections are installed at the rear of the unit, they are supported and guided using a flexible energy chain.

The geometry of the product to be coated is obtained using 2D laser scanners which transmit the data to the Nordson Powder Pilot control system. This control system defines the movement required for each individual gun and precisely moves them using a servo motor and the latest technology drives.

Installation

WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

When the DCM is mounted onto the vertical reciprocating device, it is essential to define the area required for all machines to move freely and avoid collision. According to Norm EN13857, regarding the safety of machinery and safe distances in hazardous zones.

All electrical connections must be made by a qualified electrician.

All fasteners and clamps must be securely tightened before operating the DCM.

NOTE: Pneumatic (including pressure and quality) and electrical supplies must be in accordance with the system drawings supplied by Nordson.

Transport

Transport the unit so as to avoid damage. Use suitable packaging materials. Protect the unit from humidity, large temperature fluctuations (condensation), dust and vibrations.

Unpacking

Unpack the unit carefully to avoid damage. Inspect for any damage caused during transport. Save packing materials for possible later use, or otherwise dispose of properly according to local regulations.

Storage

Use suitable packaging materials. Protect the unit from humidity, large temperature fluctuations (condensation), dust and vibrations.

Preparing for Installation

NOTE: The Nordson DCM units are delivered fully assembled and only require the Encore automatic gun to be mounted. Ensure that all necessary brackets are available ready to mount the DCM.

Installation Concept and Connection Points

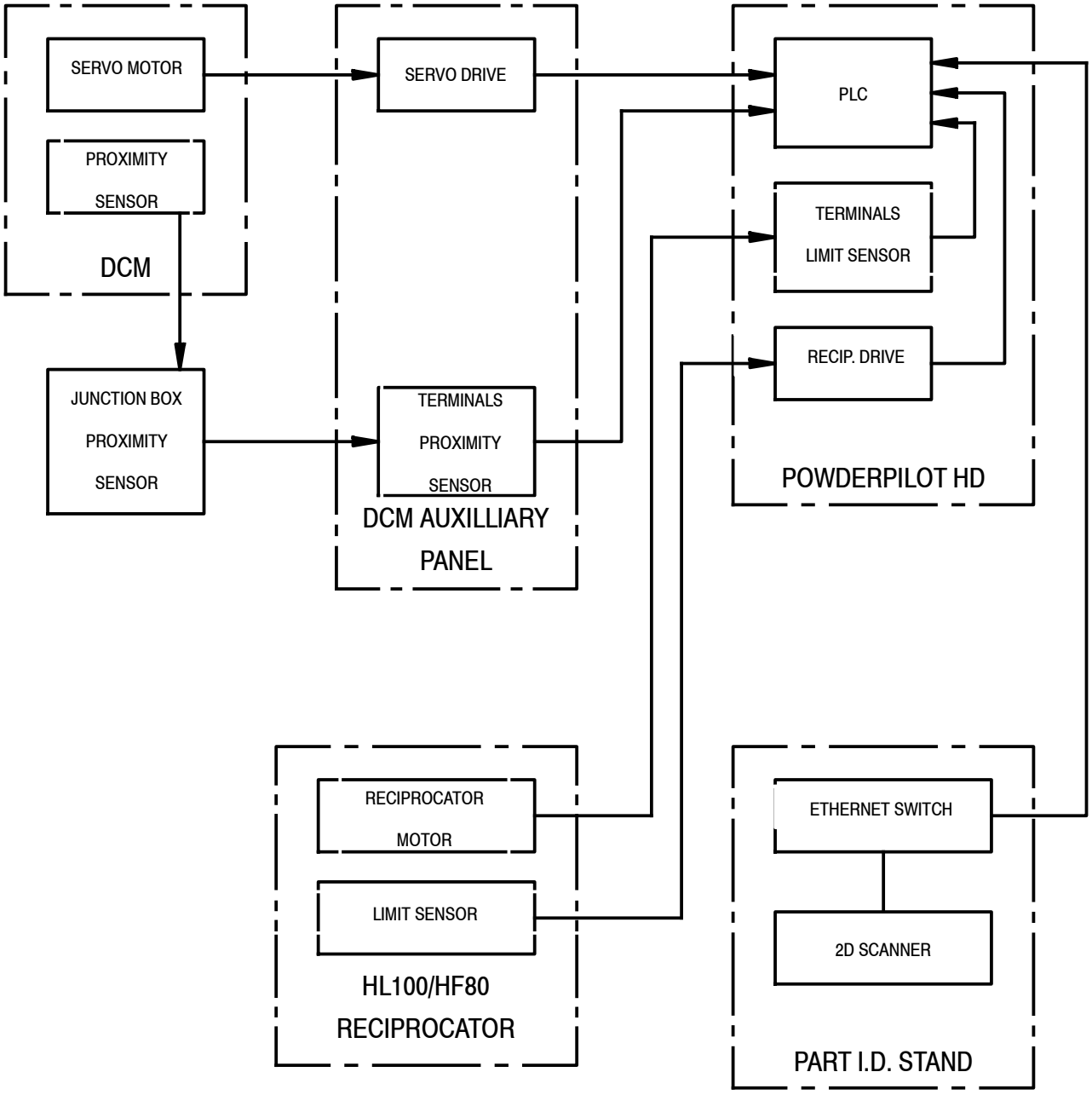

Figure 3 Layout Showing Installation Concept and Connection Points

The DCM's are connected to the coating system as displayed in the above diagram. This diagram shows the minimum requirements needed to run the DCM.

