

NOP Cyclone Filter Pump

(G-CI)

User's Instruction Manual

Cyclone type
Large-flow low-pressure coolant unit

Important

Read this manual thoroughly and carefully before installing or selecting a pump.

Follow all instructions carefully to ensure the correct and efficient installation and operation of the pump.

This manual contains recommendations and instructions on pump selection, installation, operation, and troubleshooting.

Failure to observe this manual prior to operation may result in personal injury and/or equipment damage.

Store this manual in a safe place for reference.



Nippon Oil Pump Co., Ltd.

User's Instruction Manual

User's Instruction Manual for NOP Cyclone Filter Pump (G-CI)

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For safe operation


Be sure to understand the safety countermeasures and strictly follow the precautions, and operating instructions stated in this manual for safe operation.


When you see the following symbols and titles in this manual, be alert to the potential for personal injury or property damage.


This manual uses the following symbols and titles to identify the risk and danger levels.

- | | |
|---|--|
|  Danger: | Failure to follow instructions will result in death or serious personal injury. |
|  Warning: | Failure to follow instructions can result in death or personal injury. |
|  Caution: | Failure to follow instructions can result in personal injury or pump and other equipment damage. |

 Danger
Do not operate the pump in potentially explosive atmospheres or high concentration of dust. Do not place a flammable liquid or article around the motor. It may cause an explosion or fire.
Make sure that the power is disconnected before installing a pump, performing maintenance work or inspections to avoid the risk of electric shock.
Transporting, installation, plumbing, wiring, operation, or maintenance work must be performed by personnel specifically knowledgeable in the respective task, and any legally regulated work must be performed by personnel properly qualified under the related law.

 Warning
Getting your fingers, hands or articles caught in parts of the drivetrain may cause unexpected injury.
Heat will build up in the motor and pump while in operation. Contact with hand may cause burns.
Ensure the power is disconnected prior to do any wiring work. Also take measures to avoid accidental power-on.
Connect the motor in accordance with the motor wiring diagram or the User's Instruction Manual to prevent fire and electrical shock.
Ground the equipment properly to prevent fire and electrical shocks due to electrical leakage.
The pump cannot be used for gasoline and other volatile liquids. They may cause an explosion or fire.
Pumping high temperature liquid may result in personal burns from a damaged pump or leaked liquid.

 Caution
Failure to install “ground fault interrupter” (GFI) or overload protection device may cause damage to the equipment or motor burnout.
Frequency of motor start-up/stop must be kept 1 time per minute. Frequent start-up/stop may cause burnout of motor.
NOP coolant unit is limited to indoor use only.
Make sure to use the predefined parts of suspension fittings whenever you lift the pump up. Check the position of suspension fittings from the drawing. During hoisting, it may fall down horizontally due to unbalance of the product.
Mounting pump in a wrong orientation will damage the motor. Install the pump unit in an upright position.
Mounting on an uneven surface or forced installation into misaligned mounting holes may damage the pump.
Do not install in locations where pump may suck tramp oil floating on the liquid surface or foam is generated. Installation in such locations may not only cause a significant loss in cyclone filter performance, but also a cavitation which damages the pump.
A pre-filtration, such as inserting a plate (screen-type) filter must be done to remove the large objects prior to the pump inlet. Recommended filter mesh size is 18 (about 1mm sieve size).
Suction of excessive amount of needle-like or wool-like swarf, which smaller than 3 mm, may even cause inlet port or venting impeller clogging.
If in-line filter is to be installed in the outlet line, it must be washed regularly. Continuous use of clogged filters may cause abnormal noise, vibration, inadequate discharge, and damage to the pump.
Suction of tramp oil or foam in the liquid will impair cyclone filter performance. Insert a partition, for example, to prevent the pump from sucking tramp oil or foam.
Pipes connected to the contaminant drain port must be as large as the port diameter. Also make sure that piping of contaminant drain line is no higher than 1 meter from the tank bottom vertically, and no longer than 3 meters horizontally. The piping layout should be as short and straight as possible and with as few bends as possible (Use of PVC pipe is recommended). Failure to follow and apply will result in discharge failure and may lead to pipe clogging or pump damage.
Inspect all valves, cocks, joints and the like before installation. Avoid using any component that has a small port or a cavity in the casting. Failure to follow and apply will result in contaminant discharge failure and may cause pipe clogging or pump damage.
Significant flow restriction (20 l/ min or lower) in contaminant drain port will impair the performance of cyclone filter and may damage the pump. Do not restrict the flow if pump would discharge a large amount of contaminant. It will result in contaminant discharge failure and may cause pipe clogging or pump damage.
If a valve is to be inserted in the contaminant drain line, select a gate type. A ball type will reduce the port diameter and may result in contaminant discharge failure and damage the pump.
Be sure to avoid setting up the contaminant drain pipe (hose) in locations where the dirty coolant coming through the contaminant drain line might cause impact on pump suction (such as suction of foam). Suction of foam may reduce flow in outlet line.
Tightening pipes above the specified torque value (listed in Table 3) may cause damage to the port.
Excessive use of thread-sealant tape on pipe thread or use of a liquid type sealant will reduce the friction resistance and may result in over-torque and damaging the port.
Incomplete flushing may result in the pump and connecting equipment failure.
Do not attempt to flush out the pipes after connecting to the pump.

