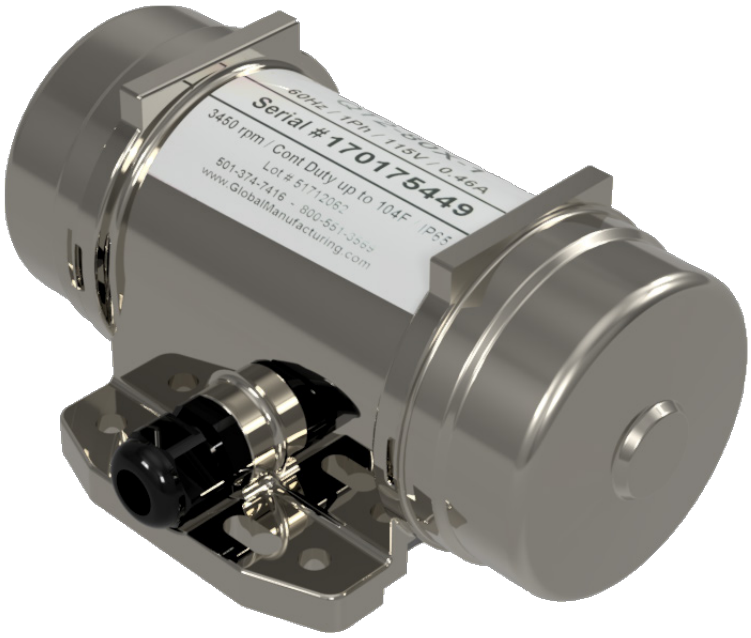
Quiet THUNDER®
INDUSTRIAL ELECTRIC VIBRATORS

Models
Single Phase
115 Volt - 60 Hertz
QT2-40X
QT2-80X
QT2-100X
QT2-130X

Operating Instructions



Global® VIBRATORS
Viber® VIBRATORS
Global® AIR BLASTERS

Global Manufacturing, Inc
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Little Rock, Arkansas 72202
501.374.7416 TEL
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800.551.3569 FREE USA & CANADA
Viber-Vibrators.com
GlobalManufacturing.com

SAFETY PRECAUTIONS

- Follow wiring and installation wiring instructions.
- A licensed electrician should adhere to all electrical codes when wiring three phase and direct wired single phase vibrators.
- Take amperage and voltage readings upon completion of installation. See page 9 for run and start amp draws for each vibrator and page 21 for more information on voltage drops.
- High amperage reading means something is wrong and the vibrator may be damaged or not mounted properly. Do not operate a vibrator that pulls high amps.
- For single-phase, use properly grounded 3-prong receptacle and do not use an extension cord without knowing the voltage drop in order to use the correct gauge size. See page 21 for instructions on how to calculate what size of extension cord you should use.
- Make sure all electrical connections are secure and will not vibrate loose.
- Follow all mounting instructions.
- Bolt vibrator to a flat surface, across a long vertically oriented channel iron flush to the outside of the hopper wall.
- Contact factory if you are unable to closely follow all installation instructions or if amperage readings are high.
- Attach a safety cable or chain from vibrator to an independent stronghold.
- Prior to use, check vibrator for damage (twisted unit, cracked junction box, loose wires, missing end covers, etc.) Do not operate a damaged vibrator.
- Maximum ambient operating temperature is 104°F (40°C).
- Do not mount electrical control boxes onto structure (bin/hopper) wall to be vibrated.
- Do not operate vibrators when structure is empty.
- Do not operate vibrators when gate is closed or conveyor is stopped unless consolidation of material is desired.
- Wear ear protection for 90+ decibel levels.
- Do not operate vibrators without side covers.
- Always disconnect electricity before maintenance.
- Follow OSHA regulation Section 1910.145 for lockout program.