Installing the DCM onto the Reciprocator

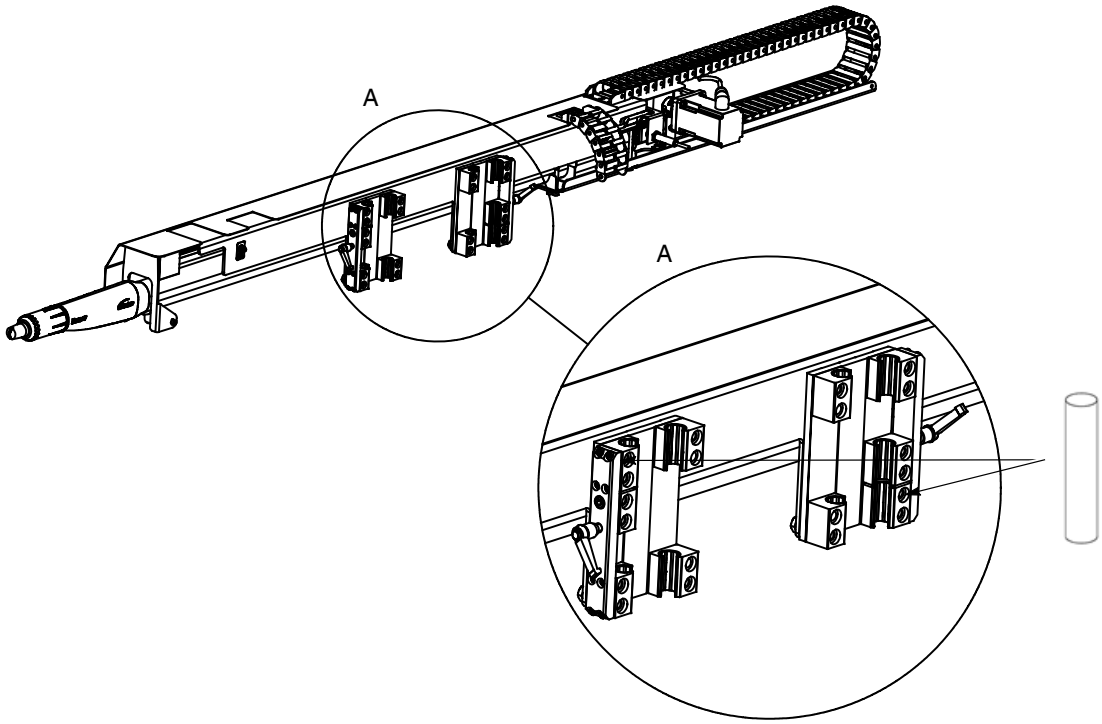

Figure 4 DCM Mounting Brackets

1. Loosen the clamps (A) on the back side of the DCM. Do not remove the support bolt as this is holding the sliding bearing in place. Then fit the installation guide rods.

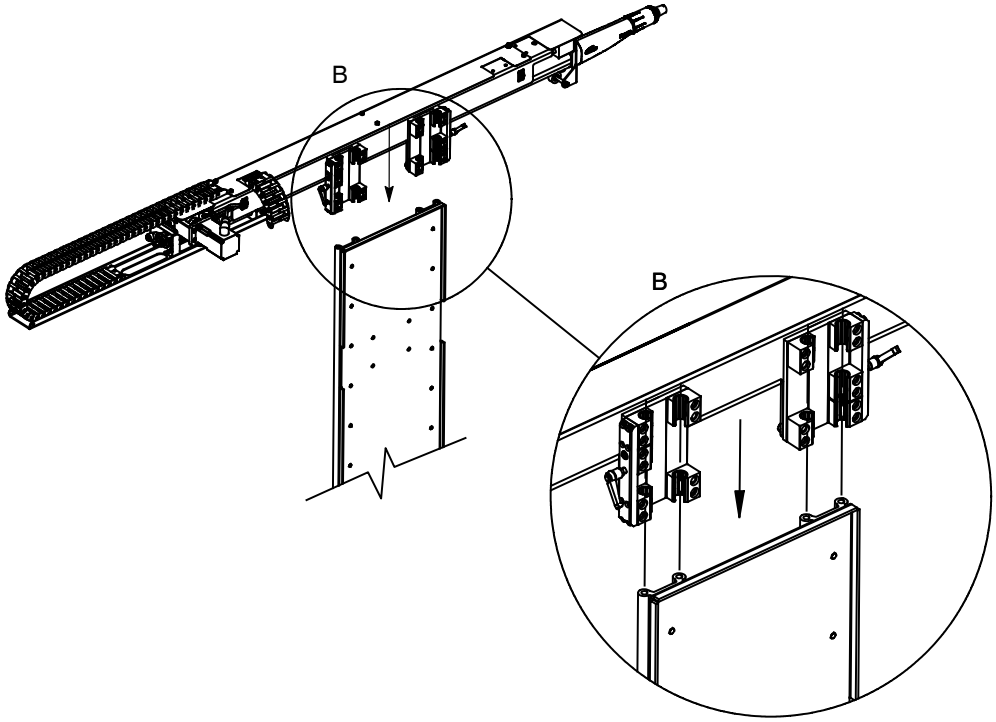

Figure 5 Attaching the DCM

2. Use the installation guide rods to cover the sharp edges of the mounting rail. Slide the DCM into the bracket as shown above.

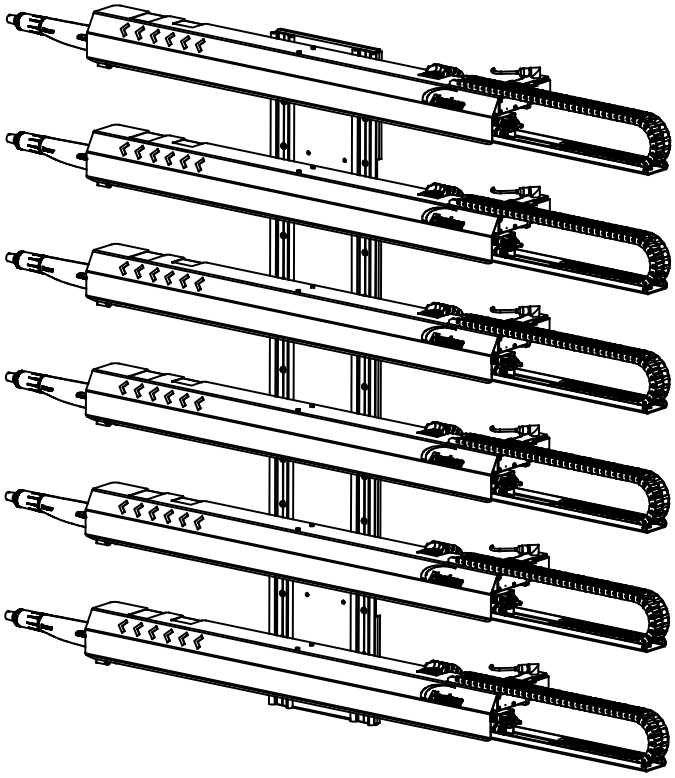

Figure 6 DCM Mounting Brackets

3. Install all DCM's onto the rail. Tighten the clamps to secure them in position.

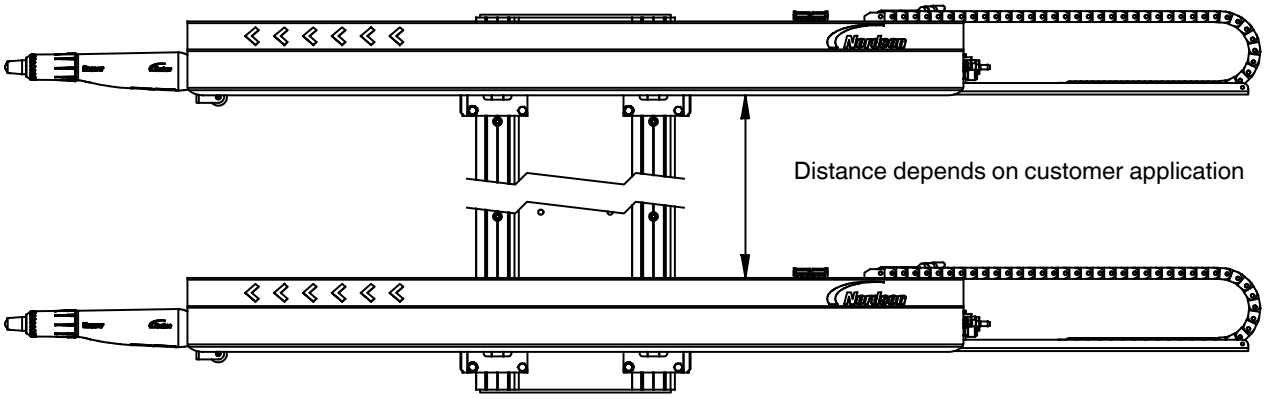

Figure 7 Positioning the DCM

4. Set the limit sensors and mechanical hard stop on the reciprocator to the required position.

NOTE: The counterweights inside the reciprocator will need adjusting to accommodate the additional weight. For the installation guide of the counterbalance weights, please see the relevant technical manual on the Nordson eManuals website - www.emanuals.nordson.com/finishing (Powder-Europe)

