

# MULTI-PORT GRAVITY BLENDER

Installation, Operation, and  
Maintenance Manual



**THE  
YOUNG<sup>®</sup>**

INDUSTRIES, INC.  
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MUNCY, PA 17756

**FOREWORD**

This manual contains instructions for installation, operation and maintenance of The Young Industries Multi-Port Gravity Blender. The care taken during receiving, storage, installation, operation and continued maintenance will add to the reliable operation and long service life of this equipment.

This manual must be read and understood in its entirety by the operator and the director of plant safety before performing any work on or operating a Multi-Port Gravity Blender. Contact Young Industries for additional copies of this manual if needed.

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## SAFETY

**READ AND FULLY UNDERSTAND THIS MANUAL BEFORE INSTALLING, OPERATING OR WORKING ON ANY YOUNG MULTI-PORT GRAVITY BLENDER. FAILURE TO OBSERVE AND FOLLOW SAFETY PRECAUTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE.**

If you have previously received delivery of a Young Industries Multi-Port Gravity Blender and have just received this manual, insist that both the blender operator and the director of plant safety read and fully understand this manual before continued use of or performing any maintenance on the blender.

Notify Young Industries if your Multi-Port Gravity Blender does not include safety warning labels or devices recommended within this manual. Contact the Engineering Manager for assistance at (570) 546-3165 before continued use or maintenance.

Notify Young Industries if you transfer any Young Industries Multi-Port Gravity Blender to another user. Your assistance will allow Young Industries to contact the new user with updated safety and operational recommendations.

Operator safety must be considered at all times in the operation and maintenance of mechanical equipment. Use of proper tools and procedures can prevent serious accidents. Always lock out and release stored energy of all energy sources before working on any Gravity Blender.

Safety precautions are listed throughout this manual. Study them carefully and follow them and insist that those working with you do the same.

Some Blenders are furnished with light gauge covers and may be marked, "No Step". Do not permit anyone to use the cover of such a unit as a work platform. Blenders are frequently furnished with hinged and/or removable covers. All persons working around these units should be careful to keep covers closed or in place except when actively engaged in any procedures which require covers to be open.

The various precautions and recommendations detailed within this manual are not necessarily all-inclusive. Young Industries has attempted to provide SAFETY AND OPERATIONAL GUIDANCE relating to typical installations. You must review your particular Multi-Port Gravity Blender installation and determine if there are potential hazards not addressed by the warnings of this manual.

If you have any safety or operational questions about the design or application of any Multi-Port Gravity Blender, please contact the Engineering Manager, Young Industries, telephone (570) 546-3165.

**WARNING:**  
**IF THE GRAVITY BLENDER WILL BE HANDLING COMBUSTIBLE MATERIALS**

It may be necessary to convey using inert gas, install automatic explosion suppression systems, and/or explosion venting systems.

To minimize danger of explosion and fire when handling combustible materials, Young Industries recommends that the installation, operation and maintenance of all equipment be done in compliance with the requirements of the following National Fire Codes and any other National, State and Local codes which may be in effect.

NFPA 654 Prevention of Fire and Dust Explosions from Manufacturing Combustible Particulate Solids

NFPA 68 Venting of Deflagrations

NFPA 69 Explosion Prevention Systems NFPA 77 Static Electricity

NFPA 70 National Electrical Code

**WARNING:**  
**ELECTRICAL GROUNDING AND BONDING ARE  
REQUIRED**

All ungrounded machinery presents a potential hazard of fatal electrical shock from electrical power sources. Static electricity may also accumulate on equipment which has not been grounded and bonded. Static electricity sparks from ungrounded equipment or between unbonded pieces of equipment can cause explosion or fire if flammable vapor and/or dust are present. Ungrounded/unbonded pneumatic conveying equipment is capable of accumulating considerable static electricity charge.

Electrical equipment must be installed by a certified professional electrician in accordance with all electrical codes in effect at the installation location.