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Performance Data

VIBRATOR MODEL	Unbalance Min	Unbalance Med	Unbalance Max	Speed	Force Min	Force Med	Force Max	Available Voltages	Amp Draw Run	Output Power
	lb-in	lb-in	lb-in	rpm	lb	lb	lb	volts	amps	hp
	kg-mm	kg-mm	kg-mm		kN	kN	kN			
QT2-40X	0.04	0.09	0.13	3450	15	29	44	115	0.46	0.05
	0.5	1.0	1.5		0.07	0.13	0.20			
QT2-80X	0.04	0.13	0.22	3450	15	44	73	115	0.46	0.05
	0.5	1.5	2.5		0.07	0.20	0.33			
QT2-100X	0.13	0.22	0.30	3450	44	73	102	115	0.46	0.05
	1.5	2.5	3.5		0.20	0.33	0.46			
QT2-130X	0.22	0.30	0.39	3450	73	102	132	115	0.46	0.05
	2.5	3.5	4.5		0.33	0.46	0.59			

Each model is factory set at the maximum force-pound value given in the table above unless requested otherwise. All models come with full set of weights that can be adjusted from 15 lb-f to 132 lb-f in 14.6 lb-f increments.

Motor casing in aluminum.

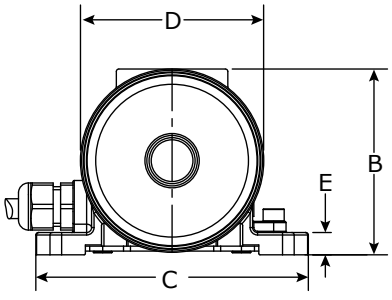
Weight covers in 304 stainless steel.

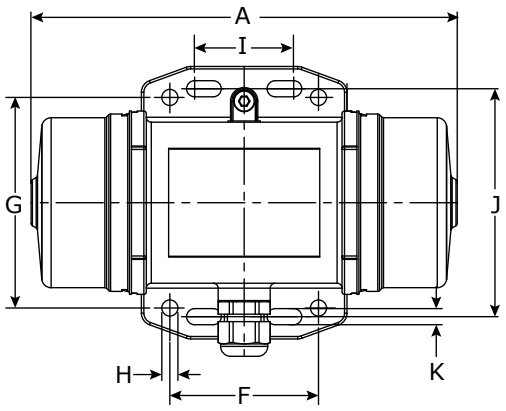
Operating Temperatures: -4°F - 104°F (-20°C - 40°C).

Insulation Class F (275°F or 135°C).

Mechanical protection = IP 65 (Total protection against dust and low pressure water).

Designed for continuous duty with 100% centrifugal force.





QT2-40X or 80X or 100X or 130X Series - Electric Vibrator Dimensions

Weight	A Total Length	B Total Height	C Foot Width	D Body Width	E Foot Thickness	F Rd Bolt Hole Separation Length	G Rd Bolt Hole Separation Width	H Round Bolt Hole Size	I El Bolt Hole Separation Length	J El Bolt Hole Separation Width	K Elongated Bolt Hole Size
lb	in	in	in	in	in	in	in	in	in	in	in
kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4.9	6.77	2.95	4.33	2.93	0.35	2.36	3.35	.236	1.00-1.57	3.62	.256
2.0	172	75	110	74	9	60	85	6.0	25-40	92	6.5

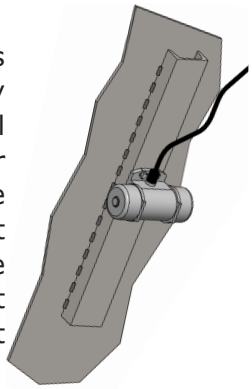
INSTALLATION

⚠ Caution!

Do not mount the vibrator directly to the structure wall. Use a channel iron stiffener for proper mount rigidity and as the transducer of the vibrational energy.

The axis of rotation of the eccentric weights, which are found on the end(s) of the motor shaft, should rotate toward the desired direction of material flow. In hopper applications, the weights should rotate towards the bin wall and down. The shaft of the vibrator should ideally be in a horizontal position to prolong bearing life.

The key to successful vibration is a proper mount because rotary vibration resonates the material inside the structure. The vibrator should appear motionless. There should not be a large amount of motion or noise. Follow the instructions on how to mount the vibrator and you will get great results.



