

User's Manual

High Pressure Coolant Filter Systems

MODEL : ACFC-S25-70-C20-TM

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Chapter 1. Notes for Safety

■ You must Follow belows

Belows are for right usage of product and preventing accident or damage from happening.



Warning Death or damage if not following this



Caution Injury or material damage if not following this



Prohibition Prohibition Mark



Grounding Indicates grounding to prevent electric shock



Danger For preventing electric shock

Danger of not following aboves

The damages and losses caused by neglecting the contents specified in this manual are not covered by our quality assurance and liability.

- Product breakdown due to motor failure or pump malfunction and irreparable damage caused by the unqualified person's disassembling or failure to comply with the suitable operation conditions or prescribed pressure setting method.
- Personal injury due to electrical, mechanical and chemical factors
- Environmental pollution by coolant's leakage
- If there is significant vibration, abnormal noise or smell during initial commissioning, immediately shut off the power supply and contact our quality team for service.

Our disclaimer

Damage caused by any of the following conditions is not covered by the liability.

- Natural disaster caused by earthquake or flood
- Loss due to user's intention or negligence
- Loss caused by fire or third party's actions

■ Notice for carrying & installation

DANGER

- ▷ Be sure to ground
If the electrical insulation deteriorates, an accident caused by electric shock can be prevented.
- ▷ Be careful not to get water on the power cable when using.
- ▷ Never connect a ground wire to a gas pipe because there is a risk of explosion.
- ▷ Be sure to disconnect power and then to ground

- ▷ To prevent electric shock, always shut off the incoming power when installing and troubleshooting the system unit.

WARNING

- ▷ To protect the system unit, be sure to attach an electromagnetic switch
We can not guarantee the problem caused by the overload of the system unit when there is not enough capacity's electromagnetic switch.
- ▷ The electronic switch is not supplied by us.

- ▷ Do not carry and install pipes or power cables with holding them by hands when carrying or installing
It may cause electric shock due to piping leakage and cable breakage

CAUTION

- ▷ Empty the coolant in the tank during carrying and installation
It may overflow due to impact or tilting when carried in the state of containing fluid, which may cause environmental pollution.
- ▷ It should be installed in a well-ventilated, dry place, on a flat surface to avoid falling over and Maintain sufficient spacing in easy-to-maintain locations
- ▷ Do not unscrew or shock the pipes while the system unit is in operation. Damage to the pipes can cause damage to the human body.
- ▷ The system unit must be installed only indoors and maintain static temperature so that the coolant may not freeze in winter.

Chapter 2 Product specifications

.The ACFC Series is a high pressure coolant cyclone filter system suitable for supplying high pressure coolant to CNC machine tools for special processing and high speed machining.. The high pressure coolant pump and the Cyclone filter are integrated together. It is designed as a compact cabinet type, and the appearance is beautiful and the installation place is less restricted.

.The ACFC Series is designed in such a way that the sludges filtered in the first Cyclone Filter is collected in the dirty tank and is introduced into the coolant's tank by the discharge pump.

The second Element filter filters floating materials that were not filtered from the first Cyclone filter. The Cyclone Filter applied to this system uses a centrifugal force of the fluid introduced by the feed pump to separate foreign materials such as cutting chips. It has good filtration efficiency and long durability, so it can be used semi-permanently without replacing the filter. The second element filter can be cleaned and reused after cleaning

.Features of product use : Improved cutting speed when machining general steel and hard materials. High speed machining is possible by cutting the cutting-chip finely, improving the surface roughness of the workpiece and extending tool life

Type	High Pre' Pump		Motor				Built-in Pump
	Discharge volume ℓ /min	Max' Pressure MPa/bar	Motor Out-put kW	Frequency Hz	Voltage V	Current A	
ACFC-S20-30	8.0	3.0/30	3.0	50	200/220	12.5	AJ-200
	10.0			60	200/220	11.0	
ACFC-S25-70	18.0	7.0/70	5.5	50	200/220	24.2	AJ-250
	22.0			60	200/220	23.1	

Product specifications

※ The discharge pressure is changed by the applied orifice.

