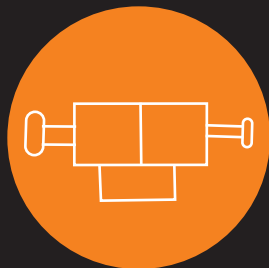


Automated Paint Repair

3M™ Robotic Paint Repair System

3M's application expertise can help you where others can't.



Experience You Can Count On

3M has over 25 years of robotics experience working across industries all around the world. Our experienced application engineers have access to a global network of manufacturers, system integrators and robotics experts to help ensure your operation's success.

You need to make sure your vehicles don't ship with paint defects, and fixing them has to be done efficiently and effectively to ensure you're not slowing the manufacturing process down.

A robotic system featuring the 3M Robotic Paint Repair System will allow you to automate this important step in your manufacturing process. The 3M™ Robotic Paint Repair System is a critical part of a complete automated solution that enables robots to efficiently and reliably sand and buff.

Our experienced application experts can show you how automating can help improve consistency and productivity as well as help to provide long-term cost savings.

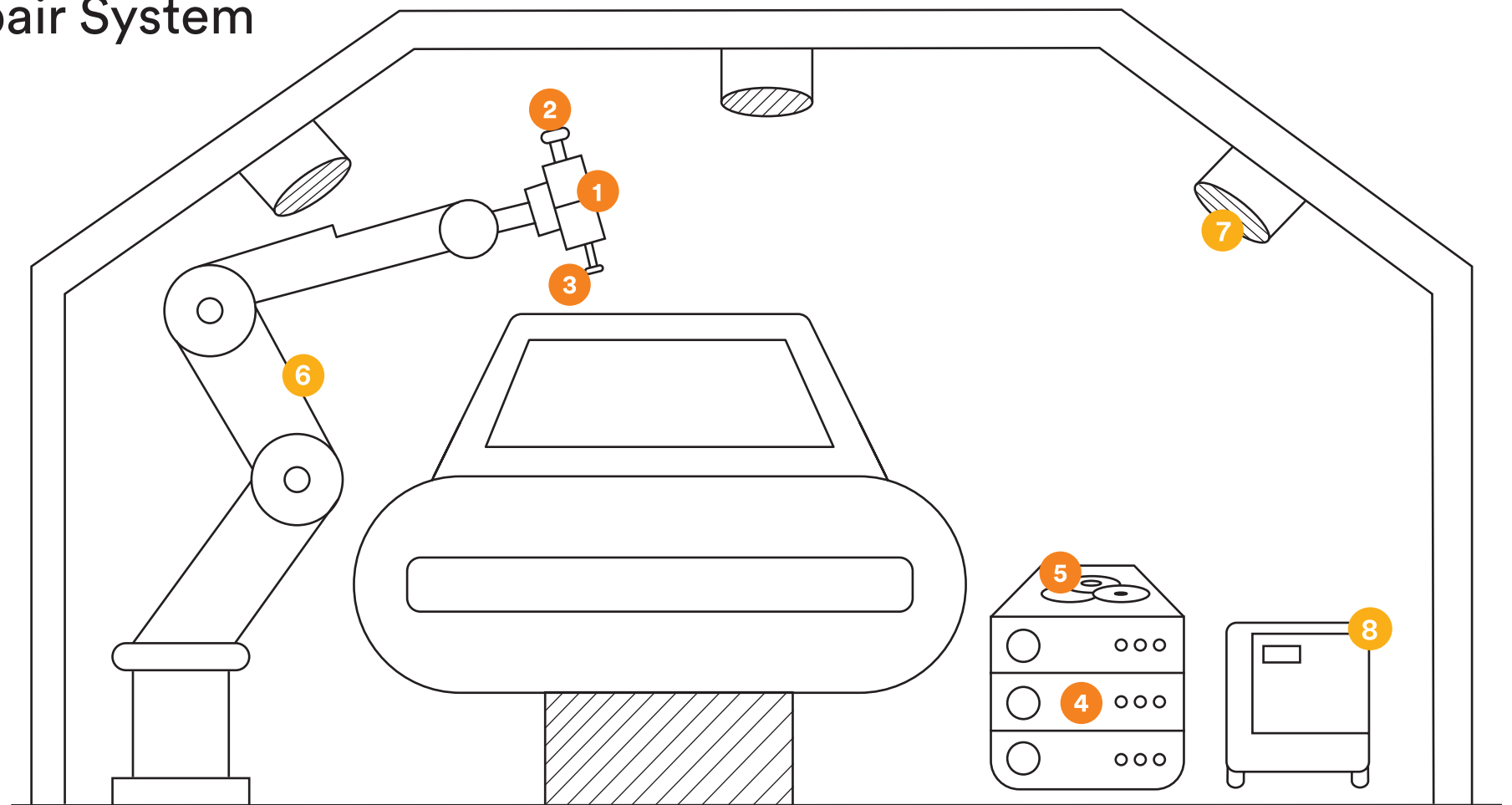
Meet the system.

