



YZ 0000028

BL Series Fuel Dispenser

Operation Manual



Operation Manual

- Please read the manual carefully before installation and use, and operate as the procedures described in the manual.
- If you have any problems or difficulties, please contact our company or our local agent. We will provide you with high-quality service at any time.

Thank you for using BL Series Fuel Dispenser

The operation manual is supplied to you, in order to let you have a deep understanding and proper operation of BL Series Fuel dispenser.

The manual completely describes various aspects of BL Series Fuel Dispenser including installation, use, operation, repair and maintenance. Please read the manual carefully before use, which will be helpful to your proper use.

In order to continuously improve functions, performance and reliability of our products, we often make further modifications for the products and manuals as well. We would like to have your understanding if you find any difference between the product and manual supplied.

If you have any problems or difficulties, please contact our company or our local agent companies. We will provide you with high-quality service.

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Thank you for your support and cooperation.

Zhuhai Beilin Fueling Equipment Co., Ltd

Serial Number of Explosion -proof certificate: CNEx05.705 and CNEx06.0835

Manufacturing license: MC YZ00000028

Explosion-proof Marking : Exdib II AT3

Contents

1	General	3
2	Technical parameter	4
3	Structure of complete appliance	5
4	Working principle of complete appliance	6
5	Structure of main parts	7
6	Installation	16
7	Operation	19
8	Maintenance	26
9	Troubleshooting and repairs	28
10	Tubing diagram of gas station	31
11	Packing and easy-damaged accessories	32

General

BL Series Fuel Dispenser is a new-generation fueling equipment with all functions of ordinary fuel dispenser. It is applicable to the gas stations for filling motor vehicles with gasoline and light diesel.

BL Series Fuel Dispenser is composed of motor, vane pump, gas separator, four-piston flow meter, electromagnetic valve, signal sensor and computer control part. It features high reliability and running speed, multiple functions and easy operation. The machine is able to display sale, liter and price. Both set-quantity and non-set-quantity fueling are provided for option, facilitating operation of fueling personnel and accurate and swift fueling to any vehicles. All data of fuel dispenser is displayed through LCD, which is clear and nice.

The series products conform to standards of GB3836.1-2000, GB3836.2-2000, GB3836.4-2000, and has been granted the Certificate of Explosion-proof Apparatus by China National Quality Supervision and Test Center for Explosion Protected Electrical Products.

Important Notice

Gas stations should be equipped with good earthing system and TN-S power supply system, i.e. three-phase five-wire system, to ensure not only the safety of your fueling personnel and equipment, but also no-failure operation of your fuel dispenser, especially the control part, under normal conditions.

Technical parameter

Flow Rate	5~45L/min
Accuracy	±0.3%
Noise	≤80dB (A)
Power Supply	AC220V(+10%, -15%)/ 50Hz or AC380V(+10%, -15%)/ 50Hz
Inlet vacuum Pressure	≥54kPa
Temperature Range	-45℃ ~ +60℃
Ex-proof Motor	AC220V/ 50Hz/0.75Kw AC380V/ 50Hz/0.75Kw
Relative humidity	45% ~ 75%
Atmospheric pressure	86kPa~106kPa
Price Range	0.00~99.99
One service limit	0.00~9999.99
Totalize Range	0.00~9999999.99

Structure of complete appliance

● Configuration of BL series fuel dispenser

BL Series fuel dispenser consists mainly of an explosion-proof motor, combined pump, flow meter, signal sensor, switch, nozzle and control system, etc. Figure 1 shows the overall configuration of single-nozzle dispenser.

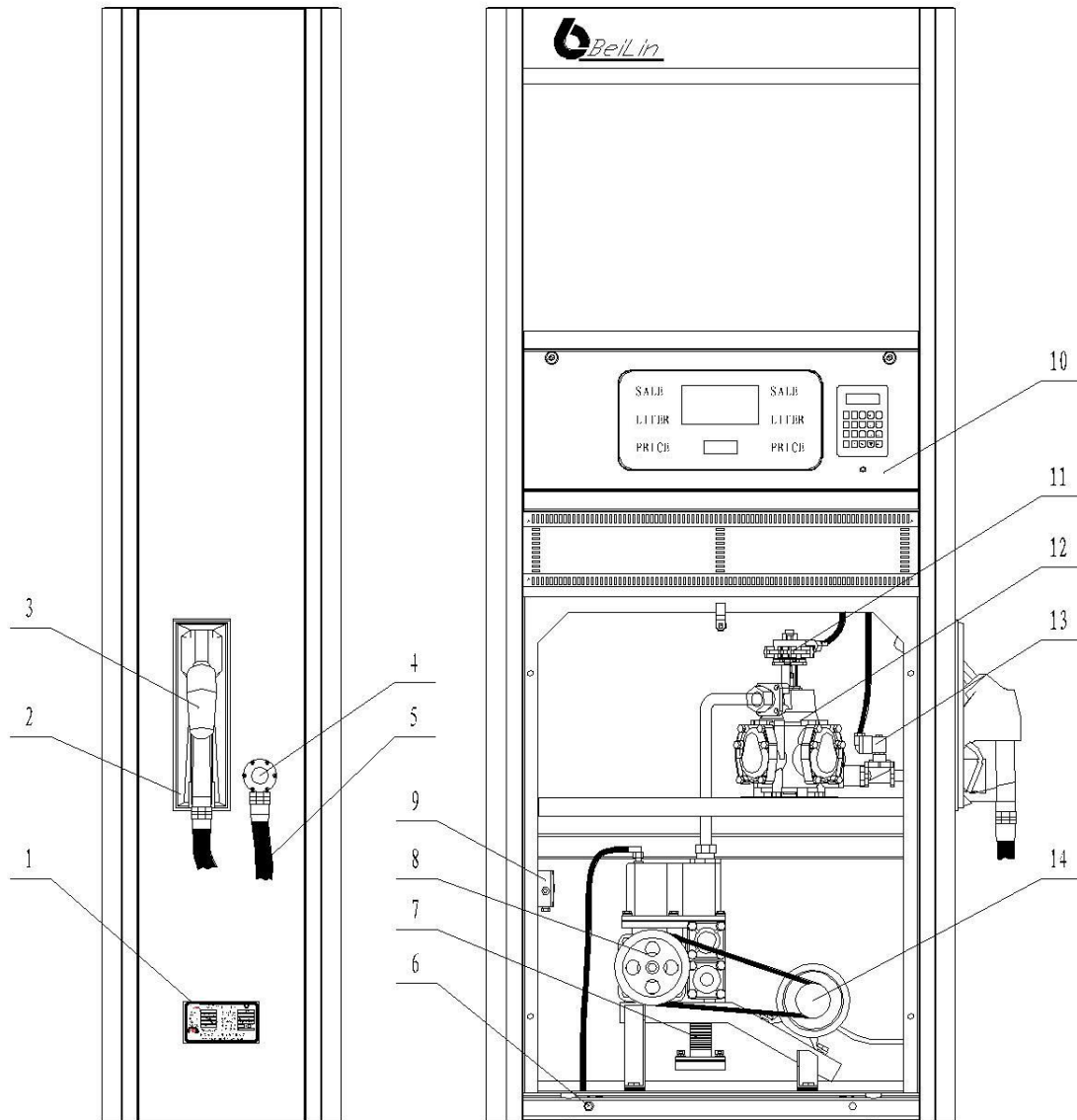
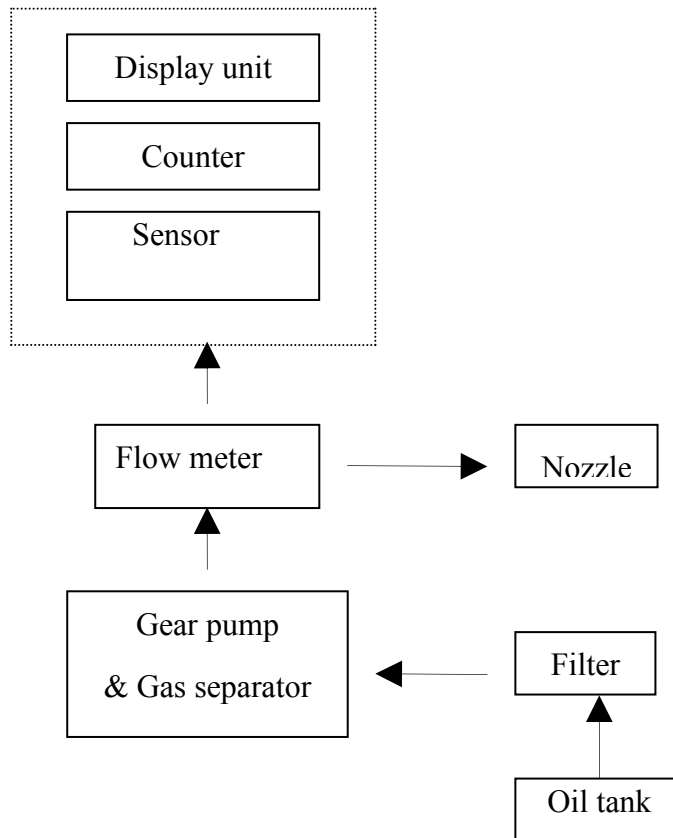


