Technical Assistance: *(800)257-5911 or (215)766-2670*
Email: info@scaletronscales.com

OEM Manual Disclosure, Notices & Warnings

These instructions generally describe the installation, operation, and maintenance of subject equipment.

The manufacturer reserves the right to make engineering refinements, including but not limited to editing part names and/or part designs as needed. These changes may not be immediately noted or described in this documentation or publication. Therefore, it is advised to always include your product serial number when engaging in correspondence with Scaletron Industries Ltd. This will allow Scaletron to efficiently process your concerns and/or requests as quickly as possible.

All possible precautions were taken in packaging each piece of equipment to prevent shipping damage. Carefully inspect each item and report damages immediately. Report damage claims to shipping agent involved for equipment shipped F.O.B. job site. Do not install any damaged equipment.

All instructions given on any labels, or attached tags, should be followed. Carefully inspect all packing material before discarding to prevent the loss of accessories, mounting hardware, spare parts, or instructions.

DISCLAIMER NOTICE:

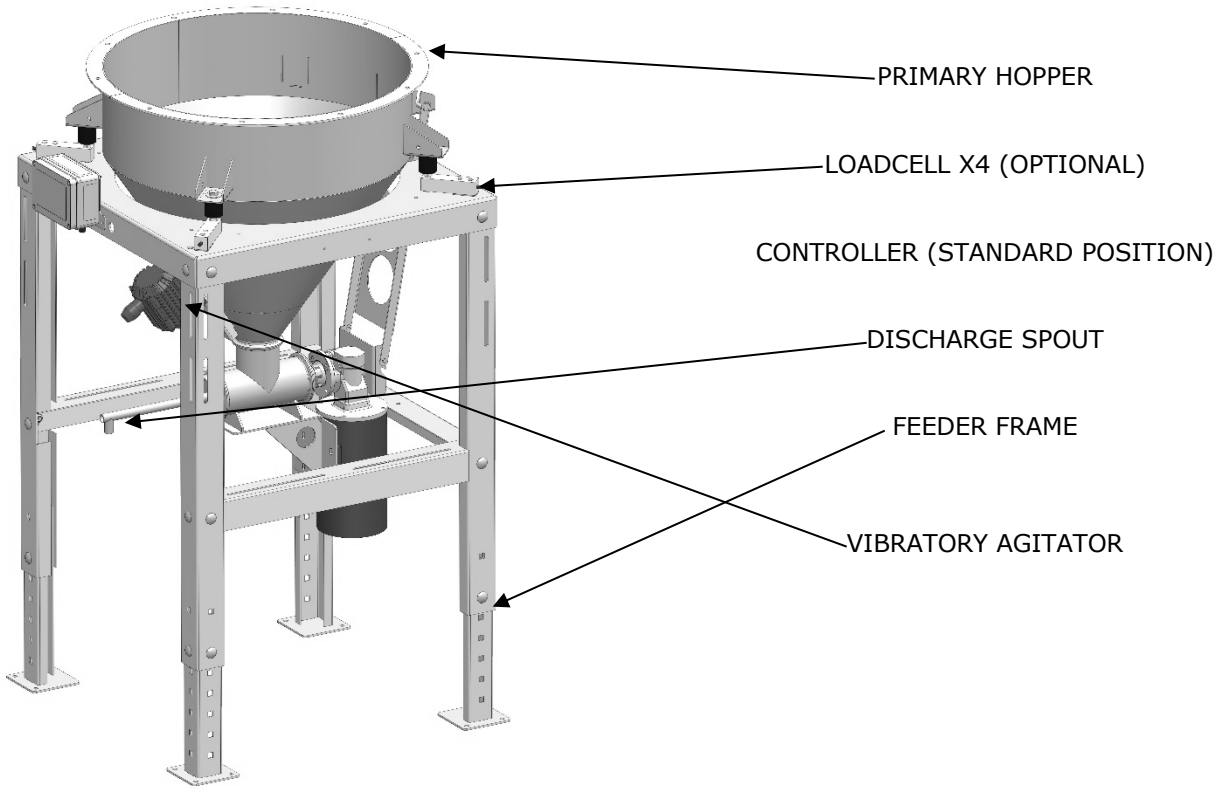
All technical data, drawings, and written information provided in this operational manual is proprietary information owned by Scaletron Industries Ltd. The provided information is to be utilized only by the owner, operator, or maintainer of equipment purchased from Scaletron Industries Ltd. Disclosing, copying, and/or reproduction of any or all the material enclosed in this operational manual for purposes not related to Scaletron Industries Ltd. equipment is directly violating company interests and/or patents owned by Scaletron Industries Ltd. and therefore strictly prohibited.

