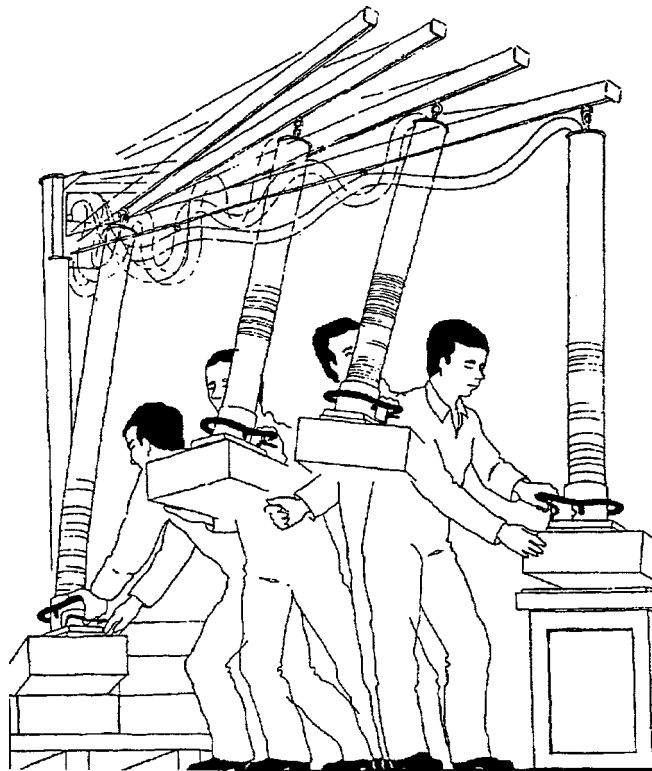


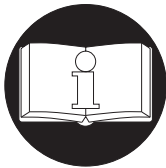
PARTS, INSTALLATION AND MAINTENANCE MANUAL



SELF CONTAINED VACUUM LIFTING SYSTEM Models ZV065, ZV090, ZV125, ZV175, ZV225, ZV260 and ZV350



(Dwg. MHP1271)



READ THIS MANUAL BEFORE USING THESE PRODUCTS. This manual contains important safety, installation, and maintenance information. Make this manual available to all persons responsible for the operation, installation and maintenance of these products.

Always operate, inspect and maintain this system in accordance with applicable safety codes and regulations.

Refer all communications to the nearest Ingersoll-Rand Material Handling Office or Distributor.

