DP-HXP20 Hydraulic Sprayer Machine System

For Polyurea Or Polyurethane

Operating Instruction

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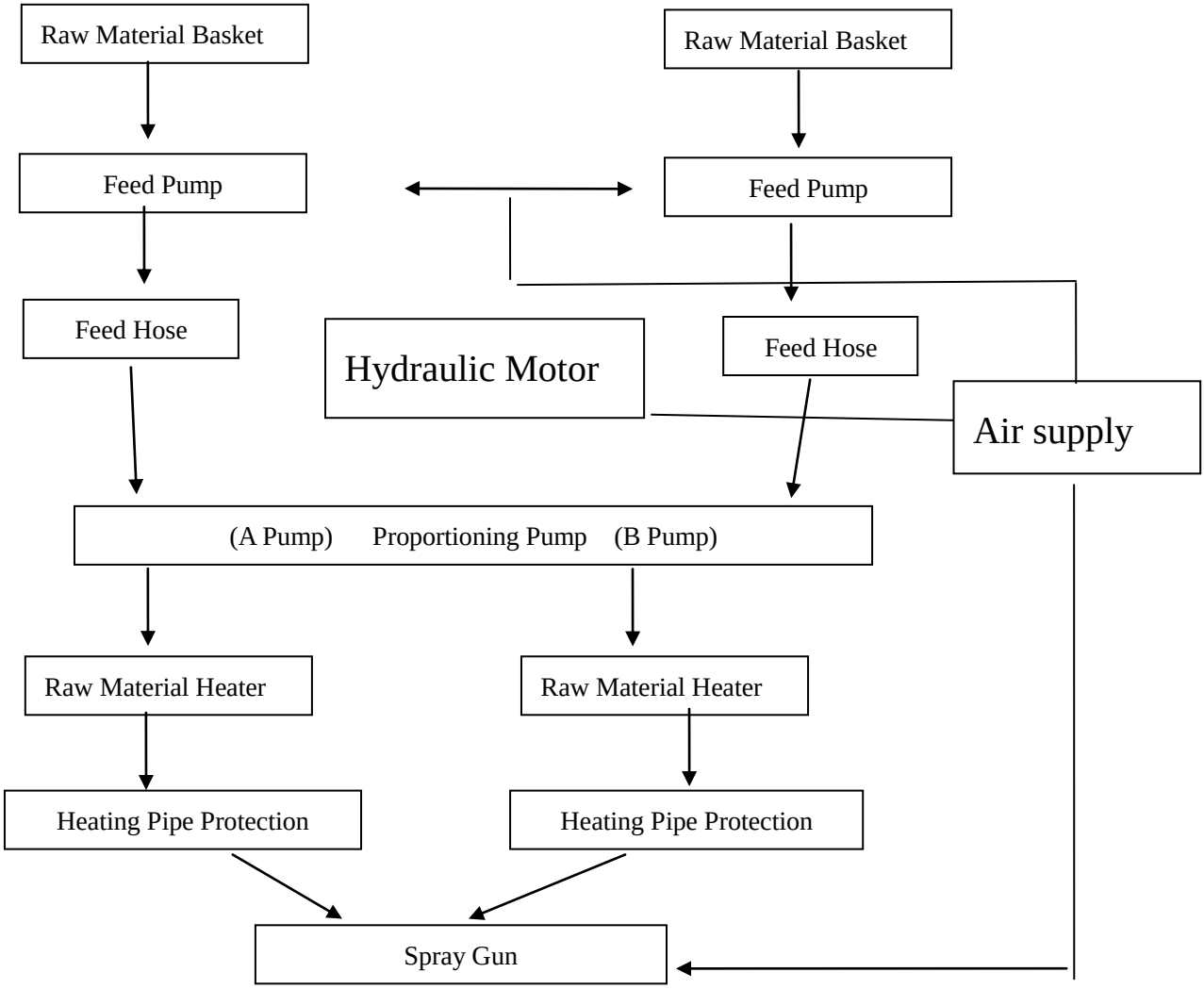
Warning

Respected Clients:

Thanks for your trust in our company and choosing our company's products. In order to help you become skilled at grasping, using, operating and maintaining the equipment to extend the service life, reduce the consumption of quick-wear parts and bring maximum return on investment to you, Please ensure the equipment operator observes the this instruction in great detail, especially the part about use and maintenance of spray gun. In consideration of problems discovered by the numerous clients during the use, the detailed description is written. Please pay attention to it.

Raw Material Flow Diagram



1. DP-HXP20 Polyurea Spraying System Technical Data

Technical Parameters

1. Working flow: 8-10kg/min
2. Working pressure: 15~20Mpa
3. Consumed power: ＜18KW
4. Raw material ratio: 1: 1
5. Power supply: 380V±10 50Hz
6. Equipment's input air pressure: 0.6~0.8 Mpa
7. Equipment's total air consumption: 0.5m^3/min
8. Overall dimensions: L850mm*W880mm*H1100mm
9. Hauled weight: 236kg
10. Way to clean gun: mechanical cleaning

Main components of equipment:

1. Spray gun
2. Feed pump (2:1)
3. Proportioning pump (2.2:1)
4. Temperature controller
5. Heating device
6. Pressure limiting device
7. Pump and structural frames
8. Feed tube

1). 15M high-pressure heat preservation feed tube (standard configuration)

2). 1.5M gun connection high-pressure material pipe

3). Low-pressure feed delivery pipe

Notes:

1. This machine is high-pressure equipment, which should be operated according to the operational procedures. During the work, the jet orifice should not be directed at any parts of the human body by any means to avoid accidents.

2. The raw material of Polyurea belongs to polymer compound. In case of its friction, the static electricity is easily caused from friction. Therefore, the inflammables and explosives should be kept far away from the job site.

3. The equipment grounding wire should be connected. (PE wire)

4. Before using the equipment, the operator should observe the equipment instructions carefully.

5. Do not have any parts of the body placed with the range of jetting, do not direct the orifice to people as game actions and also don’t look into the small ostiole of the mixing chamber of the gun. For the harmful substances are used in the raw material, the operator is suggested to wear mask, glove and goggles.

II. System Installation

Notes: before installing the systems of raw material, the power supply of the equipment should not be connected and the compressed air should not be connected with main source air (air compressor).

1. Raw material pipeline installation

(1) Connection between the feed extraction pump and proportioning pump:

After opening the cover of the charging basket and insert the feed extraction pump into the charging basket slowly. Insert the feed extraction pump with red label into the back charging basket and the one with blue label into the white charging basket. It is an imperative to wipe the feed extraction pump before inserting it into the charging basket. The impurities should not be brought into the feed liquid. Connect the one end of low-pressure feed delivery pipe with the discharge hole of feed extraction pump with the other one connected with the feeding hole of proportioning pump.

