



**CM Refrigeration**

Nanjing Wonfulay Precision Machinery Co., Ltd

[www.cm-green.com](http://www.cm-green.com)

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# Explosion Proof Gas Compressor CMEP-V400

## Operation&Maintenance Manual

**For professional use only**



Warning:(1) Read the operation manual before using the equipment (2) Inspection, maintenance and installation of CM products must be made only by experienced, trained and qualified personnel. (3) Maintenance, use and installation of CM products must comply with CM instructions, applicable laws and safety standards (4) Transfer of toxic, dangerous, flammable or explosive substances using CM products is at user's risk and equipment should be operated only by qualified personnel according to applicable laws and safety standards (5)Operation manual must be packed with carton for easily achieving and reading (6)Operation manual must stay with equipment even for second sales

CM Refrigeration

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# 1.Safety Precautions

**PLEASE READ THIS OPERATION MANUAL BEFORE USING THIS EQUIPMENT !**

<b>WARNING</b>	
	<ul style="list-style-type: none"> <li>· ONLY VAPOR, NO LIQUID! The compressor is designed for butane propane including mixture gas, it is forbidden to recovery ethanol or any other medium</li> <li>· This equipment must always be operated by a qualified technician and comply with all local codes and regulations.</li> <li>· To reduce the risk of fire, extension cords should not be used</li> <li>· Overfilling of the tank may cause injury or death.</li> <li>· Use only authorized refrigerant storage tank. Referring to this instruction manual for tank specification.</li> <li>· Disconnect power before moving or servicing the machine</li> <li>· Keep fire and spark 8m away from working area</li> <li>· All electrical wiring must be done by a qualified electrician</li> <li>· This equipment must be grounded to reduce risk of sparking and electric shock</li> <li>· Keep a working fire extinguisher in the work area.</li> </ul>
	<ul style="list-style-type: none"> <li>· Do Not touch pipeline and pressurized components! Pipeline &amp; valves will become very hot while refrigerant transfer</li> <li>· Do not alter or modify equipment</li> <li>· Check equipment daily. Repair or replace worn or damaged parts immediately with manufacturer's replacement parts only</li> <li>· Tighten all hose and pressure connections before operating the equipment.</li> <li>· Vapor or liquid refrigerant from the equipment, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.</li> </ul>
	<p>Always use equipment in well-ventilated area and stay away from fire and spark, the ventilation flow rate must be more than 1000 m<sup>3</sup>/h (600 CFM)</p>
	<p>Wear appropriate protective equipment when in the work area to prevent serious injury, including eye injury, hearing loss, inhalation of fumes, and burns.</p> <p>This protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> <li>· Protective eyewear, and hearing protection.</li> <li>· Respirators, protective clothing, and gloves as recommended by the solvent manufacturer.</li> </ul>