Single Phase models: **Mount vibrator with the power cord facing upwards.**

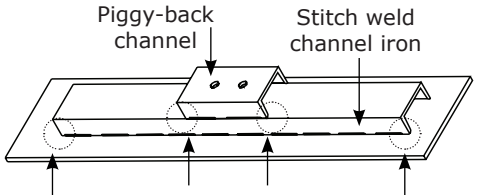
Important!

The channel iron should be at least two-thirds of the height of the sloped portion of the hopper but no greater than 6 feet (1.8 m).

CHANNEL IRONS - HOW TO MOUNT

The channel iron should be at least 2/3 the height of the sloped portion of the hopper, but not less than 2' (.61 m) or greater than 6' (1.8 m) in length. The channel iron width should not be less than the base width of the vibrator. DO NOT install more than one vibrator on the same channel iron or use a channel iron shorter than the recommended length. A short channel may flex the bin wall.

Attach the vibrator to the channel iron. Stitch weld nuts to the back of the channel iron or the channel iron may be drilled and tapped to accept the mounting bolts. An alternate method is to cut a second channel iron slightly longer than the footprint of the vibrator. Stitch weld the second channel iron to the first. Do not weld the ends. Mount the vibrator to the second channel iron.



Do not weld the ends of the channel iron. This allows the vibrational force to "escape". Solid welded ends trap the force, which can cause stress cracks.

Attach a safety cable to a stronghold (not the channel iron mount), which is higher than the mounted vibrator and capable of holding the vibrator's weight.

Stitch weld the channel iron vertically to the slope portion of the bin wall. Weld 3 inches (7.5 cm), skip 1 inch (2.5 cm), weld 3 inches (7.5 cm), etc... Leave 1 inch (2.5 cm) un-welded on the ends and corners. This allows the vibration to dissipate out the ends of channel without causing stress cracks to the hopper or bin. By doing so, should the weld fail, the entire mount will not fall off. Do not mount the channel iron horizontally.

Secure the vibrator to the channel iron using the 4 slotted holes with SAE coarse thread ¼"-20 grade 8 plated bolts with lock washers or an adhesive such as Loctite® 262. If the four round holes are used for mounting use 10-24 grade 2 plated bolts with lock washers or an adhesive such as Loctite® 262. Tighten bolts in a sequential process. At least two passes are required in most situations. Give all bolts the same torque value. If Loctite® is not used, torque the bolt after the vibrator has operated for a few minutes and check tightness often. If Loctite® is used do not torque the bolts a second time as this will break the Loctite® bond.

Channel Irons for Mounting Electric Vibrators

Vibrator Model	Width	Minimum Web Thickness	Minimum Length	Weight Per Length
	inch	inch	feet	lb/ft
	mm	mm	mm	kg/m
QT2-40X, QT2-80X, QT2-100X, QT2-130X	3.0	.17	2	4.1
	75	4	609	6.0

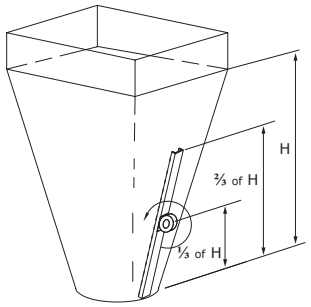
Vibrator Bolts and Required Torque

Model	Bolt	Torque
QT2-40X QT2-80X	10-24 grade 2 plated bolts	4 lb-ft (5 N-m)
QT2-100X QT2-130X	¼"-20 grade 8 plated bolts for slotted holes	10 lb-ft (13 N-m)

Mounting Locations

Single Vibrator

Install a channel iron stiffener on the outside of the sloping wall 1/3 the distance above the discharge opening.

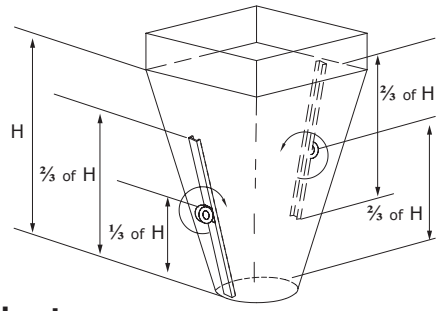


Multiple Vibrators

Use more than one vibrator when the diameter or width of any wall is greater than 12 feet (3.66 m). Always mount the vibrators on different planes.