Prompts:

A. When the temperature of white feed exceeds ２４℃ and during its transportation, the drastic oscillation of liquid will result into intense expansion. If the cover of the raw material basket rapidly, the raw material will be ejected from the basket. Therefore, when opening the cover of basket, it is necessary to loosen the cover of basket slowly. At this time, the gas will overflow from the gap of cover of basket and send out the sound of nose. Screw off the cover of basket after the gas is let out completely in order to the ejecting of raw material leads harm to the personnel.

B. Storage of raw material: in winter, the environmental temperature shall be at １５～２０℃, in the ventilated and dry place; in summer, in the cool and dry place, can not be shined directly in the sun, otherwise the basket of white feed might be exploded in the sun.

(2) Connection between proportioning pump and gun

Connect one end of 15M high-pressure heat preservation feed tube with the discharge hole of proportioning pump and the other end with the feed hole of the gun. Connect one end of feed pipe with red label with the discharge hole of black feed proportioning pump and the other end with the pipe joint of feed pipe at the left side of the gun. Connect one end of pipe joint of feed pipe with blue label with the discharge hole of white feed proportioning pump and the other end with the pipe joint of feed pipe at the right side of the gun.

Notes: do not connect the discharge hole of host machine with all pipe joints of the feed pipe of the spray gun with the flexible cord. For the insulation is necessary to connect

circuit. Otherwise, the short circuit will be resulted. As a result, after the partial pipe is heated, the temperature is exceeded. Thus, the explosion of the pipe might be resulted.

(3). If it is 15M heating temperature preservation pipe, the output voltage of transformer is 18V, as shown by the Fig. (2)

(4) If the 30M feed delivery pipe is connected, the output voltage of transformer is 36V, as shown by the Fig. (3). Again, the company's supporting pipe should be selected.

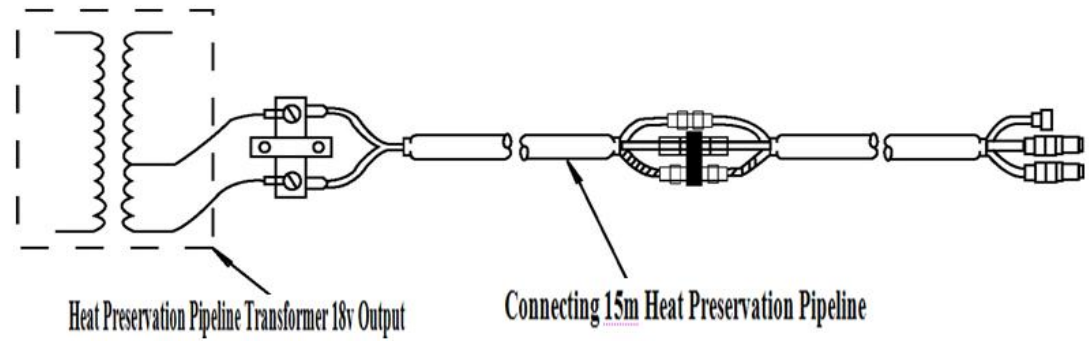


Fig. (2)

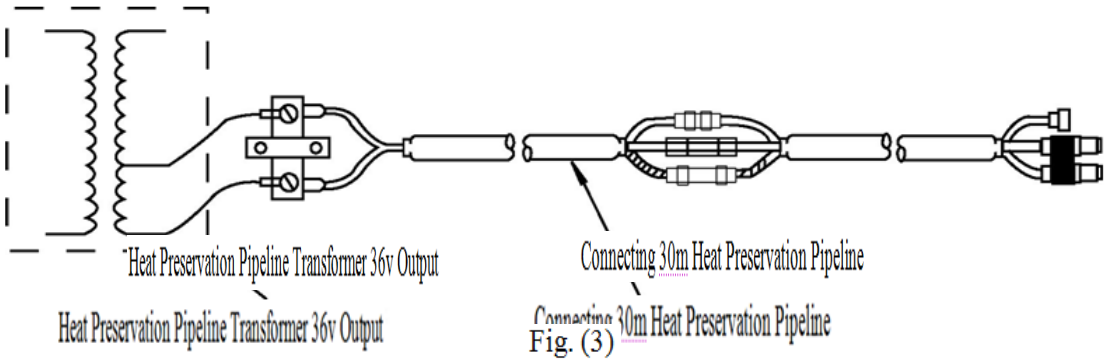


Fig. (3)

2. Gas circuit connection: lead to two feed extraction pumps through the quick plug on the one end of three direct links and connect the other end to the source gas pipe of spray gun attached to the pipe.

3. Connection and requirements of power supply

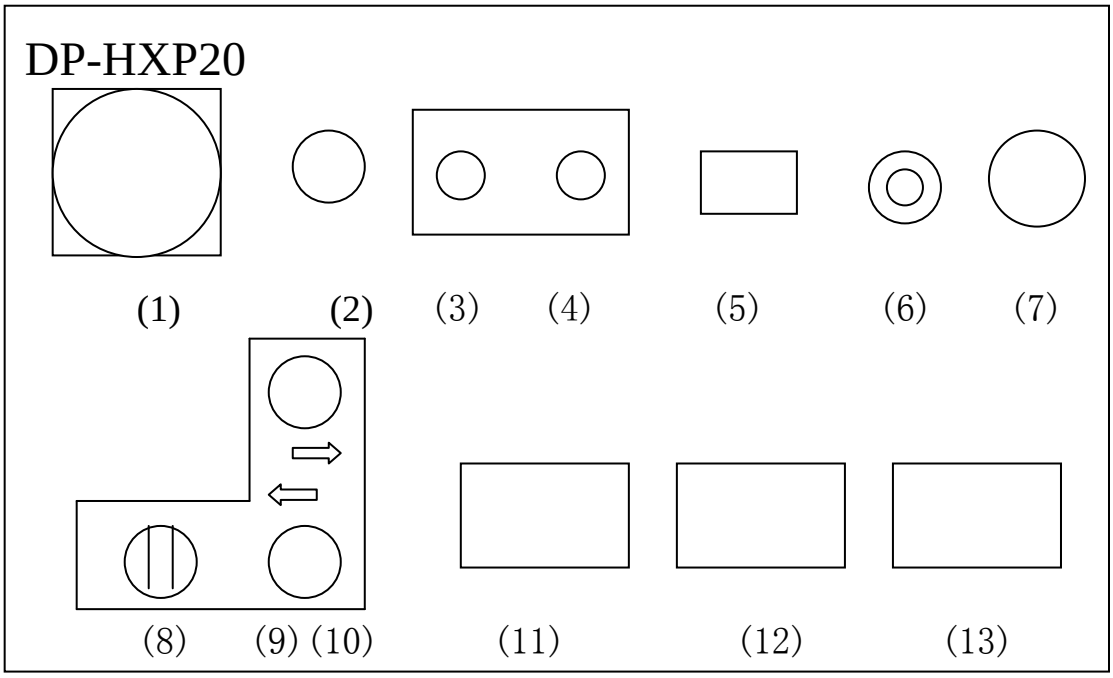
Connect the end of three-phase three-wire (no zero line) power line. The leakage circuit breaker of the host machine to the 380V and 50HZ single-phase power supply, the power shall satisfy 18KW. The earth terminal at the outside of the equipment's distribution box shall be grounded reliably to avoid electric leakage of equipment and cause casualty accidents. When it is necessary to maintain and repair electric part of equipment, it is required to cut off the general power from the three-phase power supply. The switch of

three-phase power supply is inside the electric control box.