Form MHD56170

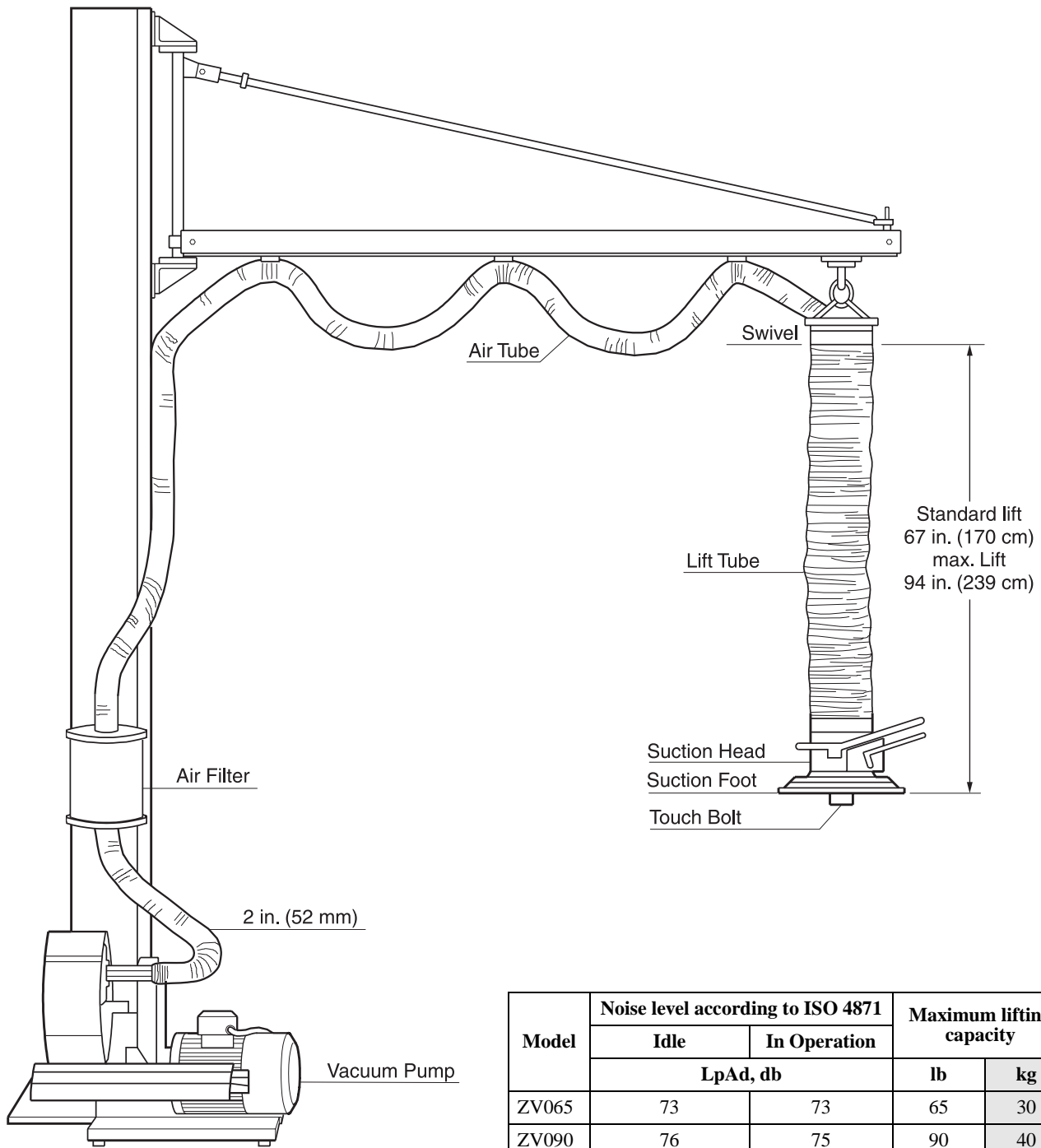
Edition 2

September 1998

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ZIMMERMAN
HANDLING SYSTEMS



(Dwg. MHP1639)

Guarantee

The Guarantee is 12 months when employed in one 8 hour shift per day. On two or more shifts, or more intensive operation, the Guarantee period is reduced accordingly.

Valid only with original parts.

Model	Noise level according to ISO 4871		Maximum lifting capacity	
	Idle	In Operation	lb	kg
	LpAd, db			
ZV065	73	73	65	30
ZV090	76	75	90	40
ZV125	76	81	125	60
ZV175	76	81	175	80
ZV225	80	83	225	100
ZV260	73	79	260	120
ZV350	75	80	350	160

SAFETY INFORMATION

This manual provides important information for all personnel involved with the safe installation, operation and proper maintenance of this product. Even if you feel you are familiar with this or similar equipment, you should read this manual before operating the device.

Danger, Warning, Caution and Notice

Throughout this manual there are steps and procedures which, if not followed, may result in a hazard. The following signal words are used to identify the level of potential hazard.

⚠ DANGER Danger is used to indicate the presence of a hazard which **will** cause **severe** injury, death, or substantial property damage if the warning is ignored.

⚠ WARNING Warning is used to indicate the presence of a hazard which **can** cause **severe** injury, death, or substantial property damage if the warning is ignored.

⚠ CAUTION Caution is used to indicate the presence of a hazard which **will** or **can** cause injury or property damage if the warning is ignored.

NOTICE Notice is used to notify people of installation, operation, or maintenance information which is important but not hazard-related.

Z VAC PRINCIPLE

The **Z VAC** is a lifting device which uses the same vacuum both for lifting and gripping a load.

Through its patented valve system a variety of objects can be lifted in a fast labor - saving and precise manner.

The **Z VAC** consists of two main parts.

1. **The lift unit contains:**
 - a. Top swivel with suspension point.
 - b. Lift tube.
 - c. Suction head.
 - d. Suction foot to suit different applications.
2. **The motor unit contains:**
 - a. Vacuum pump with silencer.
 - b. Air filter.
 - c. Air tube.

TECHNICAL DATA

	SA350/2	SA320/2
Output Rating 50 Hz	3.0 kW	2.2 kW
Output Rating 60 Hz	3.45 kW	2.55 kW
Pressure Difference (Vacuum)	63 kPa	55 kPa

	Silencing Cover			
	Without	With	Without	With
<i>Noise level according to ISO (LpAd)</i>				
By pressure difference 180 mbar	73 dB (A)	64 dB (A)	73 dB (A)	62 dB (A)
By pressure difference 340 mbar			71 dB (A)	63 dB (A)
By pressure difference 400 mbar	75 dB (A)	66 dB (A)	---	---

Lubrication

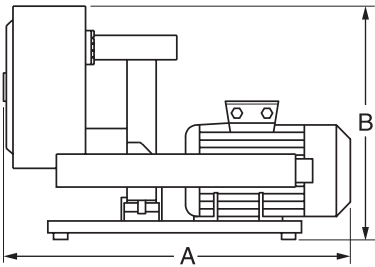
The following applies in connection with normal operating conditions (suction and ambient temperatures 104 degrees fahrenheit (40° C) max and permissible total differential pressure). After approximately 20,000 hours of operation, or after 2-1/2 years of use, the rolling-contact bearings and adjacent spaces should have the spent grease removed and be recharged with fresh grease. About 50% of the free space in the rolling-contact bearings and about 65% of the adjacent grease spaces should be filled with grease. Only UNIREX N3 grease (ESSO) should be used.

NOTICE

- A filter ZV10921 or ZV10927 must always be connected in front of the vacuum pump inlet pipe.
- A motor protection circuit-breaker must be used, set to the nominal motor current.

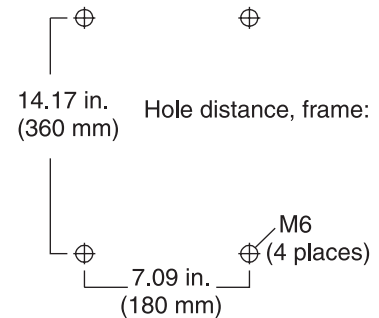
Measurements

Vacuum Pump Assembly



(Dwg. MHP1641)

