

Hitachi
Oil-free Scroll Compressor
SRL-7.5CB
Engineering Sheet

Specifications No.: BCX00039-04

Date: 30 July, 2021

Hitachi Industrial Equipment Systems Co., Ltd.

Safety Precautions

Improper use of the compressor may result in an accident or injury. Carefully read this document before proceeding with installation, operation, maintenance and inspection of the compressor, and follow the instructions.

Important information about safety includes a symbol described as below.

Graphic Descriptions:

 **WARNING** WARNING indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

 **CAUTION** CAUTION indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.

These safety precautions are important propositions about safety of the compressor. Take safety measures in accordance with local laws and regulations in the region the compressor to be used. Hitachi shall assume no responsibility for anything resulting from disregard to these safety precautions.

General Safety Precautions

WARNING

- Do not use the compressor to compress any gas other than air.
- Do not use the compressor to breathing air application.
- Prepare a spare machine or alternative equipment in case of failure or defect of the compressor, when using the compressor to an important facility.

CAUTION

- Discharged air may contain materials contained in suction air such as oil and dust, and abrasion powders of sliding parts in the compressor.

Installation and Operation Safety Precautions

WARNING

- Do not run the compressor out of working range of pressure and rotation speed.
- Do not run the compressor in an environment of explosive gas, flammable gas, explosive dust, or saw dust.
- Do not touch the compressor when running because of the rotating parts and high temperature parts.
- Do not touch the compressor immediately after end of operation because of high temperature parts.

CAUTION

- Do not install the compressor to high place with a risk of falling.

Maintenance and Inspection Safety Precautions

WARNING

- Ensure that the power supply has been cut and compressed air in the compressor has been released before performing the maintenance and inspection.

CAUTION

- Do not modify the compressor.

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1 Specifications

1.1 General Specifications

Model	SRL-7.5CB	
Compression Method	Rotary Type Displacement, Single Stage	
Bearing Lubricating Method	Grease Lubrication (Compression Chamber Unlubricated)	
Cooling System	Forced-air Cooling (by Built-in Cooling Fan)	
Drive System	Belt Drive	
Suction Gas	Air	
Suction Gas Pressure	Atmospheric Pressure	
Rated Point ¹⁾	A	B
Maximum Pressure ²⁾	0.8 MPa (116 psig)	1.0 MPa (145 psig)
Capacity FAD ³⁾⁴⁾	0.85 m ³ /min (30.0 cfm)	0.68 m ³ /min (24.0 cfm)
Rotation Speed	3700 min ⁻¹	3100 min ⁻¹
Input	7.5 kW (10 hp)	
Standard Control Pressure ²⁾	0.65-0.8 MPa (94-116 psig)	0.8-1.0 MPa (116-145 psig)
Discharge Port Size	R1/2 (ISO7-1, JIS B 0202-1999, JIS B 0203-1999)	
Pulley	Attached (Effective Diameter: Ø131 mm)	
Belt	Not included (Recommended type: 3VX (JIS K 6368-1999), SPZ (ISO 4184-1992))	
Suction Filter	Attached (Nominal Filtration Accuracy: 10 µm)	
Ambient Temperature ⁵⁾	0 to +40°C (+32 to +104°F)	
Ambient Humidity	Not greater than 95% RH without condensation	
Rotating Direction	Counter Clock Wise seen by Pulley Side	
Length × Depth × Height	421 × 439 × 354 mm (16.6 × 17.3 × 13.9 inch)	
Weight	28.0 kg (62.0 lb)	

Note:

- 1) Refer to the section 2.1 about Rated Point and Working Range.
- 2) Maximum Pressure and Standard Control Pressure refer to the pressure on the discharge port.
- 3) Capacity FAD is converted value to the suction condition at suction pressure 101.3 kPa(abs) (14.7 psia), temperature 20°C (68°F), relative humidity 65%.
- 4) Tolerance of Capacity FAD is more than -6% of rated value on above table. Guaranteed value of Capacity FAD is determined in a separate agreement.
- 5) Refer to the section 4.5 about the cautions of temperature rise around the compressor when the compressor installed in a cabinet.
- 6) Specifications on above table are applicable at an altitude of sea level (0 m). Refer to the section 3.2 about limitation by altitude.
- 7) Scope of Supply: Oil-free Scroll Compressor.

- These specifications are applied to Hitachi Oil-free Scroll Compressor, Model: SRL-7.5CB.
- Hitachi will inform our customers promptly in case changes occur in the product, in order that we improve our products.