 Caution
Test the pipes for air tightness before installing the pump.
Reverse pump rotation may cause liquid leaks or damage to the pump.
Never run the pump dry for 10 seconds or longer. If pump will not prime, stop the motor.
If an abnormal phenomenon is observed, stop the pump immediately and check for the defective areas. (See Table 4, P.19)
Use of liquid which doesn't offer lubricity, rust protection (such as tap water) or contains corrosive substances will damage the pump.
The seals of NOP coolant unit are made of fluoro carbon rubber. Check in advance with the liquid manufacturer (or distributor) for the compatibility with the material of seals. Use of incompatible liquid will cause liquid leakage.
Operation over the specified temperature range may cause motor burnout, pump damage and severe accident. It can also substantially shorten the pump life-time and cause a performance loss or liquid leakage.
liquid with higher viscosity will not just cause a performance loss in cyclone filter, but also increase motor output.
Use of work materials harder than HV 600, such as Inconel, Titanium alloys, Tungsten alloys, may shorten the pump life-time substantially, and result in pump performance decrease or liquid leakage.
Use of work materials, such as hardened steel, carbon fiber, glass fiber containing materials, carbon materials, may shorten the pump life-time substantially, and result in pump performance decrease or liquid leakage.
Use of materials, such as coating film, resin may not just cause a significant loss in filtration performance but also clog the cyclone filter.
Applying incorrect supply voltage or frequency may lead to motor burnout, abnormal pressure or abnormal flow.
Connect the pump with appropriate power supply frequency according to the model specifications. Connection with wrong frequency may lead to motor burnout, abnormal pressure or abnormal flow.
Operation at a slow speed (3000 min^{-1} or less) may cause pump malfunction.
The excess resistance in the outlet line will reduce the suction performance.
Entry of air into the inlet port will reduce suction performance.
Inlet port cleaning must be performed on a regular basis, continuous use of clogged inlet will cause abnormal noise, vibration, discharge failure, which result in the pump damage
Do not run the pump against a closed outlet. Or it will result in pump or motor damage.

Safety precautions

•Safety devices

- Install “ground fault interrupter”(GFI) or overload protection device on the motor power source without fail.
- Check the motor nameplate for the ratings, and set up and operate the motor within the specified ratings.
- Follow all the technical standards applicable to electrical facilities.

⚠ Caution: Failure to install “ground fault interrupter” (GFI) or overload protection device may cause damage to the equipment or motor burnout.

- To avoid pump damage, install a flow monitor, pressure sensor, or such other devices in the pump’s outlet line to detect dry running.
- The oil seals and packings are not usable perpetually.
- Install the pump in a safe location, or provide an protective cover or device that accidental oil leakage would not cause personal injury or equipment damage.

•Safety measures

- Keep children or other people incapable of judging risks away from the pumps.
- Furnish a protective cover or device over the drive section to prevent your fingers, hands, or other articles from getting trapped into the section.

⚠ Warning: Getting your fingers, hands or articles caught in parts of the drivetrain may cause unexpected injury.

- Do not contact a pump or motor during the operation, or immediately after the operation stops.

⚠ Warning: Heat will build up in the motor and pump surface while in operation. Contact with hand may cause burns.

⚠ Danger: Do not operate the pump in potentially explosive atmospheres or high concentration of dust. Do not place a flammable liquid or article around the motor. It may cause an explosion or fire.

Model Numbering System

TOP – YTH ① ② – ③ C G

① Motor capacity	1500 : 1.5kW	
② Motor type	W1 : AC415V/50Hz 3 phase induction motor IE3	
	R2 : AC230V/60Hz 3 phase induction motor IE3	
	W3 : AC200V/50Hz/60Hz 3 phase induction motor IE3	
	W4 : AC400V/50Hz 3 phase induction motor IE3	
	R5 : AC380V/50Hz 3 phase induction motor GB2	
	R6 : AC440V/60Hz 3 phase induction motor IE3	
	W7 : AC220V/60Hz 3 phase induction motor IE3	
③ Flow rate ※	50Hz	I135 : Impeller pump (5 stages/135L)
	60Hz	I132 : Impeller pump (2 stages/135L)
Filtering method		C : Cyclone type
Spec		G : Global spec

Pump installation

●Place of installation

⚠ Caution: NOP Cyclone Filter Pump is limited to indoor use only.

⚠ Caution: Make sure to use the predefined parts of suspension fittings whenever you lift the pump up. Check the position of suspension fittings from the drawing. During hoisting, it may fall down horizontally due to unbalance of the product.

⚠ Caution: Mounting pump in a wrong orientation will damage the motor. Install the pump unit in an upright position.