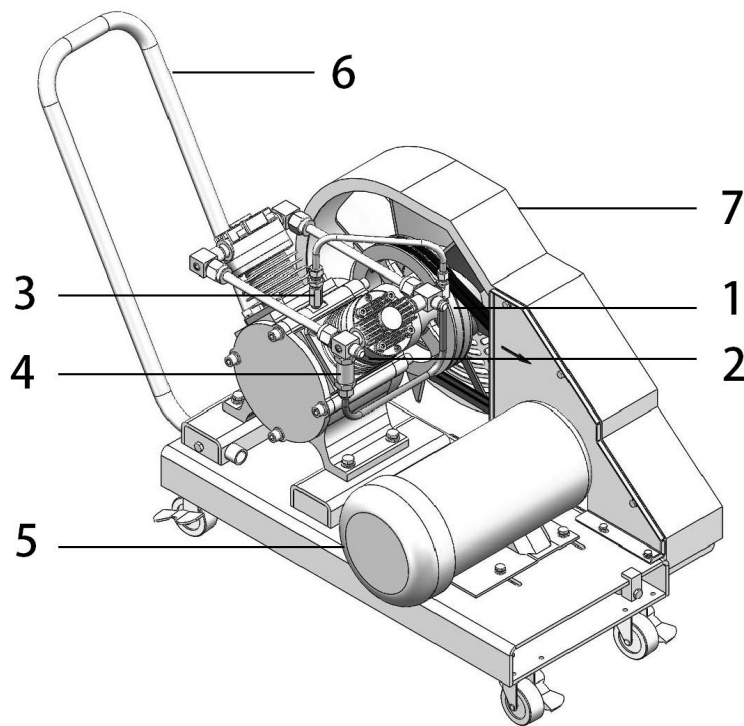


## 2.Product Description

### 2.1 Features

- Recovery hydrocarbon solvent at 4CFM
- Max outlet pressure 160Psi rated for butane and propane including mixture
- Powerful 2HP UL listed C1D1 explosion proof motor
- 2000 hours running time without maintenance
- Air cooled design with oversized fan for high efficiency heat exchange
- Compliant with NFPA and UL explosion proof standard

### 2.2 Equipment Introduction



No	Description	No	Description
1	Outlet	2	Inlet
3	Single-Way Valve	4	Pressure Relief Valve
5	Motor	6	Pull Rod
7	Pulley Cover		



### 3. Technical Data

ITEM	MODEL	CMEP-V400	
Performance Data	Gas Displacement	4 CFM	
	Propane Recovery Rate	1.1 lbs/min (based on inlet pressure 29 PSI) 0.8 lbs/min (based on inlet pressure 14.5 PSI)	
	Butane Recovery Rate	1.3 lbs/min (based on inlet pressure 29 PSI) 0.9 lbs/min (based on inlet pressure 14.5 PSI)	
	Max. Pumping-out Pressure	160 Psi	
	Max Inlet Pressure	70Psi	
	Inlet / Outlet Port Size	1/2" JIC Male	
	Ultimate Vacuum Degree	28 inHg (0.96 Bar)	
	Compressor Cooling Way	Air Cooling	
	Noise Level	70 dB	
	Pressure Relief Valve	217Psi	
	Working Temperature	0-50°C	
Explosion Proof Motor	Horsepower	2 HP	
	Voltage	230V 60Hz 3PH	460V 60Hz 3PH
	Max. Amperage Load	5.2 A	2.6 A
	RPM	1725	
	Approved	UL Class I Division I Group C&D	
Material	Compressor, Valve & Pipeline	Food grade stainless steel	
	Piston Ring	PTFE	
Weight	Net Weight	60 Kg	
Dimension	L * W * H	1020*465*680 mm	

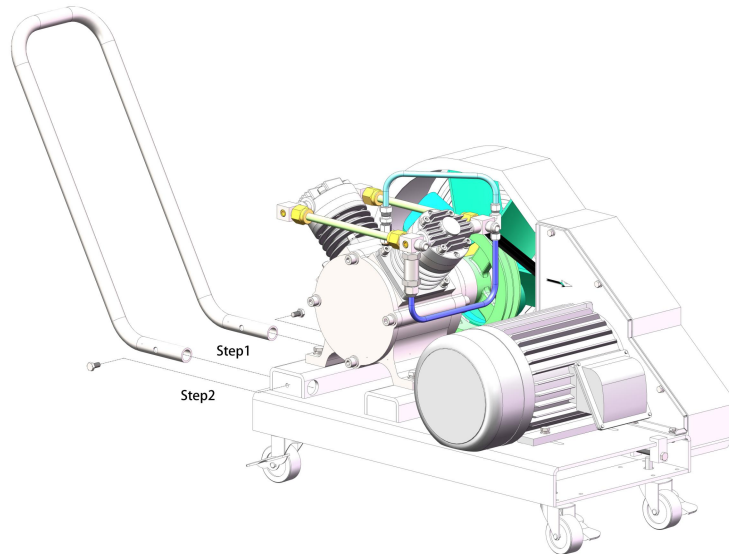
## 4. Installation

CMEP-V400 compressor units should be installed in a clean, ventilated, relatively cool situation and leave enough space around the unit (if the side of the pulley faces the wall, at least 2.6 feet away from the wall). The space should be equipped with air exchange fan, the air volume requirement  $>1000 \text{ m}^3 / \text{h}$ .