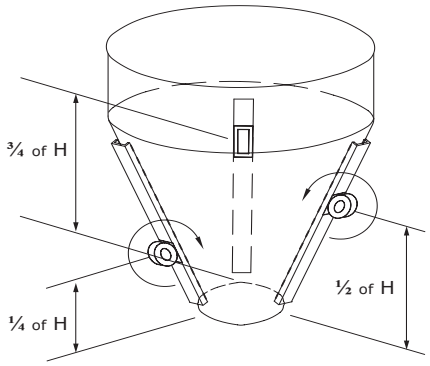
Two Vibrators on Round or Square Hoppers

Install channel iron stiffeners 180° apart. Install one vibrator on the outside of the sloping wall 1/3 the distance above the discharge opening. Install the second vibrator on the outside of the opposite sloping wall 2/3 the distance above the discharge opening.



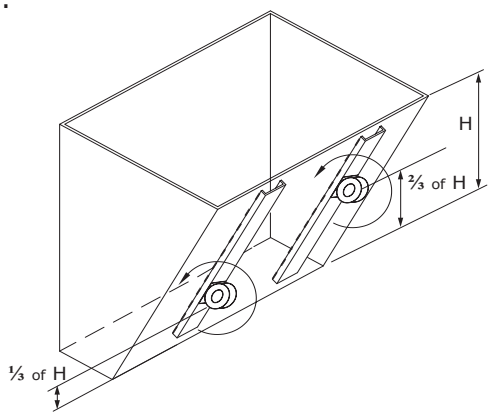
Three Vibrators

Install channel iron stiffeners mounted 120° apart. Install the first vibrator on the outside of the sloping wall 1/4 the distance above the discharge opening. Install the second vibrator on a separate channel iron at 1/2 the distance above the discharge opening. Install the third vibrator on the remaining channel iron at 3/4 the distance above the discharge opening.



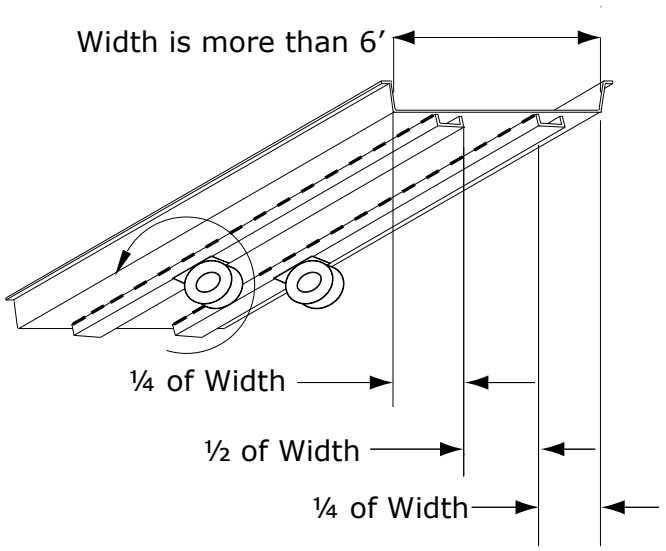
Two Vibrators on Rectangular Hoppers

Install channel iron stiffeners on opposite sides of the long walls. Install one vibrator on the outside of the sloping wall 1/3 the distance from the discharge opening. Install the second vibrator on the outside of the opposite sloping wall 2/3 the distance above the discharge opening. When only one wall slopes, mount both stiffeners on it. Equally space the stiffeners on the wall. Place one vibrator 1/3 above the discharge opening on one channel iron and the other vibrator 2/3 above the bin's discharge opening on the second channel.



Installation on Chutes and Flow Pipes

Mount channel iron stiffeners vertically or in the direction of material flow. Center the channel if the chute is less than 6 feet (1.83 m) in width. If the chute is greater than 6 feet in width, use two vibrators on separate channel irons. To maximize each vibrator's radius of influence; center each channel iron in each half of the chute. Each channel iron should be located ¼ of the chute width from the edge and ½ of the chute width apart. (e.g. – for a chute 8' wide, the channel iron locations would be 2' from each edge and 4' apart.) When wall thickness is less than 1/8", additional reinforcement may be required.