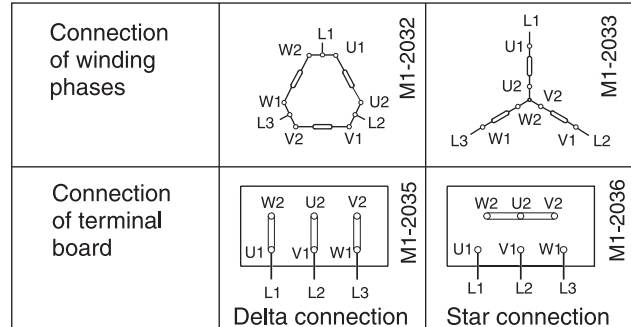
Dim	SA320/2		SA350/2	
A	21.06 in	535 mm	24.8 in	630 mm
B	17.7 in	450 mm	17.7 in	450 mm
Width	13.19 in	335 mm	13.19 in	335 mm



(Dwg. MHP1642)

Connection Of The Three (3) Phase Motor

The rated voltage of the motor must correspond to the line-to-line voltage of the system. Check the motor serial plate to see that the voltage and frequency correspond to those of the electrical supply. On the inside of the lid of the terminal box you will find how to connect the motor in star connection or delta connection. Minimum cable area: 1.5 mm² Fuses:16A



(Dwg. MHP1640)

INSTALLATION

Assembly Instructions

1. Connect air tube to nozzle on the top swivel.
2. Attach a suction foot to the suction head.
3. Suspend the lift unit on the trolley of a jib crane or light crane system. The unit must hang freely so that unnecessary wear is avoided. The lowest point of the suction foot must not be closer than 6 in. (152 mm) to the floor. Check that the overhead system is level and free moving. A free hanging lift tube must stay where the operator leaves it and it must not drift.

CAUTION

- The overhead crane system for the lift tube must be designed to life a minimum of 1.5 times the lifting capacity of the lift tube.

4. Mount the vacuum pump unit in a suitable position and connect it to the power supply. Check that a motor circuit-breaker is fitted and set to the nominal current shown on the motor plate. Refer to page 12.
5. Connect the air tube and air filter to the vacuum pump. The air filter must be fitted between the pump and the lift tube.

CAUTION

- Z VAC must not be used by anyone who has not received training in the safe operation of this product. Do not operate the unit with your face close to the lift tube or suction foot.

Starting up

Start the vacuum pump and check if the pump is rotating in the right direction.

Balancing the unit without a load

The lift unit can be balanced without a load so that the suction head will remain at a convenient height for the operator. This is done by adjusting the airflow with a valve operated by a screw (ZV10104) on the left side of the suction head. Loosen the locknut and turn the screw until level is achieved.

Balancing the unit with a load

In order to facilitate work with the Z VAC the lift unit can also be balanced with a load. By balancing the unit, the load can be made

to float at a level convenient for the operator. Balancing is done by adjusting the black screw (ZV30128 or ZV10151). Lift the load to the required level and turn screw until balance is achieved.

The touch bolt should be adjusted so that the head of the screw is about 1/2 in. (13 mm) below the lowest point of the suction foot. When lifting bags with suitable suction foot the touch bolt should be adjusted approximately 1/2 in. (13 mm) from the lowest point of the suction head. The lifting speed can be adjusted by the valve on the air filter. High speed is achieved by closing the valve.

The Z VAC is now ready for work!!

OPERATING INSTRUCTIONS

Raise the lift tube so that it can be placed directly over the load to be lifted. The suction head is lowered to the object by pressing the operating handle down so that the suction foot contacts the load. Lifting is done by squeezing the operating handle upwards. Lift the load to required position and lower it by pressing the operating

handle down. The suction foot can be released from the load by pressing the operating handle fully down.

MAINTENANCE

Check daily that the lift unit has maximum lifting capacity. The lifting capacity will be reduced if a vacuum leak occurs in the lift tube or air tube. The rubber gasket on the suction foot must be changed when it becomes worn or damaged. It must be correctly fitted. The air filter must be cleaned at regular intervals. This may be done daily, weekly or monthly dependent on the dust in the environment. Cleaning the air filter can be done by blowing the air filter with compressed air. Reduce the air pressure so as to prevent damage to the filter.

Check the function of the touch bolt by allowing the lift tube to hang freely. Push the touchbolt upwards. A rapid downwards movement will then occur. If not, clean the noise and dust filter in the suction foot and check that no dirt has accumulated in the valves.

The top swivel joint includes a safety valve. The valve automatically closes if the power fails and the load sinks to the floor under control. Check the operation of the safety valve by suspending a load and then stopping the vacuum pump.

