



RANDOM ORBITAL SANDER ELITE SERIES INSTRUCTION MANUAL

77 mm (3 in)

12,000 RPM

Important Safety Information

Please read understand and follow all safety information contained in these instructions prior to the use of this tool. Retain these instructions for future reference.



Intended Use

This pneumatic tool is intended for use in industrial locations, and used only by skilled, trained professionals in accordance with the instructions in this manual. This pneumatic tool is designed to be used with a disc pad and appropriate abrasive for sanding metals, wood, stone, plastics and other materials. It should only be used for such sanding applications and within marked capacity and ratings. Only accessories specifically recommended by 3M should be used with this tool. Use in any other manner or with other accessories could lead to unsafe operating conditions.



Do not operate tool in water or in an excessively wet application.

Do not use disc pads that have a Max RPM less than the tool Max RPM rating. Never use disc pads that have a weight and/or size different than what the tool was specifically designed for.

Summary of device labels containing safety information

Marking	Description
	 WARNING: Refer to Instruction Manual
Always operate at 90 PSIG / 6.2 bar max	Maximum Pneumatic Inlet Pressure
12,000 RPM	Maximum Rotational Speed
Hand / Wrist / Arm injury can occur with prolonged exposure to vibration	Vibration Safety Note

Explanation of Signal Word Consequences

 WARNING:	Indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury and/or property damage.
 CAUTION:	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and/or property damage.

Read the Material Data Sheets (MSDS) Before using any materials



Contact the suppliers of the workpiece materials and abrasive materials for copies of the MSDS if one is not readily available.

WARNING

Exposure to **DUST** generated from workpiece and/or abrasive materials can result in lung damage and/or other physical injury. Use dust capture or local exhaust as stated in the MSDS. Wear government-approved respiratory protection and eye and skin protection. Failure to follow this warning can result in serious lung damage and/or physical injury.



WARNING

To reduce the risks associated with impact from abrasive product, pad, or tool breakup, sharp edges, hazardous pressure, rupture, vibration and noise:

- Read, understand and follow the safety information contained in these instructions prior to the use of this tool. Retain these instructions for future reference.
- Only personnel who are properly trained should be allowed to service this tool.
- Practice safety requirements. Work alert, have proper attire, and do not operate tools under the influence of alcohol or drugs.
- Operators and other personnel must always wear protection for eyes, ears, and respiratory protection when in the work area or while operating this product. Follow your employer's safety policy for PPE's and/or ANSI Z87.1 or local/national standards for eyewear and other personal protective equipment requirements.
- Wear protective apparel, taking into consideration the type of work being done.
- Never exceed marked maximum input pressure (90psi / .62Mpa / 6.2Bars).
- Proper eye protection must be worn at all times.
- Tool is not to be operated in the presence of bystanders.
- If you notice any abnormal noise or vibration when operating the tool, immediately discontinue its use and inspect for worn or damaged components. Correct or replace the suspect component. If abnormal noise or vibration still exists, return the tool to 3M for repair or replacement. Refer to warranty instructions.
- Never operate this tool without all safety features in place and in proper working order.
- Never over-ride or disable the safety features of the start-stop control such that it is in the on position.
- Make sure the tool is disconnected from its air source before servicing, inspecting, maintaining, cleaning, and before changing abrasive product.
- Prior to use, inspect abrasive product and accessories for possible damage. If damaged, replace with new abrasive product and accessories available from 3M.
- Only use accessories supplied or recommended by 3M.
- Never allow this tool to be used by children or other untrained people.
- Do not leave an unattended tool connected to air source.
- Immediately discontinue use of tool if its noise reduction muffler system has been damaged or is otherwise not functioning properly. Have tool repaired before placing back into use.

To reduce the risks associated with vibration:

- If any physical hand/wrist discomfort is experienced, work should be stopped promptly to seek medical attention. Hand, wrist and arm injury may result from repetitive work, motion and overexposure to vibration.

To reduce the risks associated with loud noise:

- Always wear hearing protection while operating this tool. Follow your employer's safety policy or local/national standards for personal protective equipment requirements.

To reduce the risks associated with fire or explosion:

- Do not operate the tool in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. The abrasives are able to create sparks when working material, resulting in the ignition of the flammable dust or fumes.
- Refer to MSDS of material being worked as to potential for creating fire or explosion hazard.