OPERATION

These electric vibrators are built for continuous duty, however the vibrators may be cycled on and off for intermittent duty. The minimum time between consecutive starts is two (2) minutes. Each time the vibrator starts it draws high amperage. To prevent overheating and damage to windings, the unit must be allowed to cool between consecutive starts.

Do not operate the vibrator on an empty hopper. The vibration will vibrate the hopper and the vibrator causing damage if no bulk material is present. When the vibrator is mounted rigidly the vibration will pass through the structure and resonate the material inside the hopper.

Operate vibrators when discharge gates are open unless compaction of material is desired. The vibrator should appear motionless.

WIRING ELECTRIC VIBRATORS

Only a qualified electrician should connect an electric vibrator to a power source. Using power of incorrect voltage, phase, or inadequate wire size will damage the vibrator and void the manufacturer's warranty.

Always measure the amperage on all legs of the supplied power after installing the vibrator. If the amp draw exceeds that specified on the motor nameplate, turn off the vibrator immediately. Operating an electric vibrator with an excessive amp draw will lead to premature motor failure that is not covered by the manufacturer's warranty.

The cause for a high amp draw must be determined and corrected before operating the vibrator. Possible causes of high amp draw:

1. A non-rigid mount
2. Mount plate too thin
3. Warped mount plate
4. Low voltage (from power source or due to inadequate wiring or extension cord)
5. Incorrect voltage
6. Vibrator produces too much force for application

It is recommended that the initial amperage readings be recorded for future reference. If you cannot determine the cause of a high amp draw, Do Not Operate the Vibrator. Call Global Manufacturing customer support at 1-800-551-3569. When seeking customer technical support, please provide the product serial number, voltage and phase of the power source, and the initial amperage readings. If you periodically check the amperage, an increase in the amp draw will indicate the onset of a problem such as decreased or fluctuating voltage, loose mount bolts, or a loss in rigidity of the mount. High amp readings should never be ignored.

These Global vibrators do not have dual voltage motors. They are designed and wired at the factory for 115-volt single phase power. They cannot be rewired for a different voltage.

MAXIMUM ALLOWABLE CURRENT DRAW:

115 Volt - Single Phase	
Model	**Amps Max Run**
QT2-40X, QT2-80X, QT2-100X, QT2-130X	.46

THREE LEADING CAUSES OF ELECTRIC VIBRATOR FAILURE

1. Low Voltage:

Possible failure point is low voltage caused by high starting current. An electric vibrator will take 2 to 3 seconds to reach full running speed. During this starting period, the vibrator draws more current than it draws at full running speed. The high starting current may cause the voltage to sag or drop below 80% of the rated voltage when measured at the vibrator. If inadequate voltage is provided initially, a voltage drop will cause problems. Low voltage may prevent the vibrator from reaching its rated speed, and cause the motor to continue to draw high starting current for a prolonged period until it burns up. The electric power circuit must be able to handle the high starting current without dropping below 80% of the rated voltage. The most common problems are using a long extension cord with the wire gauge undersized or an undersized transformer which cannot handle the high amp draw on start up.

2. Improper Mounting:

When an electric motor runs slower than its rated speed, it will draw excessive current and eventually burn up. A non-rigid mount hinders the vibrator from reaching full running speed. In screen and feeder applications, the vibrator may get "trapped" in the resonant frequency of the structure and not have enough power to reach full running speed. Adjust the springs if possible to change resonant frequency. Improper mounting of the electric vibrator will cause it to fail.

3. Excess Force:

If vibrator produces too much force and causes flexing of the mount on the bin wall, the vibrator will not reach full speed, will pull high amps and fail.

Important!