⚠ Caution: Mounting on an uneven surface or forced installation into misaligned mounting holes may damage the pump.

⚠ Caution: Do not install in locations where pump may suck tramp oil or foam floating on the liquid surface. Installation in such locations may not only cause a significant loss in cyclone filter performance, but also cavitation which damages the pump.

Figure 1: Pump mounting hole patterns

There are 2 mounting positions. Select either one of them considering the depth of your tank and the liquid level.

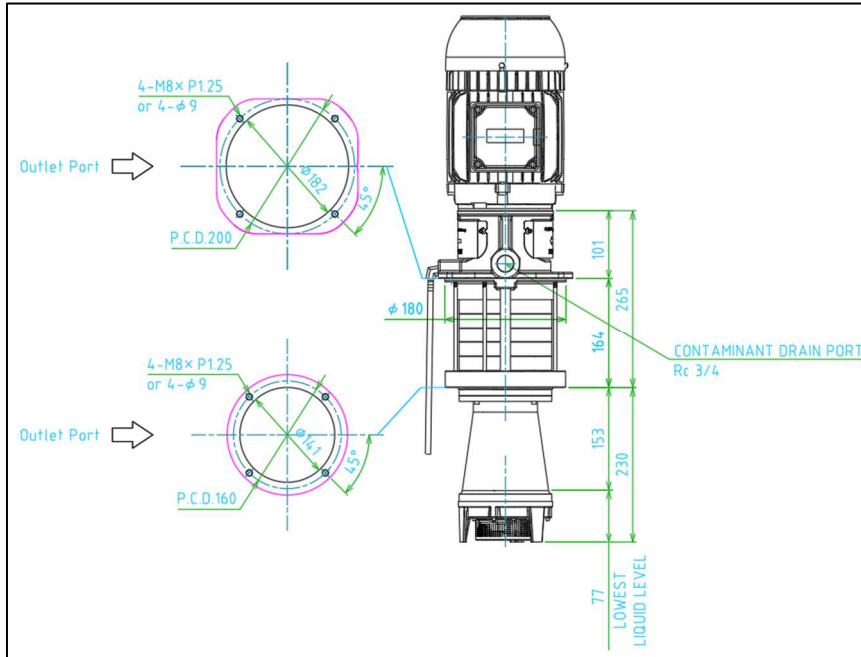
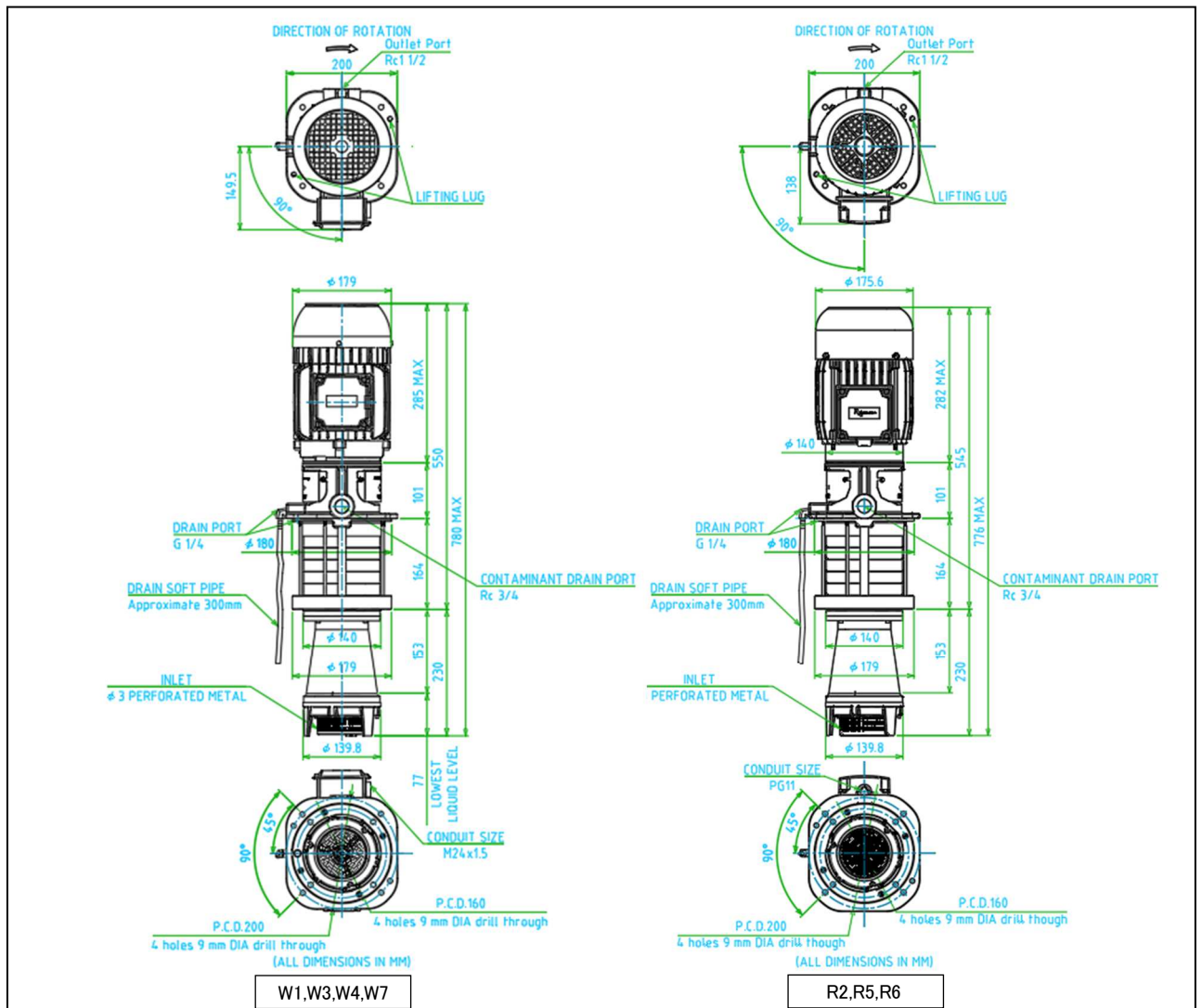