To reduce the risks associated with hazardous dust ingestion or eye/skin exposure:

- Use appropriate respiratory and skin protection, or local exhaust as stated in the MSDS of the material being worked on.

To reduce the risks associated with hazardous voltage:

- Do not allow this tool to come into contact with electrical power sources as the tool is not insulated against electrical shock.

CAUTION

To reduce the risks associated with skin abrasion, burns, cuts, or entrapment:

- Keep hands, hair, and clothing away from the rotating part of the tool.
- Wear suitable protective gloves while operating tool.
- Do not touch the rotating parts during operation for any reason.
- Do not force tool or use excessive force when using tool.

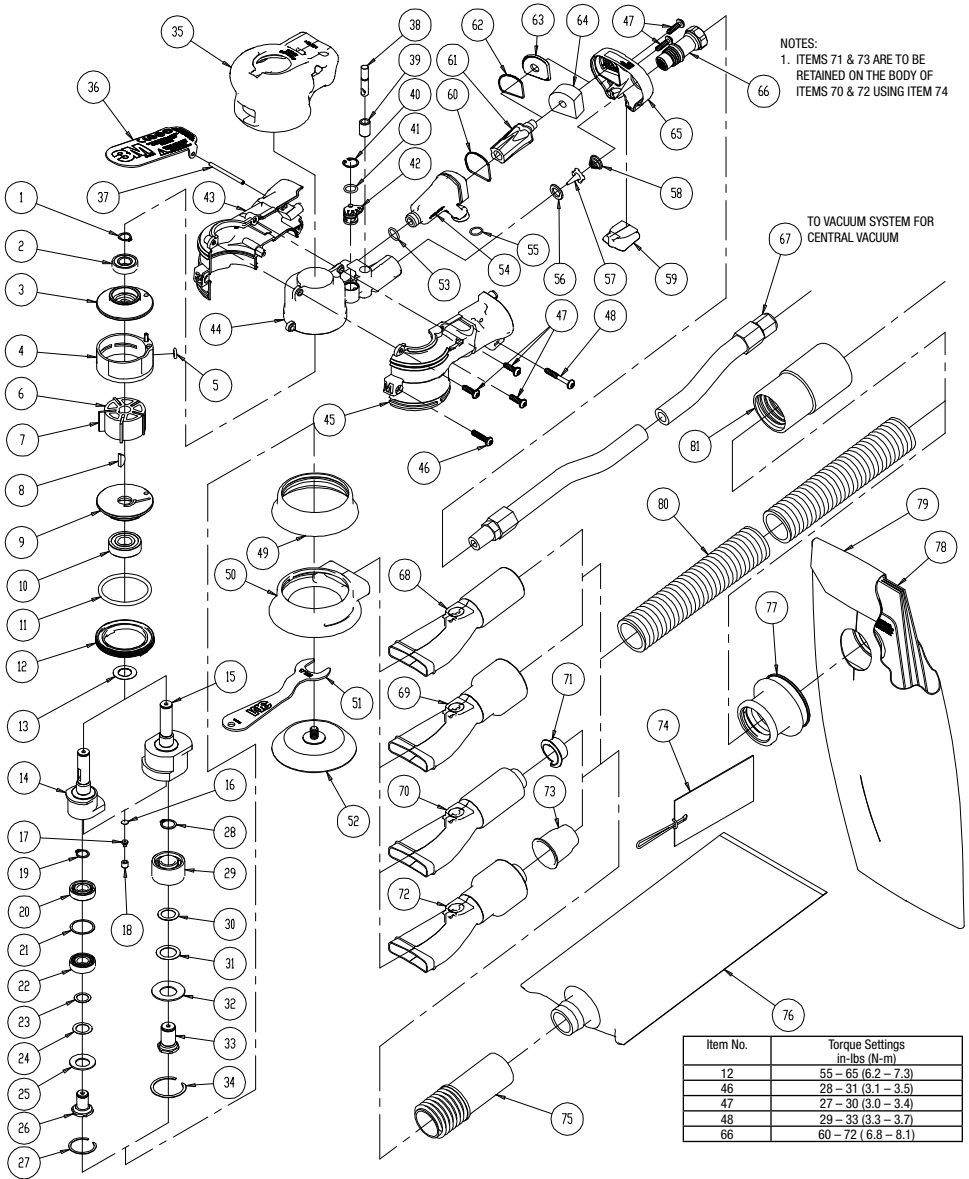
To reduce the risks associated with whipping or hazardous pressure-rupture:

- Ensure supply hose is oil resistant and is properly rated for required working pressure.
- Do not use tools with loose or damaged air hoses or fittings.
- Be aware that incorrectly installed hoses and fittings might unexpectedly come loose at any time and create a whipping/impact hazard.