Grounding

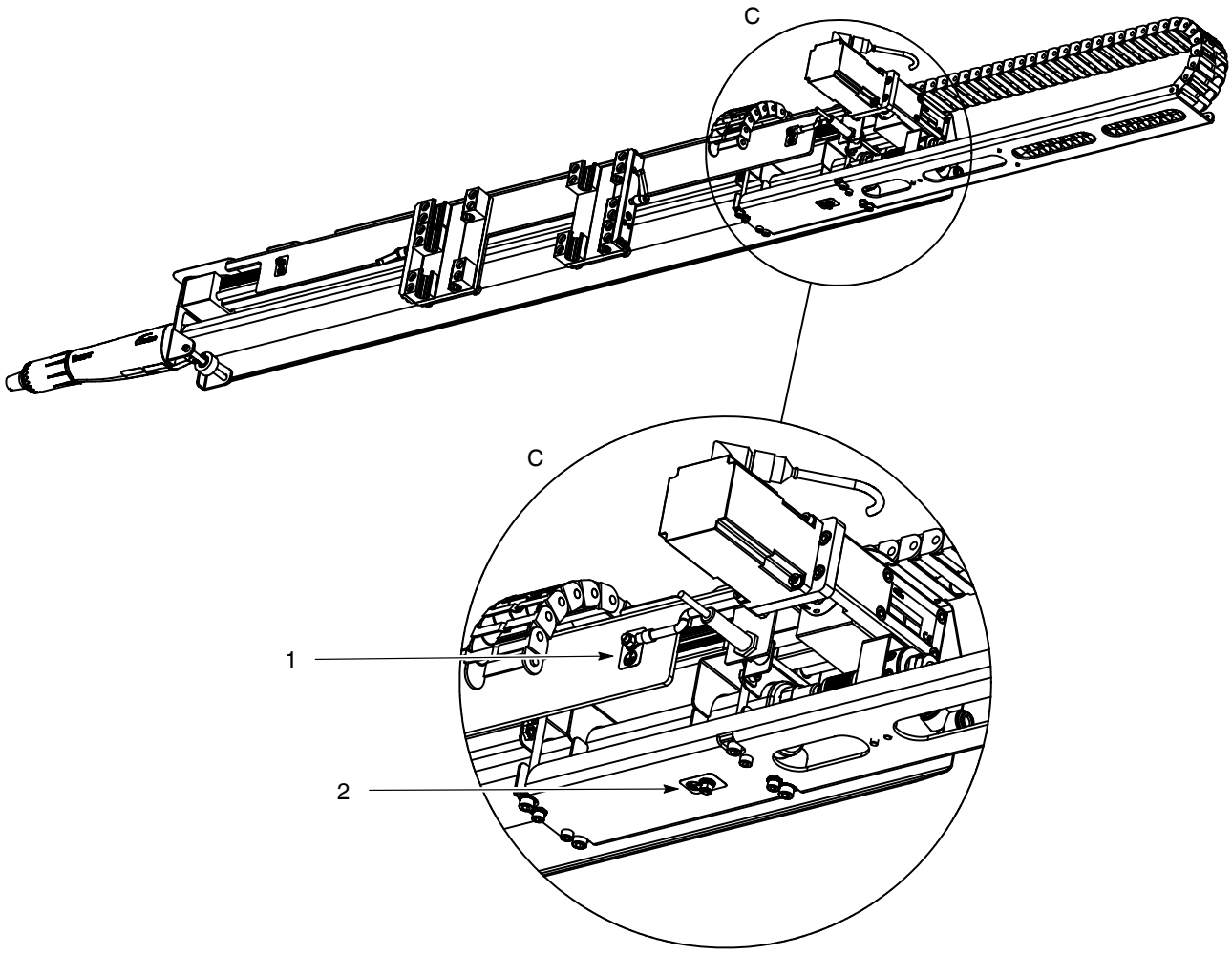

Figure 8 Grounding Points

It is essential that the DCM is always properly grounded. Points 1 and 2 must be connected with a ground cable via the energy chain. Point 1 must also be connected to the ground point on the reciprocator.

Removing the Encore Automatic Gun

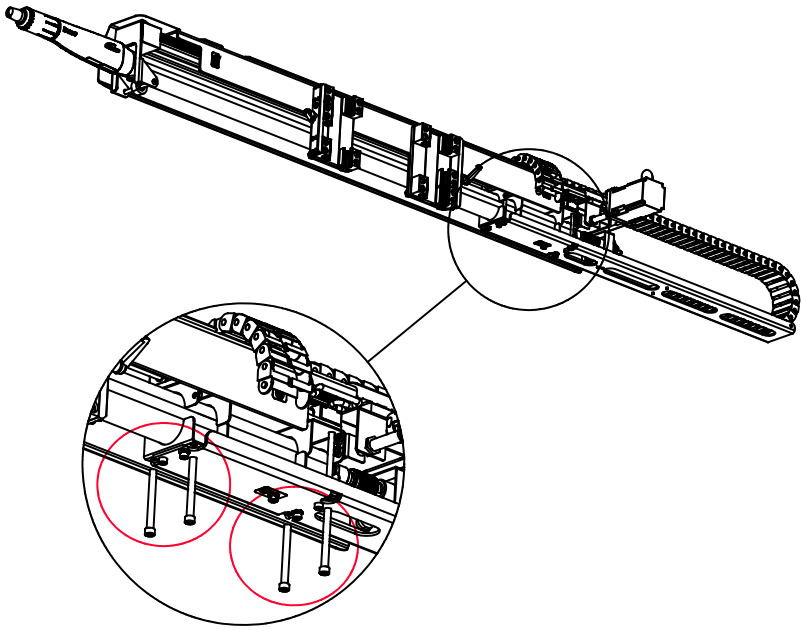

Figure 9 Fixing Points of Encore Automatic Gun

1. Drive the DCM to its starting position.
2. Turn off the system power and isolate.
3. Unplug all cables and hoses then disconnect the gounding points.
4. Loosen the 4 screws indicated above.

