

Quick Start Manual for DRY VACUUM PUMP CR16B,CR30B

《For safe use》

This quick start manual is prepared to help users to quickly understand the product's operating method and display content. Please read the instruction manual beforehand for detailed usage, caution on product use, and safety information to use the pump correctly.

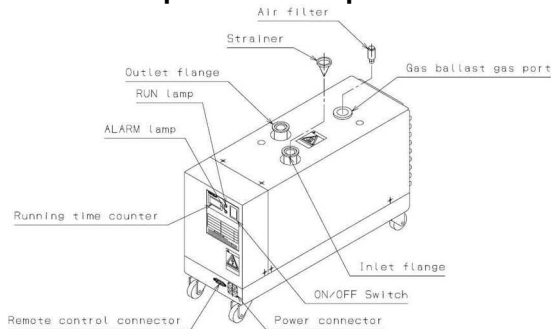
You can download the instruction manual from Ulvac website.
<https://showcase.ulvac.co.jp/ja>

1. Acceptance and Storage of the Pump

Upon delivery of this product, check first that the delivered is exactly what you have ordered and there is no break or damage through transport or the like.

Name	Specification	Quantity	Remark
Power Connector	NET Connector (Nanaboshi)	1 set	NET-244-PF
Remote Connector	D-sub 15pin (DDK)	1 set	17JE-23150-02(D8A)-CG
Instruction Manual	English and Japanese	1 copy	Plain paper
Air filter	For gas ballast	1 ea	1/4 inch
Guard	For Power Connector	1 ea	

2. Name and description of each part



- Inlet flange : To be connected to vacuum chamber or pipe.
- Outlet flange : Outlet of exhaust gas.
- Gas ballast gas port : To be used to introduce air or CDA*, N2 gas if intake gas contains moisture. Several optional parts are prepared.
*CDA : Clean Dry Air.
- ON/OFF switch : To start / stop the pump.
- RUN lamp : The lamp lights when the pump starts.
- ALARM lamp : The lamp lights when ALARM is given.
- Running time counter : To show running hours.
- Power connector : Metal connector for power supply.
- Remote control connector : D-sub connector (15-pin) for remote signal.
- Power connector guard : Guard of the power supply connector. This product is approved permanently connected equipment and must be used this guard.

3. Ambient Condition for Storage, Install and Operation

As precise clearances are provided with this machine, be sure to fulfill the following for its storage, install and operation;

- ① Ambient temperature and humidity for storage :
-10°C to 60°C, less than 90%RH
- ② Ambient temperature and humidity for operation :
15°C to 40°C, less than 80%RH
- ③ Height (for both storage and operation) : Lower than 1,000 meters altitude
- ④ External vibration (for both storage and operation) :
Vibration acceleration less than 114dB (0.5G)
- ⑤ Miscellaneous (for both storage and operation)
 - a. There shall be no corrosion behavior or explosive gas.
 - b. There shall be no freeze or dew formation.
 - c. There shall be no dust.
 - d. It shall be in house.
 - e. Another pump shall not be put on the Pump.
The Pump shall not be laid down nor put touching its motor edge face or oil gauge edge face with the ground.
 - f. There shall be no direct sun beam.
 - g. Heat source shall be put away from the Pump.

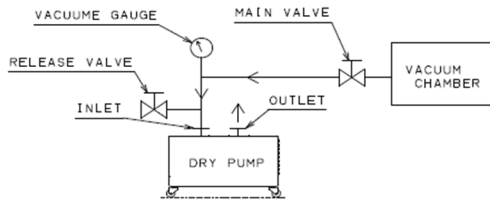
- Install the Pump in a horizontal position where there are less dust and humidity. As for the
- Decide where the Pump is installed. Ensure enough space around for power connecting.
- Mounting so that the operator can easily turn on and off the ON/OFF switch.
- Inlet and outlet ports are sealed with protection cap. Do not remove the cap until ready to use the Pump.
- This unit is air-cooled. Keep adequate ventilation if use the pump in the housing of equipments.