4. Control instrument panel: for details, refer to the Fig. 4

(1) Power switch (2) Power indicator lamp (3) hydraulic oil pump is on (4) hydraulic oil pump is off (5) Counter (6) overpressure alarm (7) rush switch (8) exit, stop and work buttons (9) right-towards running indicator lamp (10) left-towards running indicator lamp (9) A circuit temperature controller (12) B circuit temperature controller (13) C circuit temperature controller

The general power switch is at the left side of the box.



DP-HXP20 temperature controller

A. Brief

The temperature controller is one important component in DP-HXP20 spray system. Its role is to control the heating temperature of Polyurea raw material to obtain the optimal spraying finishing effect. This controller is adopted with the advanced SCM technology to heat A and B categories of raw materials. The constant temperature is automatically controlled. The red double-layer nixie tube respectively displays and measures temperature value. It is simple and convenient to set temperature value.

For China boasts vast area and different environmental conditions, in order to be geared to the working under various environments at different regions. On the feed delivery pipe, we also adopts feed pipe external thermal insulation heating device.

Through adjusting C circuit temperature controller, heating preservation temperature of the feed pipe is controlled to realize that the spraying system is always at an optimal working state.

B. Technical parameters:

1. Working power: 380V±10% 50HZ 45A total power: 18kw

2. Heating method: central heating+ heat preservation of feed pipe

3. Maximum heating power: A、6kw B、6kw C、2kw

4. Measuring digital display range: 0 ~ 99.0℃

5. Measuring error: ±1%

6. Working environment: 0-50℃ RH ≤85% (non-corrosiveness and non-strong electromagnetic field radiation situation)

C. Main several components of temperature controller

(1) Intelligent chemical and mathematical temperature display accommodometer (three blocks) A, B and C circuits could respectively set temperature. According to the characteristics of spraying raw material by different manufacturers, by selecting different heating temperature, the different working requirements could be satisfied. The spraying temperature is generally set at 50－75℃.

(2) Sensor

Three sensitive elements (Pt100) play the role of sensing and transmitting the temperature changes in the circuit.

(3) Overheat element: the overtemperature switch is installed on A and B heaters respectively

The radiator is installed with three solid-state relays (250V and 40A). When the temperature is not controlled, the heating power supply should be tripped and cut off.

D. Operation process

1. Power-on, indicator lamp is on.

2. After start A circuit switch, the red figure on the temperature accommodometer (A) will heat device and set temperature.

3. Set heating temperature necessary for A circuit. The specific operations are as below:

(1). Turn on total power switch and press ON/OFF buttons at the left side of A circuit

temperature controller.

(2) Press ▼ button: Red figure will decrease.

(3) Press ▲ button: The red figure will be increased.

(4) After setting, the temperature accommodometer is at the normal control state and heater heats.

(5) Press SET button and observe the actual measured heating temperature. Uplift artificially to set temperature.

4. Start B circuit switch; as for the setting procedure of B circuit's temperature, operate according to the way to operate A circuit's.

5. Start C circuit switch; as for the setting procedure of C circuit's temperature, operate according to the way to operate A circuit's.

6. Counter

Before work starts, press the counter down once to make the digital display become "0". At this time, the setting of temperature controller is completed. After digital temperature controller's setting temperature is the same as the actual temperature, it indicates the raw material has been heated successfully. To check whether the actual heating temperature reaches the setting temperature, firstly, observe the indicator lamp on the temperature controller. The red lamp indicates heating and the setting temperature has already been reached; secondly, press SET button on the temperature controller with hand. Pressing down indicates the displayed numerical value refers to the actual heating temperature. If the button is loosened, the displayed numerical value refers to the setting temperature. When the temperature reaches the setting temperature, the spray gun can work.

7. Connection and requirements of power supply

Connect the end of three-phase three-wire (no zero line) power line. The leakage circuit breaker of the host machine to the 380V and 50HZ single-phase power supply, the power shall satisfy 18KW. The grounding wire of the equipment shall be grounded reliably to avoid electric leakage of equipment and cause casualty accidents. When it is necessary to maintain and repair electric part of equipment, it is required to cut off the general power from the three-phase power supply. The leakage circuit breaker of general three-phase power supply is installed at the inner left side of the electric control box.

8. Control instrument panel

E. Checking and maintenance of faults

1. If the indicator lamp is not on after power is connected, check whether the grounding wire is grounded correctly and the leakage circuit breaker is powered on, the emergency stop switch is connected and three air switches at the inner right side of box, two 380 V switches and one 24 V switch are connected.

2. If the heating rod does not heat, check the resistance value of the heating rod is correct. R=85Ω around. And check the over-temperature switch is cut off.

3. If the heating temperature is not controlled, check the resistance value of sensor is correct. The correct resistance value PT100=105Ω ±2Ω。（+25℃）

F. Notes for use of temperature controller

1. to avoid damage and invalidation of instrument, the rated working power 380V±10% 50HZ should be adopted.

2. To avoid fire and explosion, it is not allowed to use in the sites with inflammables and explosive gas and discharged vapour.

3. The environmental temperature is required to be 0℃～+50℃. No straight shine in the sun. RH is 45%～85%

4. Not allowed to directly shake and shock the major structure.

5. Heater control system:

Turn on the general power switch, and then the power indicator lamp is on. At this time, A, B and C circuits could be heated.

A. B circuit (white feed heating) heating:

Press white feed heating switch button, and then the white feed heating controller will display the B circuit heating setting area and setting the necessary heating temperature. When the heating temperature has already reached the set heating temperature, the white heating controller will automatically cut off heating circuit and stop heating. In case that the heating temperature is lower than the set heating temperature, the temperature controller will also automatically heat. B circuit's actual heating display area displays the actual temperature of feed temperature. Namely press SET button to observe.