CAUTION

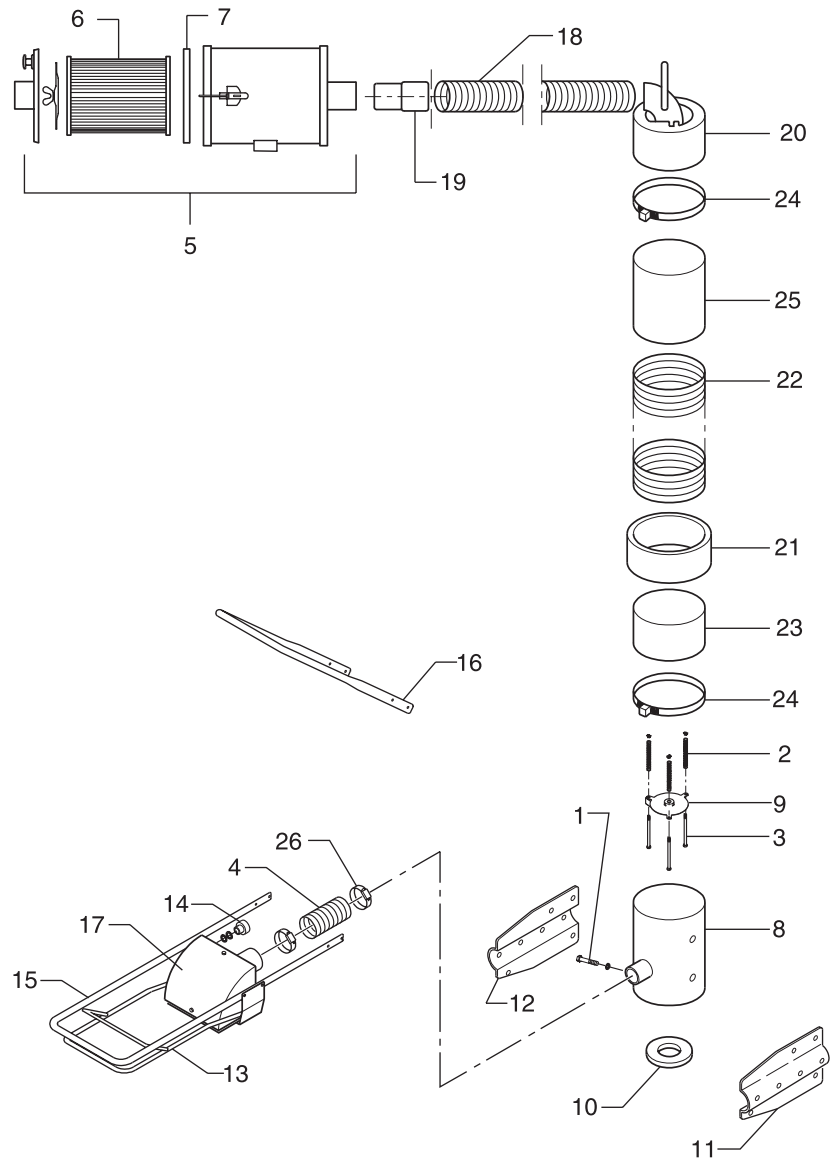
• Use of replacement parts other than Ingersoll-Rand could result in damage to the Z VAC.

WARNING

• To make the Z VAC a safe tool to use, the following instructions must be followed.

1. The operator **must** be trained on the safe operation of this product.
2. All instructions in the manual **must** be followed.
3. A motor circuit breaker **must** be used.
4. The overhead system **must** be installed by trained Technicians and all safety rules **must** be followed.
5. When in operation the operator **must** not place his head above the unit.
6. When in operation the operator **must** not be under a hanging load.
7. Maintenance instructions **must** be followed.
8. Service records **must** be maintained and be accessible for inspection.
9. Only original parts **must** be used.
10. The touch bolt **must** not be removed.
11. The maximum load weight **must** not be exceeded.
12. The operator **must** use two hands when handling the unit.
13. The lift tube **must** be used only in a vertical position.
14. All connections **must** be checked regularly.
15. All parts connecting the overhead system and the unit **must** be checked for wear.
16. The vacuum pump **must** not be taken apart.
17. The electrical installation **must** be done by a licensed electrician.
18. A load **must** never be left hanging for an extended period of time. This can cause pump to overheat.

ZV065 AND ZV090 PARTS DRAWING

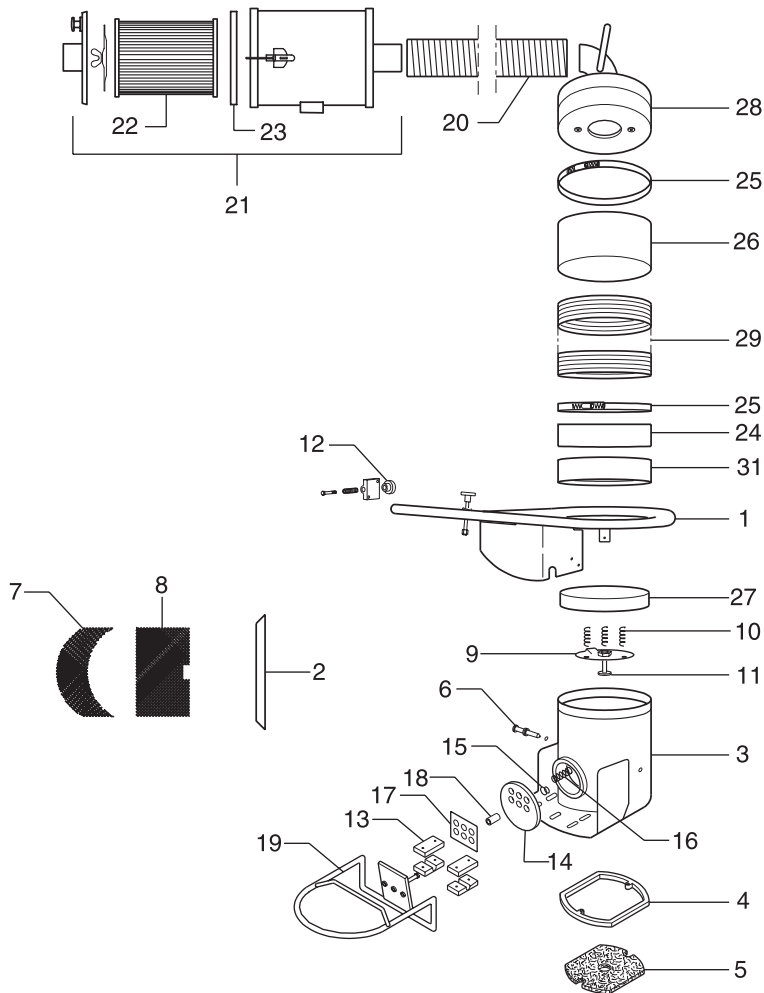


(Dwg. MHP1643)