To reduce the risks associated with fly off of abrasive product or parts:

- Use care in attaching abrasive product and pad; following the instructions to ensure that they are securely attached to the tool before use.
- Never free speed the tool or otherwise allow it to be started unintentionally.
- Never point this product in the direction of yourself or another person, or start tool unintentionally.
- Never over-tighten accessory fasteners.

Parts Page



Item No.	Torque Settings in-lbs (N-m)
12	55 - 65 (6.2 - 7.3)
46	28 - 31 (3.1 - 3.5)
47	27 - 30 (3.0 - 3.4)
48	29 - 33 (3.3 - 3.7)
66	60 - 72 (6.8 - 8.1)

Parts List

IT	3M UPC PN	3M P/N	DESCRIPTION	QTY.
1	28113	A0040	External Retaining Ring	1
2	55185	55185	Bearing, 10 mm x 22 mm x 6 mm deep Groove Ball (2 Shields, 6900ZZ)	1
3	55174	55174	Rear Endplate, Elite	1
4	30347	30347	Cylinder Assembly	1
5	28115	A0042	O-Ring, 5 mm x 2 mm	1
6	28170	B0005	Machined Rotor	1
7	28099	A0010	Vane	5
8	28114	A0041	3 mm x 13 mm Woodruff Key	1
9	30326	30326	Front Endplate	1
10	28106	A0019	12 mm x 28 mm x 8 mm Bearing - 2 Shields	1
11	28118	A0045	O-Ring, 39.4 mm x 3.1 mm	1
12	30337	30337	Lock Ring, 50 mm Thread	1
13	55186	55186	Front Bearing Dust Shield	1
14	28176	B0084	Shaft Balancer, 3 in. x 3/32 in. Orbit, Elite	1
15	28182	B0309	Shaft Balancer, 3 in. x 3/16 in. Orbit, Elite	1
16	28132	A0122	Filter	1
17	28131	A0121	Duckbill Check Valve	1
18	28130	A0120	Valve Retainer	1
19	28128	A0107	Retaining Ring	1
20	28136	A0162	10 mm x 22 mm x 6 mm Bearing - No Seal/Shields	1
21	28140	A0196	Spacer, 22.0 mm x 18.0 mm x 0.1 mm	1
22	28135	A0161	10 mm x 22 mm x 6 mm Bearing - 1 Seal	1
23	28129	A0108	Shim, 10.1 mm Inner Diameter (ID) x 14.0 mm Outer Diameter (OD) x 0.2 mm Thick	1
24	55188	55188	Spindle Bearing Dust Shield	1
25	28133	A0126	Belleville Washer 12.1 mm ID x 22.4 mm OD x 1.86 mm Thick	1
26	28175	B0083	Spindle	1
27	28139	A0177	Retaining Ring, 22.2 mm	1
28	28127	A0090	Retaining Ring, 11.9 mm (15/32 in.)	1
29	28148	A0938	12 mm x 28 mm x 16 mm Double Row Angular Contact Bearing - 1 Seal	1
30	28103	A0016	Spacer, 12.1 mm x 18.0 mm x 0.2 mm	1
31	55187	55187	Spindle Bearing Dust Shield	1
32	28104	A0017	Belleville Washer	1
33	28183	B0312	Spindle	1
34	28105	A0018	Retaining Ring	1
35	55204	55204	2 1/2 in. (.65 mm) Grip, Elite	OPT
35	55205	55205	2 3/4 in. (.69 mm) Grip, Elite	1
35	55206	55206	3 in. (.75 mm) Grip, Elite	OPT
36	55181	55181	3M™ Random Orbital Sander 2.5 mm (3/32 in.) Orbit Lever, 12,000 RPM, Elite	1
36	55182	55182	3M™ Random Orbital Sander 5.0 mm (3/16 in.) Orbit Lever, 12,000 RPM, Elite	1