CAUTION: Do not remove the screws completely as this may cause the gun or brackets to fall.

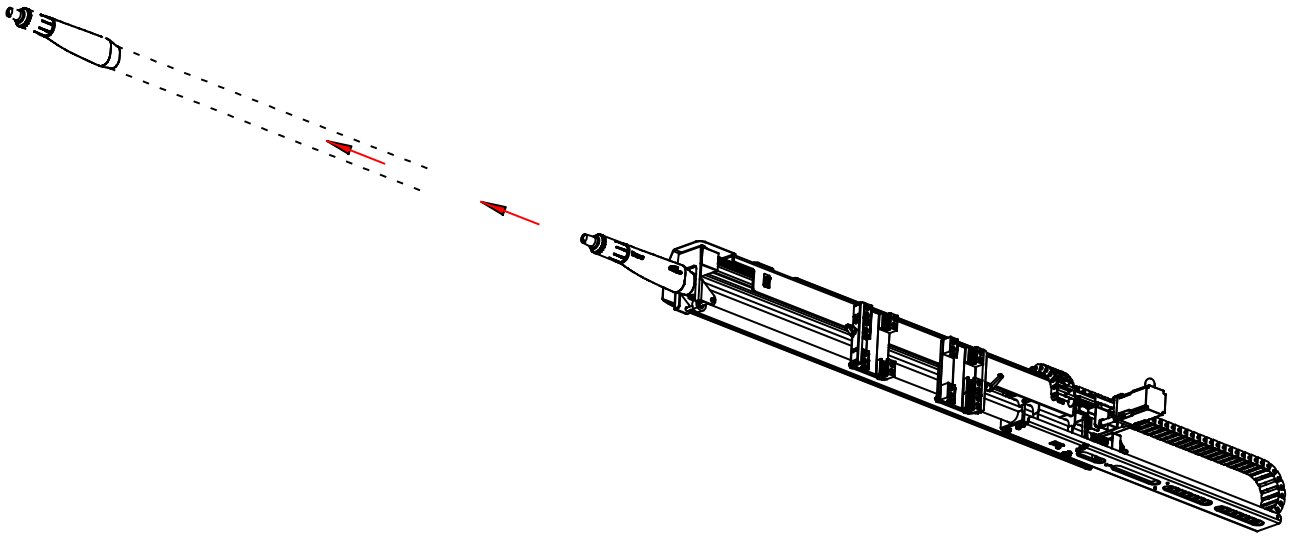

Figure 10 Automatic Gun Removal

5. The gun is now completely free to slide out from the front of the DCM.
6. To reinstall the gun or a replacement, reverse steps 1 - 5

Maintenance

WARNING: Breathing in certain airborne dusts (including finishing powders) may be hazardous to health. Ask the powder manufacturer for a Material Safety Data Sheet (MSDS) for information. Use appropriate respiratory protection. Always disconnect the power and wait until the motor has cooled, before removing covers and working on the device.

CAUTION: It is important to follow the specific maintenance instructions of each product.

Maintenance Table

Description	Operator	Action	Daily	Weekly	Monthly	Quarterly	6 Monthly	Yearly	AR
Clean and remove powder from the automatic spray gun	TO	Use a clean lint free cloth to wipe the powder	X						
Clean and remove powder from the linear axis	TO	Use a clean, lint free cloth to wipe the powder	X						
Clean and remove powder from the drive motor	TO	Use a clean, lint free cloth to wipe the powder	X						
Clean and remove powder from the inductive sensor	TO	Use a clean, lint free cloth to wipe the powder	X						
Clean and remove powder from the belts and cables	TO	Use a clean, lint free cloth to wipe the powder		X					
Re-adjust / tighten all clamps on the reciprocator	TO	For tightening turn the grip handle clockwise			X				
Check all electrical power cables	ST	Visual inspection			X				
Check all powder hose connections	ST	Visual inspection			X				
Check all gun cables	ST	Visual inspection			X				
Check the complete system and replace worn or damaged parts	ND or ST	Visual inspection					X		
Replace the sliding bearings bushing	ND or ST	Refer to the instructions that follow							X
ND = Nordson Technician - TO = Trained Operator - ST = Skilled/Trained Technician									