B. A circuit (black feed heating) heating and C circuit (pipe heating) heating:

The method is alike the heating procedure of white feed.

6. Running times record system of proportioning pump

Speaking of the running times record display screen of proportioning pump, in case of reciprocating motion of the power source hydraulic cylinder of proportioning pump for once, then record is 1. In case of reciprocating motion of hydraulic cylinder for 100 times, then the record figure displayed is 100. The record display screen can be reset manually. The hydraulic cylinder drives A and B feed pumps to work. Therefore, the times of reciprocating work of two pumps are recorded.

The system could calculate how much feed is used per day precisely.

III. System Operation

3.1 Check before operation

3.1.1 Whether there is 2/3 cups of DOP in systematic circulation lubrication cup of the pump

3.1.2 Check whether all joints are tightened tightly.

3.1.3 Check whether the power line is correctly connected and the productive ground wire is reliably grounded.

3.1.4 Whether all switches on the control panel is at OFF position.

Notes:

5. Do not have any parts of the body placed with the range of jetting, do not direct the orifice to people as game actions and also don’t look into the small ostiole of the mixing chamber of the gun. For the harmful substances are used in the raw material, the operator is suggested to wear mask, glove and goggles.

3.2 Initial start

When confirming all liquid flow pipes, air source pipes and power lines have been connected and there are no errors, then operating system can be started. At this time, the operator should fully understand the functions of every part of the control panel. The steps are as follows:

Step1. Filling system

Respectively insert the feed extraction pumps into the corresponding raw material baskets, that is, inserting the one with red label into the black feed (A feed) basket and the one with blue label into the white feed (B feed) basket, then open the air sources leading to the host machine. At this time, the work feed extraction pumps will work, inputting the raw material into the booster pump of the host machine, primary heater and inside the heat preservation pipe.

Step2. Place one clean container under the feed delivery block, slowly open one raw material valve on the feed delivery block, let out the atmosphere in the feed delivery pipe until the raw material is sprayed out stably, then replace for another.

Step3. After air exhausting, turn off two raw material valves (only use feed extraction pump to exhaust air). The raw material pressure values displayed by the raw material pressure shall be approximately qual. In the event that one at one side is higher, then the slightly open the raw material valve of the feed delivery block at the higher side to let the raw material flow out until the pressure at the two sides is approximately equal.

Notes: the pressure value at this time is very low

Step4. Rationally and safely deal with the waste

Step5. Wipe off the residual raw material on the feed delivery block and coat the lubricating grease and install the feed delivery block on the gun body and tighten the feed delivery block to fasten the screw so that the feed delivery block contacts the gun body closely and there is no phenomenon of feed leakage.

Step6. Straighten the feed delivery pipe to avoid uneven heating and cause damages to internal heating wire. Respectively place the heating power switches of black and white feed and pipe on the ON position and set the heating temperature. After temperature reaches the set value, rotate and loosen the regulating value under the electric cabinet anticlockwise, then the switch of hydraulic oil pump of the host machine can be turned on.

Notes: for the combined polyhydric alcohols will be expanded when heated, the hydraulic pressure value of the host machine should not be set the pressure value in case of working before the equipment system sprays in order to avoid the pressure gauge is damaged due to the excessive pressure caused by heated raw material inside the pipe and even the explosion.

Step8. Regulate the pressure value under the electric cabinet to make the pressure at 3-6mpa.

Step 9, firstly turn on the inlet switch on the gun body and then open the two raw material valves on the feed delivery block.

Step10. At this time, all system has been completed. Rotate the pressure regulating valve clockwise to observe the pressure gage of the heater of the host machine. When the numerical value of the pressure gage reaches 14－17Mpa, the feed can be sprayed out so long as trigger is pulled.

Notes: If you want to stop operating, please do close the raw material values on the two feed delivery blocks to avoid ejecting of raw material due to misoperation.

3.3 Steps for daily shutdown

Notes: In case of shutdown each time, the primary pump body shall be deviated to the most left side so that the pump body is soaked in the oxygen-free A feed to avoid the sealing elements inside the pump are strained in case of startup again. In case of operation, return the work knob to its position.

In the meantime, the spray gun should be checked to prevent the sealing elements inside the gun from being damaged during working and the leakage of raw material inside the spray gun after the gun is stopped. As a result, the raw material is solidified inside the gun body and the spray gun can not be operated again.

3.3.1 Steps for shutdown

Step1: shut down A, B and pipe heating power switch. Press oil pump STOP button.

Step2: check spray gun. When it is confirmed that there are no faults in spray gun and it could work normally again, the next step can be done. Otherwise, it is necessary to clean, maintain and overhaul spray gun;

Step3: turn off the total power switch on the instrument panel of the host machine;

Step4: shut down air source;

Step5: clean up the job site and confirm the step of shutdown has been finished. Check whether the remaining raw material quantity could satisfy the raw material necessary for startup again to be ready for the work again.

3.3.2 Check spray gun carefully

3.4 Daily maintenance

1. Check the quantity and color of lubrication grease in oil cup of proportioning pump; replace the severely discolored and invalid lubrication grease to avoid destroying sealing elements. Pour out the discolored and invalid lubrication grease and clean up the container and then pour the pure and clean lubrication grease into 2/3 cup.

Notes: In the case that the lubrication grease in the oil cup of pump body is discolored quickly, it is necessary to replace the sealing elements inside the pump.

2. Spray a layer of grease evenly on the white feed pump rod. At this time, only the white feed pump rod is exposed outside.

3. According to the spray gun check step in the daily shutdown step, finish checking

and maintaining the spray gun.

Notes: before repairing and maintaining the equipment system, it is an imperative to discharge all air pressure.

3.5 Long-term shutdown operation

This operation shall be done under the circumstance of not using this machine for a long term, just like the measure adopted in case of shutdown in winter or the use at irregular intervals.

1. Bring up the feed extraction pump from the raw material basket, clean up the part with raw material on the external wall of the feed extraction pump by using solvent, and then put the feed extraction pump into the container with clean DOP; open the air valve of the feed extraction pump.

2. Turn on the power switch of the host machine, regulate the hydraulic pressure regulating valve of the host machine and regulate the pressure to 2-3Mpa.

3. Open the raw material valve and spray the defective material in the equipment system into a proper container until the clean solvent comes up.

4. Put the feed extraction pump into the protective liquid container with DOP.

5. Restart equipment to begin spraying until all solvents are cleaned up and the gun sprays out DOP.

6. Shut down according to the step for daily shutdown and seal all feed inlets and discharge holes.

Notes: A feed raw material is easily solidified if placed in atmosphere. Therefore, all feed inlets and discharge holes should be sealed strictly to prevent the air from entering into the pipe and system.