36	55183	55183	3M™ Random Orbital Sander 8.0 mm (5/16 in.) Orbit Lever, 12,000 RPM, Elite	1
37	28109	A0031	Lever Spring Pin	1
38	28097	A0008	Valve Stem Assembly	1
39	28102	A0015	Valve Sleeve	1
40	28112	A0039	Internal Retaining Ring	1
41	30652	30652	O-Ring, 9 mm x 1.5 mm	1
42	55172	55172	Speed Control, Elite	1
43	55212	55212	Right Hand Housing - 3 in. (.77 mm), Elite	1
44	55199	55199	Inner Housing, Machined	1
45	55211	55211	Left Hand Housing - 3 in. (.77 mm), Elite	1
46	55196	55196	Screw, Button Head Torx M4 x 20 mm	1
47	30321	30321	Screw, Button Head Torx M4 x 15 mm	5
48	30322	30322	Screw, Button Head Torx M4 x 30 mm	1
49	28154	A1334	3 in. Random Orbital Sander, Non-Vacuum Shroud	1
50	55192	55192	3 in. Non-Vacuum Skirt - 2.5 mm (3/32 in.) Orbit - 20428 Pad	1
50	55209	55209	3 in. Vacuum Skirt - 2.5 mm (3/32 in.) Orbit - 20350 Pad	1
50	55210	55210	3 in. Vacuum Skirt - 5.0 mm (3/16 in.) Orbit - 20350 Pad	1
51	28134	A0146	17 mm Pad Wrench	1
52	N/A	N/A	1 disc pad supplied with each tool (type determined by model)	1
53	30652	30652	O-Ring, 9 mm x 1.5 mm	1
54	55198	55198	Exhaust Chamber	1
55	55165	55165	O-Ring, 9.5 mm x 1 mm	1
56	28098	A0009	Valve Seat	1
57	28096	A0007	Valve	1
58	30655	30655	Valve Spring	1
59	55166	55166	Non-Vacuum Cover, Elite	1
60	55175	55175	O-Ring, 28 mm x 1 mm	1
61	55191	55191	Internal Muffler Assembly	1
62	55176	55176	O-Ring, 24 mm x 1 mm	1
63	55173	55173	Self-Generating Exhaust Cap, Elite	1
64	55180	55180	Muffler, Elite	1
65	55201	55201	End Cap, Elite	1
66	55171	55171	Inlet Bushing Assembly, Elite	1
67	20209	20209	3/8 in Ø x 4 feet air line with ¼ in. Ø Compression fittings	1
68	55189	55189	3 in. x 4 in. Orbital Sander and 3 in. Central-Vacuum Swivel Exhaust Fitting - 3/4 in./19 mm Hose	OPT
69	55177	55177	3 x 4 in. Orbital Sander and 3 in. Central-Vacuum Swivel Exhaust Fitting - 1 in./28 mm Hose	1
70	55190	55190	3 in. Self-Generating Vacuum Swivel Exhaust Fitting - 3/4 in./19 mm Hose	OPT
72	55178	55178	3 in. Self-Generating Vacuum Swivel Exhaust Fitting - 1 in./28 mm Hose	1
73	28146	A0778	1 in./28 mm Hose Seal	1
74	N/A	N/A	Tag with Instruction for 3M 1 in./28 mm Hose Seal	1
75	20453	20453	3M™ Filter Bag Adaptor, 1 in. EXT Hose Thread x 1 in. OD	1
76	20452	20452	3M™ Clean Sanding Filer Bag (5 in. x 12 in.)	1
77	28302	28302	1 in. Double Bag Vacuum Fitting	OPT
78	20338	20338	Vacuum Bag Insert	OPT
79	28303	A1434	3M™ Vacuum Bag	OPT
80	28301	28301	1 in. Ø x 6 feet Vacuum Hose	OPT
81	20341	20341	Hose End Adaptor 3/4 in Hose Thread x 1 in./28 mm Hose Thread	OPT
81	30324	30324	Hose End Adaptor - 1 in./28 mm Hose Thread x 1 1/2 in. OD	OPT