Recommended Supply Pump Volume	ℓ /min	80~200 (ACP-1100HMFS, 1800HMFS)
Supplying Pump Head	m	10~30
Cyclone Filter	20A	ARCF-20B (IN, OUT, DRAIN PT1")
Dirty Pump Volume	50/60Hz	120/150L/min (ACP-250F)
Current	50/60Hz	1.5/1.6A Ø220V

Chapter 3 Installation Method

1. System installation method

- 1) Install the System Unit horizontally on a flat surface and Adjust the adjuster to lift the caster from the ground.
- 2) Filter is needed to ensure adequate work space for cleaning and inspection.
- 3) Do not install the product outdoors. Install in a well-ventilated room.
- 4) Please note that this System Unit was not made hermetically and so, the coolant fluid may overflow due to shock or movement fluctuation.

2. Selection of the Supply Pump and piping (Coolant Supply Pump)

- 1) The selection of the supply pump should be three times higher than the high-pressure discharge flow rate and Select the pressure of Cyclone Filter to 1 ~ 3 bar. If the Coolant pump with the supply pressure of

- 1 bar or less is selected, the suction flow rate to the Cyclone Filter is lowered and the efficiency is lowered.
- 2) Rubber hoses or flexible resin tubing hoses are recommended for pipe's connection between the machine tool and the system unit and Avoid piping that curves at 90 ° as much as possible. Pipes made of rigid materials such as steel pipes are not recommended because they cause vibration.
- 3) It is recommended to work with sealant or Teflon tape because it may cause noise and vibration if air is mixed due to defective sealing when working on piping of suction part.
- 4) When installing the valve on the suction part, use the type of ball valve or gate valve that can be fully opened and closed (Do not install Check valve)
- 5) The piping size should be the same as or larger than the Cyclone Filter inlet and outlet. (System unit piping is Rc1")

3. Overflow Piping

- 1) Overflow Piping is a pipeline that flows naturally to the coolant tank of a machine tool when the clean tank is full. If the coolant can not escape properly, the clean tank may overflow. Piping should be done by maintaining sufficient inclination considering the height difference with the coolant tank of the machine tool.
- 2) This system unit's overflow piping is factory set to Rc 1" and It is not recommended to install a valve in the middle of the piping or to reduce the piping diameter arbitrarily because the clean tank may overflow
- 3) If the Clean Tank overflows even if piping is done by taking care of the above 1) and 2), install a valve in the outlet line of the supply pump to maintain the supply flow rate appropriately.
- 4) To prevent overflowing coolant, install the partition or install it so that it does not flow directly into the supply pump inlet.

4. Install the Dirty drain pipe and the Filter Basket.

- 1) The coolant filtered by the Cyclone Filter flows into the clean tank, and the chips and sludge flows into the dirty tank or coolant tank of the machine tool through the drain outlet. Sludge can be collected by piping the outlet of the Dirty Drain toward the Chip Conveyer or installing the Filter Basket.
- 2) To prevent vibration during piping, use a flexible piping material and Piping should be done by maintaining sufficient inclination considering the height difference with the coolant tank of the machine tool.