Fig. 1 Overall configuration of single-nozzle dispenser

- (1)Nameplate (2)Nozzle box (3)Automatic shutoff nozzle (4)Oil viewing device
- (5)Hose (6) Vent (7)Bellows (8)Pump (9)Explosion-proof box
- (10)Display board (11) Signal sensor (12)Flow meter (13)Electromagnetic valve
- (14)Explosion-proof motor

Working Principle of Complete Appliance

● Functional diagram of the fuel dispenser



When opening the switch of the nozzle, the motor will be started to drive the pump to run, pumping the oil to the filter and removing all impurities. It flows into the gas separator where the gas is separated from the oil and exhausted through a vent-pipe, and finally to the oil receiver through the nozzle after passing through the flow meter. When oil passes through the flow meter, the signal sensor is actuated to generate counting pulse signals which are picked up, counted and displayed by the computer unit to ensure correct measurement.

Structure of Main parts

● Combined pump(option)

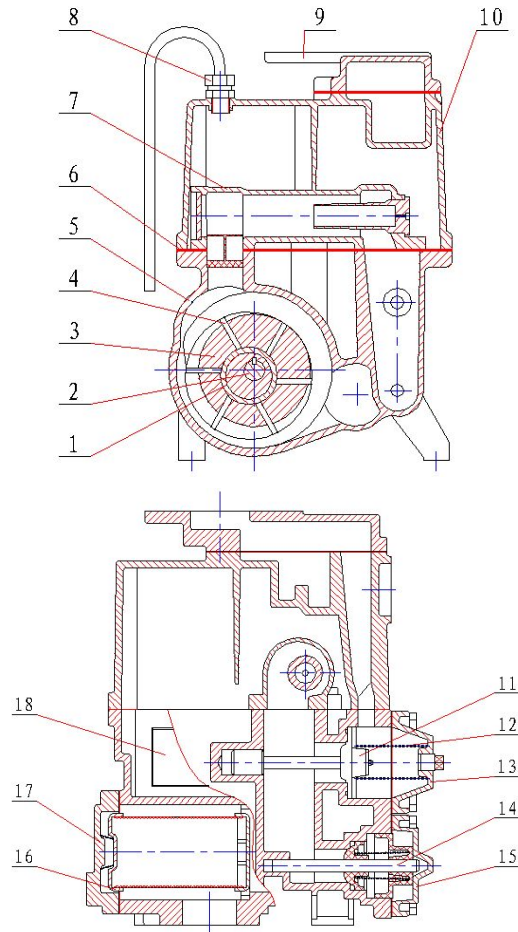


Fig. 2 Combined pump

- (1) Blade locating ring (2) Pump shaft (3) Rotor (4) Blade (5) Pump body
(6) Shim (7) Dredging component (8) Gas outlet connector (9) Transition bracket
(10) Separator body (11) Oil outlet valve component (12) Oil outlet valve spring
(13) Oil outlet valve pressing cap (14) Overflow valve component
(15) Overflow valve pressing cap (16) Filter component (17) Filter pressing cap
(18) Oil dredging valve component

● Vane pump (option)

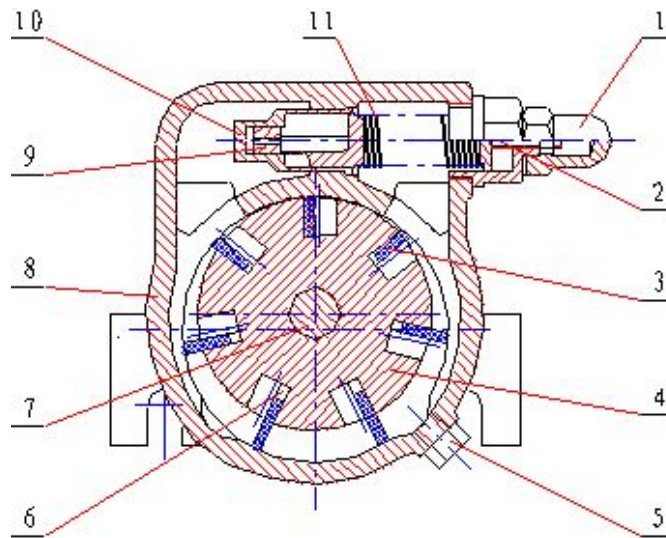


Fig.3 Vane pump

- (1) Cap nut (2) Adjusting screw (3) vane (4) Rotor (5) Sealing block (6) Cylindrical spring (7) Shaft (8) Pump body (9) Valve core (10) Valve seat (11) Spring

● Gear pump A(option)

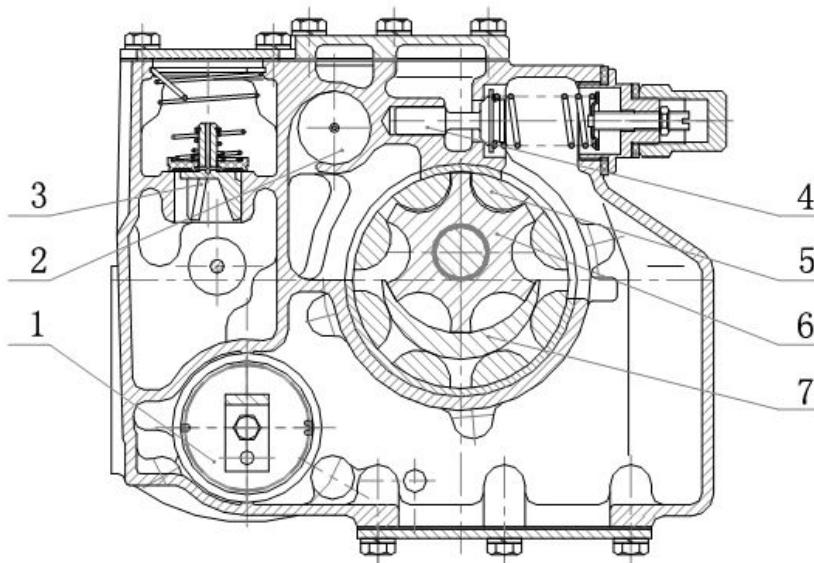


Fig.4 Gear pump A

- (1) Filter (2) Gas separator (3) Discharge valve (4) Relief valve (5) Inner gear (6) Outer gear (7) Pump cover