Product Configuration/Specifications: 12,000 RPM Random Orbital Sander

Model Number	Vacuum Type	Orbit mm (in.)	Pad Size mm (in.)	Product Net WT. kg (lb.)	Height mm (in.)	Length mm (in.)	*Noise Level dBA Pressure (Power)	**Uncertainty K dBA Pressure (Power)	***Vibration Level m/s ² (ft/s ²)	**Uncertainty K m/s ²
28494	Non Vacuum	5 (3/16)	77 (3)	0.692 (1.52)	92.5 (3.64)	147 (5.78)	74 (85)	0.692	2.04 (6.69)	0.70
28496	Non Vacuum	2.5 (3/32)	77 (3)	0.596 (1.31)	86 (3.38)	147 (5.78)	74 (85)	0.596	1.87 (6.13)	0.68
28503	Central Vacuum	5 (3/16)	77 (3)	0.742 (1.63)	92.5 (3.64)	203 (7.99)	73 (84)	0.742	1.51 (4.95)	0.64
28505	Central Vacuum	2.5 (3/32)	77 (3)	0.644 (1.41)	87.5 (3.44)	201 (7.91)	72 (83)	0.644	1.62 (5.31)	0.65
28511	Self-Generating Vacuum	5 (3/16)	77 (3)	0.752 (1.65)	92.5 (3.64)	209 (8.22)	85 (96)	0.752	2.13 (6.99)	0.71
28513	Self-Generating Vacuum	2.5 (3/32)	77 (3)	0.651 (1.43)	87.5 (3.44)	207 (8.14)	87 (98)	0.651	1.81 (5.94)	0.67

* Declared noise levels; measurements carried out in accordance with standard EN ISO 15744 and EN ISO 11203.

** Declared vibration levels in accordance with EN ISO12096; measurements carried out in accordance with standard EN ISO 28927-3.

IMPORTANT NOTE: The noise and vibration values stated in the table are from laboratory testing in conformity with stated codes and standards and are not sufficient risk evaluation for all exposure scenarios. Values measured in a particular work place may be higher than the declared values. The actual exposure values and amount of risk or harm experienced to an individual is unique to each situation and depends upon the surrounding environment, the way in which the individual works, the particular material being worked, work station design, as well as upon the exposure time and the physical condition of the user. 3M™ cannot be held responsible for the consequences of using declared values instead of actual exposure values for any individual risk assessment.

Operating Instructions

PRIOR TO THE OPERATION

The tool is intended to be operated as a hand held tool. It is always recommended that while using the tool operators stand on a solid floor in a secure position with a firm grip and footing. Be aware that the sander can develop a torque reaction. See the section "SAFETY PRECAUTIONS".

Use a clean lubricated air supply that will give a measured air pressure at the tool of 6.2 bar (90 psig) when the tool is running with the lever fully depressed. It is recommended to use an approved 10 mm (3/8 in) x 8 m (25 ft) maximum length airline. Connect the tool to the air supply as shown in Figure 1. Do not connect the tool to the airline system without an easily accessible air shut off valve. It is strongly recommended that an air filter regulator and lubricator (FRL) be used as shown in Figure 1 as this will supply clean lubricated air at the correct pressure to the tool. In any case appropriate air pressure regulators shall be used at all times while operating this tool where the supply pressure exceeds the marked maximum of the tool. Details of such equipment can be obtained for your tool distributor. If such equipment is not used the tool should be manually lubricated. To manually lubricate the tool disconnect the airline and put 2 to 3 drops of suitable pneumatic motor lubricating oil such as 3M™ Air Tool Lubricant PN 20451Fuji Kosan FK-20 Mobil ALMO 525 or Shell TORCULA® 32 into the hose end (inlet) of the tool. Reconnect tool to the air supply and run tool slowly for a few seconds to allow air to circulate the oil. If the tool is used frequently lubricate it on a daily basis or lubricate it if the tool starts to slow or lose power. It is recommended that the air pressure at the tool be 6.2 bar (90 psig) while the tool is running so the maximum RPM is not exceeded. The tool can be run at lower pressures but should never be run higher than 6.2 bar (90 psig). If run at lower pressure the performance of the tool is reduced.