Figure 2: Pump mounting dimensions [There are two sizes available depending on the motor type.]



● **Space required for installation.**

Do not operate NOP coolant unit in a dusty, extremely high, or low temperatures environment. (See P. 16 for the ambient temperatures.) It is recommended to provide minimum clearances as illustrated for easy maintenance.

Position of pump inlet port

The pump is to be mounted in the tank maintained more than 1 mm from the tank bottom. If sediments of sludge, chip or other material larger than 3mm would accumulate at the tank bottom, provide a sufficient clearance to prevent the pump from sucking the sediments.

The pump must be at least more than 77 mm below the liquid level while the pump is running.

Being installed no deeper than 77 mm will allow air to be drawn into the pump, resulting in abnormal noise, impairing cyclone filter performance and pressure drop, and the pump will be damaged.

G 1/4 drain piping

If mounting the pump at middle flange, make sure to do proper drain piping to direct the liquid from G 1/4 drain line back to the tank.

Filters

⚠ Caution: A pre-filtration device such as a plate (screen-type) filter must be inserted to remove the large objects prior to the pump inlet.
The recommended filter mesh size is 18 (about 1mm sieve size).

All foreign objects larger than the perforations of the inlet port must be pretreated.
If higher filtration accuracy than shown in Table 1 above is required, install in-line filter in the outlet line.

Figure 3: Required clearances around the pump

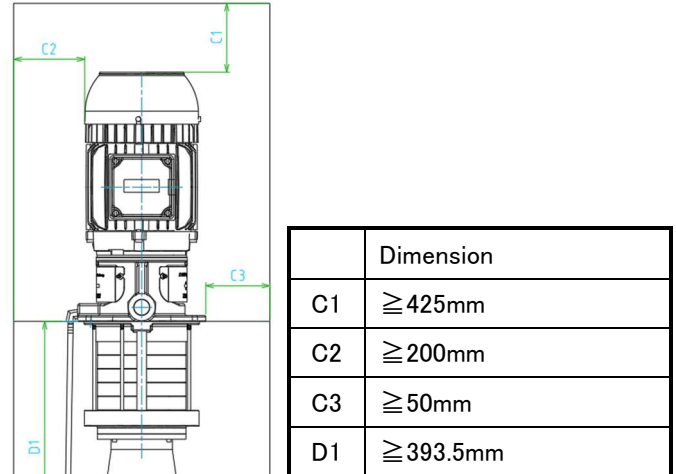
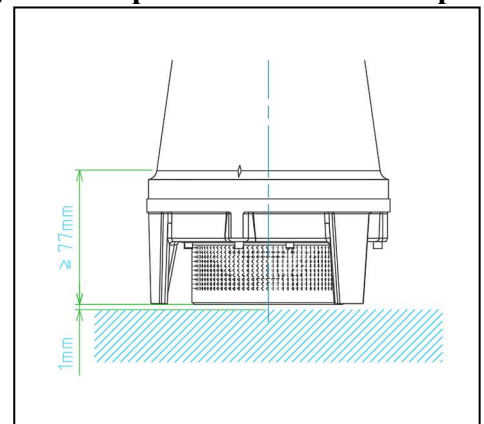


Figure 4: Gap under the bottom of pump



●Performance of built-in filter.

Table 1 : Filtering performance (Nominal value)

Inlet port	3 mm (Solids larger than 3 mm must be removed from the tank.)	
Cyclone filter	Water soluble coolant 100 μm	99.9 % (Specific weight 2.7)
	Straight oil 100 μm	80 % (Specific weight 2.7)

⚠ Caution: Suction of excessive amount of needle-like or wool-like swarf, which is smaller than 3 mm, may even cause inlet port or venting impeller clogging.