● Gear pump B(option)

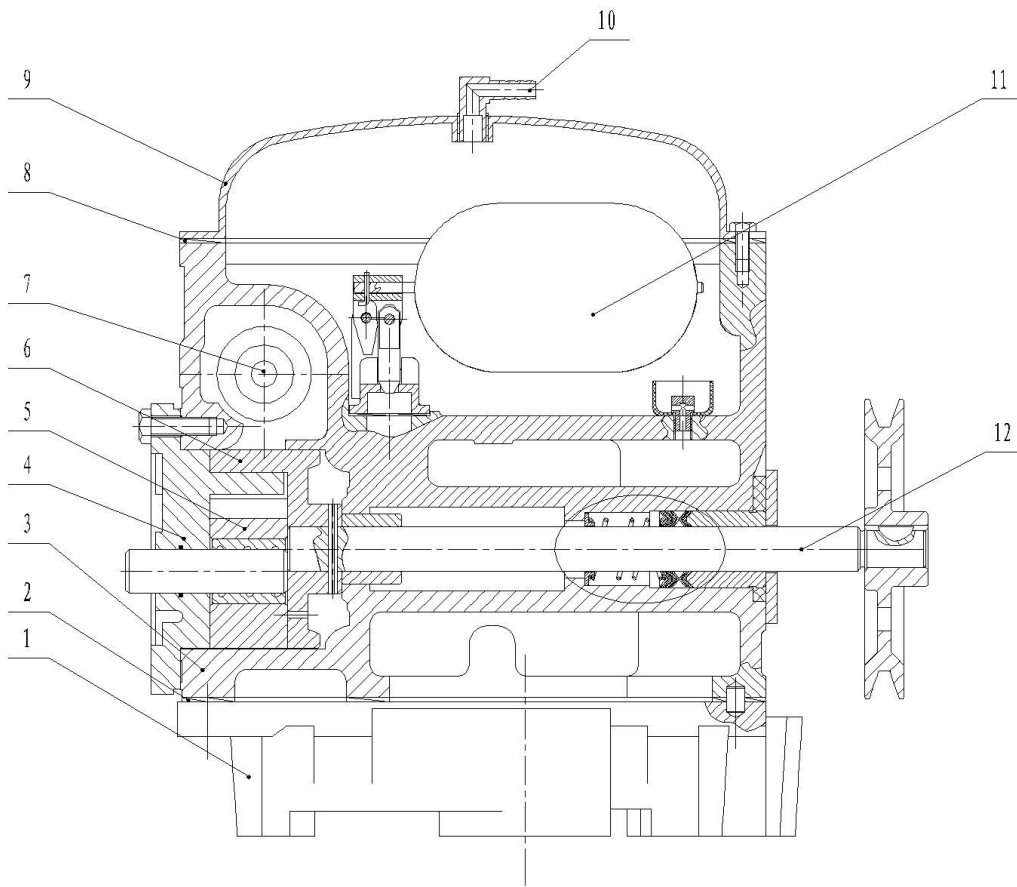


Fig.5 Gear pump B

- (1)Bottom cover (2)Cover gasket (3)Body (4)Pump cover
(5)Gear (6)Rotor (7)Filter (8)Body gasket (9) Cover
(10)Gas outlet connector (11)Ball cock (12)Shaft

● Gas separator

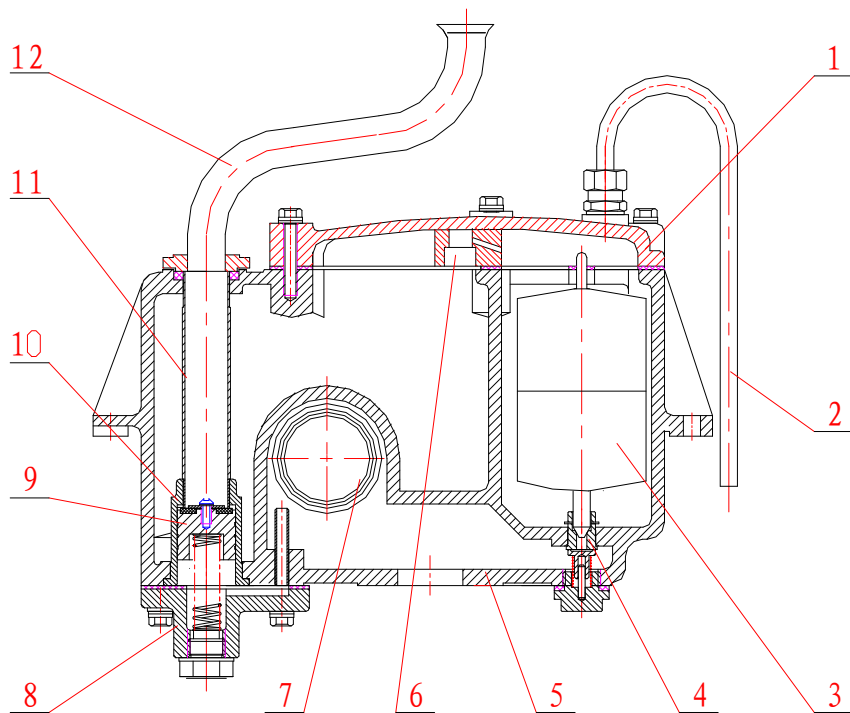


Fig. 6 Gas separator

- (1) Upper cap (2) Escape pipe (3) Oil return floater (4) Parallel valve
(5) Separator body (6) Air discharge valve (7) Filter (8) spring seat (9) Outlet valve
(10) Outlet valve seat (11) Outlet tube (12) Oil outlet tube

Under the vacuum suction of the combined pump, oil in the underground tank is sucked through the filter into the pump cavity where the high-pressure oil is sent to the dredging tube by the rotor eccentrically installed in the pump cavity. The action of the oil pressure of the dredging tube makes the oil outlet valve open, allowing the high-pressure oil to flow through the tube into the flow meter, and the gas in the oil to flow through a small hole at the end of the dredging tube to the cavity of the gas separator and then to the atmosphere through the escape pipe. A small quantity of oil is accumulated in the cavity. When the quantity of accumulated oil reaches a certain level, the oil-returning floater will go up to cause part of the accumulated oil to return to the low-pressure cavity through the parallel valve. The overflow valve is mainly comprised of valve seat, valve core, spring and adjusting screw. Its operation principle is similar to that of the vane pump.

● **Flow meter (a)**

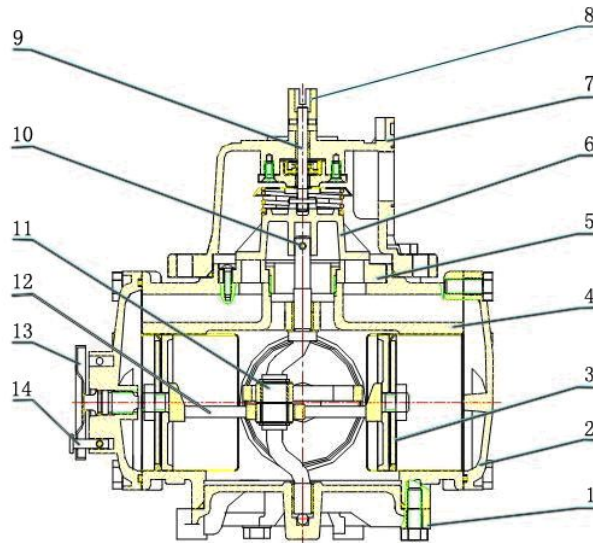


Fig. 7 Flow meter (a)

- (1) Bottom cover (2) Side cover (3) Piston (4) Body (5) Distributor bush seat
 (5) Distributor (6) Top cover (7) Coupling cover (8) Spring seat (9) Driving shaft
 (10) Drive pin (11) Crank shaft (12) Link (13) Adjusting wheel (14) Piston pin

