

Spec.No. KRF110-V-01E-1

Orion Trade Name DRY PUMP

Orion Model KRF110-V-01

Date June.25.2009

APPD	CKD	DWN
<i>F</i> <i>Yamada</i>	<i>y.</i> <i>Takahashi</i>	<i>T.</i> <i>Kobayashi</i>

1. Warranty

1-1. Warranty information

When the breakdown occurs by any chance in the guaranteed term because of our clear responsibility, I will repair by the following free of charge. (note)It limits it when using it in Japan.

It wishes actual expenses to be borne responsibility for the adjustment exclusion item. (The alternative part transportation fee and the serviceman movement cost, etc. are included. )

1-2. Warranty period

The product shall be warranted for a period of one year from the date of purchase, or for 3000 hours of operation, whichever comes first.

1-3. Items exempted from warranty

Consumable parts and periodic replacement parts.

Fault caused by careless handling or improper use and maintenance. (Operation not following the specifications and the instruction manual. Operation under abnormal environmental conditions.)

Fault caused by fire, flood, lightning stroke, abnormal voltage or unforeseen disasters.

Fault caused by repair or modification not performed by ORION or ORION authorized service contractors.

Change of appearance, such as damage or deterioration caused in general use.

Secondary damages caused by the fault (Incidental damages such as loss, inconvenience, and commercial loss resulting from the failed product).

(Note) In case of a fault or an accident, contact the dealer with the model name and serial number.

## 2. Consumable parts / Periodic replacement parts

(1) Consumable parts (Parts to be replaced depending on the state at the time of inspection)

Name of Parts	Parts Number	Qty/ unit	Inspection period	Replacement criterion
Filter element (Inlet side)	04041878010	1	1 week	When damaged, or dirt cannot be removed by blowing air.
Liner *1	040028390 0	To be decided by actual positioning	Replacement of vane	When damaged.
Gasket (A)	04002846010	2	Removal of suction case and delivery case	When damaged or worn.
Gasket (B)	04000020010	3	Removal of suction case and delivery case	When damaged or worn.
Rubber packing	04006914010	1	Replacement of element	When damaged or worn.
Packing	04001458010	1	Replacement of element	When damaged or worn.
Spring tube	04042925020	1	Replacement of element	When damaged or worn.
Spider	04101313010	1	6 months	When it was cracked or damaged

\*1 The second digit from the right is subject to thickness.

0.2t(white) 1, 0.1t(black) 2, 0.05t(yellow) 3, 0.03t(red) 4

## (2) Maintenance of plastic parts affecting safe operation

Replace the following plastic parts that may affect safe operation promptly when any damage or deformation is found. Failure to do so may cause injury.

Name of Parts	Parts Number	Qty/ unit
Front cover 110	03101446010	2

## (3) Replacement parts (Parts to be replaced at regular time intervals)

Name of Parts	Parts Number	Qty / unit	Exchange time
			Operation under normal pressure.
Vane	04100653010	6	5,500
Bearing	0A000333000	2	5,500

\* The indicated blade replacement period is recommended in order to help prevent breakdown due to blade wear, and assumes average blade wear at 60Hz operation; specific performance is not guaranteed. The blade should be replaced soon if performance decreases or noise levels increase.

\* When vanes are replaced, replace bearing at the same time. Use ORION specified bearings that are lubricated with special grease.

\* Use the maintenance kit for replacement parts.

NAME of Parts	Parts Number	Items	Pcs / kit
Maintenance kit 110 Assembly	04101348010	Vane	6
		Bearing	2
		Liner (white)	2
		Liner (black)	2
		Liner (yellow)	4
		Liner (red)	6

## (4) Motor Maintenance Cycle (An estimated indication of when motor replacement might be necessary. Actual motor lifetime will depend on specific operating conditions.)

Part Name	Part Number	Specifications	Qty	Maintenance Cycle
Motor	0A001676000	Three phase 3.7kW 6P	1	20,000h

\* Indicates the time when the chance of failure due to wear increases. The motor does not necessarily require replacement after this time; the actual replacement time will depend on the operating conditions and environment of the particular installation. Please have the motor replaced when operation becomes abnormal.

## 3. Specifications

Model		KRF110-V-01	
Frequency	Hz	50	60
Designed capacity *1	L / min	1 8 5 0	2 2 0 0
Continuous operative vacuum *2	kPa	60or less	
Ultimate vacuum *3	kPa	90or more	
Diameter of piping connection		Rc1 1/4	
Motor	Phase · output · pole	Three-phase · 3.7kW · 6P	
	Frame no. / heat resisting class	132S · B	
	Rated voltage – frequency	200V-50/60Hz 220V-60Hz	
	Rated current (A)	16.2/15.6 14.6	
Setting for thermal protection *4	A	16.2/15.6 14.6	
Mass	kg	120	
Painting color		Black (except motor)	
Installation condition (Suction air)	Installation site	Indoor	
	Permissible ambient temperature	0to40	
	Permissible ambient humidity	65 ± 20% (JIS Z8703)	
	Conditions	Conditions where there is no corrosive and explosive gas exist. Clean air without vapor and dew condensation, and less dirt and dust.	
Operation noise *5	dB	74	75

\*1 Designed capacity: It is the theoretical value calculated from capacity. Please use the pressure-flow rate diagram for the actual flow rate.