WARNING!!

Failure to follow recommended safety, operating and maintenance procedures may result in personal injury and/or damage to property. Ensure all operators, installation technicians and maintenance technicians have fully read and thoroughly understand the information provided in this operational and maintenance manual.

Standard Included Parts for: Model VMF-28™

Basic Components:



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Basic Product Description:

The Model VMF-28™ Volumetric Screw Feeder is designed for accurately dispensing bulk powdered chemicals into secondary processes. The VMF-28™ series consists of a base model volumetric screw feeder that can be outfitted with a large selection of optional accessories. Using these additional accessories in combination with modifications to the base feeder's integral components allows the VMF-28™ to meet a wide variety of industrial system demands. Below is a brief list of the attributes.

1) 5.0 cubic foot capacity, stainless-steel built-in gravity fed hopper.
2) Corrosion resistant powder coated steel frame.
3) Optional independently controlled vibratory agitator
4) Optional stainless steel concentric helical overwind auger.
5) Stainless steel, 0.5" to 3.75" diameter solid auger or 1.5" to 37" diameter open helix.
6) Variable speed control capable of remote and SCADA operation.
7) "Loss in Weight" measurement system.
8) Large selection of expandable accessories and configurations to meet customer's specific needs.

General Product Design Specifications:

NOTE: The Model VMF-28™ and/or optional accessories shall be installed by the contractor according to manufacturer's specified recommendations. The power source for the Model VMF-28™ and/or optional accessories shall be of appropriate size for safe operation of furnished equipment from the manufacturer.

I. Volumetric feeder shall be a Model VMF-28™ Volumetric Screw Feeder as manufactured by Scaletron Industries Ltd., Plumsteadville, PA.

II. The volumetric screw feeder shall be positioned so that the feed screw operates in a horizontal condition. A variable speed SCR motor controller, housed in a NEMA 4X enclosure shall operate a DC motor specific to the material being handled. The DC motor shall be directly coupled to a stainless-steel feed screw assembly, consisting of a helical overwind auger and a solid or open helix feed screw. There shall be no external belts, pulleys, chains, or external drive mechanisms; all gearing shall be enclosed in the motor housing. All external bearings shall require no additional lubrication.

III. The combination of feeder screw dimensions, motor characteristics, and gearing shall be based on customer specified requirements. Therefore, the feed rate of the volumetric feeder shall be determined by the motor, gearing and feed screw combinations specified by the customer.

All Surfaces that have direct and continuous contact with utilized feeding chemicals shall be constructed of 304 or 316 stainless-steel. Components that will or may have secondary intermittent contact with utilized feeding chemical shall be constructed of non-reactive materials or be furnished with a chemical resistant zinc oxide primed and dry powdered epoxy coating.

IV. Access to feeder screw assembly shall be easily achieved for regular maintenance via the use of tooling free connections. Higher echelon and infrequent maintenance procedures shall be explained in the user's manual furnished by the manufacturer. To counteract feed material, build up complications, the feeder can be furnished with one or any combination of the following material agitation and conditioning methods.

1. A helical overwind auger connected to the feed screw drive assembly.
2. An independently controlled electric or pneumatic vibratory agitator.
3. A bin insert located in the primary feeder hopper which promotes flow internally by controlling the rate at which the material is dispersed.

V. The primary hopper cone shall have a 5.0 cubic foot internal capacity. The hopper cone shall have an opening to accept utilized feeding chemicals. The feeder inlet shall accept multiple styles of covers/lids/accessories that are optional from the manufacturer.

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VI. The accuracy of feeding shall be 2% or better relative to volume feed rate. Actual accuracy depends on onsite operation and feeding material variables and shall only be determined only after field trials have been executed. Speed and correlating feed rate shall be controlled by the SCR motor controller which can be directly mounted to the volumetric feeder or in a remote location. The SCR motor controller shall be capable of operating from the feeder or from a remote location. The SCR motor controller shall have a manually adjustable speed control knob or a button actuation pad with digital display indicating rotational speed increments from 0% to 100%accessible from the exterior of the NEMA 4X enclosure.