IV. Check of Equipment Problems

As a qualified operator, you should understand several following points:

A. What is the normal raw material?

B. How does the equipment work?

C. How is the normal operation of equipment?

D. In what direction is the raw material in the equipment?

5.1 Check of abnormal display of liquid flow pressure gage

Overhauling should be started from the first step one by one sequentially, determined by the pressure displayed by the raw material pressure gage. As there is difference in the raw materials, temperature and viscosity, it is not necessary to be equal

in the numerical value (material pressure) of air pressure and gage.

Step1: determine what kind of raw materials are void of or lost.

The raw material pressure displayed by the raw material pressure gage at the side of lacking material is quite low. This phenomenon indicates the inadequacy in supply of material between the pressure gage and material supply system. It is necessary to check whether the phenomenon of obstruction or that the raw material basket is void of material occurs to the material supply system

Step2: determine whether the raw material output pipe is obstructed.

For the phenomenon of obstruction occurs to the raw material pressure gage and spray gun, the pressure displayed by the raw material pressure gage is greater than the normal value.

Step3: in case of discovery of insufficient supply of material at the side of lacking material, it is necessary to begin overhaul the one end farthest away from the host machine from the most fundamental and palpable aspects. As for the one end the with the pressure displayed by raw material pressure gage greater than the normal value, it is necessary to check from the spray gun to the raw material outlet end of heater.

Step 3.1 if the pressure displayed by the raw material pressure gage is two low, it is necessary to check according to the following several aspects.

(1) Whether there is material in the basket?

(2) What temperature of the raw material is?

(A) If the temperature at the bottom of the raw material basket is too low, the viscosity of the raw material will be increased and the feed extraction pump will be obstructed or the raw material will not flow smoothly and the system can not enter into the system.

(3) Feed extraction pump

(A) Whether to run?

(B) Whether the air source is opened?

(C) Whether the pressure of the air pressure reaches the appropriate numerical value?

(D) Whether there are dirty substances on the shaft of A feed extraction pump (if there are dirty substances, it indicates that this shaft is not protected by being coated with lubrication grease or the sealing elements have been damaged.)

(E) Check the filter of feed extraction pump

(F) It's better to determine whether there is something wrong with the feed extraction pump after determining there are no questions about other parts, especially, the attention should be paid to the second point (A) of step3.

(4) Filter

Check whether the filter at the outlet of feed extraction pump is applicable or the phenomenon of obstruction occurs.

(5) Proportioning pump

Determine whether the fault occurs to the left or right strokes of the pump.

1. A material pump

a. If the pressure is low (cutoff) in case of changing direction at the left end of A material pump, then the small one-way valve steel ball is not sealed and there might be dirty substances on the small steel ball.

b. If the pressure is low in case of changing direction at the right end of A material pump, then the big one-way valve steel ball is not sealed and there might be dirty substances on the small steel ball.

2. B material pump

a. If the pressure is low in case of changing direction at the right end of B material pump, then there will be dirty substances adhered to the big one-way valve steel ball.

b. If the pressure is low in case of changing direction at the left end of B material pump, then there will be dirty substances adhered to the small one-way valve steel ball.

Step 3.2 If the pressure displayed by the raw material pressure gage is too high, it is necessary to check according to the following several points:

(1) Check whether the filter screen of the spray gun is obstructed.

(2) Whether there are solidified crystal raw materials inside the raw material pressure gage, spray gun and pipe, which results into unsmooth flow of raw material.

Through checking according to the foregoing steps, if the problems are discovered, it is necessary to deal with related articles of the instruction manual as far as possibly. If the turned-on device is placed in the atmosphere for a long time, other problems will be generated. For example, the humidity enters into the system, thus the A material will be crystallized and solidified, etc.

5.2 The adjustment of abnormal discharging of the head of spray gun

For details, refer to the operation manual of DP7 gun

5.3 Situation of bad ejecting state

To check the problems about bad spraying condition, it is an imperative to know about two factors of mixing conditions.

1. Temperature:

(1) If the temperature of raw material is too high, cotton flying effect of raw materials will be generated and the raw materials will fly off excessively.

(2) If the temperature of raw material is too low, cotton flying effect of raw materials will be generated, thus the raw material will be mixed unevenly and wasted.

2. Pressure

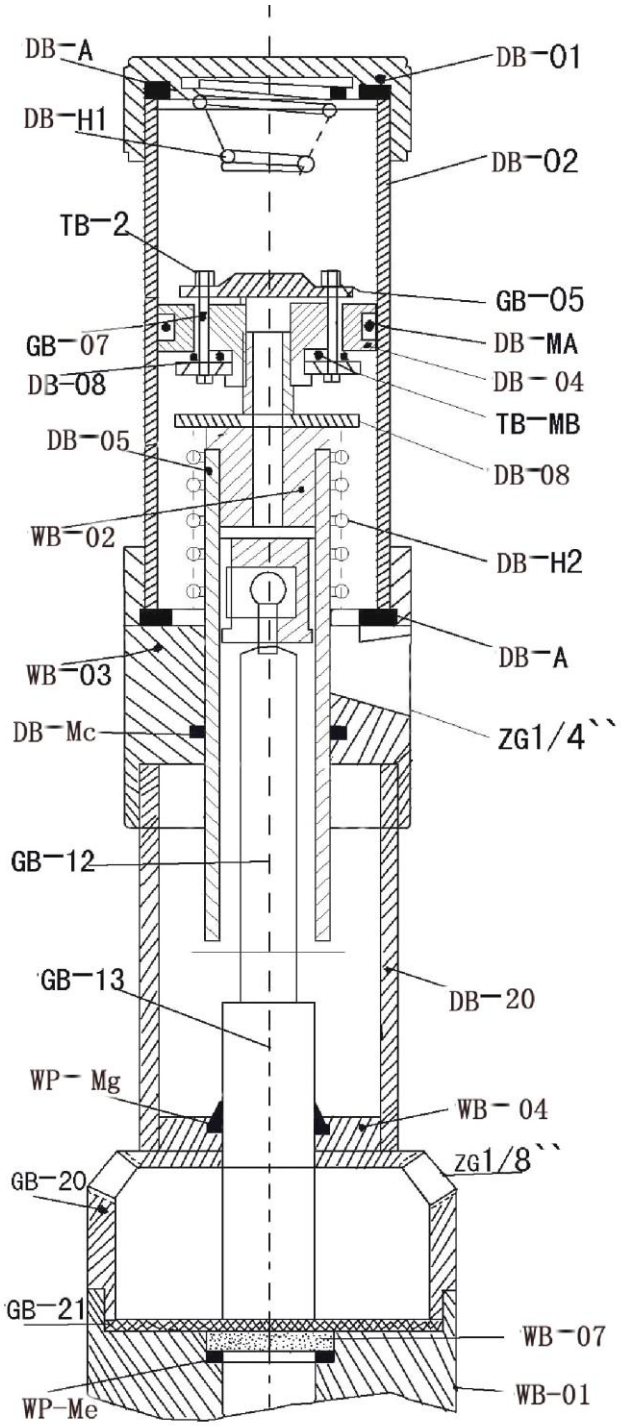
(1) If the pressure is too high, the raw material will rebound, it will be hard for the operator to control the evenness of the construction surface

(2) If the pressure is too low, the raw material will be mixed unevenly.