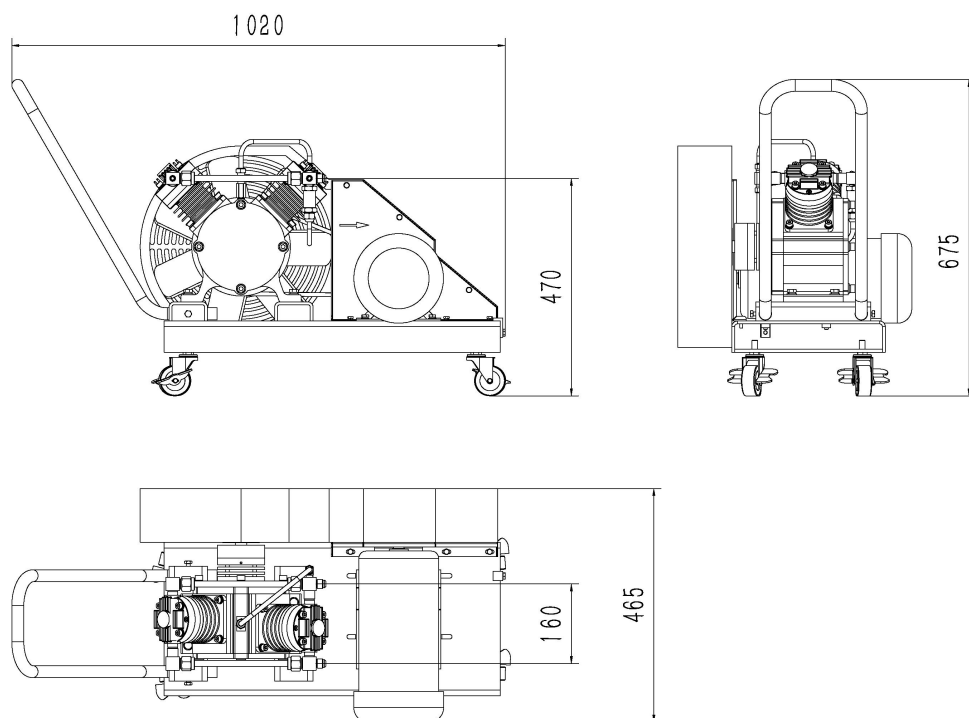
### 4.1 Pull Rod Installation

A. Install the pull rod according to below diagram

B. Tighten the screw



### 4.2 Dimension



## 5. Wiring Connections

The compressor comes without motor starter or on/off switch, a C1D1 rated explosion proof on/off switch for hazardous location is highly recommended to install by manufacturer.

To avoid injury from fire, explosion, or electric shock, all electrical wiring must be done by a qualified electrician and comply with all local codes and regulations for C1D1 electrical connection.

### 5.1 Wire Connections At the Explosion Proof Motor

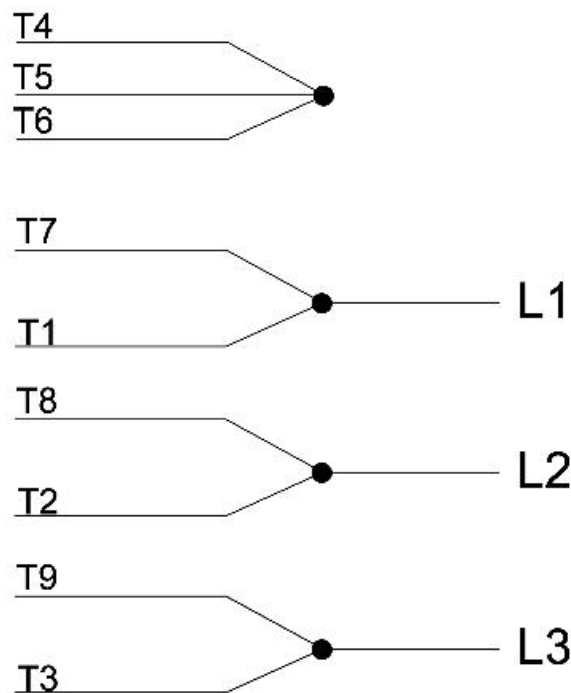
Install the wiring at the motor as follows:

A. Open the motor electrical box.

B. Install wiring system with proper connections to the motor electrical box. A C1D1 installation requires conduit or armored cable with sealing fittings in accordance with NFPA 70.