Recommended Airline Size - Minimum		Recommended Maximum Hose Length		Air Pressure	
10 mm	3/8 in	8 meters	25 feet	Maximum Working Pressure	6.2 bar 90 psig
				Recommended Minimum	NA NA

Safety Precautions

1. Read all instructions before using this tool. All operators must be fully trained in its use and aware of these safety rules.
2. The tool RPM should be checked on a regular basis to ensure proper operating speed.
3. Make sure the tool is disconnected from the air supply. Select a suitable abrasive and secure it to the pad. Be careful to center the abrasive on the pad.
4. Always wear required safety equipment when using this tool.
5. When sanding/buffing always start the tool on the workpiece. This will prevent gouging due to excess speed of the buff pad. Stop air flow to the tool as it is removed from the workpiece.
6. Always remove the air supply to the sander before fitting, adjusting or removing the abrasive or pad.
7. Always adopt a firm footing and grip and be aware of torque reaction developed by the sander.
8. Use only 3M approved spare parts.
9. Always ensure the material being sanded is firmly fixed to avoid movement.
10. Check hose and fittings regularly for wear. Do not carry the tool by its hose; always be careful to prevent the tool from being started when carrying the tool with the air supply connected.
11. Dust can be highly combustible. Keep working area clean.
12. If tool is serviced or rebuilt check to ensure that the maximum tool RPM is not exceeded and that there is no excessive tool vibration.
13. Do not exceed maximum recommended air pressure. Use safety equipment as recommended.
14. Prior to installing any sanding or polishing accessory, always check that its marked maximum operating speed is equal or higher than the rated speed of this tool.
15. The tool is not electrically insulated. Do not use where there is a possibility of contact with live electricity, gas pipes, and/or water pipes.
16. This tool is not protected against hazards inherent in grinding and cutting operations and no such accessories should ever be attached.
17. Take care to avoid entanglement with the moving parts of the tool with clothing, ties, hair, cleaning rags or loose hanging objects. If entangled, stop air supply immediately to avoid contact with moving tool parts.
18. Keep hands clear of the orbiting pad during use.
19. If the tool appears to malfunction, remove from use immediately and arrange for service and repair.
20. Immediately release the start handle in the event of any disruption of pressure; do not attempt to re-start until the disruption has been corrected.
21. When tool is not in use, store in a clean dry environment free of debris.
22. Operate tool in a well lit work area.
23. Recycle or dispose of tool according to Local, State, and Federal Regulations.
24. Whenever performing maintenance procedures, use care to avoid exposure to any hazardous substances deposited on the tool as a result of work processes. Also, refer to warnings related to dust exposure.

3M™ Disc Pads

3M Disc Pads are perfectly mated for use in the 3M Sander. Constructed from premium, industrial-quality materials and featuring a riveted fiberglass and steel hub with molded urethane, their durability and precise construction are the ideal complement to the performance of the 3M Sander. See Product Configuration/Specifications table for the correct replacement pad for a particular model.

See 3M ASD Accessories to Optimize Performance catalog 61-5002-8098-9 and Engineered Metalworking Solutions catalog 61-5002-8097-1 for additional accessories.

Removing and Mounting Disc Pad to Random Orbital Sander

1. Disconnect air line from sander.
2. Remove old disc pad from sander by inserting the wrench, supplied with the tool, between the rubber shroud and the disc pad. Use the wrench to secure the sander spindle while turning the disc pad counter clockwise.
3. After the old disc has been removed from the sander, inspect the threaded hole in the spindle to ensure that the threads are free of debris and undamaged.
4. Ensure that the phenolic washer is in place around the threaded shaft of the new disc pad.
5. Secure the sander spindle with the wrench and tighten the new disc pad securely to the tool.

⚠ WARNING

An inadequately tightened disc pad could cause the threaded shaft to break causing damage to the tool and work piece and possible injury to the operator or bystanders.