● **Flow meter (b)**

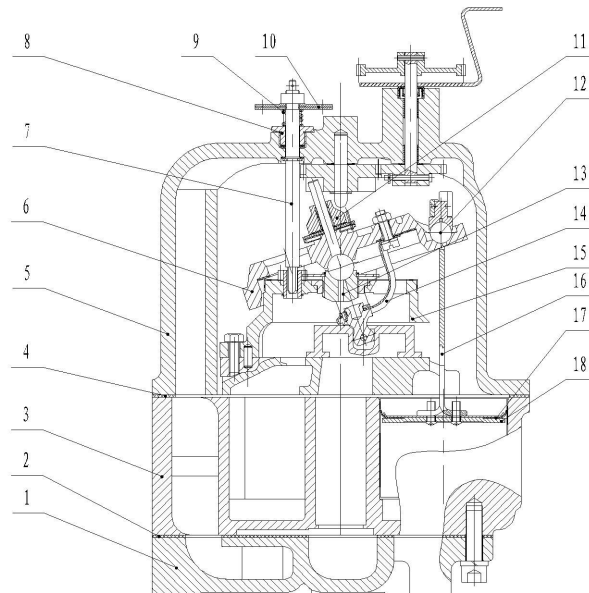


Fig. 8 Flow meter (b)

- (1) Bottom cover (2) Cover gasket (3) Body (4) Body gasket (5) Cover (6) Wobble plate
 (7) Compensator shaft (8) Nut (9) Spring (10) Compensator index disc (11) Slack spring
 (12) Ball (13) Adjust screw (14) Bracket (15) Main pivot bracket (16) Connector
 (17) Plunger cup kit (18) Plunger cup support

● **Flow meter (c)**

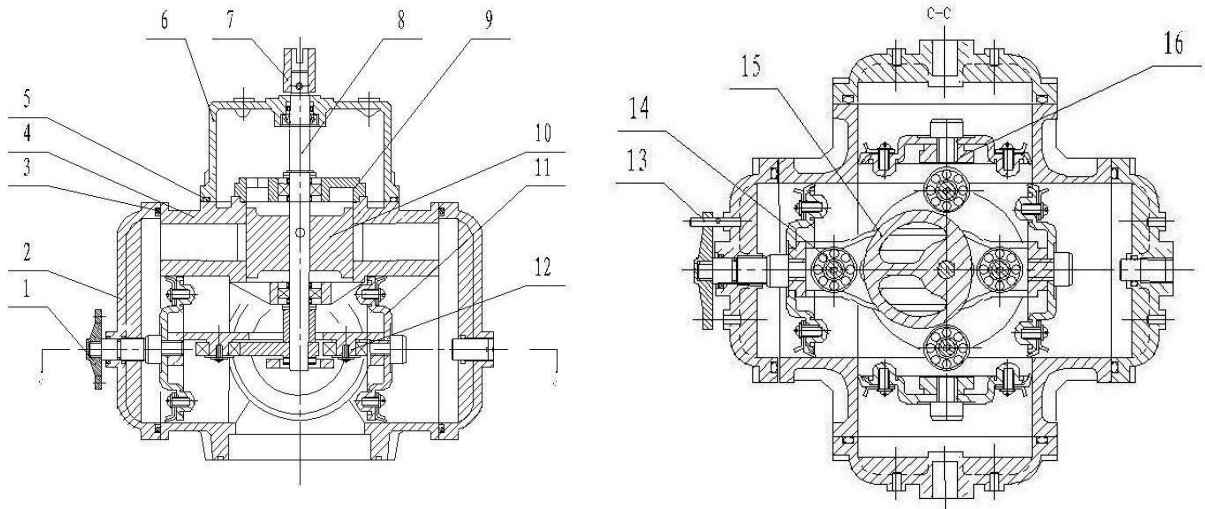


Fig. 9 Flow meter (c)

- (1)Adjust wheel (2)Side cover (3)O-ring (4)Body (5)O-ring (6)Cover (7)Coupling cover (8)Drive shaft (9) Axletree bushing (10)Distributor (11)Plunger (12)Bottom link (13)Position pin (14)Ball bearing (15)Cam (16)Shim

● **Flow meter (d)**

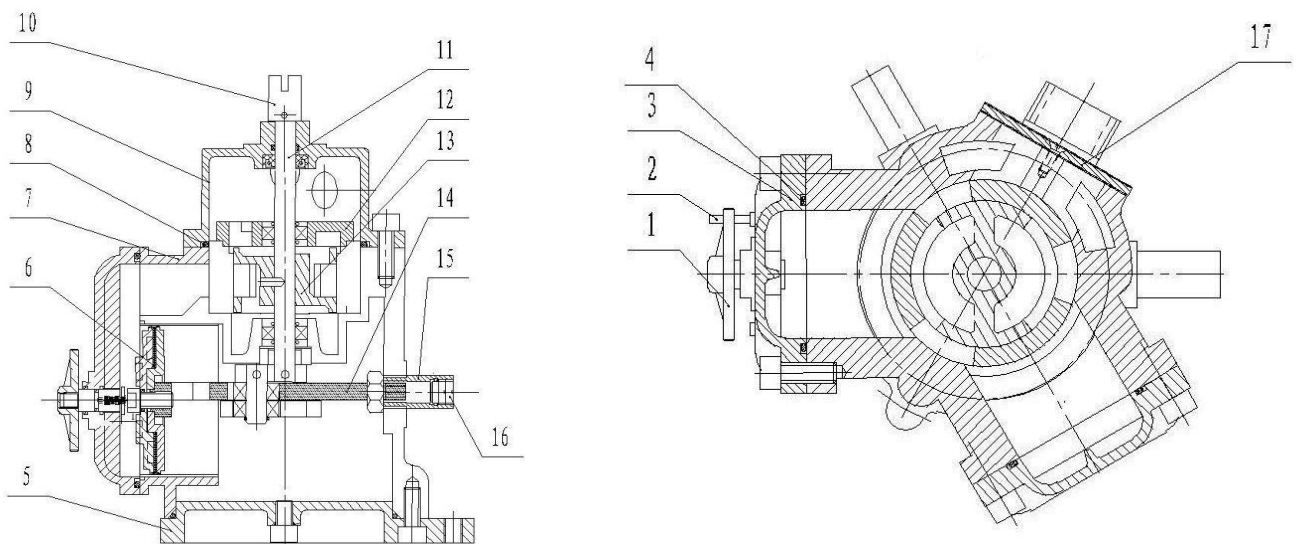


Fig. 10 Flow meter (d)

- (1)Adjust wheel (2)Position pin (3)Side cover (4)O-ring (5)Bottom cover (6)Plunger (7)Body (8)O-ring (9)Cover (10)Coupling cover (11)Drive shaft (12)Bearing assembly (13)Distributor (14)Link (15)Oriented seat (16)Bolt (17)Close cap

● Flow meter (e)