⚠ Caution: If in-line filter is to be installed in the outlet line, it must be washed regularly. Continuous use of clogged filters may result in abnormal noise, vibration, inadequate discharge, and damage to the pump.

⚠ Caution: Suction of tramp oil or foam in the liquid will impair cyclone filter performance. Insert a partition, for example, to prevent the pump from sucking tramp oil or foam.

Contaminant drain port

- After being separated by a cyclone filter, dirty coolant which contains contaminant will be discharged through the contaminant drain port.
- Filtering the dirty liquid discharged through the contaminant drain line will help maintain the liquid in the tank clean

Table 2: Contaminant drain port performance

Model	Flow rate	Discharge pressure
I135	20~35 L/min	0.02MPa
I132	25~40 L/min	

*These values are for reference only and not for guaranteeing the performance.

⚠ Caution: Pipes connected to the contaminant drain port must be as large as the port diameter. Also make sure that pipe layout of contaminant drain line is no higher than 1 meter from the tank bottom vertically, and no longer than 3 meters horizontally. The piping layout should be as short and straight as possible and with as few bends as possible
(Use of PVC pipe is recommended).
Failure to follow and apply will result in discharge failure and may lead to pipe clogging or pump damage.

⚠ Caution: Inspect all valves, cocks, joints and the like before installation.
Avoid using any component that has a small port or a cavity in the casting.
Failure to follow and apply will result in contaminant discharge failure and may cause pipe clogging or pump damage.

⚠ Caution: Significant flow restriction (20 ℓ/ min or lower) in contaminant drain port will impair the performance of cyclone filter and may damage the pump. Do not restrict the flow if pump would discharge a large amount of contaminant. It will result in contaminant discharge failure and may cause pipe clogging or pump damage.

⚠ Caution: If a valve is to be inserted in the contaminant drain line, select a gate type. A ball type will reduce the port diameter and may result in contaminant discharge failure and damage the pump.

⚠ Caution: Be sure to avoid setting up the contaminant drain pipe (hose) in locations where the dirty coolant coming through the contaminant drain line might cause impact on pump suction (such as suction of foam).
Suction of foam may reduce flow in outlet line.

Outlet port

· Pipes connected to the outlet port must be as large as the port diameter and pressure resistant type.

Piping for the pump

•Torque applied on pipe connection

The maximum torques permissible for pipe connections to NOP Cyclone Filter Pump are given in the table that follows:

Table 3: Maximum permissible torque by the pipe size

Pipe size, Rc	1 — 1/2"	3/4"
Torque N·m	150	60

⚠ Caution: Tightening pipes above the specified torque value (listed in Table 3) may cause damage to the port.

⚠ Caution: Excessive use of thread-sealant tape on pipe thread or use of a liquid type sealant will reduce the friction resistance and may result in over-torque and damaging the port.

•Connecting the pipes

- To prevent leaks and air entry, make sure all pipe connections are securely and completely airtight,
- Be sure to install pipe-support to keep the weight of pipes off the pump.
- During pipe-working, check the pipe lengths and angles carefully to prevent exertion of undue force on the pump by the pipes.
- Installation of a pressure gauge in the outlet line is recommended to monitor the pump operation.
- Installation of a stop valve, union joints, and such other fittings are also recommended for easy maintenance.

•Pipes and pipe joints

- All pipes must be cleaned thoroughly before connected to the pump. Some pipes may have dust from storage or threading chips remaining inside. Be sure to flush out all pipes to ensure that they are thoroughly clean before use.

⚠ Caution: Incomplete flushing may result in the pump and connecting equipment failure.

⚠ Caution: Do not attempt to flush out the pipes after connecting to the pump.

⚠ Caution: Test the pipes for air tightness before installing the pump.

Electric wiring

Electric wiring must be carried out by qualified personnel.

⚠ Warning: Ensure the power is disconnected prior to do wiring work.
Also take measures to avoid accidental power-on.

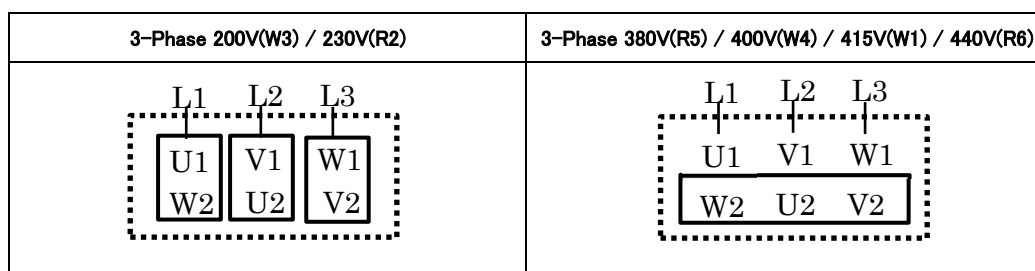
⚠ Warning: Connect the motor in accordance with the motor wiring diagram or the User's Instruction Manual to prevent fire and electrical shock.

⚠ Warning: Ground the equipment properly to prevent fire and electrical shocks from electrical leakage.