VOLTAGE & AMP READINGS MUST BE DONE PRIOR TO OPERATING VIBRATOR

Typically, motors can tolerate a 10% drop in voltage while running. Since start-up lasts only 1 to 2 seconds, a 20% drop should be tolerated for that short period of time when the motor is pulling higher amps. The best way to check this is to use a voltage meter at the motor. Check minimum voltage during **start-up** and the running voltage once the motor has reached its running speed. Assuming 120 volt motor, it needs at least 96 volts during start-up, and once the motor reaches its operational speed it needs 108 volts. When **sizing an extension cord** one must be careful because the extension cord is only one source of voltage drop. The power source might also fluctuate. It is best to assume the power source could fluctuate by 5%. Thus the 120 volt source might at times only provide 114 volts. Therefore, the extension cord cannot cause more than a 15% voltage drop during start-up and only a 5% drop after reaching operational speed. With a 100' 14AWG copper wire extension cord, one would get a 20.231 voltage (16.86%) drop during motor start-up when pulling 39 amps. This means the voltage at the vibrator might be as low as 93.77 volts, too low for proper starting. Once the vibrator reaches full speed it pulls only 2.6 amps. The voltage drop here would be 1.349 volts leaving 112.65 volts, which should be sufficient to keep the unit running. HOWEVER, the low voltage during start-up causes excess heat that degrades the motor insulation. This effect is cumulative, so even though the vibrator starts the first, second, or third time the damage done by low voltage is building. Eventually the insulation fails and the motor will burn up. In this example only the start windings will fail prematurely, which will leave the vibrator inoperable.

TO FURTHER EXPLAIN VOLTAGE DROPS PERTAINING TO THE PREVIOUS EXAMPLE:

If a 12AWG cord is used the voltage drops will be:

Start-up=12.733 volts giving a net of 101.3 volts
Run=0.849 volts giving a net of 113.2 volts
This extension cord would be adequate.

If a 10AWG cord is used the voltage drops will be:

Start-up=8 volts giving a net of 106 volts
Run=0.534 volts giving a net of 113.5 volts
This extension cord would be better.

The website below has a good voltage drop calculator. If you have the wire size, length, power source voltage, and amp draw it will calculate the voltage drop.

http://www.powerstream.com/Wire_Size.htm

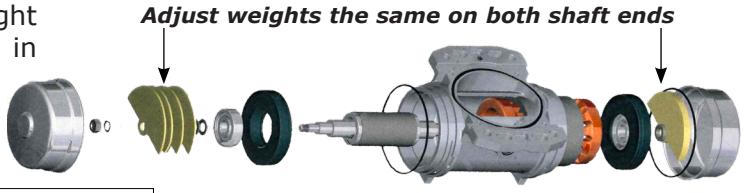
YOU MUST ALSO CHECK THE AMP DRAW

If the amp draw exceeds the manufacturer's specifications then the vibrator is probably not properly mounted. The mount may not be level or lack proper rigidity. Please follow the mounting instructions in this manual. Also, the vibrator force could be too great for the application. If you have confirmed the mount is adequate (proper size and length of channel welded per instructions), adjust the weights to reduce the force output and recheck the amp draw. Continue to reduce the force until the amp draw is less than or equal to the amp rating in the performance table on page 3.

WEIGHT SETTING ADJUSTMENTS

The weights on this vibrator can be adjusted to produce force outputs from 15 pounds of force to 132 pounds of force. There are two methods for adjusting the weights. Using the **Weight Rotation Method** individual weights are rotated 180 degrees to reduce the force output from the maximum setting where all nine weights are in alignment (none rotated). **The configuration of the weights must be the same on both ends of the vibrator shaft.** See the possible weight configurations and their resulting force output in the table below.

Using the **Weight Removal Method** the force is reduced from the maximum by removing the same number of weight discs from each side. When a weight disc is removed it must be replaced with a standard flat washer of the same thickness as the weight disc. As before, the configuration of the weights must be the same on both ends of the vibrator shaft. See the possible weight configurations and their resulting force output in the table below.