Basics of Operation:

The VMF-28™ volumetric screw feeder from Scaletron Industries Ltd. is an automatic metering screw feeder that dispenses powdered, pelletized, or similar material into a secondary process dictated by the customer. The basic operation of the VMF-28™ is described below in a brief step by step description.

STEP 1) The material or chemical that is to be fed at a certain measured rate is first dispensed into the primary hopper. The primary hopper relies on gravity and/or an optional agitation attachment and/or device to move the material toward the bottom of the hopper.

STEP 2) The material or chemical is dispensed via a horizontally rotating solid auger or open helix which is directly connected to a gear motor or motor and gearing. The motor's speed is electronically controlled by an integrated electronic speed control.

STEP 3) The rotation of the auger or open helix then moves the material along the base of the hopper towards and into the feeder discharge spout.

STEP 4) The material then exits the volumetric feeder via the discharge spout, at the operators chosen rate and is dispensed into the process and/or container as determined by the operator.

Auger Sizing and Feed Rate Information:

The type and size of auger used by the volumetric feeder is directly dependent on the type and rate of material that is going to be fed through the screw feeder. An estimated figure can be determined by utilizing an approximate material density for the material to be fed and then calculate the outcome using specific formulas. Scaletron provides detailed information on topics relating to calculating auger sizes and feed rates before the purchase a VMF series volumetric screw feeder. For further information contact a Scaletron sales representative.

However, even with the proper estimated feed rate calculation the feed rate can be affected by other outside variables, such as differences in environmental conditions or uniformity of the material being fed. Therefore, actual feed rate can only be determined after testing is performed onsite after initial startup. Prior to any permanent operations the operator must ensure that the screw type and feed rate is correct if these steps are overlooked or bypassed the screw feeder may not operate as anticipated.

IMPORTANT: The given approximate volumetric capacities have been calculated using Scaletron's standard auger dimensions and a motor efficiency of 75%. It is VERY IMPORTANT that this information be used for REFERENCE ONLY. Variables relating to the material being fed, such as material density and physical characteristics, coupled with actual feeding system components, such as the size and shape of the chemical handling system, will affect the actual volumetric capacity and feed rate.

Installation & Start-up:

UNPACKING THE FEEDER:

After the volumetric screw feeder is unpacked, check all items against packing list to confirm that all parts described or required are present. This ensures that all parts have been received from Scaletron's manufacturing facility and confirms that no parts were accidently discarded during the unpacking process.

Note: If possible, all equipment should be unpacked at the location where the assembly and installation is to be conducted.

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Step 1: Remove all parts from shipping container and inspect for damage – bent metal, broken wires, cracks in indicator, etc. Any shipping damage must be reported to carrier!

Step 2: Place the equipment on a solid, dry, and even surface. Clear the area of all debris where the frame base will be anchored.

Step 3: Remove all shipping brackets if loadcell option is included.

CHOOSING A LOCATION: The location for the volumetric feeder is completely decided upon by the owner of the equipment. However, Scaletron would like to make it clear that installing the volumetric feeder in locations that are primarily damp or subject to fluctuating environmental conditions may have an adverse effect on the material density and flow rate of the material to be fed. Also, locations that are subject to strong air currents should be avoided, so that dry powdered chemicals will not become airborne creating dust that may cause property damage and/or personal injury.

MOUNTING THE FEEDER: The VMF-28™ series is designed to be supplied with a standard feeder frame but various configurations are possible, and it is the decision of the equipment owner to decide on mounting styles. However, Scaletron does recommend the following when considering mounting location priorities:

- When possible, use the correct accessories provided by Scaletron Industries, this will ensure that the volumetric feeder is properly secured per the factory requirements.
- If no standard Scaletron accessories or optional equipment has been purchased, then ensure the structure that is to support the volumetric feeder is level
- Always make sure all fasteners used to permanently locate the volumetric feeder and any connecting components are correctly installed and completely tightened and secured.

WARNING!! Failure to correctly secure all fasteners used in installation of volumetric feeder may result in personal injury and/or property damage.

NOTE: Scaletron Industries recommends that there should be 36" of clearance around the perimeter of the volumetric feeder and accompanying components after proper installation in its permanent location. Maintaining adequate clearance room will allow much easier maintenance inspections and servicing in the future.

MOUNTING THE CONTROL BOX OR PANEL: Scaletron VMF series volumetric feeders come standard with their control boxes and optional scale indicator boxes mounted directly to the motor mount box. At the request of the customer, Scaletron will furnish the required extra components and accessories if the control box and/or optional scale indicator boxes must me mounted in a remote location separate from the feeder itself. Contact a Scaletron sales representative for more information.