4. Piping for inlet side

- Connect for pipe with NW type O-ring and clamp after removing inlet flange cap.
- Design the inlet side pipe with enough consideration to conductance.
- Connect the vacuum chamber, pipe and valve after washing inside them thoroughly. Time to reach to ultimate pressure could be longer or ultimate pressure could be worse if connected with being contaminated. Use gloves and do not touch the parts with bare hands, which are used in vacuum state.
- Do leak test of equipment and inlet side pipe to reduce the amount of total leak as much as possible (Do not pressurize greater than 50KPaG to the pump)
- Insert the expansion joint in case this Pump is equipped on the equipment which is sensitive about vibration.
- Install an isolation valve between equipment and this pump, to prevent backflow of air to the equipment when pump stopped.
- Install a vent valve between isolation valve and pump, if gas inside of pump needs to be replaced with outside air or dried up when pump stopped.

5. Piping for exhaust side

- Remove cap from outlet flange.
- Maximum outlet pressure of this pump is atmosphere pressure. Excessive pressure exerted on the pump causes failure. Open full of the valve if valve is installed in the exhaust side
- Connect to the exhaust duct from the outlet of the pump if intake gas contains moisture. Protect the environment surrounding the pump.



6. Electrical Connection

- A) The electric power source for this pump is Single phase 100-115V, Single phase 200-240V, or 3-phase 200-240V, (50/60Hz).
- B) The electric power capacity should be more than 1.5kVA. This unit doesn't equipped with a mechanism to cut off the power supply. Place a MCCB (Molded Case Circuit Breaker) in supply end. Rated current of the MCCB is shown in following table.

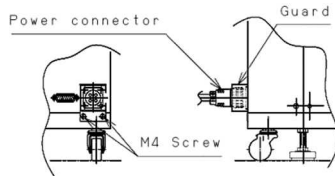
Power supply	3-phase, 200-240V	Single phase 200-240V	Single phase 100-115V
Power supply capacity	1.5kVA		
Rated breaker	5A	5A	10A

- C) Solder power supply cable to plug of power connection connector as shown in the table below. Make sure wire size is applicable wire size.

Pin No.	3-phase Power	Single phase
X	R phase	L phase
Y	S phase	N phase
Z	T phase	No use
G	PE/GND	PE/GND

Pump model	CR16B	CR30B
Receptacle maker	Nanaboshi Electric Mfg. Co., Ltd.	
Receptacle part No.	NET244-RM	
Compatible plug	NET244-PF	
Compatible wire size	AWG#14 (2.0 mm ²)	
Rated current	15A	

- D) Mount a guard to power connector after connection.



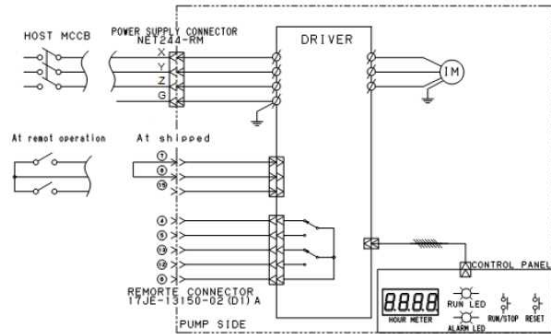
7. Wiring for remote control

Pin assignment				
No.	I/O	Item	Specification	
1		N.C		
2		N.C		
3		N.C		
4	OUT	Start check	CLOSE: At stop	OPEN: Running
5	OUT	Start check	CLOSE: Running	OPEN: At stop
6	OUT	OUT COM		
7	IN	Pump start	CLOSE: Run	OPEN: Stop
8	IN	IN COM		
9		N.C		
10		N.C		
11		N.C		
12	OUT	Alarm	CLOSE: Alarm	OPEN: Normal
13	OUT	Alarm	CLOSE: Normal	OPEN: Alarm
14		N.C		
15	IN	Alarm reset	CLOSE: Reset	

Specifications

Connector maker	Dai-ichi Denshi Ind., Ltd.
Connector part No.	17JE-13150-02 (D1) A connector
Compatible	17JE-23150-02 (D8A) -CG
Compatible wire size	AWG #22 Use the shielded cable.