3M™ Robotic Paint Repair System

- 1** 3M™ Active Compliant Tool
- 2** 3M™ Servo Random Orbital Buffer
- 3** 3M™ Servo Random Orbital Sander
- 4** 3M™ Repair Controller
- 5** 3M Abrasives, Compounds & Accessories

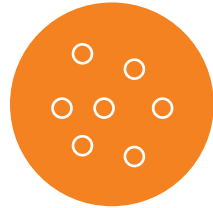
Other Components

- 6** Robot
- 7** Vision System
- 8** Integration



What makes it work.

The 3M™ Robotic Paint Repair System is comprised of tools, abrasives and process expertise all designed to work together with a range of robots—delivering results you can rely on car after car.



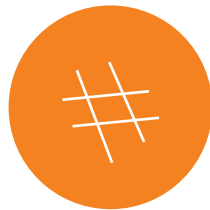
Dirt



Fiber



Pops



Scratches

What can it do?

Defects repaired by robots will focus on paint defects like dirt, fiber, and pops.

Repairs will be completed competently and efficiently with cycle times equal to or faster than current operations. Defects on or near vehicle feature lines can be more challenging due to specific limitations of the robot and/or the vision system. Some defects may need to be repaired by an operator.

What's to come?

When it comes to robotic repair solutions, we're just getting started—our commitment to innovation and expanding capabilities is ongoing.

Cycle Times

Cycle times depend on a number of factors:

- ▶ Number of robots and tools
- ▶ Type of defects
- ▶ Location of defects

3M™ Robotics Paint Repair Program

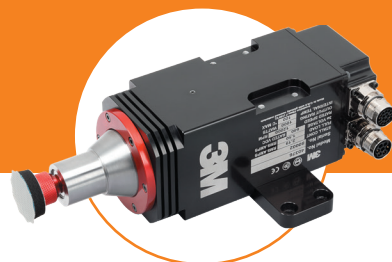
3M™ Active Compliant Tool



This component, also called force control, attaches to the robot arm and provides active compliance that allow the robotic tools and abrasives to maintain contact with vehicle surfaces at a specific pressure.

- ▶ Provides high accuracy
- ▶ Active force control with gravity compensation
- ▶ Operates at any angle
- ▶ Variable, programmable force
- ▶ Maintains consistent contact

3M™ Servo Random Orbital Sander



The 3M™ Servo Random Orbital Sander provides more consistent speed when pressure is applied than an air driven tool.

- ▶ Electric servo motor
- ▶ Compact design enables to be dual mounted on 3M ACT

3M™ Servo Random Orbital Buffer



The 3M™ Servo Random Orbital Buffer provides more consistent speed when pressure is applied than an air driven tool.

- ▶ Electric servo motor
- ▶ Compact design enables to be dual mounted on 3M ACT

3M™ Repair Controller



The 3M™ Repair Controller simultaneously controls the robots and tools and executes embedded repair recipes.

▶ Unmatched fidelity in trajectory planning and execution

Provides control and customization of robot position, velocity and acceleration throughout each trajectory.

▶ Dynamically controls the force and speed throughout the trajectory

Allows for more sophisticated trajectories and strategies.

▶ Compatible with multiple robot and vision systems

The 3M™ Repair Controller does not rely on planning tools from the OEMs and can deliver identical performance across most robot OEMs.

▶ Technology driven novel trajectories

Features access to 3M's proprietary repair strategies and trajectories while allowing users to refine their own.

▶ Designed for how you work today—and tomorrow

It is designed to support future advanced capabilities.