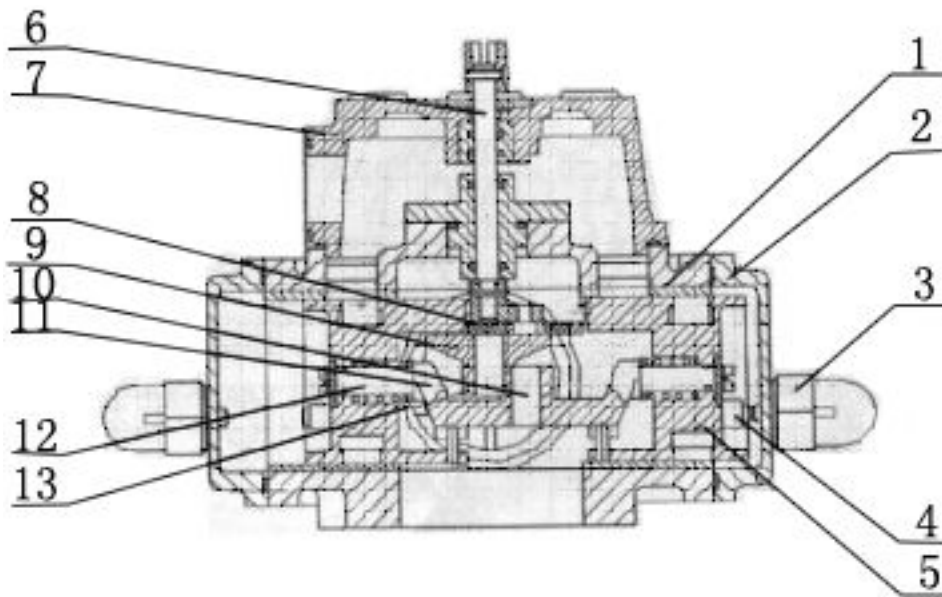


Fig. 11 Flow meter (e)

- (1) Body assembly meter (2) Side cover (3) Nut (4) Adjust assembly (5) Piston
(6) Drive shaft (7) Top cover (8) Bakelite wheel assembly (9) Top link (10) Link shaft
(11) Bottom link (12) Spring (13) Link pane

When oil from gas separator enters the flow meter, the four pistons start reciprocal movement to drive the shaft to rotate. The stroke of the piston is determined by the interval of holes of the connection block. With the shaft rotating one turn, the piston will work one operation cycle. The adjusting dial is used to calibrate delivery quantity and maintain the accuracy of the unit. The adjusting range is governed by the position of the four dials.

● Automatic shutoff nozzle

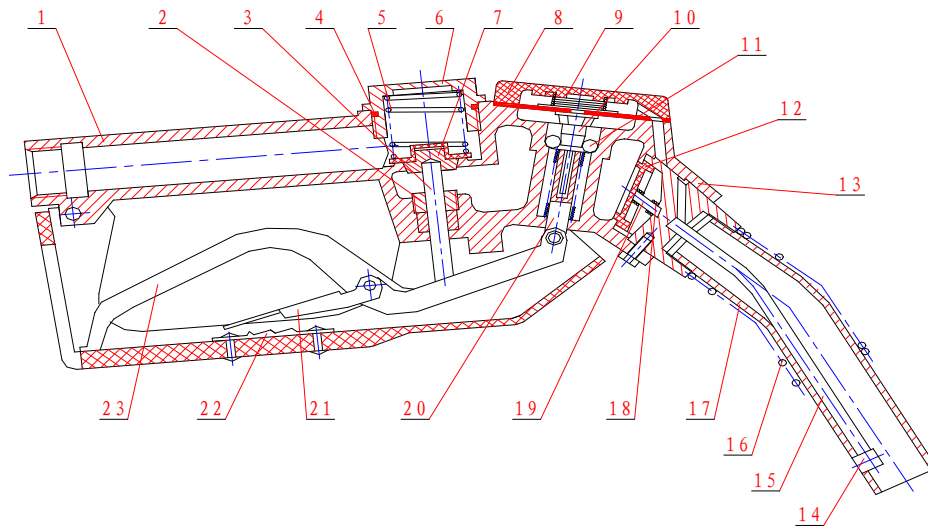


Fig. 12 Automatic shutoff nozzle

- (1) Body (2) Pressing nut (3) Ejector pin (4) O ring (5) Spring (6) Pressing cap (7) Main valve (8) Upper cap (9) Cock diaphragm (10) Self-sealing rod (11) Steel ball (12) Auxiliary valve seat (13) Adapting bushing (14) Air inlet nozzle (15) Air inlet tube (16) Spring (17) Nozzle of gun (18) Spring (19) Auxiliary valve core (20) Self-control rod (21) Stopping tab (22) Stopping plate (23) Cock handle

Automatic shutoff nozzle is a kind of filling unit with Automatic shutoff function. When a container is full, the valve of the gun will close automatically to avoid overflow and keep the refueling site clean and safe.

a. There are 4 small holes distributed along the circumference of the auxiliary valve seat (12), which are communicated with the upper cavity of cock diaphragm (9) through the tilting holes on the body of the gun; on the adapting bushing (13), there is a tilting hole, which is communicated with the atmosphere through air inlet tube (15) and air inlet nozzle (14), and also with the upper cavity of the cock diaphragm through the tilting hole on the body of the gun. The lower cavity of the cock diaphragm is communicated with atmosphere through the gap between the gun body and the self-control rod (20).

b. There are 3 steel balls in the 3 holes distributed at the upper end of the self-control rod. They will clamp self-control rod (10) by means of the sloped surface of the gun body whenever lifting up the cock handle (23); once the self-sealing rod is lifted up, the steel balls

will be gathered to the center of the self-sealing rod to force the self-control rod to move downwards and to close the main valve (7) by removing its pivot.

c. There is a stopping tab (21) on the cock handle (23). The cock handle may be placed in three different setting points by means of stopping plate (22) to allow the main valve to have three corresponding openings for obtaining different flow rates.

d. There is a spring (16) provided to the outside of nozzle (17) which is used to hold the gun to a certain position against a vehicle oil tank during refueling.

Cautions

1. After installation (or after long time stopping), the dispenser should be charged with some fuel through fuel injection hole (5) before use. The filter in the combined pump should be cleaned once a month (or once a week for newly built gas station). Another filter will be replaced per three months.

2. The pump is specially designed for underground tanks.

Installation

● Installation of the whole unit

a. Precautions

1. The fuel dispenser shall be located 20m horizontally away from any underground tank. The vertical distance from the lowest level of oil in the tank to the oil inlet of the fuel dispenser is not greater than 4m.

2. The base of the fuel dispenser shall be installed to a special cement foundation and secured with anchor bolts or expansive screws, with the installation dimensions for different types of units shown in Figures 2 and 3. The cement foundation shall be provided with holes for hose DN40mm (1.5 inch), cable and earthing lines. The holes shall be filled up with sands afterwards.

3. A single directional dual-gate valve of DN40mm (1.5 inches) should be fixed at the bottom of the oil inlet tube in the oil tank, with the distance between the lower end of the single directional dual-gate valve and the bottom of the oil tank being 10cm.

4. The oil inlet tube from the oil tank should be secured with the accompanied lower flange (1.5 inch tube screw) and aligned with the oil suction tube of the unit, and shall be connectible with the lower port of the flexible tube after inserting sealing gasket.

Cautions

1. The pipeline from the underground tank to the fuel dispenser should be so arranged that the horizontal part of the pipeline has 3/1000 up-slope towards the fuel dispenser! Minimize 90 degree turning of the hose as much as possible.

2. Before installation of the fuel dispenser, the fuel tank and pipeline should be cleaned, and test should be made to verify that the pipeline and tank are acceptable in pressure-resistant strength (test pressure is 0.5MPa).

● Electrical installation

a. Earthing line connection

In order to guarantee operation safety of the fuel dispenser, consideration should be given to the lightning arrester and earthing facility in the construction of a gas station. Lack of lightning arrester and poor earthing will cause damage to the gas station and customer's vehicle and goods, and even endanger the personal safety.