Replacing the Linear Bearing Bushing

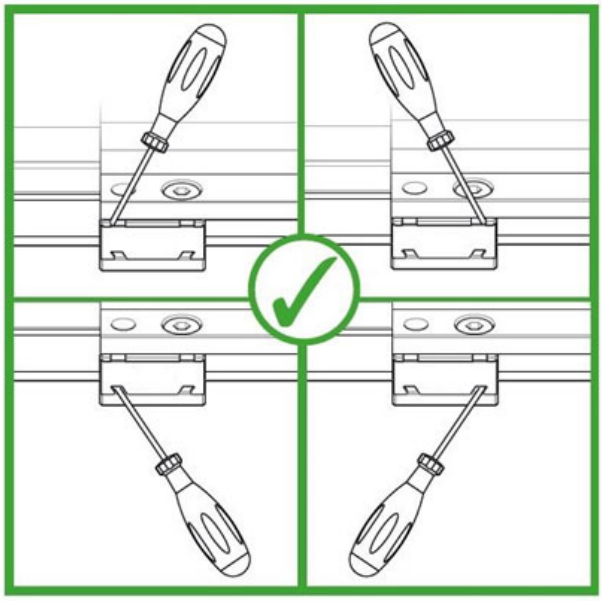

Figure 11 Linear Bearing Bushing Removal - Step 1

1. Turn off the system and isolate
2. Open the side cover of the bearing with a screwdriver

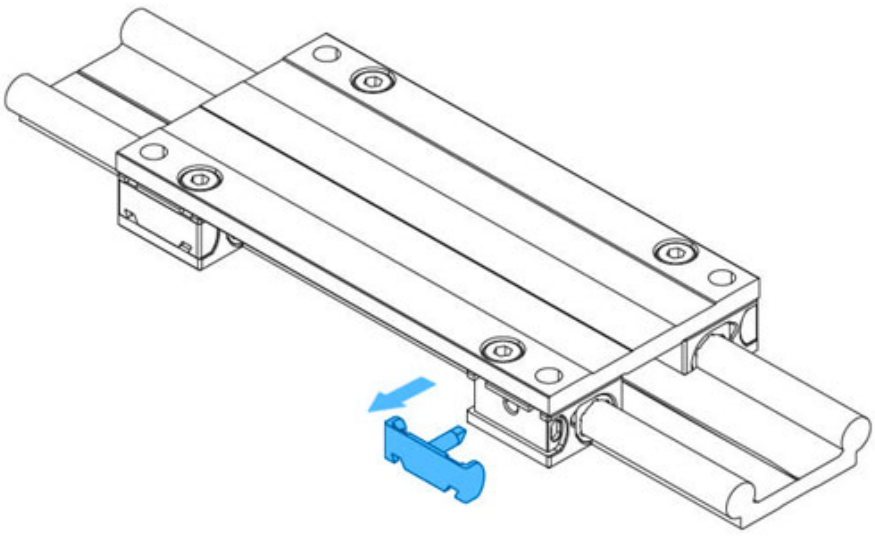

Figure 12 Linear Bearing Bushing Removal - Step 2

3. Remove the side cover of the bearing

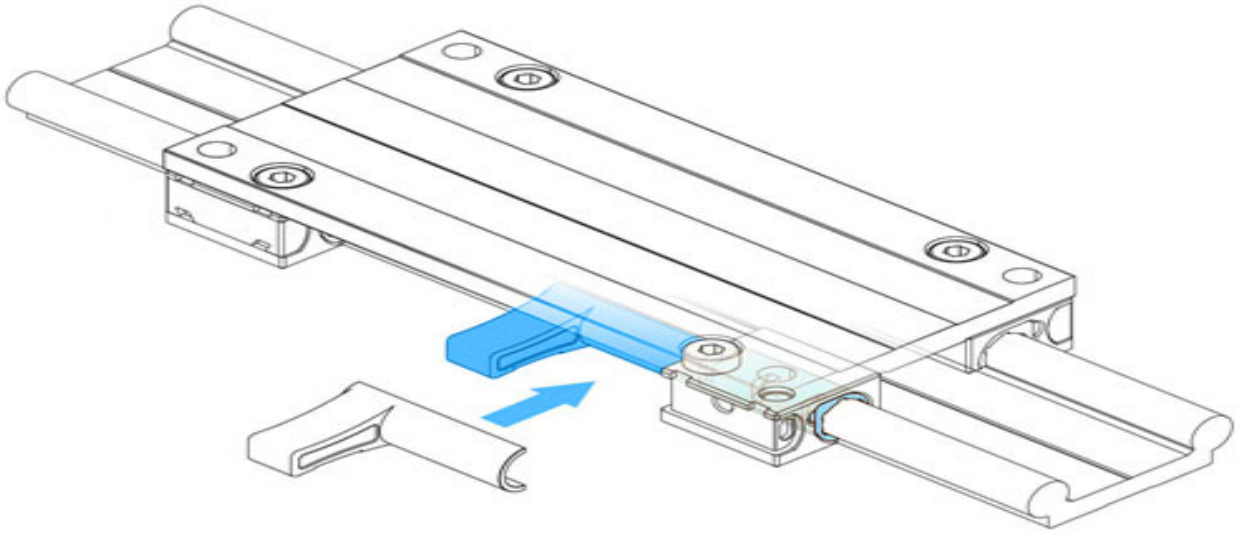

Figure 13 Linear Bearing Bushing Removal - Step 3

4. Place the bushing removal tool next to the bearing on the rail

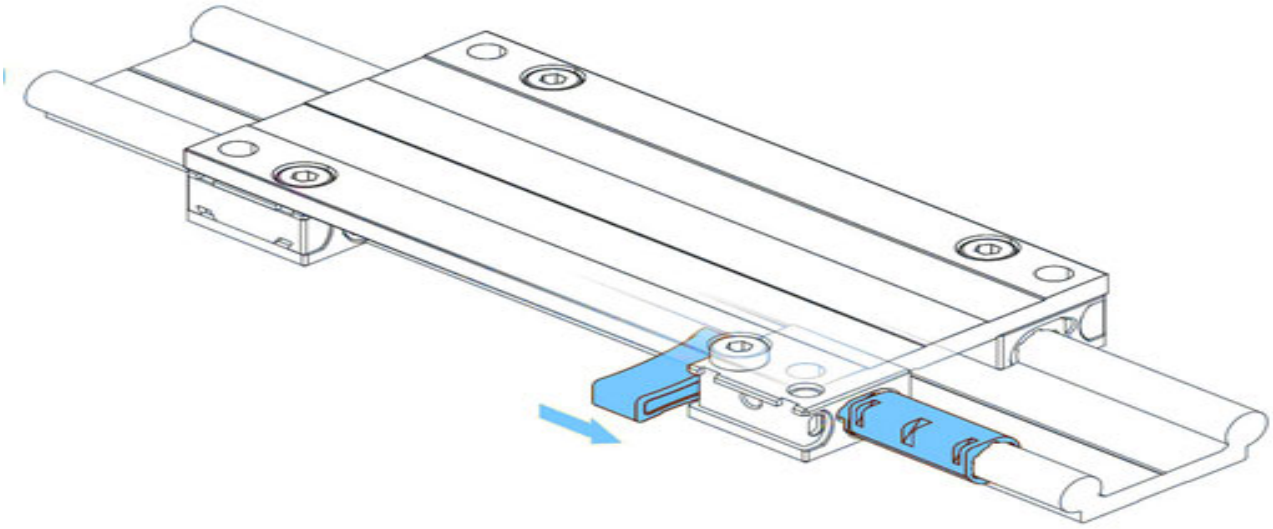

Figure 14 Linear Bearing Bushing Removal - Step 4