Before operating the equipment described by this manual and any other equipment in the same processing system, grounding and bonding must be completed in accordance with the National Electrical Code (NFPA 70) published by the National Fire Protection Association, One Batterymarch Park, Quincy, Massachusetts 02269-9101, and any other applicable National, State or Municipal codes. Codes for safe control of static electricity must also be observed, including the National Fire Code "Recommended Practice on Static Electricity" (NFPA 77) and any other applicable National, State or Municipal codes.

To avoid hazardous static discharge, all mobile, movable or portable equipment which may attach to or come near to other equipment, and which is not prohibited by codes from being connected to ground, must be safely grounded and bonded before close approach or contact is made. This warning also applies to movable containers such as drums, totes, boxes and bags.

Sections of pipe, duct, and gravity spout must be bonded to adjacent sections of pipe, duct, spout, or equipment, and must have an uninterrupted conductive path to electrical ground.

Regular periodic safety inspections of electrical systems and grounding/bonding systems are necessary.

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## INSTALLATION

### A. RECEIVING AND INSPECTION

1. When receiving equipment and material from Young Industries the following basic steps should be taken:

a. Use the packing list to determine that all the items shipped have been received. Your equipment order was carefully crated or packaged for safe shipment when given to the carrier. Check for damage.

(1) Damage in transit is the responsibility of the carrier. Be sure to have the driver sign a copy of the freight bill with a notation about any damage.

(2) If a shipment was sent to you by parcel post, have the postmaster complete a damage claim report.

(3) Concealed damage: If equipment or goods are discovered to be damaged by shipment at a later date, contact the carrier and Young Industries immediately.

(4) IN ALL CASES OF DAMAGE IN TRANSIT, CONTACT THE YOUNG INDUSTRIES' ENGINEERING MANAGER AT (570) 546-3165 FOR ASSISTANCE IN DETERMINING WHETHER OR NOT THIS DAMAGE MAY IN ANY WAY AFFECT SAFETY OR PROPER OPERATION OF A PRODUCT PUMP.

(5) If shipped via UPS or another parcel carrier, DO NOT THROW ORIGINAL CARTON AWAY. Keep all evidence for the inspector.

#### **NOTE:**

YOUNG INDUSTRIES CANNOT ASSUME ANY LIABILITY FOR SHORTAGES OR DAMAGED GOODS. CLAIMS MUST BE NEGOTIATED WITH THE CARRIER. CONTACT THE YOUNG INDUSTRIES ENGINEERING MANAGER AT (570) 546-3165 OR (800) 546-3165 FOR ASSISTANCE IN RECTIFYING ANY SHORTAGE OR DAMAGE AS IT RELATES TO SAFE AND PROPER GRAVITY BLENDER OPERATION.

2. Moving the Multi-Port Gravity Blender.

a. Moving and installation must always be performed by trained, experienced personnel, using safe and accepted rigging practices.

b. Care and caution must be exercised to prevent damaging the Blender Bin, Blending Chamber, tube stubs, elbows, tubes or other components.

#### **CAUTION:**

WHEN MOVING A PRODUCT OR COMPONENT PARTS, BE SURE THAT MOVING PRACTICES ARE SAFE FOR BOTH PERSONNEL AND EQUIPMENT. CONTACT THE YOUNG INDUSTRIES ENGINEERING MANAGER IF THERE ARE ANY QUESTIONS RELATING TO WHAT CONSTITUTES SAFE AND ACCEPTED RIGGING PRACTICES FOR MOVEMENT AND/OR INSTALLATION OF A PRODUCT PUMP.

3. Storing the Blender.

a. If moved to storage, the equipment must be located in a dry area, preferably indoors. Outdoor storage will require adequate protection from the weather.

b. The Blender has been shipped with temporary covers. Do not remove these covers while the Blender is in storage.

c. After prolonged storage and before startup, the product pump must be inspected by a qualified person. Contact Young Industries Engineering Manager at (570) 546-3165 for assistance.