5. High pressure (discharge) piping

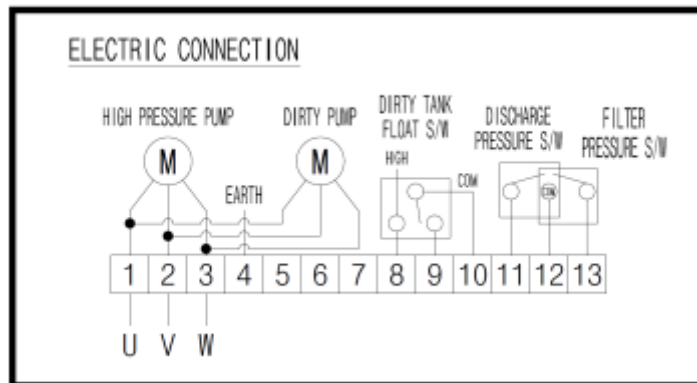
- 1) To use this system unit, first check whether the coolant piping of the machine tool is designed properly for high pressure.
- 2) We recommend high-pressure hose piping that is more flexible than steel pipe piping so that pulsations and vibrations of the system unit are not transmitted to the machine tool.
- 3) The relief valve should only be used within the operating range so that it does not exceed the maximum pressure (70 bar) of the high pressure system unit
(This system is factory set to 70bar when Nozzle Ø2)

Chapter 4 Electrical Connection

- 1) Be sure to turn off the power before working
- 2) The power unit of this system unit is manufactured by low-voltage connection 3-phase 220V 0 / 60Hz connection.
- 3) The change into High-voltage connection (Three-phase, 380V) is possible and When

changing the connection, change all phases of high-voltage pump, supply pump, and electric power input.

- 4) Depending on the connection method of the incoming power supply, the direction of rotation of the motor may be changed, which may cause serious damage to the motor. Immediately stop the operation, turn off the power, change the wiring and check the direction of rotation. You can change the direction of rotation by changing only 2 lines of the U.V.W 3 lines
- 5) The intermittent operation of the high-pressure pump (several times on / off within 1 minute) is not recommended because it may cause malfunction. Please contact the manufacturer to change the structure.
- 6) Make sure to ground for safety.
- 7) Terminal end-to-end drawing (Wiring diagram)



- 8) To control the surface level of the Dirty Tank in this System unit (preventing overflow), the float switch contacts are output. This function allows you to stop the system or output a surface rise warning alarm.
HIGH: Switch ON

- 9) This system unit is equipped with a pressure switch to detect the lowest pressure of the high pressure pump, and the contact points are output. This function can detect the normal operation of the high pressure pump.
Remove the cause and drive.

* Cause 1. Being clogged in the suction filter: Open the air breather plate and replace the suction filter or wash it.

Cause 2. Check the normal operation of the Supply Pump.
(Minimum pressure setting: 2 bar)

- 10) This System unit contains a Pressure switch to identify the cleaning period of the Element Filter.

When the Pressure Switch signal (0.8 bar) is output, clean the Element Filter.

Chapter 5 supply pump (coolant pump supply) operation.

- 1) This system unit is not equipped with supply pump.

In this case, selection of supply pump is very important. Be careful not to overflow the Clean Tank because the supply flow is too low or too high.

Select a pump suitable for the applied Cyclone filter capacity. (Recommended application pressure 1 ~ 3.5 bar)

- 2) If the flow rate of the supply pump is insufficient, it may cause the failure of the high pressure pump. In case of overflow, the clean tank may overflow. In this case, the drain hole is installed so that it can be discharged to the coolant tank on the

machine tool side. Pipes should be maintained at a sufficient slope so that they can flow naturally into the coolant tank on the machine tool side

Chapter 6 Cautions for Operation and Use

1. Precautions for commissioning after initial installation

1) Check that the piping of each part is tight and that the power of each pump is properly connected.

2) Turn Relief Valve counterclockwise to the maximum to lower the pressure.

3) Fill the clean tank to the upper limit of the coolant level. (The pump may be damaged if the high pressure pump idles while the coolant tank has insufficient coolant.)

4) Check the direction of rotation of the high pressure pump, Dirty pump, and Supply pump on the control panel on the machine for a short time (within 3 seconds).

If the rotation direction is reversed, you can change the direction of rotation by changing the two phases of the motor's U, V, and W.

5) While operating the high pressure pump,

turn the relief valve slowly clockwise to set the working pressure, then turn the lock nut to the right and fix it. Then, Close the relief valve cap

(Observe the pressure according to the nozzle diameter.)