Accessories

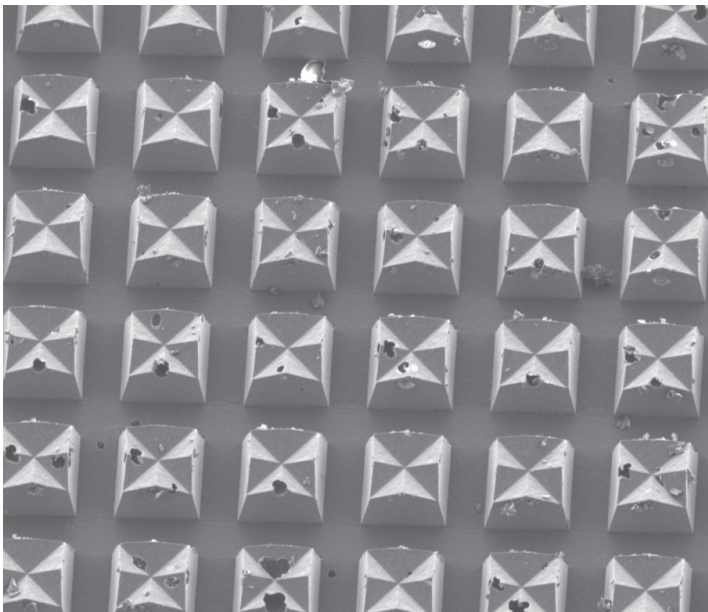
The cables, drives and hardware you need to complete your system.



Consumables & Accessories

High tech tools deserve high tech abrasives and buff pads from the industry leader.

3M has the quality, performance and selection of engineered abrasives you're familiar with in your manual process to help you create a successful automated paint repair operation.



3M Abrasive Discs



3M™ Trizact™ Discs help optimize the defect removal process. They start sharp and stay sharp, resulting in more predictable finishes and improved, consistent results.

3M Buffing Pads



3M™ Finesse-it™ Buff Pads are specially designed to be used on OEM and baked finish paints to help remove sand scratches or swirl marks on a variety of painted surfaces.

- ▶ Scratch refinement and removal
- ▶ 3M™ Hookit™ attachment system holds pad securely and provides quick pad change-out
- ▶ Available in flat and waffle faces

3M Polishes

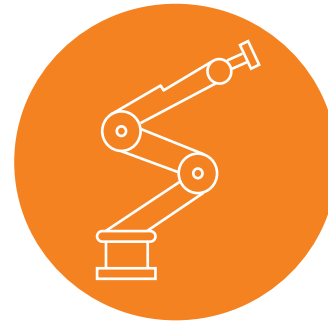


In today's fast-paced production environment, every second counts. That's why we designed our 3M™ Finesse-it™ Premium Series 300 Polishes to give you a perfect, high-gloss finish repair in less time than ever before.

- ▶ A proprietary combination of advanced abrasives and gloss enhancements
- ▶ Choose Finesse-it™ Polish 315 for fast results—or Finesse-it™ Polish 320 for even faster results
- ▶ Achieves a high-gloss finish
- ▶ Delivers rapid, predictable results
- ▶ Ideal for premium 2K clearcoats

What to know about 3M's role.

The 3M™ Robotic Paint Repair System is part of a larger system that includes robots, integration, vision systems and more. Although 3M doesn't provide all of these components, we do have trusted relationships with those that do. We can connect you with our integrators to ensure a successful implementation. To the right are components we can help you source through one of our valuable integrators.



Robots

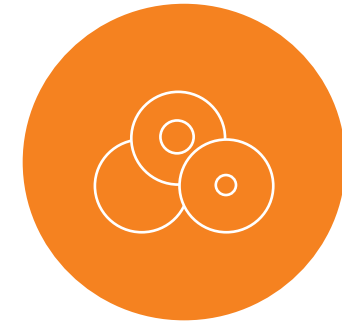
The 3M™ Robotic Paint Repair System is compatible with most major robot brands, provided that they are capable of accepting direct motion control from the 3M™ Repair Controller.

If you work with collaborative robots, 3M recommends exploring a risk assessment before making any application collaborative. Collaborative robots would need to have rigidity and a payload to be suitable for 3M tools.



Integration

Integration unites hardware and software components into a single system. When paired with the optimal consumables, processes and programming, the system can perform to meet the needs of the customer. 3M's preferred integrators are ASIS and Inovision, but we're more than happy to work with your preferred integrator.



Ancillary Processes

Disc changing—3M has identified available solutions for automated abrasive disc and buff pad changing.