\*2 Continuous operative vacuum: Operative range of vacuum. Install the gauge and controller to the pump or the piping, and use the Dry Pump at the continuous operative vacuum or less.

\*3 Ultimate vacuum: Continuous operation is not possible at maximum ultimate vacuum of the pump. It is used as model selection calculation.

\*4 Use the thermal set value as a target since the apparatus is different individually.

\*5 The operation noise is the actual measured value at the continuous operative vacuum, not the warrant value.

EC DECLARATION OF CONFORMITY



**ORION**

ORION MACHINERY CO., LTD.  
Phone +81-26-245-8537 Facsimile +81-26-245-4151  
246 Oaza Kotaka, Suzaka-shi, Nagano-ken, 382-8502 JAPAN

**EC DECLARATION OF CONFORMITY**

We hereby declare that the following our product conform with the essential health and safety requirements of EEC Directives.

Product : DRY PUMP  
Model No. : KRF Series  
(KRF15, KRF25, KRF40, KRF15A, KRF25A, KRF40A  
KRF04A, KRF08A, KRF70, KRF110)  
Manufacturer : ORION MACHINERY CO., LTD.  
246 Oaza Kotaka, Suzaka-shi, Nagano-ken,  
382-8502 JAPAN  
Directives : Machinery Directive 98/37/EC and 2006/42/EC  
Low Voltage Directive 2006/95/EC

The above product has been evaluated for conformity with above directives using the following European standards. The technical construction file (TCF) for this product is retained at the above manufacturer's location.

Machinery Directive / Low Voltage Directive:

EN ISO12100-1:2003, EN ISO12100-2:2003, EN ISO14121-1:2007,  
EN 1012-2:1996, EN 60204-1:2006, EN ISO13732-1:2006, EN 983:1996  
others

Signature : 

Date : 2009.05.25

Name/Title : Toru Kaneko/General Manager

Being the responsible person appointed and employed by the manufacturer.

#### 4. Precautions

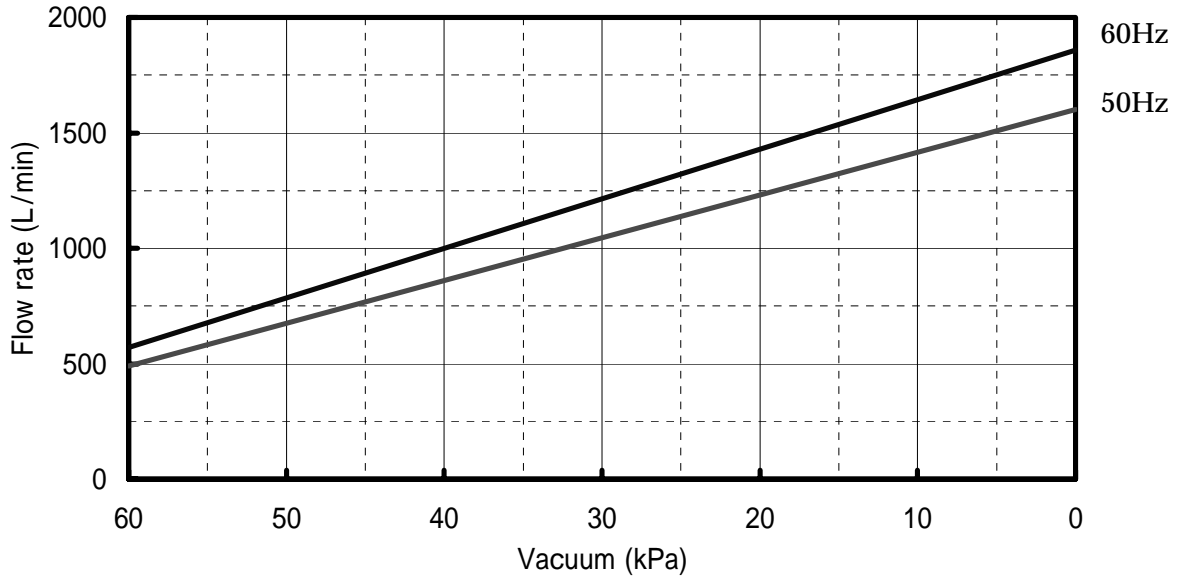
- (1) Observe precautions, and operate the product within specifications.
- (2) Read the instruction manual prior to installation, operation, maintenance and inspection of the product. Especially pay attention to safety.
- (3) The vanes may get damaged if the residual pressure reverses the rotation when the pump stops. A check valve must be installed within 50 cm from the inlet port or exhaust port for protection.
- (4) Be sure to install the product horizontally on the flat surface.
- (5) Operating the product in an enclosed space may cause malfunction due to heat generated from the pump. Provide good ventilation around the product, so the ambient temperature does not exceed the permissible level.
- (6) Be sure to clean the filters periodically. Failure to do so may cause clogging and result in trouble due to overload.
- (7) Wiring work has to be performed by qualified personnel according to applicable laws and in-house regulations.
- (8) Be sure to install an overload protection such as a thermal relay in the electric circuit.
- (9) Allowable intermittent power supply voltage fluctuation range is  $\pm 10\%$  of the specified voltage; allowable sustained supply voltage fluctuation range is  $\pm 5\%$  of the specified voltage.
- (10) Be sure to use the product 1,000m or below above sea level.