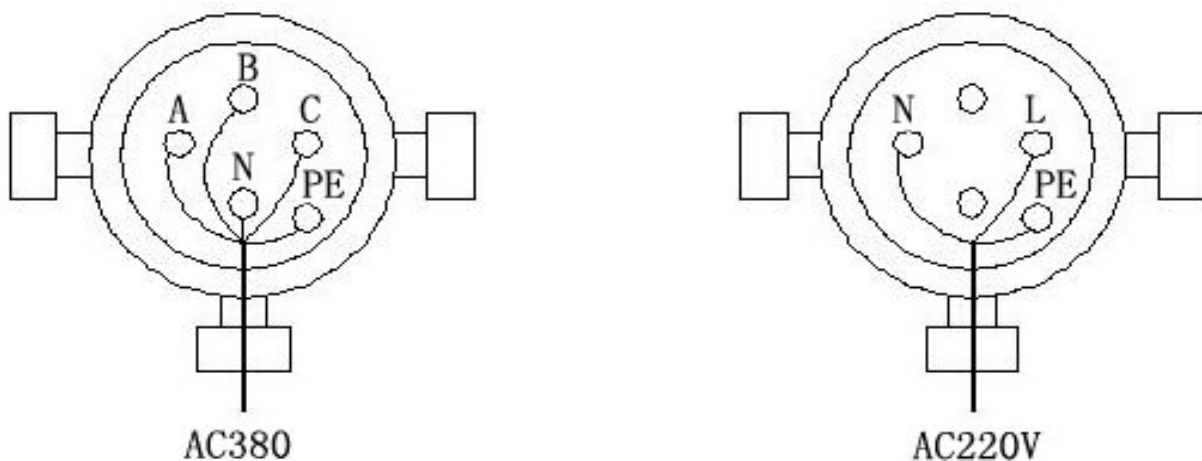
In accordance with the international standard FB2887-89:

1. The earthing resistance of the lightning protective place (such place may not be set among the building groups equipped with lightning arrester facilities) of a gas station shall not be higher than $10\ \Omega$.

2. The earthing resistance for safety protective place shall not be higher than $3\ \Omega$. A covered wire of $1 \times 15\text{mm}^2$ shall be used for earthing of the safety protective place. The wire shall be connected with the earthing screw of the fuel dispenser at one end, and with the adjacent earthing stack at the other end. It is forbidden to connect the lightning protective place with the safety protective earthing line.

b. Connection of power line

The power supply of BL series fuel dispenser shall be connected with TN-S power supply system. The wiring diagram for the user is shown as follows:



Cautions

It is important that the zero line of power should be connected in “N” terminal and other three lines of AC380V should be separately connected in “A” “B” “C” terminal, and another line of AC220V is connected in the “L” terminal. Otherwise, the control system of fuel dispenser would be burnt out.

1. The user's power line shall be cut in through the stand-by lead entrance of the explosion-proof box, with phase lines connected with A, B, C terminals respectively, and the 'N' line connected with the terminal marked with 'N'. The power supply for the user shall be of 380V 3-phase 5-line type.

2. The user's power switch shall be placed in the distribution room. The capacity of the fuse for the switch shall be determined by the rated current of the main power supply of the fuel dispenser. Each fuel dispenser shall be controlled independently by separate switch. The switch shall be of high quality and reliability air switches with leak protection.

3. All power lines shall be of oil resistant solid core cable with plastic insulation shield (RVV type). User's power supply shall be led in through $5 \times 1.5\text{mm}^2$ cable. Attention shall be paid to make sure that the outer diameter of the cable is matchable with the hole of the sealing pad in the lead-in port of the explosion-proof box. In order to guarantee the explosion-proof performance of the junction box, it is necessary to clamp the power line firmly by tightening the screw after leading the power line into the junction box. The metal shim coupled with the sealing pad is for sealing purpose and therefore shall not be lost or omitted.

4. The insulation wire of the intrinsic circuit shall be separated from that of non-intrinsic circuit.

5. The port of the conduit for leading the power line into the fuel dispenser shall be provided with water protection elbow whose outlet shall be arranged downwards to prevent oil from entering the conduit, damaging the wire and causing trouble.

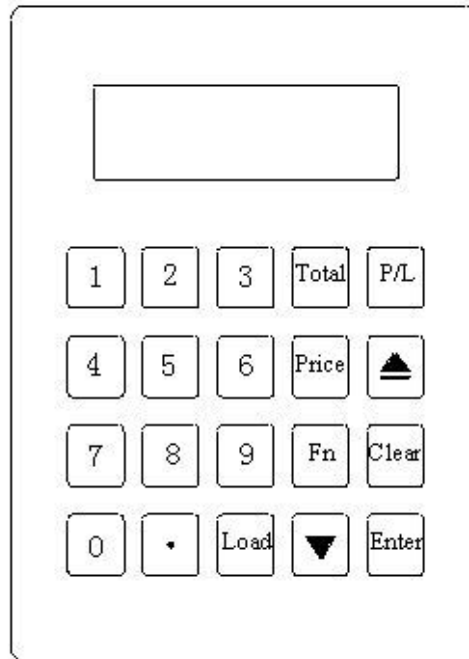
Warning

Never attempt to use water instead of oil to test the fuel dispenser!

Operation

● Definition of keyboard functions

Keyboard frame is shown in the following figure:



There are two kinds of keys on the keyboard: Digital keys and Functional keys; Digital keys can only input figures; Functional keys represent various functions; «Enter» will be used to represent the key of confirmation in the following operations. Other keys are also stated in the same way.

Notes

Electronic lock will be used for change price and other parameter. The fuel dispenser will be under the locked status when the electronic lock is turned to “off”.

● **Power-on self-test:** The computer will have a self-tested function when the dispenser is power on.

Keyboard display

L 0

Main display

0.00
0.00

2.80

● **Fueling discretionarily**

Keyboard display

L 0

Main display

0.00
0.00

2.80

Fueling can be conducted by pick up the nozzle at the time. Pick off the nozzle when the liter satisfies requirement.

● **Fixing fueling**

a. **Fixing liter**

Keyboard operation
press «P/L»

Keyboard display

L 0

Main display

0.00
0.00

2.80

Enter 100

L 100

Remain unchanged

Enter the liter (assumed as 100) and the pick up the nozzle fueling. The machine will stop automatically when the liter reaches the enter value.

Keyboard display

L 100

Main display

280.00
100.00

2.80

b. Fixing sale

Keyboard operation

Keyboard display

Main display

press «P/L»

P 0

0.00
0.00

2.80

Press 100

P 100

Remain unchanged

Enter the liter (assumed as 100) and the pick up the nozzle fueling. The machine will stop automatically when the sale reaches the enter value.

Keyboard display

Main display

P 100

100.00
35.71

2.80

Note

- 1. Beep sound will be sounded if any key is pressed;**
- 2. In case of set-value fueling once more, the value must be input again even if it is the same one. If the fuel dispenser is turned off before the set-value is reached, the actual fueling quantity will be displayed.**

● Setting of system parameters

A. Set price

Keyboard operation	Keyboard display	Main display
press 《price》	---2.80	Remain unchanged
Input the number (Assumed as 2.90)	---2.90	Remain unchanged
《Close lock→open lock》	L 0	0.00 0.00
Display the unit price after change		2.90

B. Set time

Keyboard operation	Keyboard display	Main display
press 《Fn》	-----	Remain unchanged
press 《2》	--HP--	(D/H/M) 111042 (Y/M) 200608
Input new time (Assumed as:2006.09.12.11.12)	121112	2.80 (DHM) 121112 (Y M) 200609
《Close lock→open lock》	Complete modification. Keyboard display and main display restore to standby status.	2.80

Attention

If there is a wrong setting, “HHHHHH” will be displayed on the keyboard. Please press 《clear》 to cancel.