5. Push the removal tool in the direction of the arrow shown until the bushing is completely out of the housing

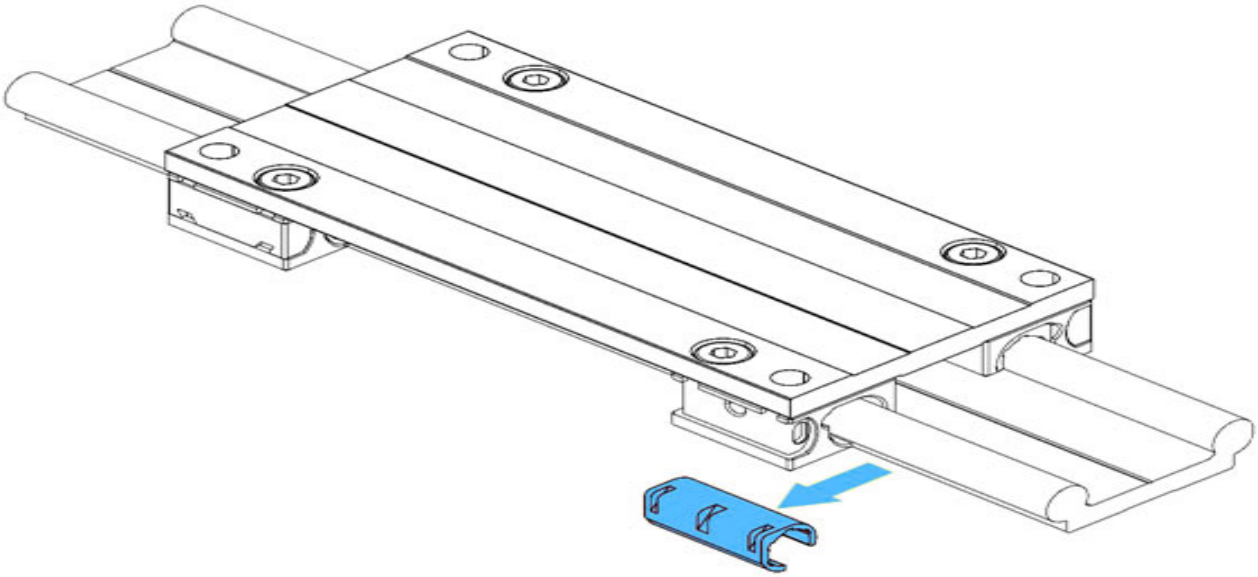

Figure 15 Linear Bearing Bushing Removal - Step 5

6. Unclip the bushing and dispose of it

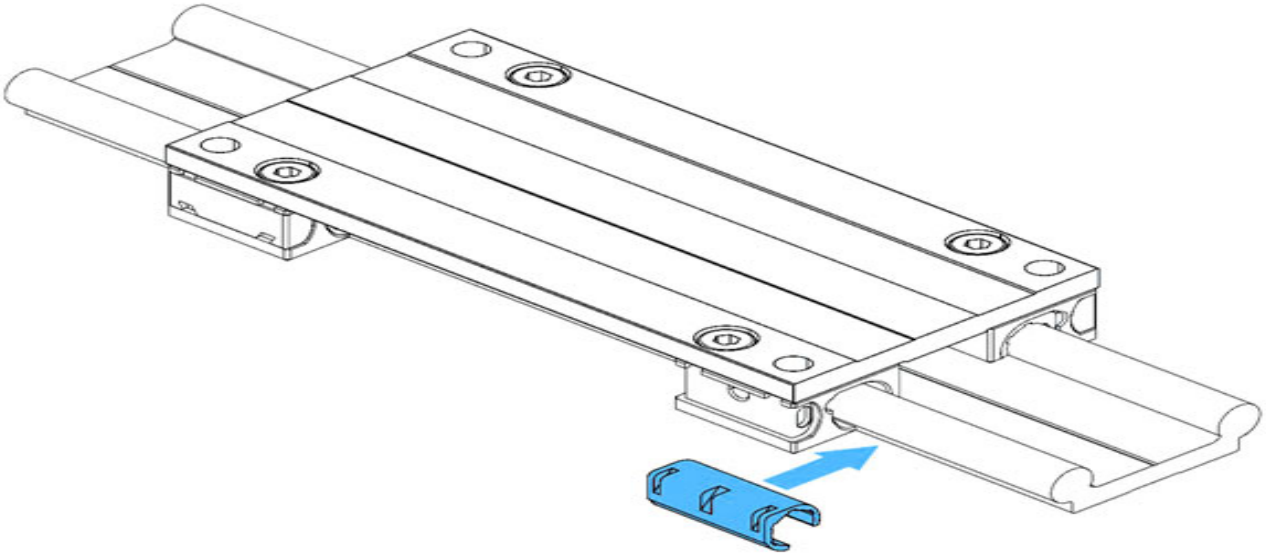

Figure 16 Linear Bearing Bushing Replacement - Step 6

7. Fit the new bushing onto the rail

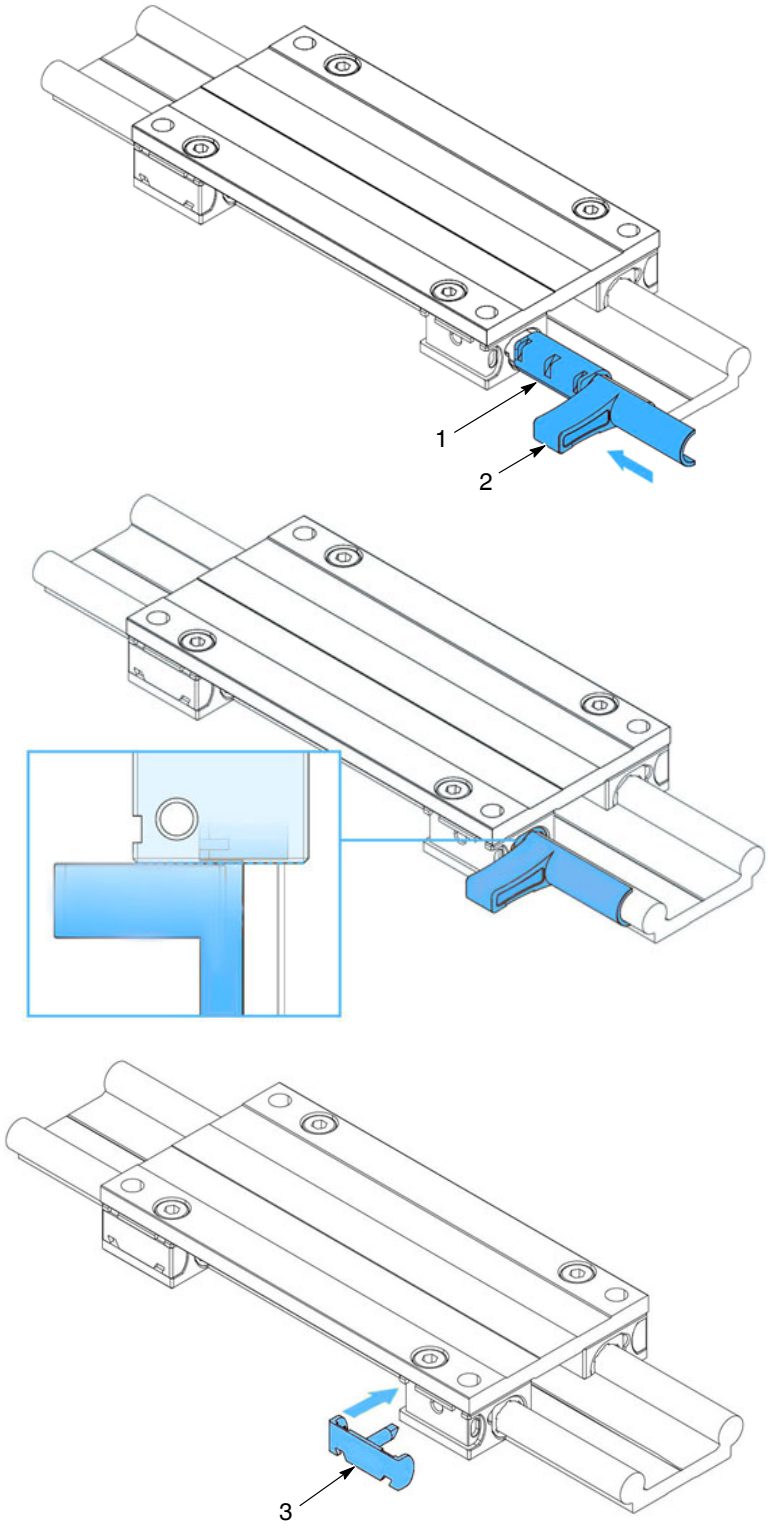

Figure 17 Linear Bearing Bushing Replacement - Step 7

8. Push the new bushing (1) inside the bearing housing until the tool (2) stops at the bearing housing, as shown above. Then refit the side cover (3) of the bearing.