#### 5. Accessories

D type compound gauge	60	1 piece
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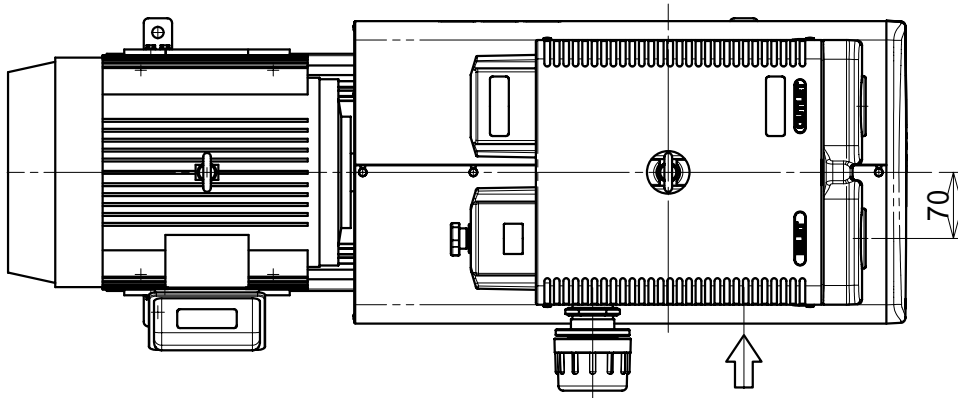
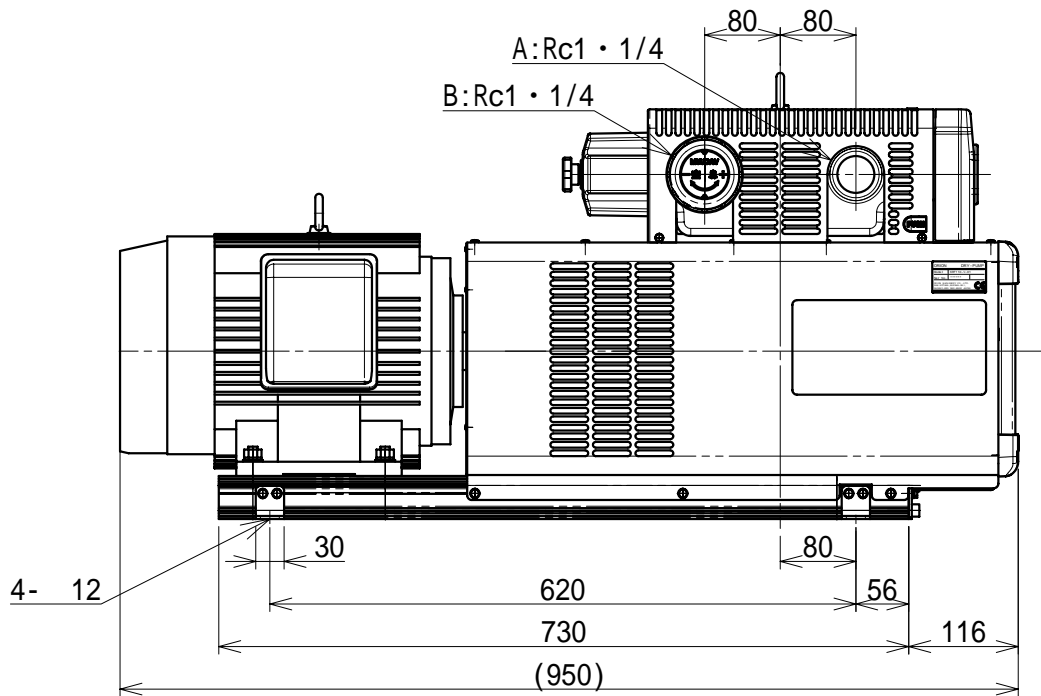
6. Pressure-Flow rate diagram

KRF110-V-01  
Vacuum Specification

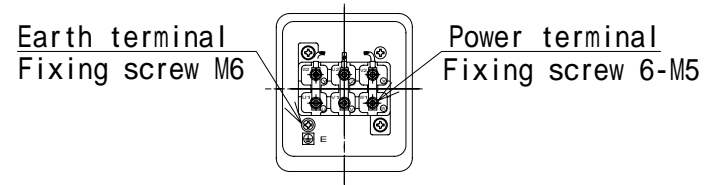


Conditions: 1 atmospheric pressure  
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The vacuum controller and the inlet port can be attached to A and B.



Detail of terminal box