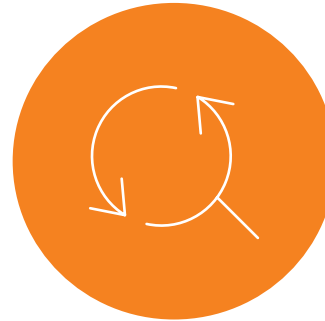
Polish dispensing—Our integrators have identified tooling and processes for applying polish to the vehicle.

3M's role

(continued)

Vision System

To work with the repair system, vision systems will need to be able to locate defects with accuracy. It also needs to be able to provide characterization of defects to enable optimal utilization of 3M's multiple repair recipes. Different vision systems may have different reach capabilities for hard-to-reach or see sections of vehicles, such as door jambs. Vision systems installed over the last decade may or may not have necessary capabilities to work with the 3M™ Robotic Paint Repair System.



Systems can detect defects during post-repair inspection, but will often struggle to identify secondary defects created by the repair process, such as orange peel removal or haze.



3M has relationships with several vision system suppliers that are compatible with our robotic paint repair system, but we will work with whichever supplier you currently use or select.



Systems that are able to see the vast majority of painted surfaces can be integrated with the 3M™ Repair Controller, although tough spots may still require manual scanning.



Connect with 3M to learn more about the requirements of the 3M™ Robotic Paint Repair System.

3M Robotic Repair System authorized integrators.

Experienced integrators are a critical piece of automation implementation—providing fully integrated and programmed automation lines using the 3M™ Robotic Paint Repair System.

ASIS

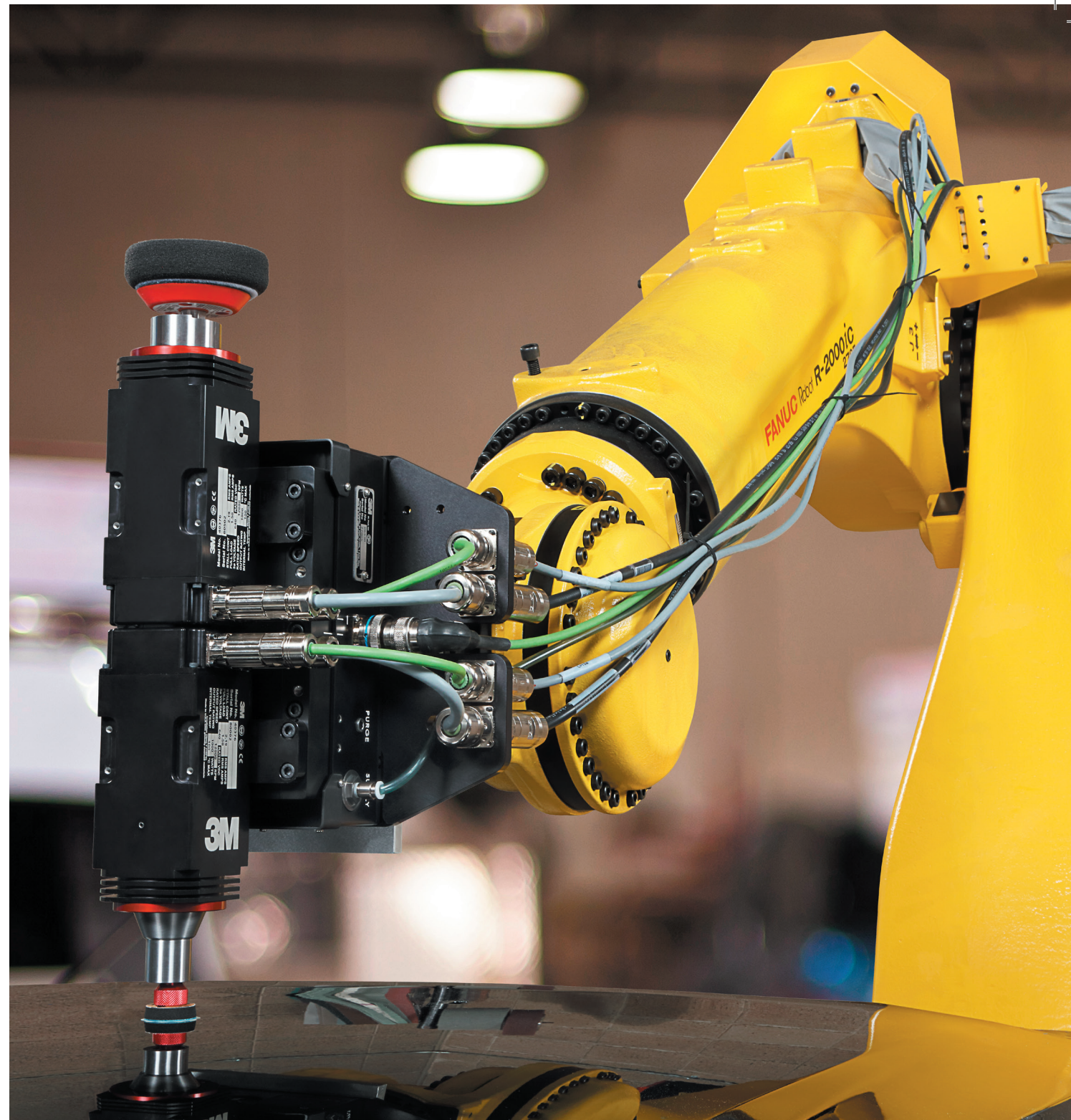
Headquarters: Landshut, Germany
Regional Office: Shanghai, China