WARNING!! Scaletron strongly advises against the utilization of any other directly mounted primary hopper extensions. The use of which may cause premature equipment failure and/or damage to property and personnel.

WARNING!! Serious injury or death may occur if proper and current electrical codes and procedures are not strictly adhered to during the installation, operation, and maintenance of this volumetric screw feeder.

CONNECTING THE POWER: Power and other electrical connections to the feeder are customizable to meet the owner's specific needs. However, the correct procedures must be followed for safe and efficient operation. Scaletron insists that the customer refers to the electrical diagrams and procedure instructions in the hard copies of the operating manuals provided in conjunction with this manual upon the purchase of a VMF series volumetric feeder from Scaletron Industries.

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INITIAL STARTING OPERATIONS: The standard VMF feeder from Scaletron Industries will arrive pre-calibrated and have the auger assembly correctly assembled. However, to ensure safe operating practices, refer to the "Safe Start Test Run" checklist below.

"Safe Start Test Run"

- ✓ Ensure power is off!
- ✓ Make sure all electrical connections and electrical enclosures are safely secured by correct methods
- ✓ Ensure all vibration mount assemblies are tight and secure
- ✓ Make sure the primary auger and overwind auger are tight and secured properly to drive shaft
- ✓ Clear any debris or foreign materials from the hopper and feeder spout
- ✓ Turn power on

After the "Safe Start Test Run" checklist has been confirmed, follow the procedures below.

NOTE: Please refer to the controller manual provided with your feeder for advanced procedures and troubleshooting. A hard copy manual of the purchased equipment is provided with each VMF Series volumetric feeder upon purchasing from Scaletron Industries Ltd.

ADJUSTING THE CURRENT SET POINTS: To speed up the installation and operation of the volumetric feeder, Scaletron ships each VMF-28™ series volumetric feeder from the factory pre-calibrated. The customer's desired specifications are taken into consideration and then calculated with standard theoretical loads, environment, and dimensions. The resulting calibration is as close to the customer's desired specifications as possible and may need no extra calibrating. However, volumetric feeders rely on other variables that can only be ascertained by real world "on site" experimentation. It is highly recommended that verification of the pre-calibration be made in the field at the installation site to establish the correct operating and calibration settings. Please refer the "Calibrating" section in the Operational Manual for the provided SCR Motor Control Unit. (A provided in electronic or hardcopy is furnished with the purchase of a VMF-28™Series volumetric feeder from Scaletron Industries)

IMPORTANT: Scaletron strongly insists that "on site" test readings be performed to correctly verify the calibration of the VMF series volumetric feeder. DO NOT solely rely on factory calibration settings, variables such as material characteristics, environment, and hopper feeding equipment WILL BE different at the installation site.

ADJUSTING THE VIBRATORY AGITATION:

IMPORTANT: Inspect all bolts, nuts, and hardware fittings before activation of vibratory agitator. Also ensure that a periodic inspection of bolts nuts and fittings is undertaken on regularly scheduled intervals if agitator is being run frequently.

The optional vibratory agitator is directly mounted to the VMF series feeder. Like SCR controls, the settings for the vibratory agitator are set to a factory standard obtained by calculating data supplied by customer's requirements and optimal theoretical operating conditions. The standard vibratory agitator is offered in a simple "on/off "configuration and will need expandable circuitry if feeding applications dictate a more complex vibrating cycle. Because finding the correct vibration setting in "real world" operating conditions can be difficult and most likely will be determined by trial-and-error experimentation. To shorten the process and length of agitation experiments, Scaletron does offer adjustable variable controls which allows vibration cycles to be set and executed automatically. For more information contact your Scaletron Industries' sales representative.

NOTE: Running the optional agitator constantly will have negative affects regarding, material feed rates and equipment longevity. It is highly recommended by Scaletron that the use of an automated vibratory agitation cycle be adopted.

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General Use:

There are two main methods of operating the VMF-28™, manual operation and SCADA operation.
For Manual operation the operator must stand by the feeder or by the control box if mounted elsewhere to properly ensure the correct dosing of material. SCADA operation the operator relies on the "Loss of weight" system to properly dispense the correct amount. Both operational methods must be practiced before actual "online" operation of the feeder system occurs.