• Check the direction of the factory-installed motor rotation indicated on the nameplate which is attached to the motor frame or terminal box. Connect the motor accordingly.

(The factory-installed special motor (a 3-phase type) is, when the pump is viewed from the suction side, designed to rotate in counter-clockwise if wired as illustrated in the figure.5.)

Figure 5: Motor wiring diagram



For operation

•Start-up checklist

- Is the tank filled with liquid up to, or over the specified level? (See Fig.4, P9)
- Are the inlet, outlet and drain ports unblocked?
- Check for loose pipe connections.
- On the initial startup, turn the pump on and off quickly to confirm that the motor is running in the correct direction.

⚠ Caution: Reverse pump rotation may cause liquid leaks or damage to the pump.

⚠ Caution: Frequency of motor start-up/stop must be kept 1 time per minute.
Frequent start-up/stop may cause burnout of motor.

•Cautions for trial run

⚠ Caution: Never run the pump dry for 10 seconds or longer.
If the pump fails to prime, stop the motor.

Inspections

●Daily startup inspections

Check for liquid leakage, abnormal sound, and heating.

⚠ Warning: If an abnormal phenomenon is observed, stop the pump immediately and check for the defective areas. (See Table 4, P.19)

●Periodical inspections

•Periodical inspection must be performed at least once a year.

<Periodical inspection checklist>

- Outlet flow rate, pressure
- Flow rate of contaminant drain port (guideline: 20 L/min, minimum)
- Clogging of contaminant drain port
- Clogging of the inlet port (perforated metal)
- Leaks from pipe connecting parts
- Liquid level inside the tank (The level that would not allow pump to draw air)
- Amount of contaminant inside the tank (It is recommended to do the tank cleaning once in a half year)
- Concentration of water soluble coolant (Within the range which the manufacturer recommends)
- Viscosity of straight oils (22 mm²/sec or less) .
- Liquid temperature (-5°C ~ 60°C)
- Over-heating of pump motor

Storage

- Customers are recommended to keep spare parts in stock (pumps, motors and coupling) to avoid operational problems caused by an unexpected trouble or performance deterioration due to aging.
- Be sure to schedule and perform a periodical inspection.
(See “Periodical inspection”, P.14)
- If a pump is to be stored for an extended period of time, protect the pump against the internal rust by pumping lubricating oil of 15 mm²/s or less viscosity for three minutes to wet inside the pump. Put lids on the ports, wrap the unit in a vinyl bag, sealed it air tight and store. If storing for six months or longer, check for exterior rust and free rotation once a month.
- If a pump has to be restarted after the long-term storage check it out for unusual noise, heating, and other abnormalities on its first run. Stop operation immediately when any of these mentioned above occurs.

⚠ Warning: Ensure the power is disconnected prior to performing maintenance work or inspections. Also take measure to prevent accidental power-on.

Warranty

- The term of warranty is for **one year after the delivery to customer's designated location, or 5000 hours of operation, whichever occurs first.**
- The warranty does not cover troubles resulting from operation beyond the specifications or other external causes.
- The product warranty is applicable only to operation within the product specifications and in accordance with this "User's Instruction Manual."
- The warranty does not cover, and consequently we will not be responsible for, any disassembly, alteration made to a product by the customer.
- The warranty will not cover pump troubles arising out of any causes which are not the responsibilities of, or are not attributable to Nippon Oil Pump Co., Ltd., including disasters and the troubles caused by other than the subject pump,
- The warranty covers the particular product as delivered. We are not responsible in anyway whatsoever for secondary loss arising out of a problem with a product that we have delivered.

For selecting a pump

●Operating method

- The pump must be limited to continuous operation. Reduce the number of ON/OFF times to a minimum if intermittent operation is unavoidable.

●Required flow rate

- Check your requirements in accordance with the catalogs, drawings, or other materials.
- The discharge rate is subject to the type, temperature, and pressure of the liquid,
- Selecting with an adequate margin of outlet pressure and flow rate is recommended.

●Required pressure

- Check your requirements in accordance with the catalogs, drawings and other material.
Note: The pump must be run within the maximum pump operating pressure and the motor output rating.

●Selecting a pumped liquid

Water-soluble coolants or straight oils with kinematic viscosity of 22 mm²/sec or less.


⚠ Caution: Use of liquid which doesn't offer lubricity, rust protection (such as tap water) or contains corrosive substances will damage the pump.

⚠ Caution: The seals of NOP Cyclone Filter Pump are made of fluoro carbon rubber. Check in advance with the liquid manufacturer (or distributor) for the compatibility with the material of seals.
Use of incompatible liquid will cause liquid leakage.

⚠ Warning: The pump cannot be used for volatile liquids like gasoline, nor fuel oils like kerosene. They may explode or cause fire.


● **Operating ambient temperatures**

- The permissible ambient temperature range is between -10°C and 50°C.