Headquarters: Rochester Hills, MI

Connect with us to learn more about the 3M Robotic Repair System.

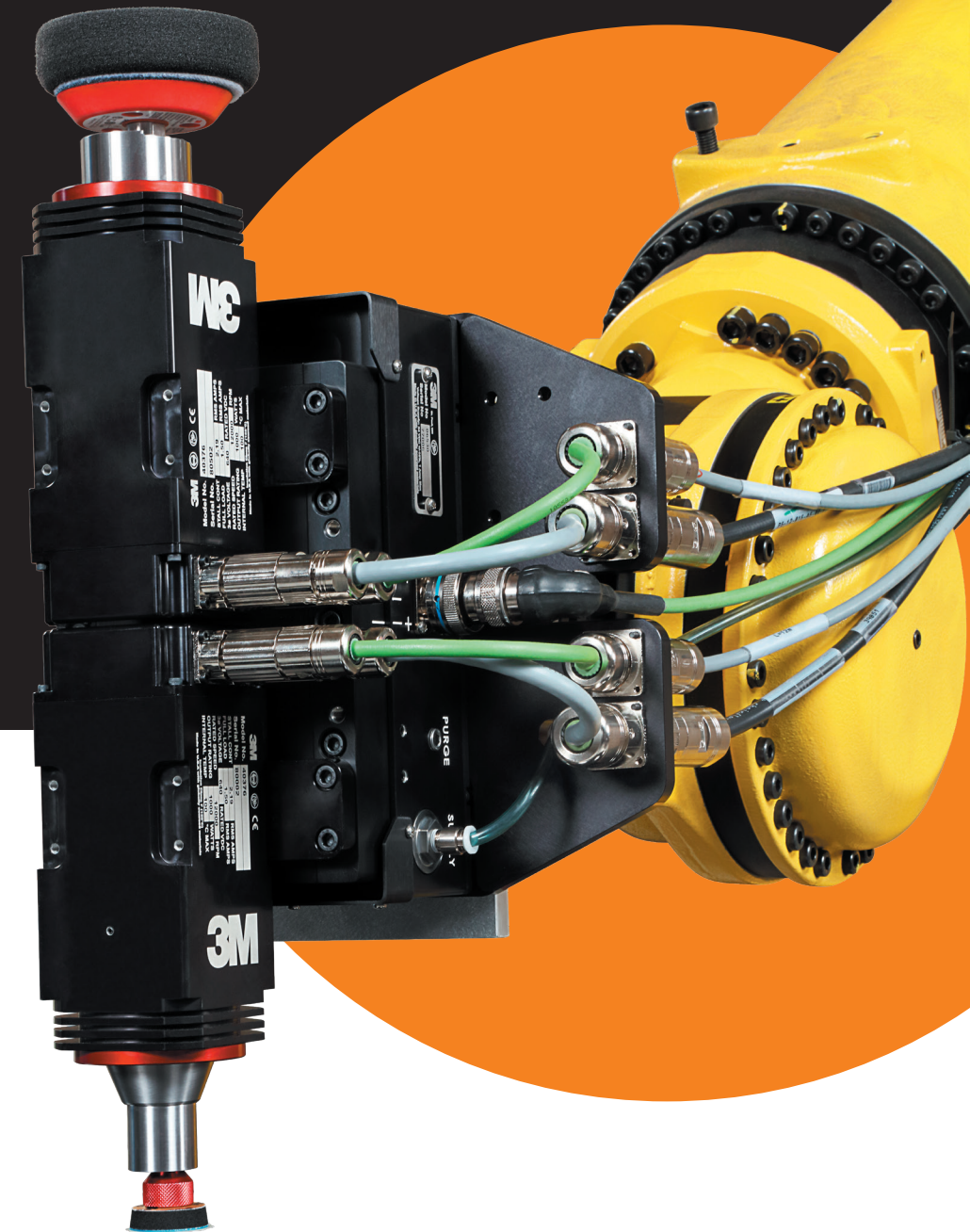
- ▶ Contact your local 3M representative or visit 3M.com/Robotics.