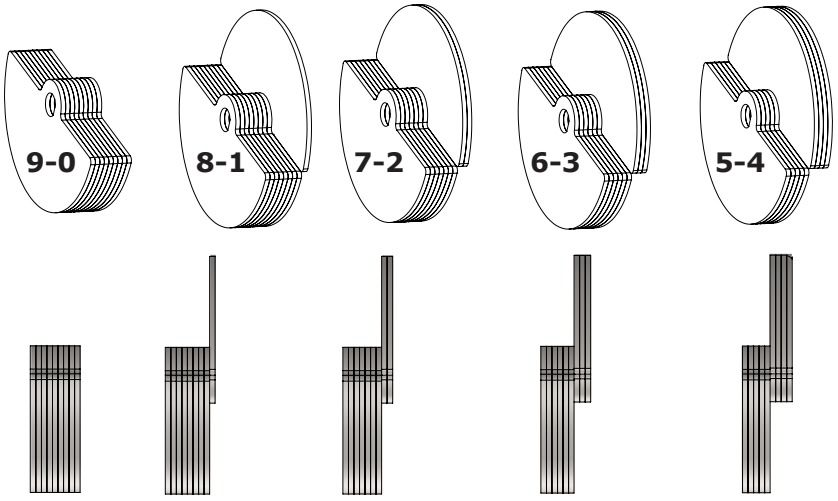
Weight Rotation Method For Setting Force Output:

One Set Of Weights = 0.0433 lb-in of unbalance and 15 force pounds

Model Factory Setting	Weight Configuration	Unbalance lb-in	Force lb-f	Comments
QT2-130X-1	9-0	0.3893	132	All 9 weights in same orientation
QT2-100X-1	8-1	0.3028	102	One of 9 weights rotated 180 degrees
QT2-080X-1	7-2	0.2163	73	Two of 9 weights rotated 180 degrees
QT2-040X-1	6-3	0.1298	44	Three of 9 weights rotated 180 degrees
	5-4	0.0433	15	Four of 9 weights rotated 180 degrees

Weight Removal Method For Setting Force Output:

Model Factory Setting	Weight Configuration	Unbalance lb-in	Force lb-f	Comments
QT2-130X-1	9-0	0.3893	132	All nine weights in same orientation
	8-0	0.3460	117	1 weight removed & replaced with flat washer
	7-0	0.3028	102	2 weights removed & replaced with flat washers
	6-0	0.2595	88	3 weights removed & replaced with flat washers
	5-0	0.2163	73	4 weights removed & replaced with flat washers
	4-0	0.1730	58	5 weights removed & replaced with flat washers
	3-0	0.1298	44	6 weights removed & replaced with flat washers
	2-0	0.0865	29	7 weights removed & replaced with flat washers
	1-0	0.0433	15	8 weights removed & replaced with flat washers



TROUBLESHOOTING

Problem	Probable Cause	Solution
Excessive noise	Vibrator mount is not rigid.	Make sure mount is rigid and the vibrator is perpendicular to channel iron See pages 6 - 8. Tighten all bolts. Check for cracked welds or broken housing.
Vibrator will not start	Single phase circuit breaker (purchased separately) is tripped.	Correct the problem that caused the overload. Reset breaker. See pages 9 & 14.
	Circuit is interrupted.	Make sure all leads are "hot".
Vibrator runs hot or overheats **Excessive Current** ***Check voltage and amp draw on start-up and on run.***	Vibrator mount is not rigid	Make sure mount is rigid. See pages 6 - 8. Tighten all bolts. Check for cracked welds or a broken housing.
	Voltage is low. Conductor gauge or extension cord is inadequate or too small.	Use a heavier gauge when using extension cords or conductor. See page 21 for voltage/amp information and how to size an extension cord.
	Stop-Start time intervals too short. The motor is restarted quickly again after stopping.	The time between start-ups needs to be at least two minutes. The amperage draw at start-up is high and creates heat. A two minute time delay allows motor to cool down.
	Ambient temperature is too hot for vibrator.	Protect vibrator from ambient temperature above 104°F (40°C).
	Mounting surface is not flat and motor is binding.	Check mount plate surface. Must be flat. Use shims to level the vibrator mount if necessary.
	Vibrator force output is excessive for application.	Reduce force by adjusting weights.