#### **CAUTION:**

USE CAUTION TO PROTECT AGAINST OBJECTS OR DEBRIS FROM ENTERING THE BLENDER.

**B. SUPPORTS**

1. The Young Industries Multi-Port Gravity Blender is designed to be supported, grouted and/or anchored to a rigid support base or foundation.
2. Locate the Blender Bin and Chamber with sufficient clearance to allow inspection and replacement of all components.
3. Support the Blender at the support shown on the assembly drawings furnished as a separate document for your Blender.
4. Level the Blender by grouting and/or shimming. Use care to eliminate twisting or bending when supporting Blender.

- (4) Apply sealant (a single pass of sealant inside screw holes is sufficient) provided to patch plate surfaces in contact with bin wall. Install patch plates using self-tapping sheet metal screws provided with unit.

NOTE: The sealant commonly supplied is GE-RTV, GR108 (Food Grade)

3. Blending Chamber

- a. The Blending chamber may be support by several different methods.

- (1) Standard installation uses rods from support lugs on Blending chamber upward to brackets on cone section of blender bin. These rods (usually three in number, equally spaced) are threaded at both ends and furnished with double nuts to provide adjustment to level Blending chamber at the proper elevation below the bin

- (2) Leg support. Blending chamber may be specified with support lugs (usually four in number) on sides to accept legs from grade level.

- (3) Structural support. Blending chamber may be specified with support lugs to be attached to steel structure at field erection. This method is commonly used with bins of skirted support type.

NOTE: Blending chamber assembly drawing is furnished as a separate document.

- b. When blending chamber is installed using methods (2) or (3) as described above, shims and/or spacers may be required to attain proper level and elevation of chamber in relation to bin.

- c. The blending chamber is shipped with the flow control cone in the lower (fully closed) position. Before installation the flow control cone should be adjusted to the upper (fully open) position. Adjustment of the flow control cone is accomplished by rotating the screw on the top cover of the blending chamber.

**C. ASSEMBLY**

1. Standard Unit

- a. Standard units are designed and fabricated with blending tube studs welded in cone cylinder sections of Blender bin.

2. Conversion Unit

- a. Conversion units are designed and fabricated using patch plates with blending tube stubs for connection to cone and cylinder sections of the Blender bin.

- b. Patch plates are assembled to blender bin at locations shown on the assembly drawing for each unit (drawing furnished as separate document)

- (1) Templates are furnished by Young Industries to define the size opening required in blender bin wall. Cut openings in bin wall.

- (2) Mark location of holes required to attached patch plates to blender bin.

- (3) Drill holes for 3/8 dia. self-tapping sheet metal screws using "R" (.339 dia) size drills provided.

### D. BLENDING TUBES

1. Installation tube #1 using elbow(s), tubing, flanges, visual flow section, compression couplings, gaskets and fasteners provided with unit. Pay particular attention to mark numbers on component parts and install parts as shown on tube assembly drawing. Proceed with installation of tubes in numerical order. Consult assembly drawing to ensure size and location of various parts to be used and see that match marks conform. Care must be taken when installing the visual flow section that no damage occurs by over tightening the bolts of the compression couplings or by improper alignment of blending tube components, thereby causing a strain on the visual flow sections.

4. If flow appears to be uniform, no adjustment of flow control cone will be required.
5. If one or more tubes appear to be subject to non-uniform flow, adjust the flow control cone toward the lower (closed) position by turning the threaded rod on top to the blending chamber in a clockwise direction until all tubes appear to be flowing at a uniform rate.
6. Flow control cone will normally need adjustment only if material flow characteristics should vary substantially.

NOTE: Blending chamber assembly drawing is furnished as a separate document.

### E. ELECTRICAL INSTALLATION

1. Standard units do not require electrical installation. Optional equipment such as level indicators or knife gate valves may require electrical installation. These requirements will vary depending on the type of components specified on subject order. Check optional equipment I.O.M.