- A) A voltage of 12VDC is applied to the input system on the pump side. Prepare a no-voltage contact.
- B) The pump side of the output is a no-voltage contact. Use the signal voltage within DC28V/1A.
- C) When starting and stopping this Pump by remote, wire signal wire to the plug of remote connector. It is possible to start and stop this pump by a contact signal.
- D) Pins 7-8 of remote connectors are short-circuited when delivery. Use plug in a state of being short-circuited, if this pump is not run by remote operation.
- E) The noise radiated from cable should be reduced for conforming to EMC directive. Ferrite core and Shielded cable should be used for wiring. The radiation noise from cable varies depending on the relationship with other built-in electrical components, the wiring condition, the layout condition, and soon. Please verify yourself whether your machine or system conforms to EMC directive.



Reference system diagram of remote control

8. Operation

8-1. Check points and Preparations before Operation

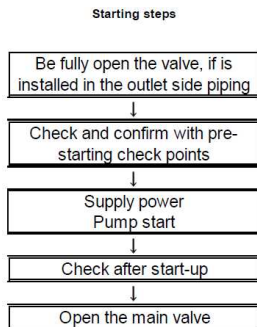
- 1) The valve in the outlet side piping line should be fully opened.
- 2) The main valve should be operated smoothly. After checking the valve operation, the main valve should be fully closed.

8-2. Operation Start

8-2-1. Local operation

During local operation, keep the remote connector plug delivered with the Pump being connected.

- 1) Supply power by turning on primary side MCCB (Molded Case Circuit Breaker).
- 2) Push on ON/OFF switch. Cooling fan starts, and operation lamp lights up. Pump rotation becomes steady within about 15 seconds increasing its rotation gradually. If the operation lamp is flashing, please check whether the plug of the remote connector is mounting.



8-2-2. Remote operation

- 1) Supply power by turning on primary side MCCB (Molded Case Circuit Breaker).
- 2) Become a state of flashing the operation lamp by pushing ON/OFF switch (stand-by state). ON / OFF state has keep also power is off (self-holding).
- 3) Turn on switch wired to the remote connector. Cooling fan starts, and operation lamp lights up. Pump rotation becomes steady within about 15 seconds increasing its rotation gradually.

8-3. Check points and adjustments after starting

After the pump is started up, check the following points

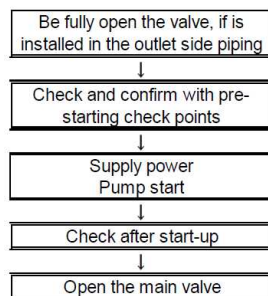
- 1) Check there is no abnormal vibration and noise.
- 2) In case of processing condensable gas, please warm-up operation.
- 3) In case of use of N2 gas purge, please supply N2 gas.
- 4) Open the main valve gradually.

8-4. Operation Stop

Follow these steps to stop the pump.

- 1) In order to prevent the back (reverse) flow of the atmospheric air or the handling gas, fully close the main (isolation) valve at suction piping side.
- 2) If the handling gas contains condensable gas or water vapor, the pump inside has to be dried. Please open the "Vacuum release valve" to introduce inert gas (atmospheric air), then continue to operate the pump for about 5 minutes.
- 3) Turn off the ON/OFF switch. In case of the remote control, turn off the start signal. The dry vacuum pump stops and the operation lamp turns off. Then, cooling fan will stop after 10 minutes
- 4) Turn off primary side MCCB (Molded Case Circuit Breaker).

Starting steps



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You can download the instruction manual from here.