ZV065 AND ZV090 PARTS LIST

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.		ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.	
			ZV065	ZV090				ZV065	ZV090
1	Adjustment Screw	1	ZV10104		16	Handle, Inner Part	1	ZV30141	
2	Spring	3	ZV10142		17	Valve Box	1	ZV30150	
3	Screw M5 x 70	3	ZV10144		18	Air Tube 1 -1/2 in. 24.6 ft. / 49 ft.	1	ZV30905/11	
4	Tube 1.5 in.	1	ZV10913						
5	Air Filter, Complete	1	ZV10921		19	Connection 1.5 in. / 2.0 in	1	ZV30915	
6	Air Filter, Insert	1	ZV10922						
7	Rubber Gasket	1	ZV10923		20	Top Swivel	1	ZV31000	ZV32000
8	Suction Head	1	ZV30101		21	Enlargement Ring	1	---	ZV32109
9	Balancing Valve	1	ZV30105		22	Lift Tube 8 ft. / 13 ft.	1	ZV31940/4	ZV32940/4
10	Rubber Ring	1	ZV30110						
11	Attachment Plate, Right	1	ZV30111		23	Rubber Hose, Lower	1	ZV31942	ZV32942
					24	Tube Clamp	2	ZV31943	ZV32943
12	Attachment Plate, Left	1	ZV30112		25	Rubber Hose, Upper	1	ZV31944	ZV32944
13	Operating Handle	1	ZV30126		26	Tube Clamp	2	ZV30113	
14	Load Adjustment Screw	1	ZV30128						
15	Handle, Outer Part	1	ZV30140						

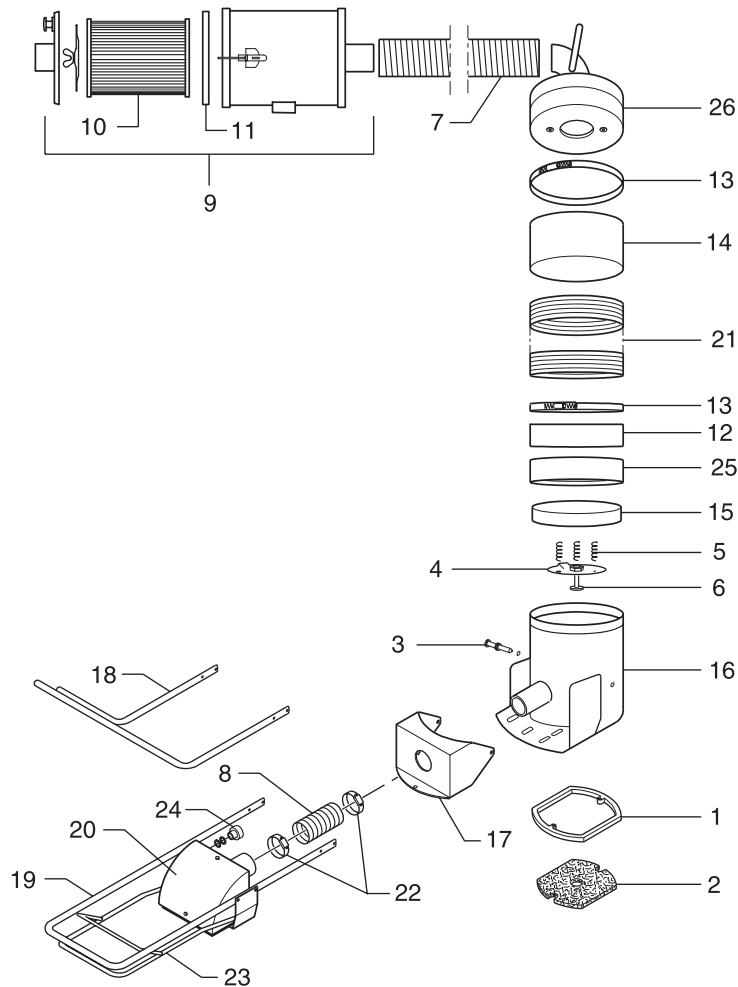
ZV125 AND ZV175 STANDARD HANDLE DRAWING AND PARTS LIST



(Dwg. MHP1644)

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.		ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.	
			ZV125	ZV175				ZV125	ZV175
1	Handle	1	ZV10090		16	Spring	1	ZV10173	
2	Rubber Gasket	1	ZV10091		17	Valve Plate	1	ZV10174	
3	Valve Box	1	ZV10101		18	Cage	1	ZV10175	
4	Rubber Packing	1	ZV10102		19	Operation Handle	1	ZV10180	
5	Dust Filter	1	ZV10103		20	Air Tube 24.6 ft./49 ft.	1	ZV10905/11	
6	Adjustment Screw	1	ZV10104		21	Air Filter, Complete	1	ZV10921	
7	Noise Reduction Pkg.	1	ZV10105		22	Filter Insert	1	ZV10922	
8	Noise Reduction Pkg.	1	ZV10106		23	Rubber Gasket	1	ZV10923	
9	Balancing Valve	1	ZV10141		24	Rubber Hose, Lower	1	ZV10942	ZV18942
10	Spring	3	ZV10142		25	Tube Clamp, Upper and Lower	2	ZV10943	ZV18943
11	Touch Bolt 2.4, 2.75, 3.5 in.	1	ZV10143		26	Rubber Hose, Upper	1	ZV10944	ZV18944
12	Load Adjustment Screw	1	ZV10151		27	Rubber Strip	1	ZV10945	---
13	Bearing (2-parts)	2	ZV10160		28	Top Swivel	1	ZV16000	ZV18000
14	Valve, Plastic	1	ZV10171		29	Lift Tube 8 ft.	1	ZV16940	ZV18940
15	Spring	1	ZV10172			Lift Tube 13.2 ft.		ZV16941	ZV18941
					31	Delrin Ring	1	---	ZV18110