6) The electrical connection of this system should be connected to the structure where the dirty pump and the supply pump work together when the high pressure pump is operated.

※ The idling of the high-pressure pump may cause fatal damage to the pump.

Make sure that the surface of the clean tank is full.

2. Cleaning the System Unit Filter

■ Cleaning the suction filter and the Dirty Tank

1) Suction filter is built in the high pressure pump inlet of this system unit.

Perform regular cleaning to maintain the performance of the pump.

(See Unit cover sticker)

Cleaning method: 1. Loosen the bolts of the air breather plate and insert your hand to

loosen the Suction Filter mounted on the pump inlet by turning it to the left.

2. After immersing in the cleaning agent, clean it by blowing air into the filter and reassemble it.

2) This system unit is divided between clean tank and Dirty tank. To maintain normal operation, perform regular cleaning to maintain the system unit's performance.

Regular cleaning is recommended, especially at the bottom of the Dirty Tank as sludges may be accumulated.

■ Cleaning the element filter

1) This system unit has an element filter

If a filter check alarm or a level low alarm (Red light on & off) happens the element filter must be cleaned and can be reused (option).

2) Cleaning and reusing the Element Filter periodically reduces maintenance costs.

(Recommend at least once a week)

3) If a filter check alarm or a level low alarm happens continuously even after the filter is

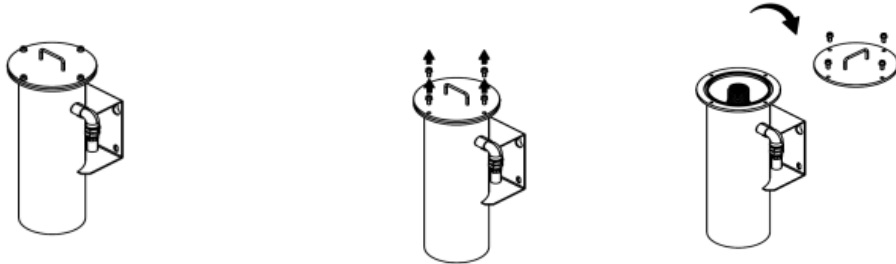
cleaned and installed,

This is because the sludges were stuck in the element filter and not fully cleaned.

Remove the element filter and replace it with new one

or clean it by brushing & blow it with air , then install it again

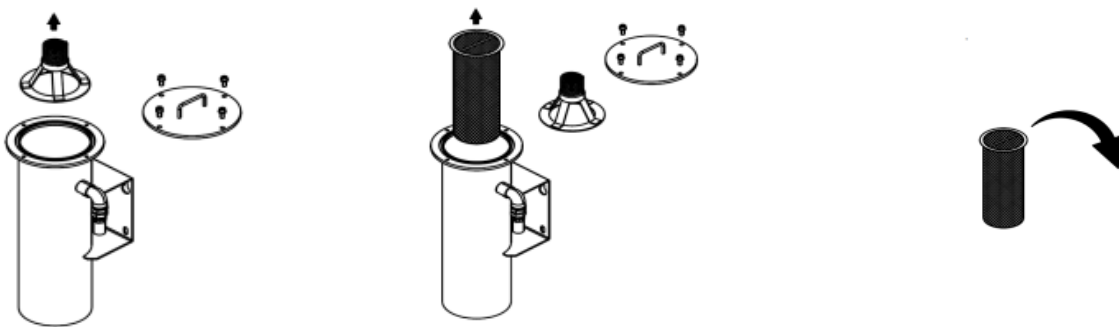
4) Replacement of Element Filter and cleaning tips



① Loosen the bolts and remove the cover from the top.