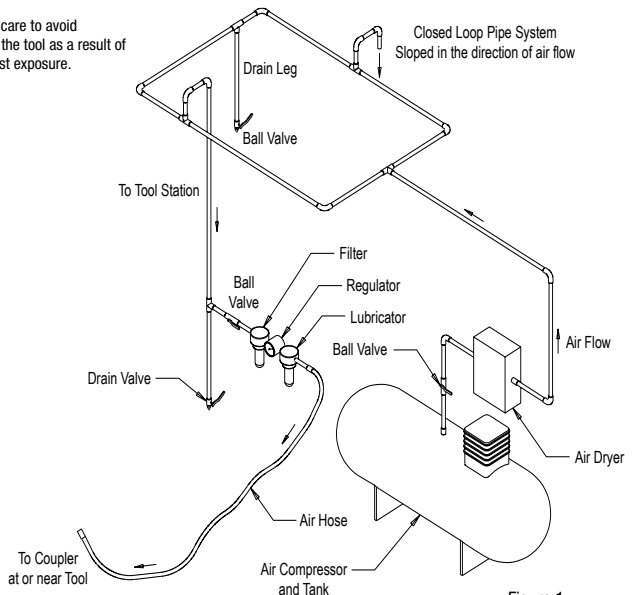


Figure 1

Warranty and Limited Remedy: 3M warrants this tool against defects in workmanship and materials under normal operating conditions for one (1) year from the date of purchase. 3M MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. User is responsible for determining whether the 3M tool is fit for a particular purpose and suitable for user's application. User must operate the tool in accordance with all applicable operating instructions, safety precautions, and other procedures stated in the operating manual to be entitled to warranty coverage. 3M shall have no obligation to repair or replace any tool or part that fails due to normal wear, inadequate or improper maintenance, inadequate cleaning, nonlubrication, improper operating environment, improper utilities, operator error or misuse, alteration or modification, mishandling, lack of reasonable care, or due to any accidental cause. If a tool or any part thereof is defective within this warranty period, your exclusive remedy and 3M's sole obligation will be, at 3M's option, to repair or replace the tool or refund the purchase price.

Limitation of Liability: Except where prohibited by law, 3M and seller will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

Submitting a Warranty Claim: Contact your dealer when submitting a warranty claim in accordance with the restrictions listed above. Please note that all warranty claims are subject to manufacturer's approval. Be sure to keep your sales receipt in a safe place. This must be submitted when filing a warranty claim, within 1 year from the date of purchase. For additional assistance call 1-800-362-3550.

Product Repair after Warranty Has Expired: Repair of 3M Abrasive Power tools that are not under warranty is available through 3M or a 3M Authorized Tool Repair Representative. Contact your 3M Abrasive Power Tool Distributor for details, or call 1-800-362-3550.

EC Declaration of Conformity



Manufacturers Name: 3M, Abrasive Systems Division
Manufacturers Address: 3M Center, Building 223-6N-02
St Paul, MN USA 55144

Does hereby declare that the machinery described below complies with those applicable essential health and safety requirements of the Machinery Directive 2006/42/EC; together with all amendments to date.

Descriptions: 3M™ Random Orbital Sanders, Elite Series, 77mm (3 in) Dia., 12,000 OPM, either Non-Vacuum, Central Vacuum, or Self-Generating Vacuum models

Model Numbers: 28494, 28496, 28503, 28505, 28511, 28513

Serial Number Range: 0010001 – 9999365, where the first 3 digits represent the sequential unit manufactured on the date specified in the final 4 digits.

The following standards have either been referred to, or complied with, in full or in part as relevant:

EN ISO 12100-1:2003 A1:2009	Safety of machinery. Basic concepts, general principles for design – Basic terminology and Technical principals
EN ISO 12100-2:2003 A1:2009	Hand-held non-electric power tools – Safety Requirements – Part E: Sanders and polishers
EN 792-8:2001 A1:2008	Hand-held non-electric power tools – Safety Requirements – Part E: Sanders and polishers
EN 983:1996 A1:2008	Safety of machinery. Safety requirements for fluid power systems and components - Pneumatics
EN ISO 14121-1:2007	Safety of machinery. Risk assessment principles
EN ISO 28927-3:2009	Hand-held portable power tools. Test methods for evaluation of vibration emission. Part 3. Polishers and rotary, orbital and random orbital sanders
EN ISO 15744:2008	Hand-held non-electric power tools. Noise measurement code. Engineering method (grade 2)

Full Name of responsible person.

Stefan A. Babirad

Position: Technical Director

Signature: 

Date: 5-11-2011

St. Paul, Minnesota, USA

Full Name and address of individual responsible to compile technical file within the Community:

Mr. Claus Geiger - Marketing Operations, Abrasive Systems Div., 3M Deutschland GmbH, Carl-Schurz-Strasse 1, D-41453 Neuss, Germany