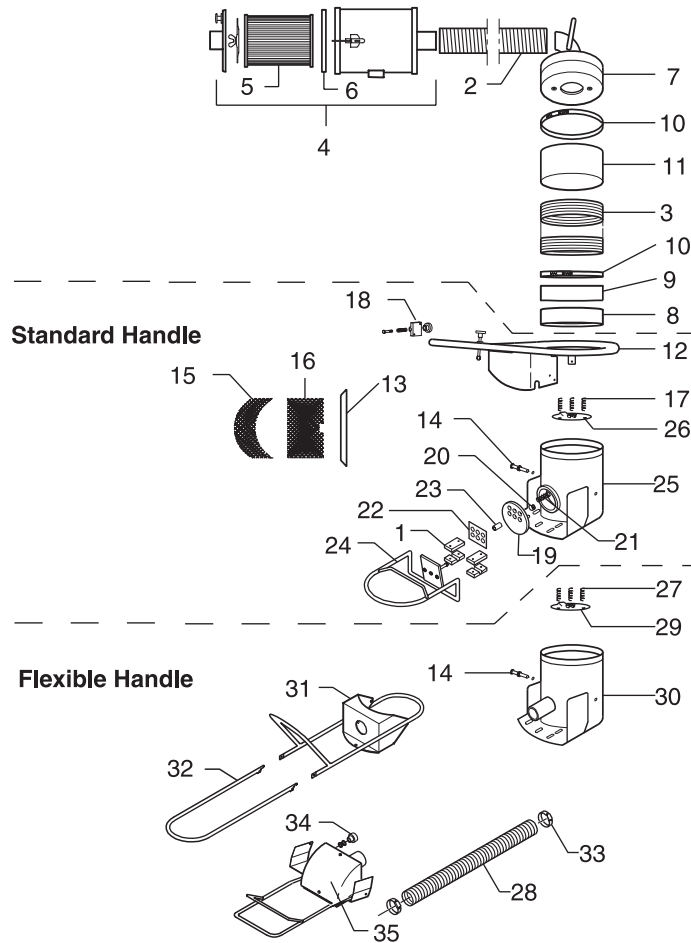
ZV125 AND ZV175 FLEXIBLE HANDLE DRAWING AND PARTS LIST



(Dwg. MHP1645)

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.		ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.	
			ZV125	ZV175				ZV125	ZV175
1	Rubber Packing	1	ZV10102		14	Rubber Hose, Upper	1	ZV10944	ZV18944
2	Air and Dust Filter	1	ZV10103		15	Rubber Strip	1	ZV10945	---
3	Adjustment Screw	1	ZV10104		16	Valve Box with Pipe	1	ZV11101	
4	Balancing Valve	1	ZV10141		17	Cover	1	ZV11102	
5	Spring	3	ZV10142		18	Handle, Inner Part	1	ZV11103	
6	Touch Bolt	1	ZV10143		19	Handle, Outer Part	1	ZV11104	
7	Air Tube 2 in. 24.6 ft.	1	ZV10905		20	Valve Box	1	ZV11150	
	Air Tube 2 in. 49 ft.		ZV10911		21	Lift Tube L: 8 ft	1	ZV16940	ZV18940
8	Air Tube	1	ZV10916			Lift Tube L: 13 ft		ZV16941	ZV18941
9	Air Filter, Complete	1	ZV10921		22	Tube Clamp	2	ZV30114	
10	Air Filter Insert	1	ZV10922		23	Operation Handle	1	ZV30126	
11	Rubber Gasket	1	ZV10923		24	Load Adjustment Screw	1	ZV30128	
12	Rubber Hose, Lower	1	ZV10942	ZV18942	25	Delrin Ring	1	---	ZV18110
13	Clamp, Upper and Lower	2	ZV10943	ZV18943	26	Top Swivel, Complete	1	ZV16000	ZV18000