 **Caution:** Operation over the specified temperature range may cause motor burnout, pump damage and severe accident.

● **Temperature range of the pumped liquid**

- The permissible temperature range for the liquid is between -5°C and 60°C.
- When start-up, keep the temperature gap between the liquid and ambient temperature within 40°C.

 **Warning:** Pumping high temperature liquid may result in personal burns from a damaged pump or leaked liquid.

● **Viscosity range of the pumped liquid**

- The permissible viscosity range is 22 mm²/sec or less


Caution: Use of liquid over the specified viscosity range (up to 22 mm²/sec) may shorten the life-time substantially and cause performance loss or liquid leakage.


Caution: Use of liquid with higher viscosity will not just cause a performance loss in cyclone filter, but also increase motor output.


Note: Control a liquid temperature on assumption that viscosity may rise substantially under the winter low temperature.

● **Compatible work materials**

- Maximum permissible hardness of work materials is within HV 600

 **Caution:** Use of work materials harder than HV 600, such as Inconel, Titanium alloys, Tungsten alloys, may shorten the pump life-time substantially, and result in pump performance decrease or liquid leakage.

 **Caution:** Use of work materials, such as hardened steel, carbon fiber, glass fiber containing materials, carbon materials, may shorten the pump life-time substantially, and result in pump performance decrease or liquid leakage.

 **Caution:** Use of materials, such as coating film, resin may not just cause a significant loss in filtration performance but also clog the cyclone filter.


For selecting a motor


●Required power for the pump.

- Select a pump with an adequate margin with reference to the performance curve in the catalog.
- The power required by a pump is subject to the pressure, flow rate and viscosity of the liquid.
- A liquid with higher viscosity requires a greater power.

Note: Select motor on the assumption that viscosity may rise substantially in the winter low temperature.

●Power supply voltage and frequency.


 **Caution:** Applying incorrect supply voltage or frequency may lead to motor burnout, abnormal pressure or abnormal flow.

 **Caution:** Connect the pump with appropriate power supply frequency according to the model specifications. Connection with wrong frequency may lead to motor burnout, abnormal pressure or abnormal flow


 **Caution:** Operation at a slow speed (3000 min^{-1} or less) may cause pump malfunction.


Suction performance

The pump performance will be reduced by resistance in the inlet line or air suction. Pay attention to the liquid surface level of a tank and clogging of the inlet port (Perforated metals).

 **Caution:** The excess resistance in the outlet line will impair the suction performance.

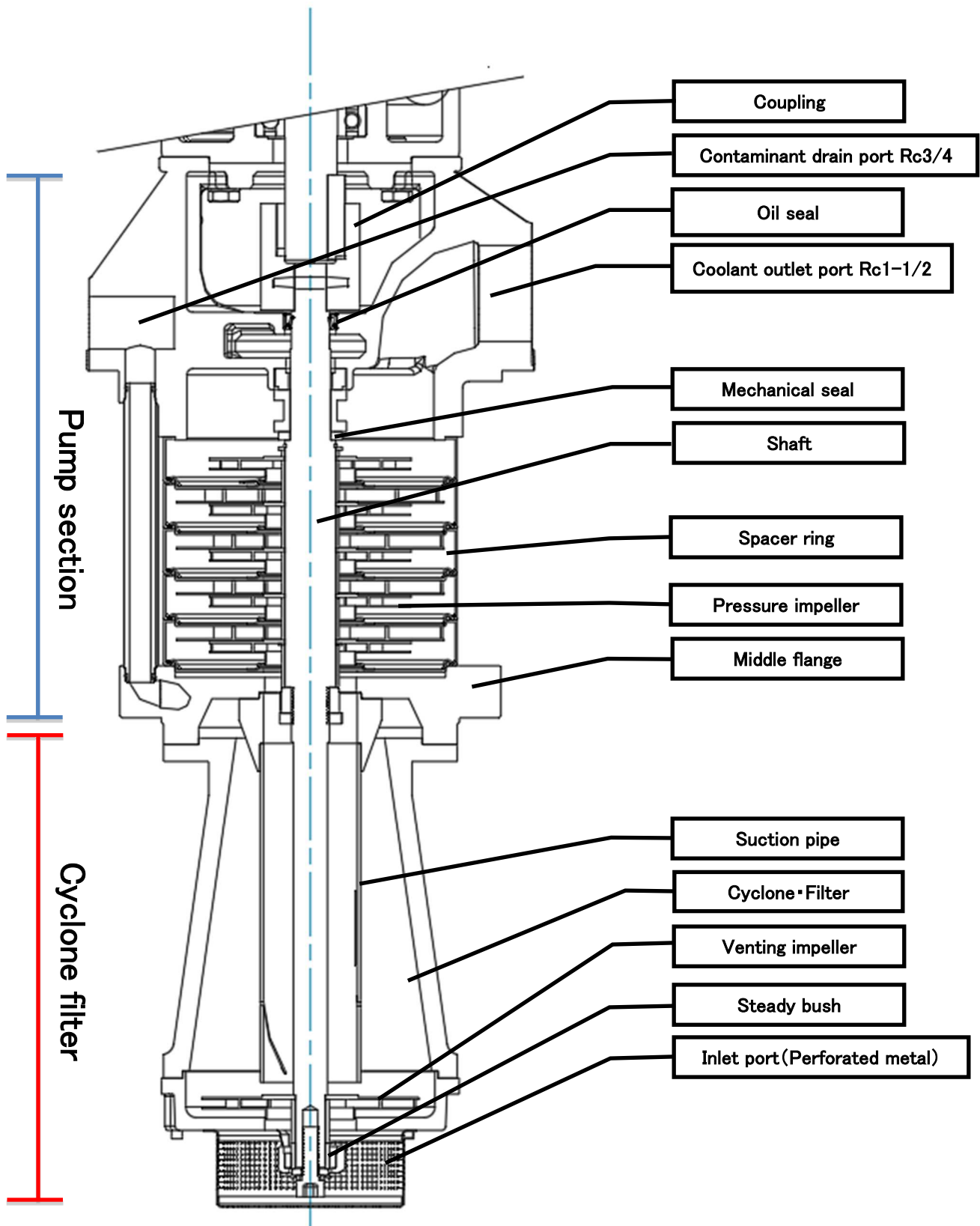
 **Caution:** Entry of air into the inlet port will reduce suction performance.