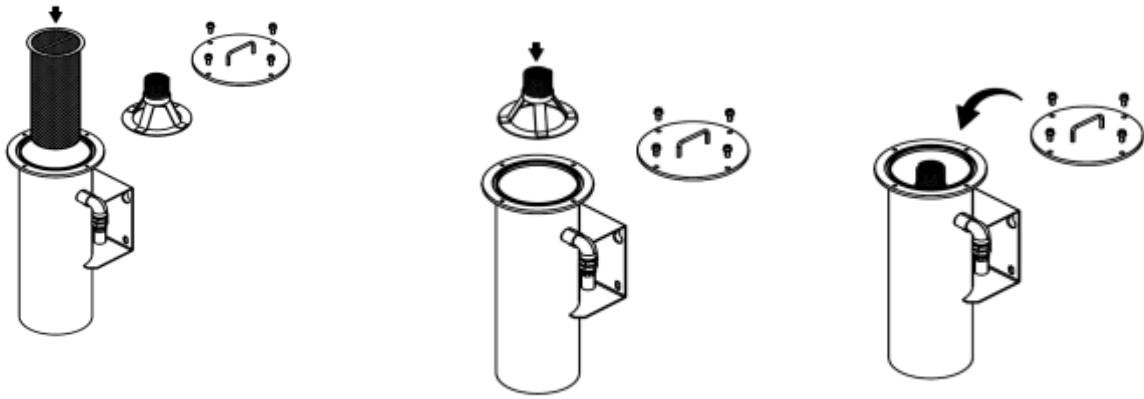
(Hexagon Wrench bolts M10*1.5p, 4EA)

(Press and hold the cover to prevent spring from splashing at this time.)



② Lift the filter support bracket and remove the element filter installed inside the filter tank.

③ Clean or replace the separated element filter. (Clean the filter with a cleaning agent and use an air gun to clean the filter inside.)



- ④ Insert the element filter into the filter tank and then insert the filter support bracket into the filter tank



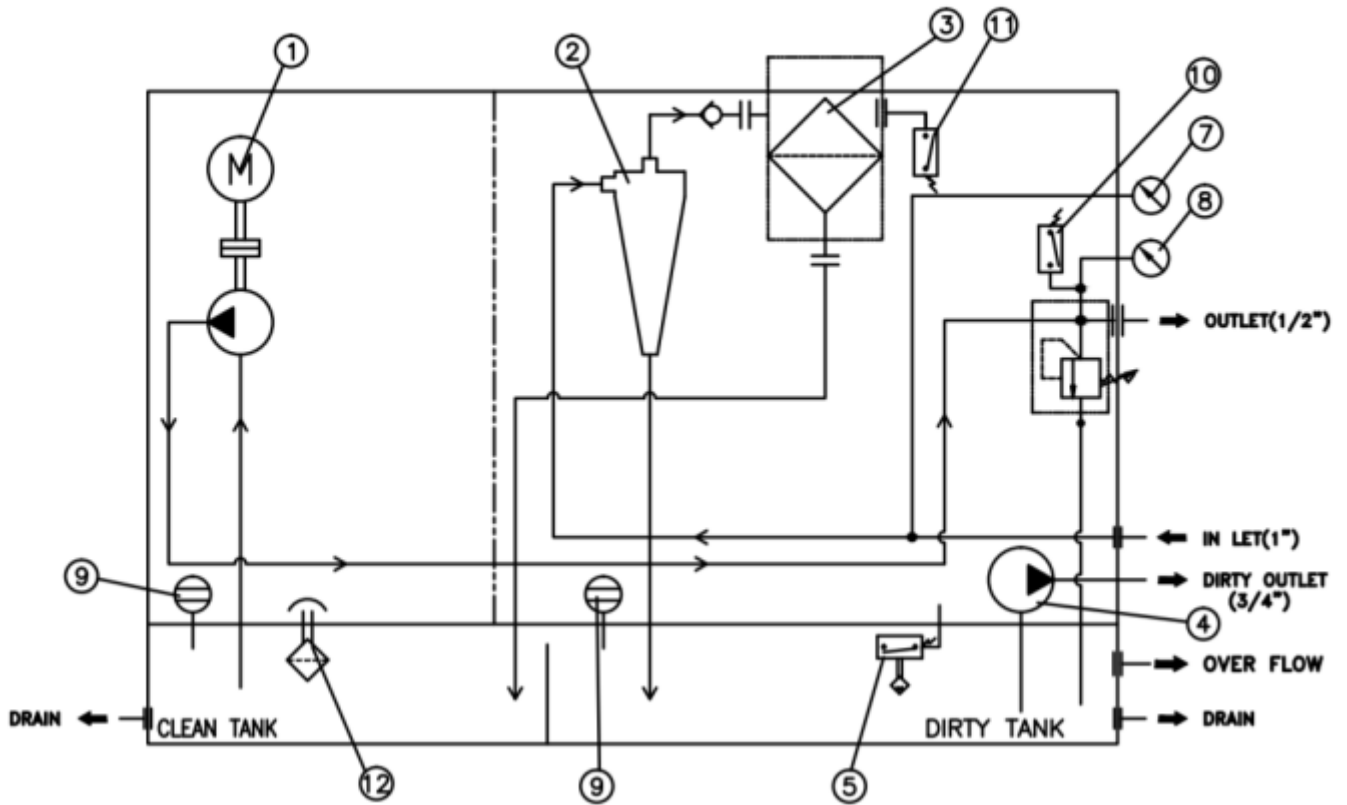
- ⑤ Press and close the spring-tight upper cover and tighten the bolt.
(At this time, Be careful not to damage the O-ring [G-180] for sealing between the filter tank and cover.)