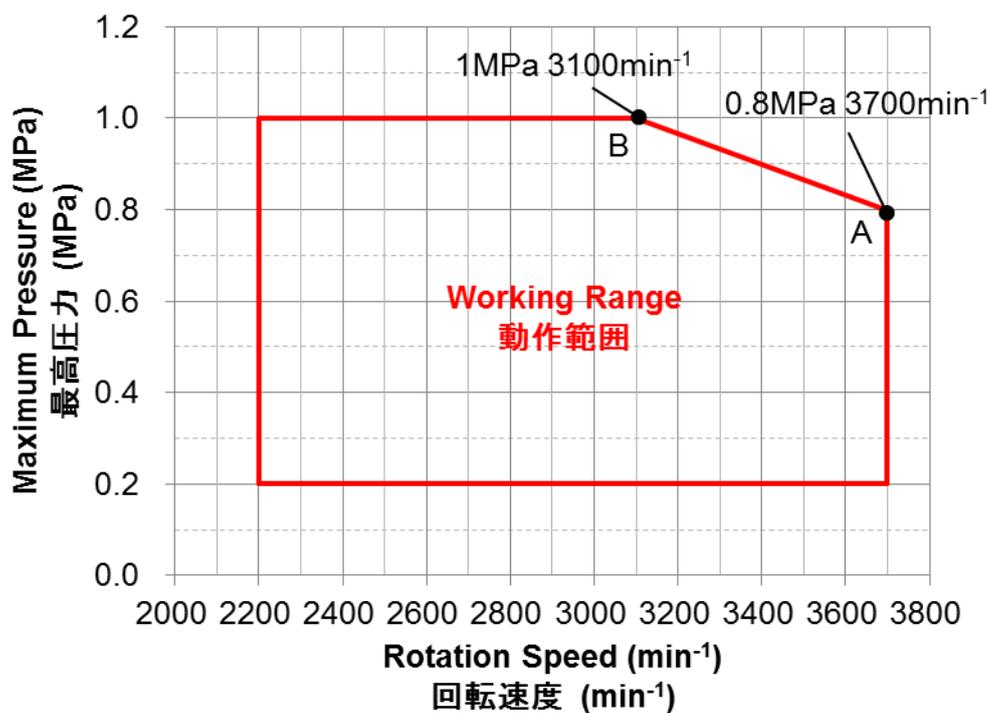
1.2 Class Zero Certification

- The quality of discharged air from the compressor has been certified as conforming to ISO8573-1:2010[-:-0].
- The certification test is conducted to a representative model of Hitachi packaged compressor after 1 hour warm-up operation. Contact Hitachi for detailed information.

2 Performance

2.1 Working Range

- Allowable rotation speed of the compressor depends on maximum working pressure. Determine the rotation speed with reference to the following chart.
- Refer to Section 3 about limitations for use.
- Refer to Section 5 about maintenance and inspection.

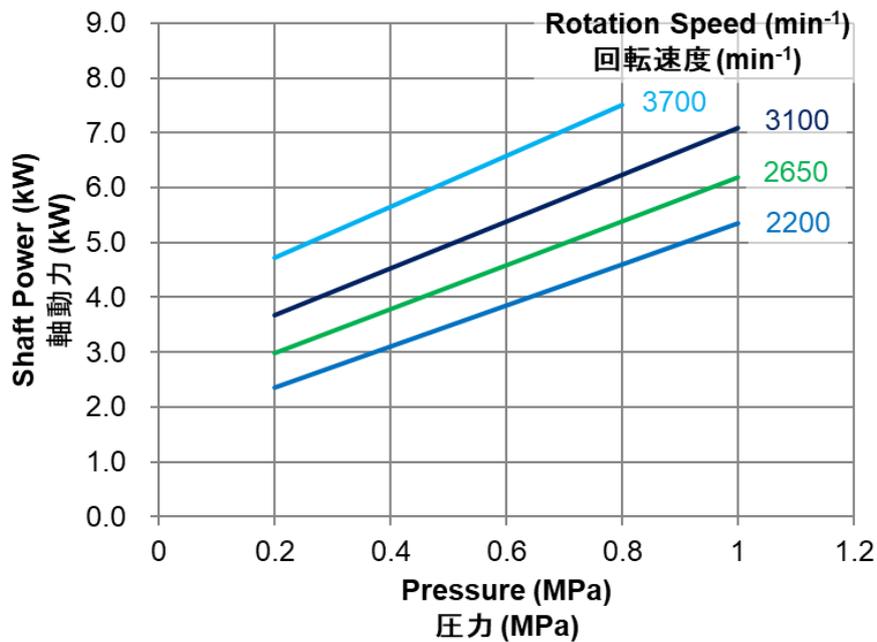
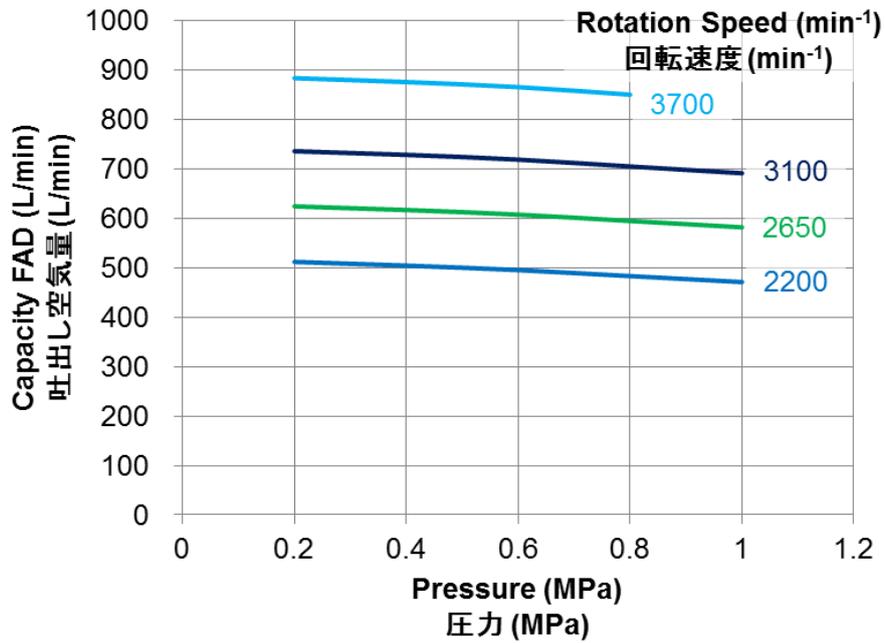