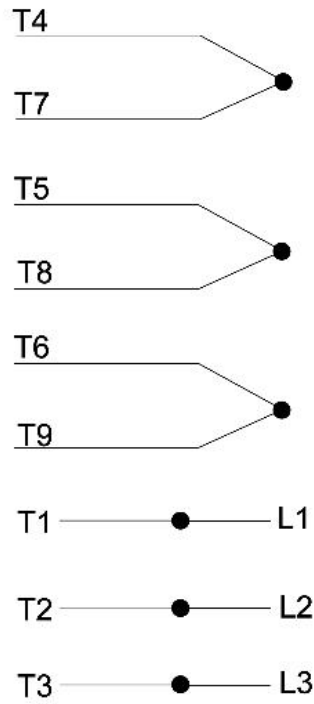
Note: A UL listed explosion proof rated motor ON/OFF switch is recommended by manufacturer

**C. For 230V 3 Phase wiring:** Bridge the wires as shown, then connect L1 to T1/T7, L2 to T2/T8, and L3 to T3/T9





**D.For 460V, 3 Phase wiring:** Bridge the wires as shown,then connect wire L1 to T1, L2 to T2, and L3 to T3







## 6.Operation

### 6.1 Operation before start

- A.Before operating equipment for the first use ,check motor wire connection first,to prevent static electricity, equipment should be grounded. After confirmation, check compressor rotation whether in the direction of the arrow marked on the pulley cover.
- B.Check all valves whether they are on the correct position.
- C.Check all pipeline,fasteners and bolts to be sure all connections are tight and leak-free
- D.Check V-belt tension and alignment. Check drive alignment on direct drive units.
- E. Rotate unit by hand. Check flywheel for wobble or play
- F.Test piping system for leaks
- G.Verify proper electrical supply to motor

### 6.2 Leakage Test Perform

- A.Install ball valve and pressure gauge for inlet and outlet port
- B.Close outlet valve
- C.Start running the compressor until inlet pressure reaches 2 bar
- D.Close inlet valve and stop running the compressor
- E.Let the compressor hold the pressure
- F.Use foam water to check all thread connection

### 6.3 Running The Compressor

- A.Observe noise and vibration levels. Correct immediately if excessive
- B.Check compressor inlet and exhaust pressure,exhaust temperature and confirm whether they are normal.
- C.check the pipeline system confirm whether it's leaked
- D.Check rotation direction
- E.Check start-up voltage drop, running amperage, and voltage at motor junction box (not at the starter).



## 7.Maintenance

Establish a preventive maintenance schedule based on the compressor service history.

Scheduled maintenance is especially important to prevent compressor failure.

For maintenance operation video, please contact CM or CM distributors

Maintenance&Inspection Cycle	Project
Daily	Compressor running noise Compressor running temperature Pipeline and fasteners tightness Compressor vibration
Monthly	Belt tightness
Every 2000 hours or per year	Remove and check the wear of the piston ring and guide ring of the compressor
Every 1000 hours or half year	Check crankshaft, crankcase bearing, worn parts, sealing device and pressure gauge



## 8.Warranty

CM guarantees all equipment referenced in this document which is manufactured by CM to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by CM, CM will, for a period of 12 months from the date of sale, repair or replace part of the equipment determined by CM to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with CM written recommendations.

**This warranty does not cover, and CM shall not be liable for general wear and tear parts, it includes: piston rings, bearings, seals, cylinder, cylinder head suction & exhaust valves, pulley belt**

If equipment should fail during guarantee period it will be repaired or replaced (at our option) at no charge with follow limitation:

- 1.the original buyer who complete the warranty card registration and purchase the machine from CM authorized distributor.
- 2.The manufacturer shall not be responsible for any additional cost associated with equipment failure including, but not limited to, loss of work time, loss of refrigerant, and unauthorized shipping or labor charges.
- 3.All warranty service claims must be made within the specified warranty period. Proof-of-purchase date must be supplied to the manufacturer.