■ Cause of problems and troubleshootings

Phenomenon	Cause	Trouble shooting
The high pressure pump is not operated	<ol style="list-style-type: none"> 1. No power (no operating sound) 2. The phases of input power don't match. (reversed Rotation of motor) 3. Motor does not rotate=Motor failure and damage 4. motor rotates but reduced pressure or discharge's failure 	<ol style="list-style-type: none"> 1. Check if the rated voltage is supplied (3Ø 220V) 2. Check the pump rotation direction and change the U.V.W. connection when turning in reverse direction. 3. Replace or repair the motor (request A/S) 4. Replace the pump (request for A/S)
Pressure switch signal output.	<ol style="list-style-type: none"> 1. Pressure detection time is short. 2. Pressure switch's failure 	<ol style="list-style-type: none"> 1. Increase the pressure detection time of the pump and set. 2. Check with the tester during high-pressure operation and replace the press switch (A/S request) if the contact points are not on.
Clean Tank (Tank is not filled with coolant)	<ol style="list-style-type: none"> 1. Supply pump is not working 2. Poor operation of the float switch 	<ol style="list-style-type: none"> 1. Check the Power supply to the Supply Pump 2. Check that the float switch is stuck or not Clean the administrative section of the float bar if it does not move properly. Check the contact points with the tester to check if there are any abnormal contacts. If the contact signal is not output, replace the float switch.
Clean Tank Over Flow (Tank's coolant overflow)	<ol style="list-style-type: none"> 1. Poor operation of the float switch 	<ol style="list-style-type: none"> 1. Check that the float switch is stuck or not Clean the administrative section of the float bar if it does not move properly. Check the contact points with the tester to check if there are any abnormal contacts. If the contact signal is not output, replace the float switch.

system circuit diagram

CIRCUIT DIAGRAM



- | | | | |
|---|---------------------------|----|---------------------------------|
| 1 | High pressure Pump | 7 | Pressure Gauge (Supply pump) |
| 2 | Cyclone Filter | 8 | Pressure Gauge (High Pre' pump) |
| 3 | Element Filter | 9 | Level Gauge |
| 4 | Dirty pump | 10 | Pressure Switch |
| 5 | Float Switch (Dirty tank) | 11 | Pressure Switch |
| | | 12 | Air breather |