ZV225 DRAWING AND PARTS LIST

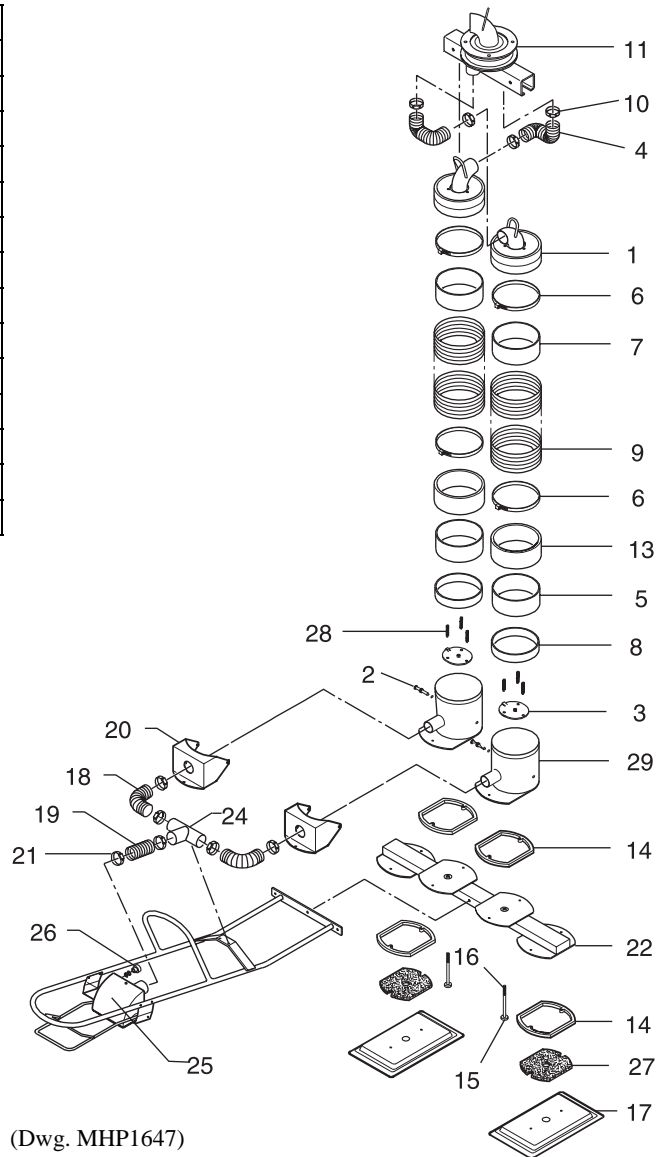


(Dwg. MHP1646)

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.	ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.
1	Aluminium Bearing (2 parts)	2	ZV10160	17	Spring	3	ZV10142
2	Air Tube 24.6 ft. / 49 ft.	1	ZV10905 ZV10911	18	Load Adjustment Screw	1	ZV10151
3	Lift Tube 8 ft. / 13 ft.	1	ZV20940 ZV20941	19	Valve, Plastic	1	ZV10171
4	Air Filter	1	ZV10921	20	Spring	1	ZV10172
5	Air Filter Insert	1	ZV10922	21	Spring	1	ZV10173
6	Rubber Gasket	1	ZV10923	22	Valve Plate	1	ZV10174
7	Top Swivel ZV225	1	ZV20000	23	Cage	1	ZV10175
8	Delrin Ring	1	ZV20109	24	Operation Handle	1	ZV10180
9	Rubber Hose, Lower	1	ZV20942	25	Valve Box	1	ZV20101
10	Tube Clamp, Upper and Lower	2	ZV20943	26	Balancing Valve	1	ZV20141
11	Rubber Hose, Lower	1	ZV20944	27	Spring	3	ZV10142
12	Handle	1	ZV10090	28	Air Tube	1	ZV10916
13	Rubber Gasket	1	ZV10091	29	Balancing Valve	1	ZV20141
14	Adjustment Screw	1	ZV10104	30	Valve Box	1	ZV21101
15	Noise Reduction Packing	1	ZV10105	31	Handle, Inner Part	1	ZV21103
16	Noise Reduction Packing	1	ZV10106	32	Handle, Outer Part	1	ZV21104
				33	Tube Clamp	2	ZV30114
				34	Load Adjustment Screw	1	ZV30128
				35	Valve box	1	ZV42150

ZV260 AND ZV350 STANDARD HANDLE DRAWING AND PARTS LIST

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.	
			ZV260	ZV350
1	Top Swivel	2	ZV16000	ZV18000
2	Adjustment Screw	2	ZV10104	
3	Balancing Valve	2	ZV10141	
4	Air Tube D. 50 mm	2	ZV10919	
5	Rubber Band	2	ZV10943	ZV18942
6	Tube Clamp	4	ZV10941	ZV18943
7	Rubber Band	2	ZV10944	ZV18944
8	Rubber Band	2	ZV10945	---
9	Lift Tube 8 ft.	2	ZV16940	ZV18940
	Lift Tube 13 ft.		ZV16941	ZV18941
10	Tube Clamp	4	ZV30114	
11	Top Swivel with Yoke	1	ZV42105	
13	Distance Ring, Lower	2	---	ZV18110

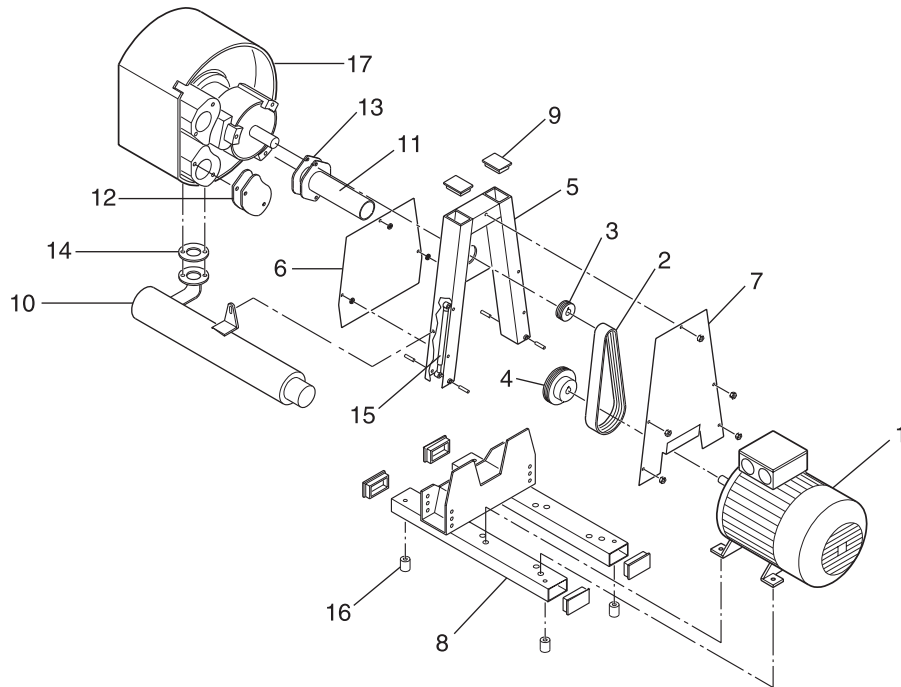


(Dwg. MHP1647)