This limited warranty does not apply if:

- The equipment or part is broken by accident.
- The equipment is misused, tampered with or any accessories are not manufactured by CM but furnished with CM equipment
- The equipment is used for recovering unauthorized medium
- The equipment is not purchased from CM authorized distributor
- The equipment is not completed with warranty registration
- Equipment installed or operated incorrectly. like wrong motor electrical wire connection and electrical voltage, the machine was used under overload pressure or ultra high ambient temperature



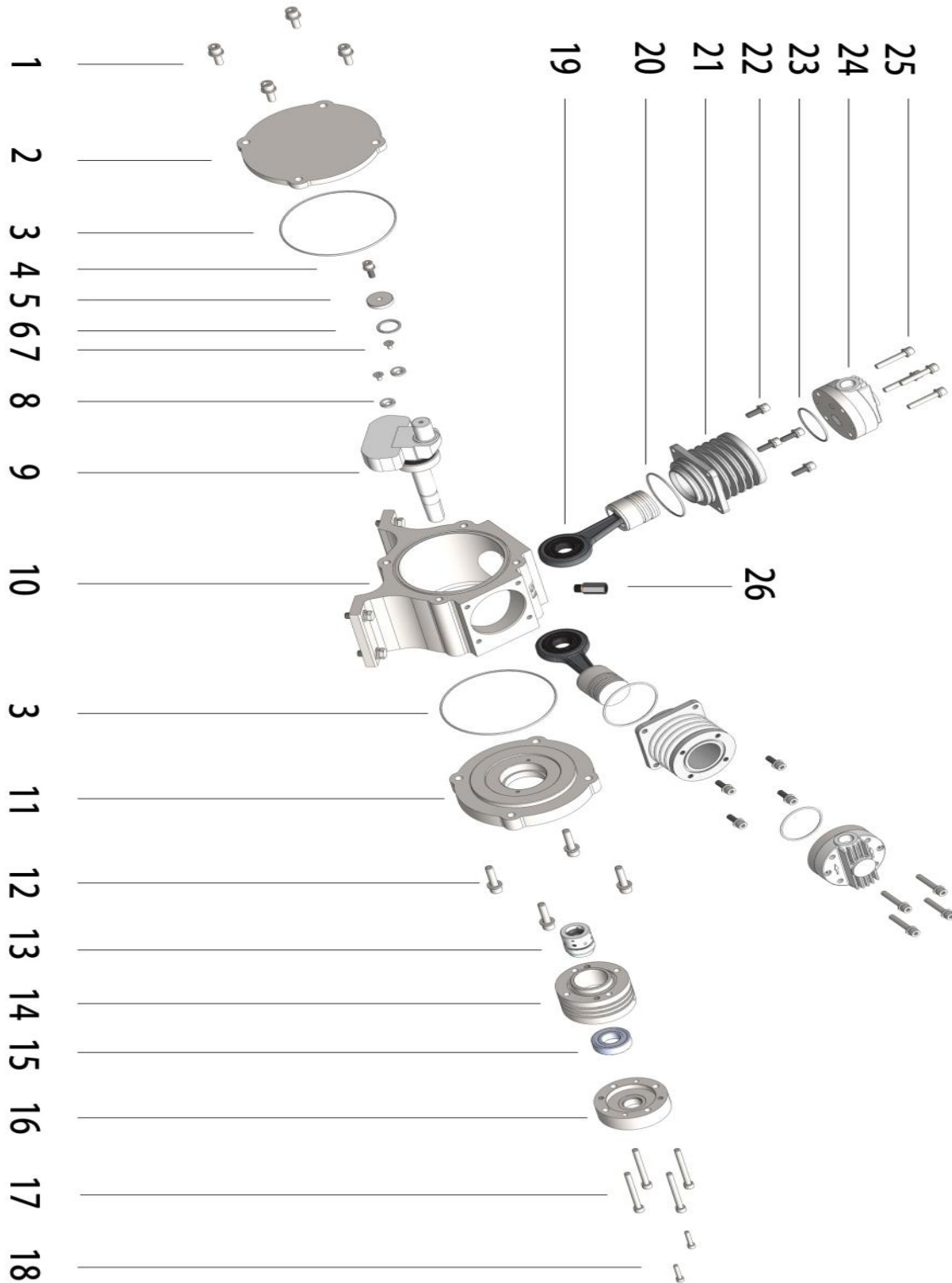
## 9. Trouble-Shooting

<b>Problem</b>	<b>Cause</b>	<b>Action</b>
<b>Exhaust temperature overhigh</b>	The suction temperature overhigh	Reduce temperature
	Cylinder head valves damaged	Replace cylinder head valve core
	Piston ring worn or damaged	Replace piston ring
	Piston and cylinder get contacted	Replace piston O-ring&piston ring
	Cooling water flow rate isn't enough	Increase cooling water flow
	Cooling water pipeline block up	Dredging the pipeline
<b>Running noise</b>	Cylinder head valves damaged	Replace cylinder head valves
	Crank bearing damaged	Replace crankcase bearing
	Piston pin loose	Replace piston and piston pin
	Piston and cylinder get contacted	Replace piston O-ring
	Debris in cylinder	Clean cylinder
<b>Motor does not start</b>	Lacking phase	Replace fuses or wires and check wire connection
	Motor damage	Replace motor
	Control system failure	Maintenance



# 10. Appendix

*Compressor Exploded Diagram*





Item No	Part No.	Part Description	QTY
1	BZLJ01281	M10*30 Screw	4
2	DZLJ123	Crankcase Cover 01	1