### F. RELIEF VALVES

1. Relief valves used on Gravity Blenders are usually of the pressure/vacuum type. These valves are present at the factory and require normal bolting and gasket installation. Relief valves are normally mounted on the top deck or cover of the blender bin or top cover of the blending chamber. Consult assembly drawings for proper locations.

### G. OPERATION

1. Fill blender bin (flow control cone in open or up position).
2. Begin discharge or recirculation phase of blending.
3. Observe material movement through visual flow section in each tube.

### H. SPARE PARTS INFORMATION

1. A nameplate is furnished with each gravity blender. The necessary information for ordering spare parts is found on this nameplate. When ordering, please provide (a) shop number and (b) serial number. Contact the Spare Parts Manager at Young Industries, telephone (570) 546-3165, for assistance.



TABLE 1 – TROUBLESHOOTING MULTI-PORT GRAVITY BLENDER

<u>SYMPTOM</u>	<u>CAUSE</u>	<u>REMEDY</u>
Product not flowing in one or more tubes	Foreign object in tube (s)	Empty Blender, remove object
	Lumpy Product	Empty blender, remove lumps, take precautions to ensure product in Blender is not lumpy.
	Flow cone not adjusted properly	Lower flow control cone until flow is uniform.

NOTE: When a blender is being discharged, the level in the bin will drop below the inlet of the upper tubes. As this occurs, the flow will stop in these tubes, and increased flow will be observed in adjacent tubes as the void around the flow control cone is filled with blending material. This is a normal condition, and no adjustment should be made to flow control cone.

Product leaks from tube joints	Loose tubing couplings	Clean and tighten tubing couplings
	Damaged coupling gasket	Replace gasket



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MADE BY	KFH	DATE	7/24/93	ORDER NO.		ISSUE	
CHKD	PFEIFFER		7/26/93				
APPR	PFEIFFER		7/26/93	SHEET	1	OF	1
CUST.	-						
TITLE	GROUNDING/BONDING WARNING						

**WARNING – ELECTRICAL GROUNDING AND BONDING ARE REQUIRED**

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Electrical equipment must be installed by a certified professional electrician.

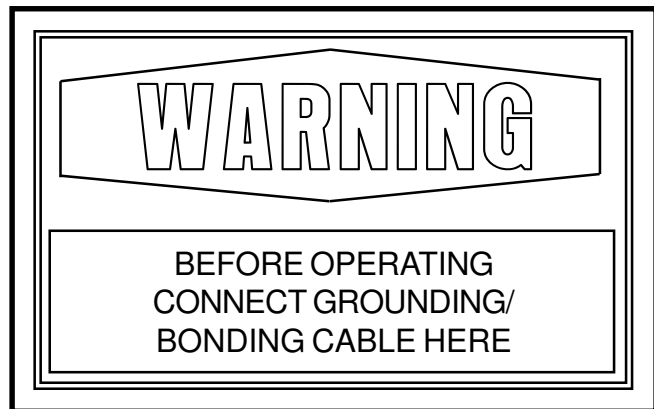
Before operating the equipment described by this manual or any other equipment in the same processing system, grounding and bonding must be completed in accordance with the National Electrical Code (NFPA 70) published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, Mass. 02269-9101, and any other applicable National, State or Municipal codes. Codes for safe control of static electricity must also be observed, including the National Fire Code "Recommended Practice on Static Electricity" (NFPA 77) and any other applicable National, State or Municipal codes.

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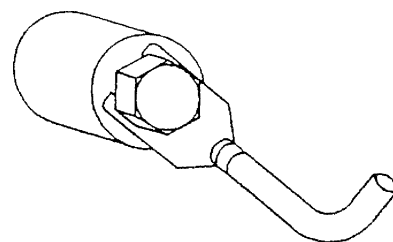
Sections of pipe, duct and gravity spout must be bonded to adjacent sections and must have a conductive path to electrical ground.

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**LOOK FOR THESE TAGS AND TERMINAL CONNECTING POINTS**



CABLES AND TERMINATIONS MUST BE SUPPLIED BY INSTALLER



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