3. Mixing chamber

After the mixing chamber is used for a period of time, the B material hole will be enlarged for there are particle fillers inside the B material, thus A and B material matching will be out of control. As a result, the mixed materials will not be even. Then, it is necessary to replace the mixing chamber.

Assembly Drawing of Feed Supply Pump
(Refer to the next page)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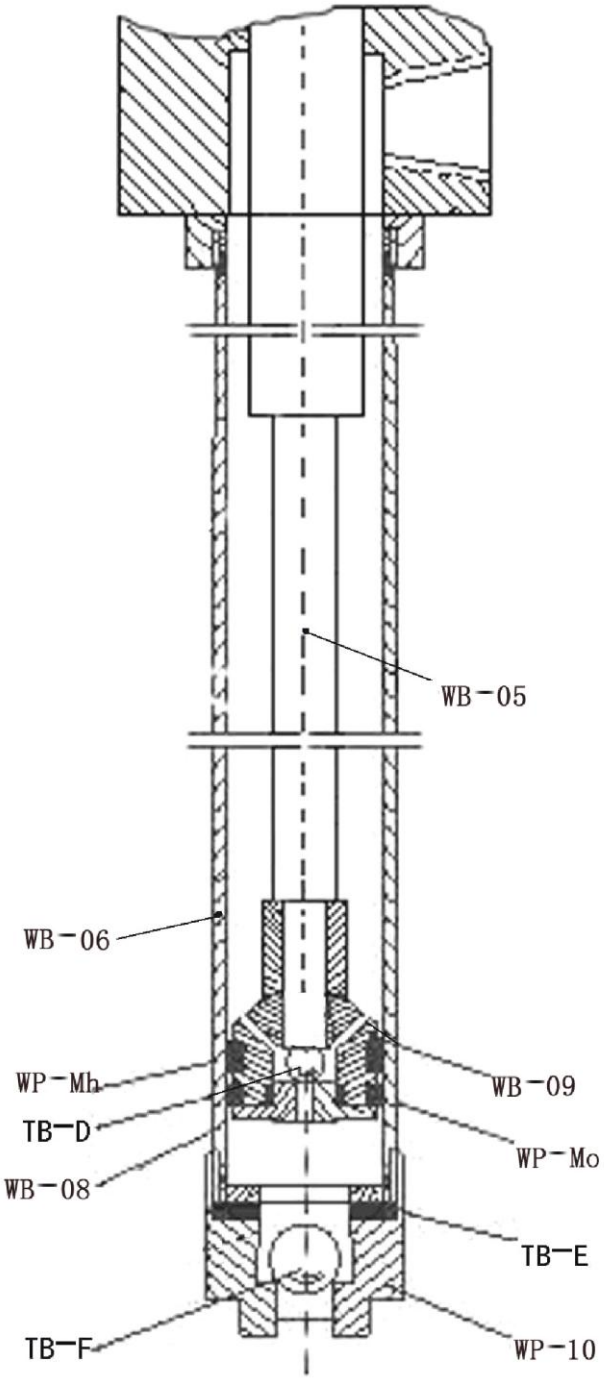