Regular Maintenance:

RECOMMENDED PROCEDURES: The VMF-28™ has been designed to be as maintenance free as possible. However, to ensure operational longevity a scheduled maintenance cycle is recommended and should be conducted periodically. Below are certain aspects and areas that are recommended to be incorporated into a maintenance checklist.

WHILE POWER IS ON

- ✓ Visually inspect surrounding area for leaks or spills.
- ✓ Listen for abnormally loud sounds, such as clinks, clacks, squeaks, or grinding, that otherwise should not be present.
- ✓ Visually inspect base and exterior for deterioration of components due to rust or other chemical corrosion.
- ✓ Visually inspect vibration mounts for cracking.
- ✓ Visually inspect for loose fasteners.
- ✓ Ensure operating environment is kept tidy and clean.

WHILE POWER IS OFF!!

- ✓ Visually inspect interior of hopper for dents, deep gouges, thin walls, abnormal wear, weak joints and cracks in welds.
- ✓ If equipped, inspect overwind auger for extreme disfigurement, bends, or cracks.
- ✓ Inspect primary auger for extreme disfigurement, bends, or cracks.
- ✓ Try to push and pull auger horizontally to check for excessive play in bearing components.
- ✓ Remove coupling safety shield and inspect coupling for wear, cracking, and loose or missing set screws. Visually inspect bearing assemblies for signs of chemical leakage.
- ✓ Ensure bearing assemblies are tightened completely.
- ✓ Visually inspect all externally exposed wires for tears, cuts, breaks, or missing protective coating.
- ✓ If a vibratory agitator is installed visually inspect mounting hardware and welds for cracks and loose fasteners.
- ✓ Grab hopper and attempt to shake back and forth in a sideways motion perpendicular to the primary auger and check for excessive movement and/or contacting metal sounds from vibration mounts.
- ✓ Ensure discharge spout and hopper connections are completely tightened and inspect for excessive wear, chips, gouges, or cracks
- ✓ Make sure a periodic cleaning of all major components is carried out at a reasonable scheduled cycle relative to the amount of use the volumetric screw feeder is exposed to.

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Calibration Procedure:

The Model VMF-28™ Volumetric Screw Feeder is calibrated at the factory to be within specified accuracy of the feed rate requested by the customer. However, to ensure accuracy the customer/ technician must conduct accuracy measurements at the site location. For additional information on calibrating with a "Loss of Weight" system option please refer to the included AccuPro indicator or HMI manual.

Troubleshooting:

The following chart is provided to help with common operational errors

Feeder has no material output (motor does not run)	Feeder has no power	Check for possible power connection issues and re-connect power
	Function switch on control box is in wrong position	Change switch to correct position
	Signals from remote location are interrupted	Check to see if feeder operates manually. Correct remote signal interrupts
	Fuse has blown	Consult operating manuals and replace fuse if necessary
	SCR controller is broken or malfunctioning	Review volumetric feeder documentation and contact Scaletron sales representative
	Motor brushes have become worn or misaligned	Consult motor operational maintenance manual
Feeder has no output (motor is running but feed screw is not turning)	Coupling set screws have come loose or fallen out	Retighten or replace set screws in drive coupling
	Feed screw is jammed with foreign material or large masses of feed material	Remove feeder spout and try to clear screw or empty feeder and remove primary auger assembly
	Current limit is set to low	Reset current limit to correct adjustment position
Slow feed or No Feeder Output	Motor is running in wrong direction	Reverse motor direction. Switch power leads connected to motor terminals
	Feed screw direction is wrong	Review volumetric feeder order documentation then consult with Scaletron sales representative
	Speed of feed screw rotation has changed	Adjust and correct speed setting
	Hopper has become empty	Fill hopper with feed material
	Material is forming a "cave" or "hollow area" around feeder screw	Consider need for feeder agitation and hopper vibration
	Foreign material or lumps are found in output material	Remove spout and try to clear screw or empty feeder and remove trough and feed screw assembly
NOTE: If feeder spout is removed while the feeder is full, contents of hopper may spill out quickly. Ensure proper measures are taken to avoid hazardous and/or unwanted chemical spills.		

For any other troubleshooting issues not mentioned in the list above or for more detailed assistance please contact Scaletron Support Services directly.

****Notice: Do not return any equipment without first contacting the factory. A return authorization number will be issued and it must be marked on all materials returned to the factory, accompanying a letter that explains the problem specifically. A Serial Number will also be required. It is located inside the indicator box.*