Suction Foot ZV41370

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.		ITEM NO.	DESCRIPTION OF PART	TOTAL QTY.	PART NO.	
			ZV260	ZV350				ZV260	ZV350
14	Rubber Gasket On Metal Ring	4	ZV10102		23	Handle 32 in.	1	ZV42101	
15	Rubber	2	ZV10146		24	T-Pipe with Attachment D. 2 in.	1	ZV42102	
16	Bolt M8 X 120	2	ZV10149		25	Valve Box	1	ZV42150	
17	Suction Foot	2	ZV10700		26	Load Adjusting Screw	1	ZV30128	
18	Air Tube D. 45 mm	2	ZV10917		27	Dust Filter	2	ZV10103	
19	Air Tube D. 45 mm	1	ZV10918		28	Spring	6	ZV10142	
20	Cover	1	ZV11102		29	Valve Box with Pipe	2	ZV11101	
21	Tube Clamp	6	ZV30114						
22	Attachment for Two Suction Feet	1	ZV41371						

VACUUM PUMP ASSEMBLY DRAWING AND PARTS LIST



(Dwg. MHP1648)

ITEM NO.	DESCRIPTION OF PART		TOTAL QTY.	PART NO.
1	Standard Electrical Motor for SA320/2 Voltage Must Be Specified	Only SA320/2	1	ZV10959
	Standard Electrical Motor for SA350/2 Voltage Must Be Specified	Only SA350/2		ZV10969
2	Drivebelt		1	ZV10980
3	Pulley		1	ZV10981
4	Pulley for SA320/2 60Hz	Only SA320/2	1	ZV10982
	Pulley for SA350/2 60Hz	Only SA350/2		ZV10983
	Pulley for SA320/2 50Hz	Only SA320/2		ZV10984
	Pulley for SA350/2 50Hz	Only SA350/2		ZV10985
5	Frame Upper Part		1	ZV80110
6	Plate		1	ZV80111
7	Plate		1	ZV80112
8	Frame Lower Part		1	ZV80113
9	Plastic Stopper		6	ZV80114
10	Silencer		1	ZV80115
11	Pipe		1	ZV80116
12	Plate		1	ZV80117
13	Packing for ZV80116 and ZV80117		1	ZV80118
14	Packing for ZV80115		1	ZV80120
15	Gas Spring		1	ZV80121
16	Rubber Foot		4	ZV80122
17	Vacuum Pump		1	ZV80969

TROUBLESHOOTING

If the Z VAC will not lift:	YES	NO
1. Check the weight of the load. It must not exceed the rated capacity of the unit. Test the unit with a light load using a non-porous surface, i.e. a steel plate. Check and if necessary clean the air filter.		
2. Has the vacuum pump started?	Go to 3	Start the pump. If it still does not work, get an electrician to check it.
3. Check the direction of rotation of the vacuum pump. Is air blowing from the silencer?	Go to 4	Change two phases over. This must be done by an electrician.
4. Is there any air leakage between the vacuum pump and the filter?	Tighten the clamps and if necessary change the air tube.	Go to 5
5. Is there any air leaking from the filter box?	Check the rubber seal underneath the lid of the filter box. Close the bleed-off valve in the lid of the filter box.	Go to 6
6. Is there any air leaking from the air tube between the top swivel and the filter box?	Tighten the clamps and if necessary change the air tube.	Go to 7
7. Check the lift tube for damage. This must be done with the tube extended to its maximum length.	Change the lift tube.	Go to 9
8. Is the suction foot fitted correctly and, if supplied, is the quick-release coupling okay? Check that there are no leaks.	Go to 9	The suction foot should be removed and re-fitted. Do not over tighten the fixing screws. Problems can occur because the screws are under tightened or over tightened. Over tightening may deform the top of the suction foot.
9. Is the rubber seal on the suction foot damaged or worn?	Change the seal.	Consult factory

SERVICE NOTES

PARTS ORDERING INFORMATION

Z VAC Systems are designed and constructed to provide long, trouble-free service. In time it may be necessary to order and install new parts to replace those that have been subjected to wear.

The use of other than **Zimmerman** replacement parts may result in decreased performance, and may, at the company's option, invalidate the warranty. For prompt service and genuine **Zimmerman** replacement parts, provide your nearest Distributor with the following:

1. Complete model number as it appears on the system.
2. Part number(s) and part description as shown in this manual.
3. Quantity required.

Disposal

When the life of the unit has expired, it is recommended that the unit be disassembled, degreased and parts separated as to materials so that they may be recycled.

 **ZIMMERMAN**
HANDLING SYSTEMS

2955 Stephenson Highway
Madison Heights, MI 48071-2387
Phone: 248-398-6200
Fax: 248-398-1374
Toll Free 1-800-347-7047

Complete and prompt repair services are available at our factory. If you are doing your own repair and you have problems or questions, contact your local Zimmerman representative or call the factory at (800) 347-7047.