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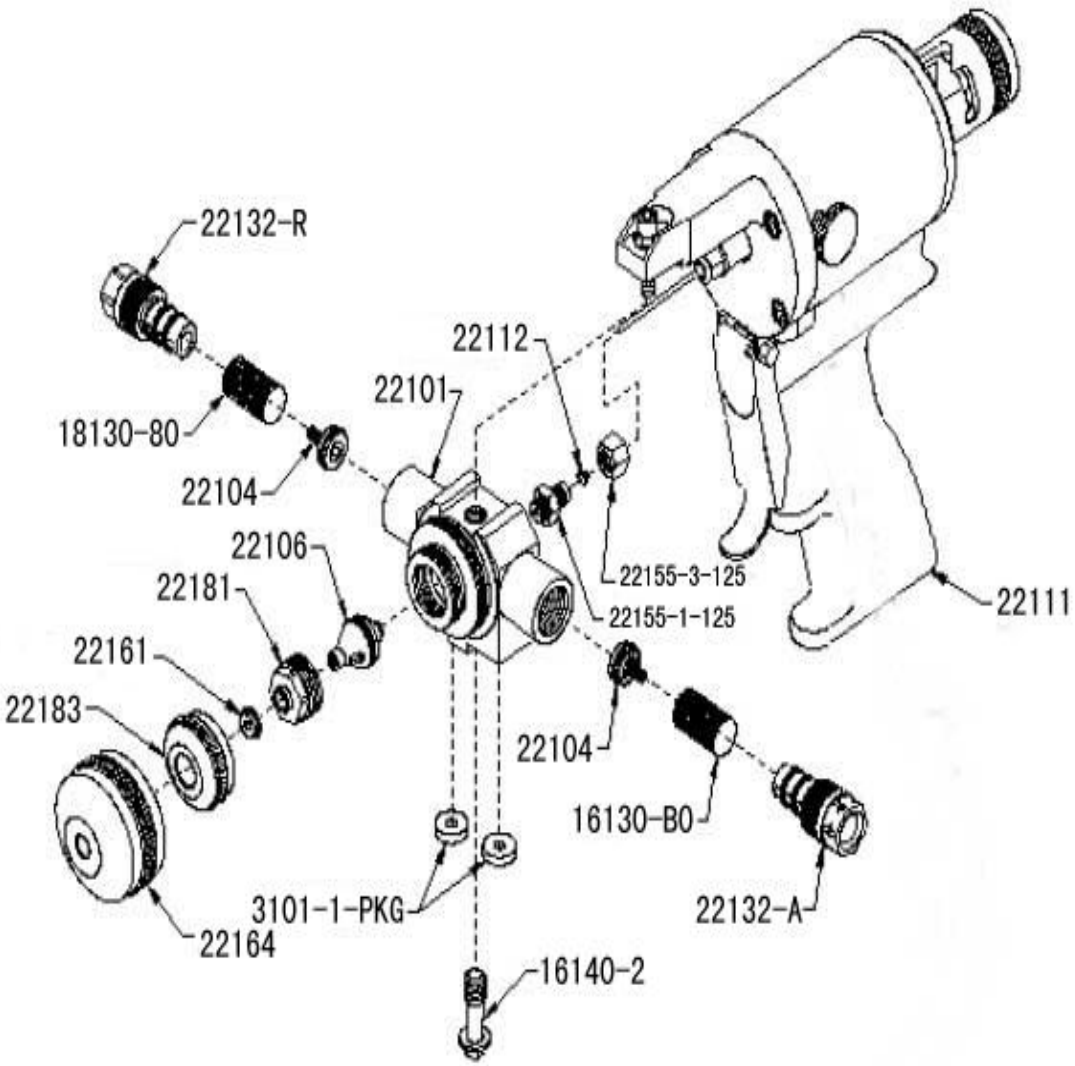
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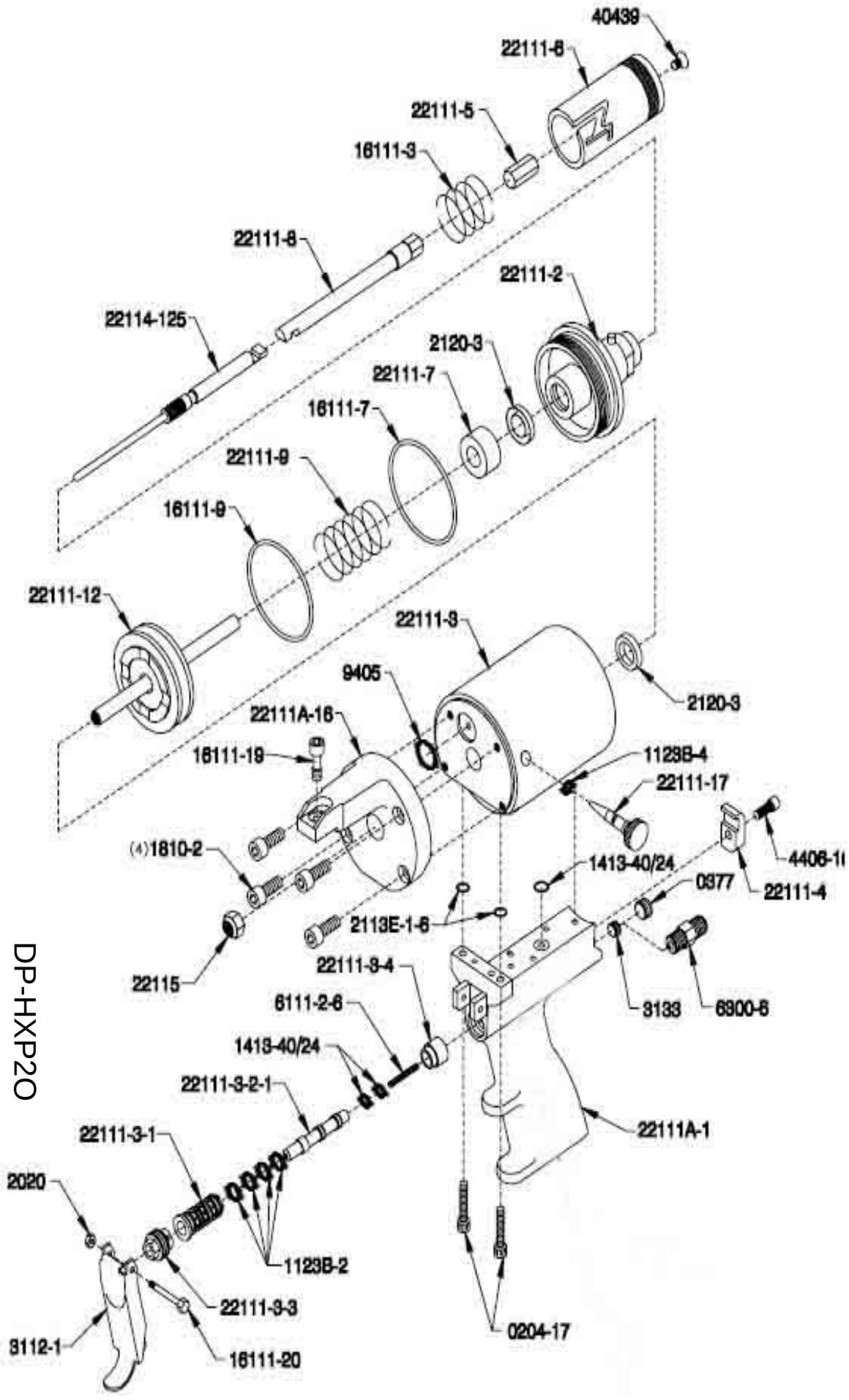
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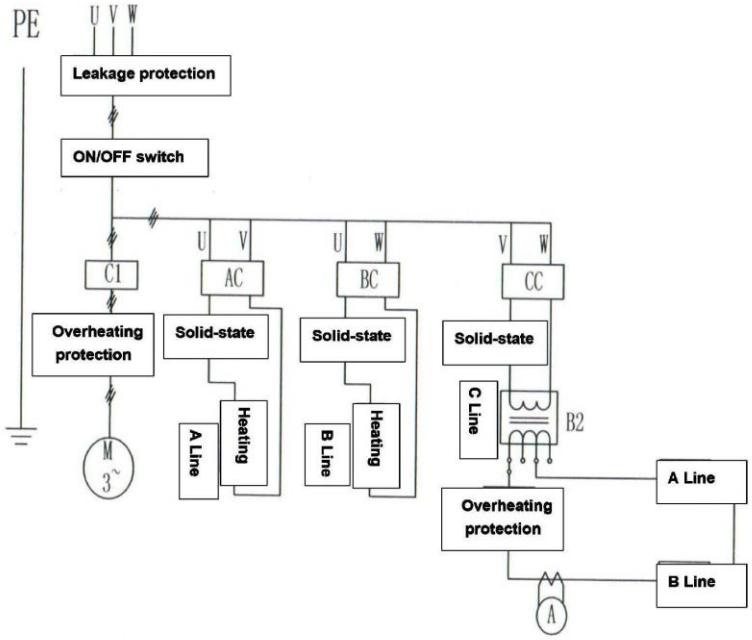
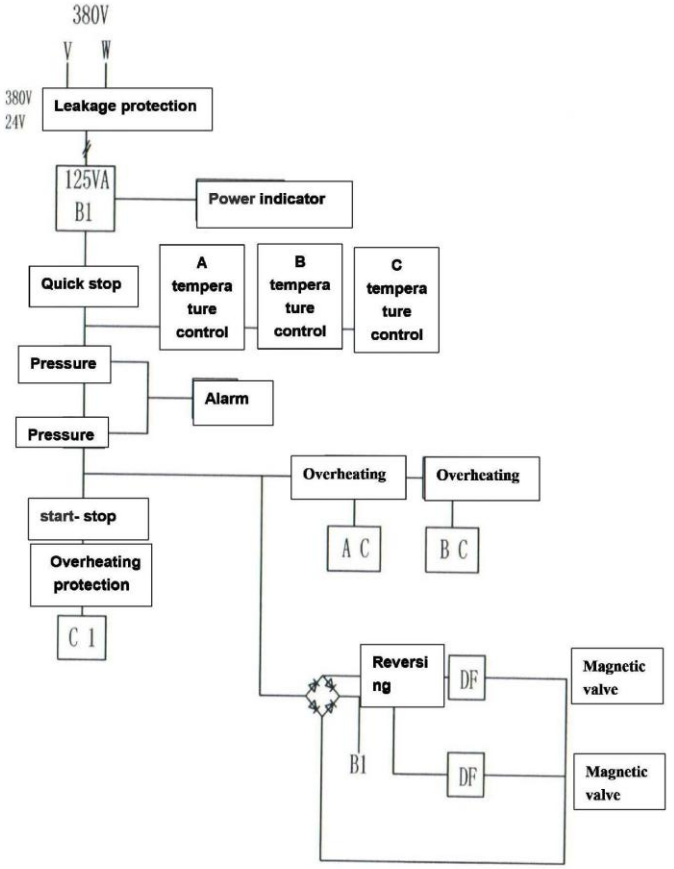
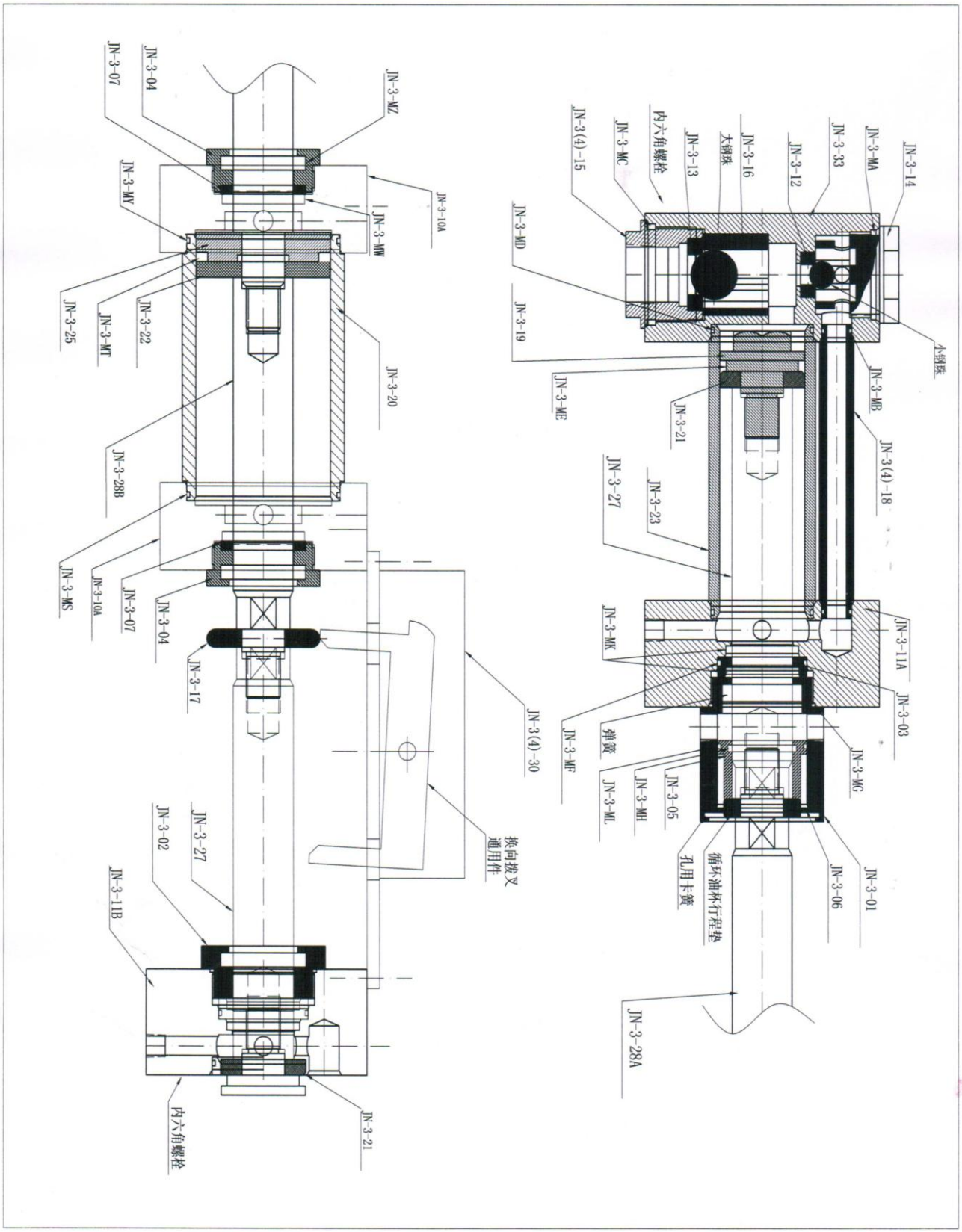
DP- HXP20



Main circuit principle diagram



Principle control diagram


JN-3-14
JN-3-MA
JN-3-33
JN-3-12
JN-3-16
大钢珠
JN-3-13
内六角螺栓
JN-3-MC
JN-3(4)-15
JN-3-MD
JN-3-19
JN-3-ME
JN-3-21
JN-3-27
JN-3-MK
JN-3-MF
弹簧
JN-3-ML
JN-3-MH
JN-3-05
孔用卡簧
循环油杯行程垫
JN-3-06
JN-3-01
JN-3-28A
JN-3-11A
JN-3-03
JN-3-MG
JN-3(4)-18
JN-3-MB
大钢珠
JN-3-MZ
JN-3-10A
JN-3-MW
JN-3-MY
JN-3-07
JN-3-04
JN-3-25
JN-3-MT
JN-3-22
JN-3-20
JN-3-28B
JN-3-MS
JN-3-10A
JN-3-07
JN-3-04
JN-3-17
JN-3(4)-30
换向拨叉
通用件
JN-3-27
JN-3-02
JN-3-11B
内六角螺栓
JN-3-21