Troubleshooting

WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

NOTE: A fault can occur for several reasons. It is advisable to check all possible causes for a given fault. Obvious causes of malfunction such as broken wires, missing fasteners etc., should be noted during visual inspections and corrected immediately. These troubleshooting procedures cover only the most common problems. If you cannot solve a problem, contact your Nordson representative.

Problem	Possible Cause	Corrective Action
1. Axis does not move	Connection cables are not connected or are defective	Inspect the cables. Ensure they are correctly connected or replace if they are defective
	Linear mover is blocked or jammed	Inspect the mover. Remove anything that could be blocking it and repair or replace if necessary
	Defective drive motor	Replace the drive motor unit
	Defective inductive sensor	Repair or replace the inductive sensor
2. Excessive noise	Toothed belt loose and scraping	Inspect the toothed belt. Re-tension or replace as necessary
	Drive motor issue	Repair or replace as necessary
3. The DCM is vibrating while moving	The carriage is not correctly mounted on the linear axis	Inspect and repair as required

Parts

To order parts, call the Nordson Industrial Coating Systems Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

See Figure 18 - page 19

Item	Part	Description	Quantity	Note
-	7035280	Dynamic Contouring Mover, 5ft Gun, R	-	A
-	7035281	Dynamic Contouring Mover, 5ft Gun, L	-	A
-	7035282	Dynamic Contouring Mover, 6ft Gun, R	-	A
-	7035283	Dynamic Contouring Mover, 6ft Gun, L	-	A
1	7035290	Energy Chain, DCM, 5ft	1	B
1A	7035291	Energy Chain, DCM, 6ft	1	B
2	7035292	Energy Chain, DCM, Outlet	1	
3	7035293	Clamp, DCM Mounting w/handle	1	
4	-	Cover plate	2	
5	7035289	Guide Wheel, DCM	1	
NS	7035279	Bushing, DCM	1	C,D
NS	------	Bushing Removal Tool	1	C,D
NS	------	Slider Bearing Side Cover	1	C,D
6A	1606970	GUN, auto, tube mount, Encore HD, 5 ft	1	B
6B	1606971	GUN, auto, tube mount, Encore HD, 6 ft	1	B
7	-	Cover plate	1	
8	-	Mounting plate	1	
9A	7035287	Belt Drive, DCM, 5ft Gun, R	1	E
9B	7035288	Belt Drive, DCM, 6ft Gun, R	1	E
9C	7035295	Belt Drive, DCM, 5ft Gun, L	1	E
9D	7035296	Belt Drive, DCM, 6ft Gun, L	1	E
10	7035284	Motor, DCM, 230V, 0,2kW	1	
11	7035285	Cable, Motor, DCM, 20M, M12	1	
12	7035286	Coupling, Motor, DCM	1	
13	736339	SENSOR, INDUCTIVE, PNP, NC,12MM DIA	1	
14	7035301	Bracket, Motor, DCM	1	

NOTE A: The DCM units are handed, Left and Right. Ensure you order the correct unit - L or R

B: Check the length of the DCM before ordering. Only the same length parts can be used.

C: Comes in kit part number

D: See Figure 17 on Page 16

E: Check the length and orientation of the DCM before ordering the part. Only the same length can be used.

AR: As Required

NS: Not Shown

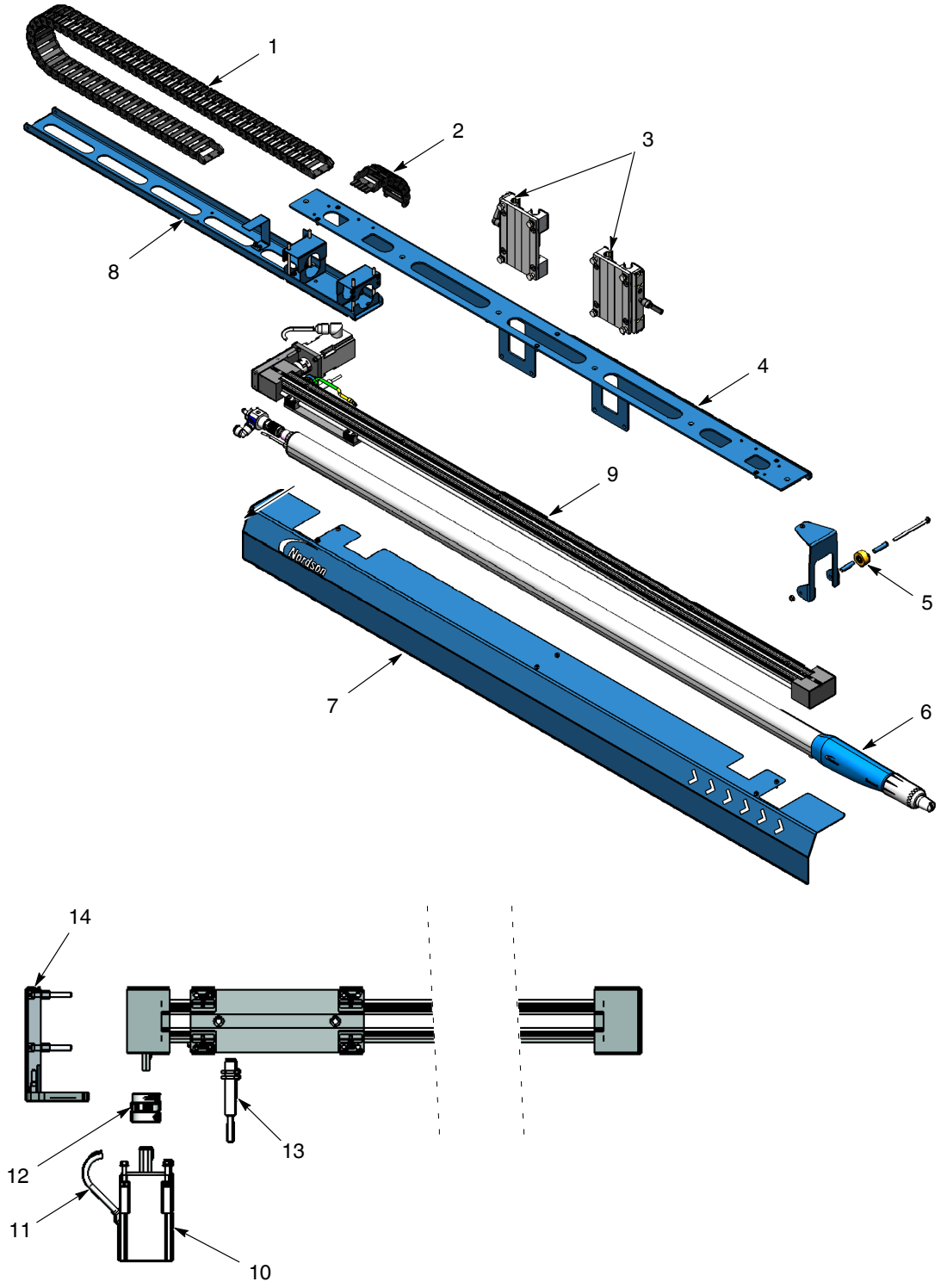

Figure 18 Spare Parts Identification Images

Electrical Data

Refer to the Services drawing supplied with the system for exact specifications. Multiple connection points may be required. Below, you can see the typical values.