C. Set advance liter

Keyboard operation	Keyboard display	Main display
Press «Fn»	<input type="text" value="-----"/>	Remain unchanged
Press «4»	(Current) <input type="text" value="----0.30"/>	
Input new lead(Assumed as: 0.6)	<input type="text" value="----0.60"/>	
« Close lock → open lock » Complete modification	<input type="text" value="L 0"/>	

D. Set nozzle' serial number (connecting with the computer system)

Keyboard operation	Keyboard display	Main display
Press «Fn»	<input type="text" value="-----"/>	Remain unchanged
Press «1»	(Current) <input type="text" value="---- 63"/>	
Input new number (Assumed as : 06)	<input type="text" value="---- 06"/>	
« Close lock → open lock » Complete modification	<input type="text" value="L 0"/>	

Attention

The nozzle' serial number is only valid when the fuel dispenser communicates to the fueling monitor, which is specially designed for management of the fuel dispensers.

E. Set LCD backlight On-off time

Keyboard operation	Keyboard display	Main display
Press 《Fn》	-----	Remain unchanged
Press 《5》	Current AH 0700	
Set new turn off time (Assumed as: at 9:00)	AH 900	
Enter 900 《Close lock→open lock》	L 0	
Complete modification.		

F. Set LCD backlight on time

Keyboard operation	Keyboard display	Main display
Press 《Fn》	-----	Remain unchanged
Press 《6》	Current PH 1800	
Set new turn off time (Assumed as: at 19:00)	PH 1900	
Enter 1900 《Close lock→open lock》	L 0	
Complete modification.		

Attention

1. It is recommended to set the fuel dispenser according to actual needs so as to save energy and prolong the life of the dispensers.

2. The background lighting switch will be turned on/off automatically per preset timing, or press down and hold the confirm key <enter> for 1 second, turning on/off the background lighting manually.

3. Timing is in 24-hour system.

● Query operation

A. Query total

Keyboard operation	Keyboard display		Main display
Press 《Total》	--LL--	Sale	135829
		Liter	101211
			2
《Clear》	Restore to standby status		

B. Query fueling record

Keyboard operation	Keyboard display		Main display
Press 《▼》	PP---1		280.00
Search for the latest fueling record			100.00
			2.80
Press 《▼》	PP---2		560.00
Search back for the previous fueling record			200.00
			2.80
.			
Each pressing 《▼》, querying one time. after you query the ninth record, if you press 《▼》 again, it will return to the first record.			
.			
Press 《Clear》	Restore to standby status		

Notice

Whenever the total value is larger than a 6-digit number, it will be displayed automatically on separate screens, with the top digits on the first screen.

Maintenance

● Maintenance

1. The filter inside the gas separator is comprised of a copper net that should be regularly washed by gasoline to remove any dirt from the low-pressure chamber in order to protect the pump and flow meter.

2. The underground oil tank should be cleaned regularly to keep them clean.

3. The pump is of vane type, therefore, the oil delivery rate of a fuel dispenser can be controlled by adjusting the inside pressure of the pump by adjusting screw of the overflow valve. The adjusting screw has been correctly adjusted according to the design requirement of oil delivery rate by the manufacturer before delivery. If oil delivery rate reduce after long-term operation, which can be corrected by tightening the screw to increase the pump pressure until desired delivery rate is achieved.

Cautions: There is a sealing ring between the surfaces of the vane pump body and cap. Don't forget to re-install it during examination or re-assembling after removal.

4. Check the connections of all hoses, oil seals of all components and sealing gaskets for leak, and repair them in time when necessary.

5. Check regularly all electric connections, especially the connection for the earthing line of the fuel dispenser for reliability, and rust as well. Solve problems immediately if there is any problem.

6. When using the nozzle, avoiding letting the oil filling tube impact the oil-receiving vessel or press the switch incorrectly, so as to keep the root of the oil filling tube from being damaged to cause oil leakage.

7. Always check the oil viewing device, if some air bubbles appear, please look for the reason and solve them.

● Cautions

1. It is strictly forbidden to use non-oil-resistant rubber gasket at the flange of oil suction pipe of the fuel dispenser.
2. Never pull out and plug in the connections without shutting down the power first.
3. When shifting the power from city power supply to stand-by generator, be sure not to use the latter before its voltage is stabilized, and vice versa.
4. As for the certified explosion-proof products, it is not allowed to replace components related with explosion protection or change their structure.

Important Cautions

- 1. Never attempt to add any sub-circuit to the existing pipeline of the fuel dispenser.**
- 2. It is forbidden to use one common pipeline to serve two fuel dispenser with self-contained pump, instead, it is mandatory to use one pipeline just for one nozzle, plus a one-way valve(check valve) added to the pipeline.**
- 3. Prior to installation of new fuel dispenser, be sure to clean the inside of the fuel tank, remove any soil, sands, welding slag and other dirt from the tank, and test the tank with pressure for leakage, to protect any incoming substances from entering the fuel dispenser to cause trouble.**
- 4. Be sure to cut off the power supply before any electric maintenance/repair. It is strictly forbidden to conduct any removal or repair with power on. When opening the explosion-proof junction box, be sure not to damage the explosion-proof surface. During re-assembling, remove all the dirt and incoming substances inside the explosion-proof cavity, check the cable for its sealing property and completeness of its metal shim and gasket, and check the screw for tightness, so as to guarantee the explosion-proof performance of the electric components.**

Troubleshooting and Repairs

● Causes and troubleshooting of mechanical failures

Table 1

Failure	Causes	Troubleshooting
1. No oil out from fuel dispenser	1) Insufficient oil or no oil in oil tank 2) Blockage or failure of base valve 3) Air leakage of pipes linking oil tank and fuel dispenser 4) Pump seizes up and can not turn 5) The rotation direction is different from arrow indication 6) Loose V-belt leads to low rotational speed of pump 7) Seriously worn pump 8) Overflow valve seizes up and can not be closed 9) Outlet valve of separator seizes up and cannot be opened. 10) Flow meter seizes up	1) Add oil 2) Clean or replace base valve 3) Check and repair sealing performance of pipes and related end face 4) Check the pump 5) Exchange any two phase wires 6) Properly tighten V-belt 7) Change inside vane or pump 8) Clean overflow valve 9) Disassembly and check outlet valve 10) Disassembly flow meter and check whether unrelated materials exist or components are damaged
2. Obvious decrease in oil delivery rate	1) The same as the above 1), 2), 3), 6), 7), 10) 2) Blockage of filter felt of separator 3) Blockage of pipes	1) The same as the above corresponding methods 2) Clean or replace oil filter 3) Check related pipes inside and outside the machine
3. Oil comes from escape pipe of separator	1) Oil-returning floater is worn or seizes up or can not float 2) Parallel valve fails to be opened or blocks 3) The diaphragm between high-pressure and low-pressure cavities of separator is worn 4) Head gasket is worn or with poor sealing	1) Check and repair oil-returning floater, correct its location, enabling it to move freely. 2) Clean parallel valve and correct its position 3) Repair or replace separator 4) Repair or replace head gasket
4. Bubble in oil	1) Air leakage of low-pressure cavity of separator 2) Blockage of escape valve of separator	1) Clean low-pressure cavity and gasket 2) Clean escape valve