Ready to get started?

We've worked on installations around the globe, and would love to work with you, too. Let's connect and talk about how we can work together to automate your paint repair process.

► **Contact your local 3M representative or visit [3M.com/Robotics](https://www.3m.com/Robotics).**



Technical Data

3M™ Robotic Paint Repair System Parts

3M™ Active Compliant Tool – PN06530	
Applications	Sanding and polishing
Specifications	
Dimensions:	9.8" (248.9mm) long, 5.9" (149.9mm) wide, 4.18" (106.3mm) tall
Max Force:	60 lbs. (267 N)
Force Accuracy:	±0.2 lb. (±1.0 N)*
Update Rate:	2mSec
Compliant Stroke:	0.8" (20mm)
Supply Air: Max	Dry, 5µm Filtered, Non-lubricated, 80 psi (5.5 Bar)
Payload Weight:	60 lbs. (27.2kg) <small>*Tested in lab, statically in horizontal orientation</small>
Weight	12 lbs. (5.4kg)

3M™ Servo Random Orbital Sander – PN77539	
Applications	Sanding Paint finishing
Specifications	
Mounting:	Direct bolt to 3M Active Compliant Tool
Dimensions:	7.99" (203mm) long, 5.60" (142mm) wide, 2.76" (70mm) tall
Max Speed (RPM):	12,000
Max Voltage:	640 VDC BUS
Motor Power:	1 kW
Disc Diameter:	1-3/8" (35mm) max
Orbit Diameter:	3/16" (5mm)
Environment Temperature:	10-50°C (50-122°F)
Weight	7 lbs. (3.2kg)

3M™ Servo Random Orbital Buffer – PN77540	
Applications	Buffing Paint finishing
Specifications	
Mounting:	Direct bolt to 3M Active Compliant Tool
Dimensions:	7.99" (203mm) long, 5.60" (142mm) wide, 2.76" (70mm) tall
Max Speed (RPM):	12,000
Max Voltage:	640 VDC BUS
Motor Power:	1 kW
Pad Diameter:	3-3/4" max (95mm)
Orbit Diameter:	1/2" (12mm)
Environment Temperature:	10-50°C (50-122°F)
Weight	7 lbs. (3.2kg)

Specifications subject to change without notice. These values are based on measurements taken in a laboratory environment. Real-world results may vary due to external factors beyond 3M's control.

3M™ Robotic Paint Repair System Products

Description	G/S ID No.	SAP ID No.	Part No.
3M™ Active Compliant Tool, Horizontal Mount, Max Applied Force 310N	60-4403-5933-3	7100210736	06530
3M™ Servo Random Orbital Sander, 12,000 RPM, TR, 3/16 in. Orbit	60-4404-0376-8	7100230884	77539
3M™ Servo Random Orbital Buffer, 12,000 RPM, .25 in. x 20 EXT, 12 mm Orbit	60-4404-0377-6	7100230885	77540
3M™ Mounting Plate with Cable Management, ACT to Robot	60-4406-0280-7	7100243932	88524
3M™ Feedback Whip Cable, Random Orbital Tools, 12,000 RPM	60-4406-0278-1	7100243933	88522
3M™ Servo Power Whip Cable, Random Orbital Tools, 12,000 RPM	60-4406-0279-9	7100243880	88523
3M™ Compliance Control Cable for ACT, 30m	60-4406-0281-5	7100243879	88525
3M™ Air Filter Cartridge, Active Compliant Tool, Pack of 10	60-4406-0277-3	7100243881	88521
3M™ Bearing Assembly, Servo Random Orbital Sander, 3/16 Orbit	60-4404-0608-4	7100244040	88519
3M™ Bearing Assembly, Servo Random Orbital Buffer, 12 mm Orbit	60-4404-0609-2	7100244054	88520



3M

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