Description	Values
Factory ambient temperature	5°C - 35°C
Drive unit	Servomotor
Power supply	230 v
Tolerance	+/- 10%
Power consumption	200w
Frequency	50/60 Hz
Protection type	IP64
Max. torque	1.85 Nm
Weight	1.1 kg
Connection type	OCC for S210
Connector size	M12

Technical Data

NOTE: The Dynamic Contouring Mover is available in 4 different versions

Dimensions and Weights - 5 ft Version

Dynamic Contouring Mover - 5 ft Automatic Spray Gun (Left / Right)	
Total length when fully extended	2650 mm
Total length when fully retracted	2170 mm
Stroke	961 mm
Weight (including 1 Encore Automatic Gun & Accessories)	11.5 kg

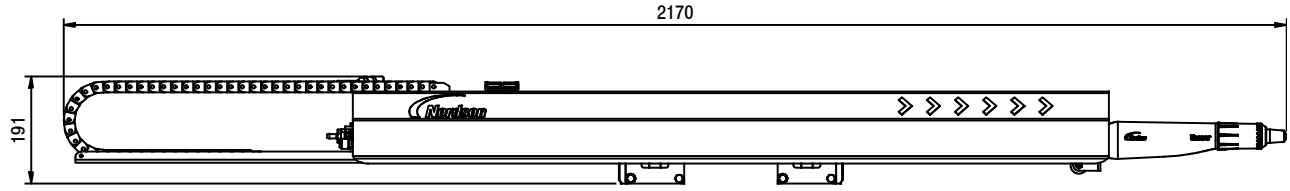

Figure 19 Encore 5ft Gun Dynamic Contouring Mover (Gun retracted – side view)

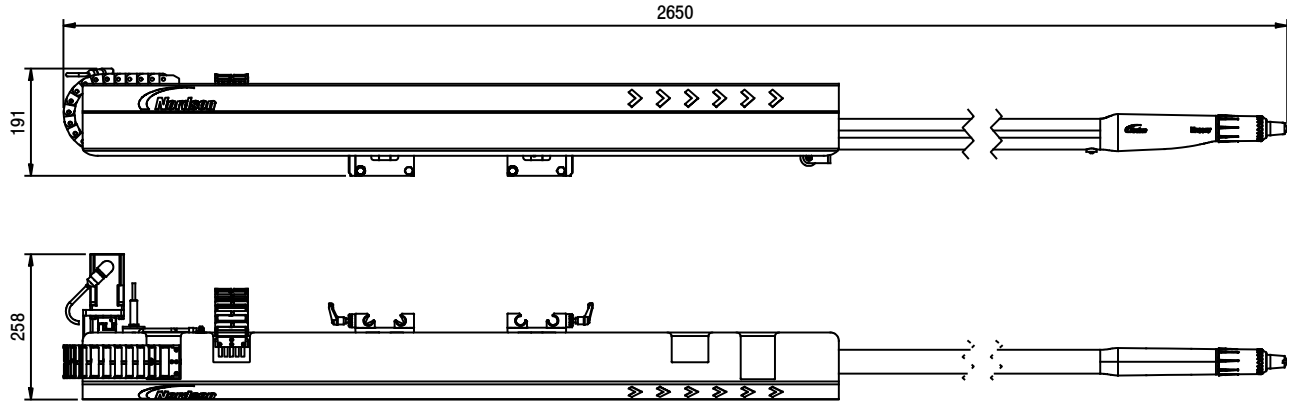

Figure 20 Encore 5ft Gun Dynamic Contouring Mover (Gun extended – side and plan view)

Dimensions and Weights - 6 ft Version

Dynamic Contouring Mover - 6 ft Automatic Spray Gun (Left / Right)	
Total length when fully extended	3250 mm
Total length when fully retracted	2620 mm
Stroke	1261 mm
Weight (including 1 Encore Automatic Gun & Accessories)	12.7 kg

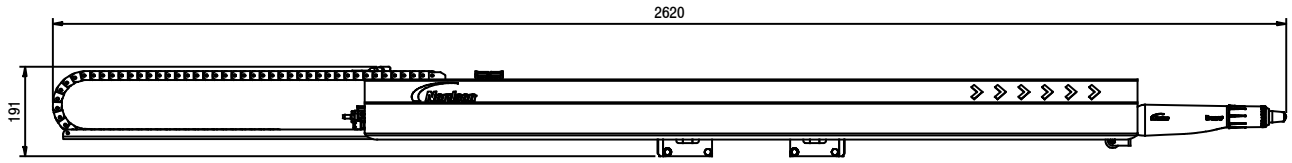

Figure 21 Encore 6ft Gun Dynamic Contouring Mover (Gun retracted – side view)

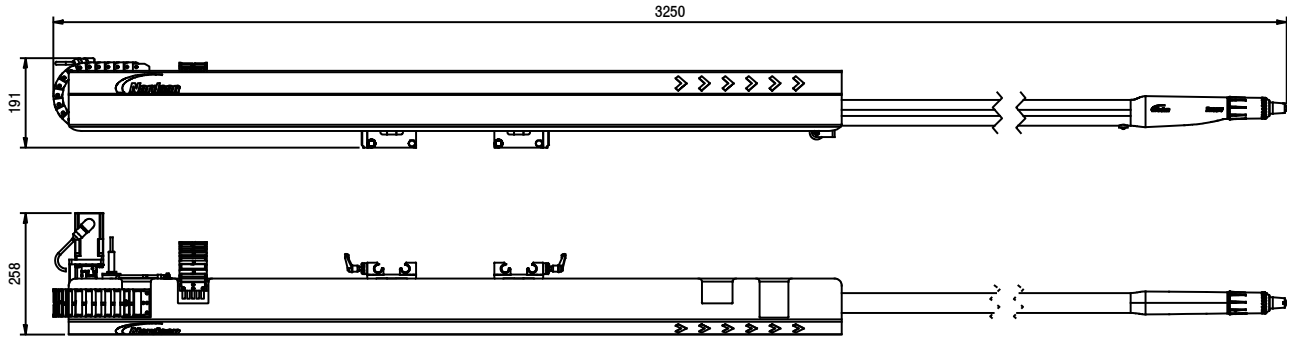

Figure 22 Encore 6ft Gun Dynamic Contouring Mover (Gun extended – side and plan view)