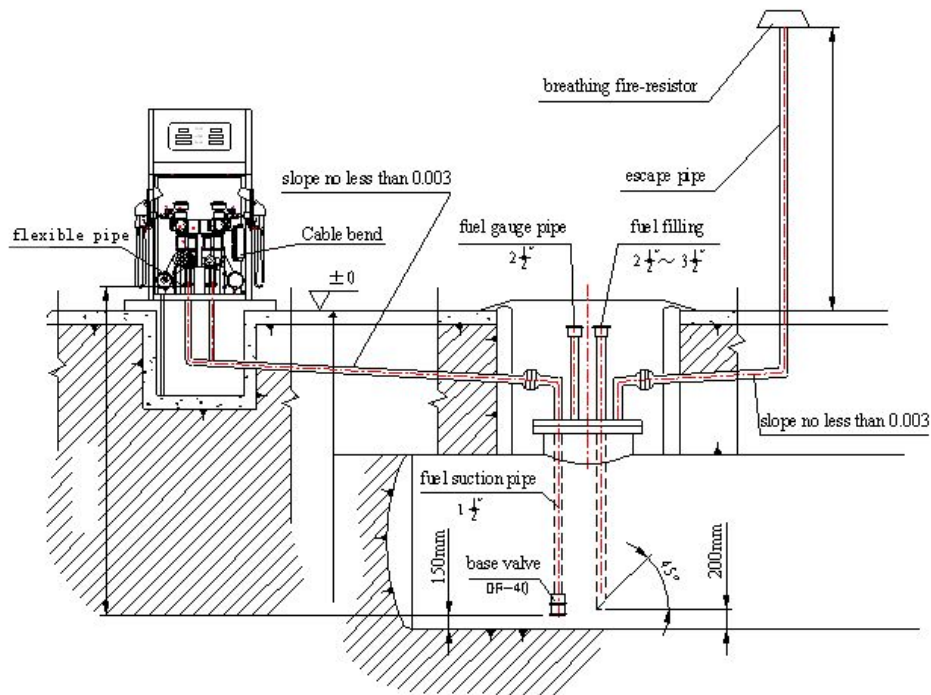
	<ul style="list-style-type: none"> 3) Air leakage of suction pipe outside the machine 4) Outlet valve of separator seizes up in “constant open” position 	<ul style="list-style-type: none"> 3) Repair suction pipe and sealing face 4) Repair outlet valve
5. Out-of-tolerance metering of flow meter (It can not be adjusted within the metering uncertainty range through fine adjustment.)	<ul style="list-style-type: none"> 1) Link location of flow meter is worn 2) O rings at the end of upper and lower connecting rod of flow meter are worn 3) Too large spacing between piston and liner of flow meter 4) Screws of piston of flow meter fall off 5) Too large spacing between worn piston and casing 	<ul style="list-style-type: none"> 1) Check center distance and hole diameter of link location, and replace it with a qualified one 2) Replace O rings 3) Change piston and keep an appropriate spacing 4) Disassembly, check and re-install 5) Check assemblies of piston and casing, changing assemblies or replace with qualified ones
6. Normal oil supply but no data display	<ul style="list-style-type: none"> 1) $\Phi 2$ pins at the ends of shaft of flow meter are broken 2) Rotation bend shaft of flow meter falls off 	<ul style="list-style-type: none"> 1) Install new $\Phi 2$ pins 2) Install new shaft pin or replace rotation bend
7. Large noise and vibration	<ul style="list-style-type: none"> 1) Head gasket or anti-vibration ball of separator is worn 2) Too small opening for base valve of oil tank 3) Blockage of filter felt of separator 4) Overflow valve of pump seizes up or spring is too tight 5) Loose connection between pump shaft and rotors 6) Bearing sleeve of pump is seriously worn and spacing is too large 	<ul style="list-style-type: none"> 1) Change head gasket or anti-vibration ball 2) Clean and repair base valve 3) Clean filter 4) Repair overflow valve 5) Replace rotor subassembly 6) Replace or repair bearing sleeve
8. Nozzle is not self-sealing or leaks oil	<ul style="list-style-type: none"> 1) Blockage of air inlet tube 2) Main valve is not completely closed 3) Mandril fails in sealing 4) oil inlet is not completely sealed 	<ul style="list-style-type: none"> 1) Clean air inlet tube 2) Adjust main valve or replace oil-resistant rubber pad 3) Adjust or replace sealing ring 4) Replace gasket
9. Leakage	<ul style="list-style-type: none"> 1) Sealing gasket or ring on sealing face is worn 2) Components are worn 	<ul style="list-style-type: none"> 1) Replace sealing gasket or ring 2) Repair or replace worn components

● Causes and troubleshooting of electrical failures

Table 2

Failure	Causes	Troubleshooting
1. Motor does not turn when starting the machine	<ol style="list-style-type: none"> 1) Three-phase power supply lacks one phase 2) Damage of switch of nozzle 3) Contact of relay on control board burned or disconnect of circuit board occurred due to burning 4) Coil of motor burned 5) Damage of output optical coupler on main board 	<ol style="list-style-type: none"> 1) Check power supply circuit 2) Replace switch of nozzle 3) Repair or replace control board 4) Recoiling or replace motor 5) Replace output optical coupler
2. Motor can not stop after switching off	<ol style="list-style-type: none"> 1) Short circuit of switch of nozzle 2) Damage of output optical coupler on main board 	<ol style="list-style-type: none"> 1) Replace switch of nozzle 2) Replace output optical coupler
3. Incomplete strokes on LCD	<ol style="list-style-type: none"> 1) Damage of LCD 	<ol style="list-style-type: none"> 1) Replace LCD
4. Dark LCD	<ol style="list-style-type: none"> 1) Oscillator of display board stops working, leading to burning of LCD 2) Damage of oscillator IC 	<ol style="list-style-type: none"> 1) Replace oscillation capacitor (0.1 μ F) of display board 2) Replace oscillator IC
5. Normal fueling but no counting	<ol style="list-style-type: none"> 1) Damage of sensor 2) Damage of counting IC on main board 3) Looseness of dial of sensor 	<ol style="list-style-type: none"> 1) Re-install a new one 2) Replace counting IC on main board 3) Tighten dial
6. No display	<ol style="list-style-type: none"> 1) Insufficient capacity or damage of spare battery 	<ol style="list-style-type: none"> 1) Replace spare battery
7. Failure of keyboard operation	<ol style="list-style-type: none"> 1) A certain key can not spring up 2) Damage of keyboard 3) Damage of keyboard interface IC on main board 	<ol style="list-style-type: none"> 1) Adjust the installation height of keyboard 2) Replace keyboard 3) Replace IC or main board
8. Failure of all computer's functions	<ol style="list-style-type: none"> 1) Too low voltage is supplied 2) Damage of major parts on main board (CPU program IC) 	<ol style="list-style-type: none"> 1) Change spare mains 2) Replace IC or main board
9. Failure of intercom of single machine with control console	<ol style="list-style-type: none"> 1) Short circuit, broken circuit or wiring error of intercom lines 2) Failure of all computer's functions 3) Damage of communication board of control console 	<ol style="list-style-type: none"> 1) Check intercom lines 2) As above 3) Repair or replace communication board of control console

Tubing Diagram of Gas Station



Notes

1. The installation design of fuel dispenser, oil tank, pipes and electric device should be entrusted to local design department. Never design by yourself to ensure safety of the system.

2. Seamless steel tubes with anti-corrosion treatment should be adopted for all pipes. The universal diameter of oil suction pipe should be 38mm.

3. If several fuel dispensers (self-contained pump type) are installed in one gas station, each dispenser should be equipped with separate pipe. If one tank supplies oil for two dispensers, a valve should be installed between the two dispensers to avoid interference.

4. At the bottom of oil inlet pipe in oil tank, a base valve should be installed. Its lower end should be about 100mm far from tank bottom.

Packing and easy-damaged accessories

● Packing

1. During transportation, packing cartons should not tilt more than 30°.
2. Violent vibration, collision and exposure to the rain should be avoided during transportation.
3. Keep it in a dry and ventilated place without corrosive gas and raining.
4. A Guarantee Card, a Qualification Certificate of Inspection, an Operation Manual and easy-damaged accessories should be put in each fuel dispenser.

● Easy-damaged accessories

No.	Items	Specification	Quantity	Remark
1	O ring	Φ21.2*3.55	2	For swivel-hosing coupling
2	Triangle pad		1	For three-triangle flange below the Bellows
3	Fuse	10A	3	For drive board
4	key		2	For the electronic lock
5	key		2	For the door lock

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