 **Caution:** Inlet port cleaning must be performed on a regular basis, continuous use of clogged inlet will cause abnormal noise, vibration, discharge failure, which result in the pump damage

 **Caution:** Do not run the pump against a closed outlet. Or it will result in pump or motor damage.

Internal construction

Figure 6 : Names of pump part



Troubleshooting guide

If you experience no oil discharge, a high pitched sound, or such other abnormal phenomena soon after the installation, check the troubleshooting chart in the table that follows.

If you cannot find out the cause of trouble, consult us or a dealer.

Table 4: Pump troubleshooting chart

Symptom	Possible causes	Check methods	Possible remedies
No discharge from outlet port.	Motor failure.	Are wires at motor loose or disconnected? Do operation test for motor individually.	• Repair or replace pump.
Insufficient flow or pressure. Abnormal noise.	Motor is wired incorrectly or disconnected.	Are wires at motor loose or disconnected? Check direction of rotation.	• Rewire motor in a correct rotation indicated on label.
	Coupling is damaged.	Check connected area between pump and motor.	• Replace coupling.
	Liquid surface level decreases.	Check liquid amount in tank.	• Refill tank with enough liquid. • Control liquid level with level sensor.
	Inlet port is clogged.	Check the inlet port for clogging.	• Periodical cleaning on and around inlet port. • Insert a plate filter prior to the inlet port as a pre-filtration.
	Air drawn into pump or pipes.	• On the first-run, after long term storage or immediately after replacing coolant liquid, pump often doesn't discharge due to the trapped air.	• Perform air-bleeding on pump or piping. Perform air-bleeding in front of check valve if the one is installed in outlet line.
	Clogging or failure of impellers.	• Check the impellers for clogging or damage.	• Remove accumulated swarf. • Repair or replace pump.
	Aeration.	• Is pump sucking foam or air?	• Take measures to prevent suction of air or tramp oil. (ex. Change pump location, use partition or defoamer)
	Pipes connected to outlet port is too large.	Is outlet discharge flow rate sufficient?	• Use smaller pipes.
No discharge from contaminant drain port	Contaminant drain port piping is too long or too high.	Pull off a pipe from the contaminant drain port and check if liquid is being delivered properly or not.	Piping must be no higher than 1 m from the tank bottom vertically, and no longer than 3 m horizontally.
	Clogging of contaminant drain port.	Check inside the pipe for clogging.	• Clean inside the pipe periodically. • Make piping layout with less bend. • Use larger pipe.
	Clogging inside the cyclone	Check inside the cyclone for clogging.	• Remove swarf. • Repair or replace pump.
	Clogging or failure of impellers.	Check the impellers for clogging or damage.	• Remove swarf. • Repair or replace pump.
Liquid leaks.	Oil seal deterioration or damage.	Does liquid leak from drain (Rc 3/8) port?	Repair seal. Repair or replace pump.
	Packing deterioration or damage.	Does liquid leak from connected area?	Repair or replace pump.
Breaker or thermal trips out.	• Motor failure. • Wiring errors.	• Check motor wiring. • Does motor start?	• Rewire motor. • Repair or replace motor.
	Overloading.	Are motor output rating and coolant viscosity adequate?	• Use motor with higher output rating. • Use pump with lower capacity. • Lower the pressure setting. • Change the coolant types.
	Coolant type is incompatible. (Viscosity is too high, lubricity insufficient, Pump failure)	• Is motor rotating? • Are liquid viscosity and lubricity adequate? • Is there abnormal noise?	• Repair or replace pump. • Change the types of coolant you use.

NOP® Nippon Oil Pump Co., Ltd.

Revision number: AGCI202503

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