3	BZLJ04118	150*2.65 O-Ring	2
4	BZLJ01174	M8*25 Screw	1
5	DZGJ1243	Crankshaft Cover	1
6	DZGJ1244	Bearing Set Collar	1
7	BZLJ01292	M6*12 Screw	2
8	DZGJ1242	Bearing Fender	2
9	ZZGJ281	Crankshaft	1
	ZZGJ282	Clump Weight	1
	DZZC182	Crankshaft Bearing	1
	BZLJ01285	M10*45 Screw	2
10	DZLJ122	Crankcase	1
11	DZLJ124	Crankcase Cover 02	1
12	BZLJ01293	M10*45 Screw	4
13	DZLJ222	Mechanical Seal	1
14	DZLJ0125	Mechanical Seal Cover	1
15	DZZC186	Bearing CMNSK6205DDUCM	1
16	DZLJ0126	Mechanical Seal Cover Gland	1
17	BZLJ01290	M8*80 Screw	4
18	BZLJ01291	M6*30 Screw	2
19	ZZGJ283	Connecting Rod	2
	DZZC186	Connecting Rod Bearing	2
	DZGJ1225	Piston Bearing	2
	DZLJ0127	Piston	2
	DZSL375	Piston Ring	8
	DZSL375Z	Strained Ring	4
	DZSL376	Rider Ring	2
	DZGJ1245	Piston Pin	2
	BZLJ01286	1/8 NPT Screw	2
	BZLJ01619	M5*8 Screw	4
20	BZLJ04152	80*2.65 O-ring	2
21	ZZGJ285	Cylinder	2
22	BZLJ01174	M8*25 Screw	8



Item No	Part No.	Part Description	QTY
23	BZLJ04079	60*2.65 O-Ring	2
24	ZZGJ288	Cylinder Head	2
	DZGJ1248B	Valve Plate	2
	ZZSL118B	Suction Valve Core	2
	ZZSL119B	Suction Valve Core nut	2
	DZTH136	Suction Valve Core Spring	2
	DZGJ1249	Exhaust Valve Seat	2
	ZZSL120	Exhaust Valve Core	2
	DZTH114	Exhaust Valve Core Spring	2
	BZLJ01190	M6*20 Screw	2
25	BZLJ01202	M8*50 Screw	8
26	DZGJ1170	Single-Way Valve	1



## 11.Warranty Card

Product Model: \_\_\_\_\_

Serial NO.: \_\_\_\_\_

Where Purchased: \_\_\_\_\_

Purchased Price: \_\_\_\_\_

Date Of Purchase: \_\_\_\_\_

Customer Name: \_\_\_\_\_

Customer Address: \_\_\_\_\_

Customer Email: \_\_\_\_\_

Customer phone: \_\_\_\_\_

### **CM Information:**

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