Working Range

Note:

- 1) The points A and B indicate the rated points. Refer to the section 1.1 about general specifications.

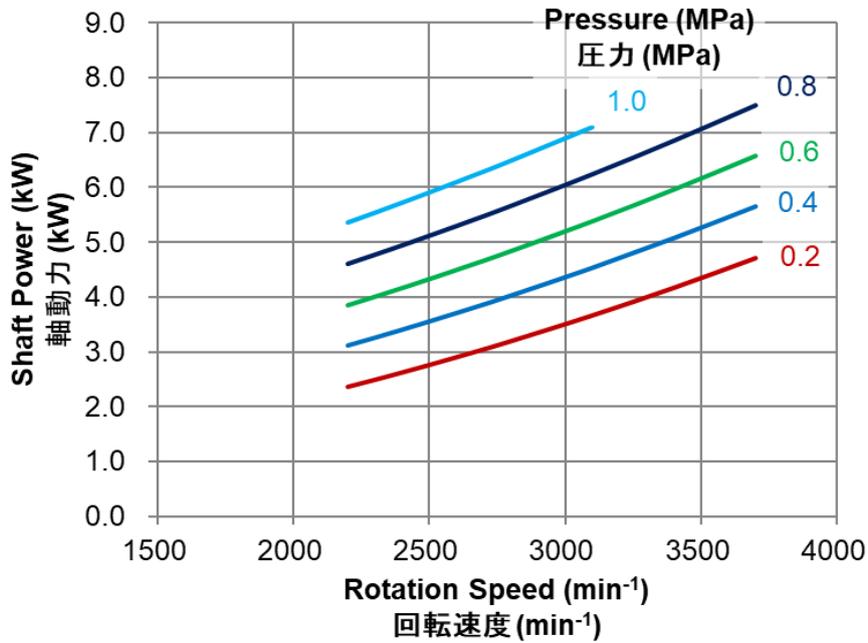
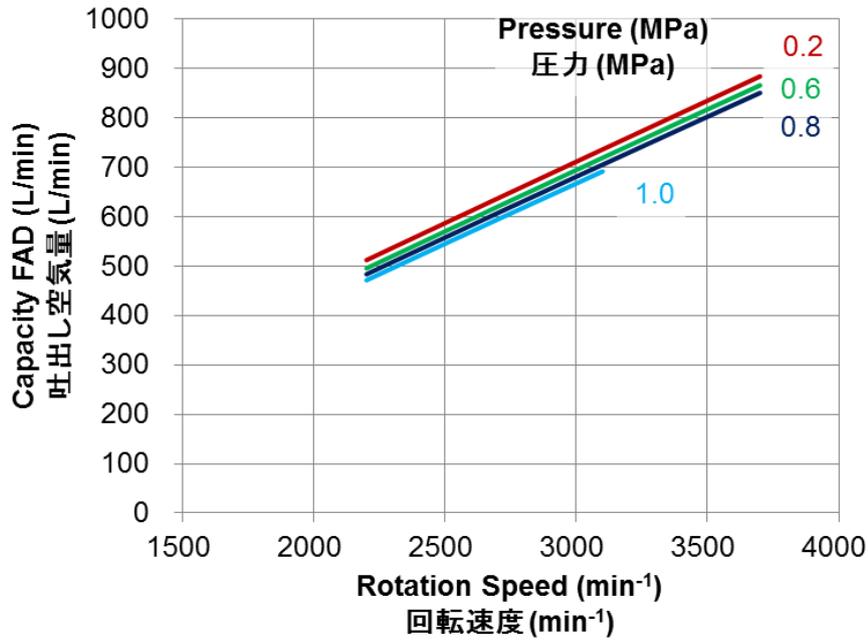
2.2 Performance Curve



Performance Curve

Note:

- 1) Capacity FAD is converted value to the suction condition at suction pressure 101.3 kPa(abs) (14.7 psia), temperature 20°C (68°F), relative humidity 65%.
- 2) Performance curves are for reference. Refer to the section 1 about rated value. Contact Hitachi about the performance not described in the figures.

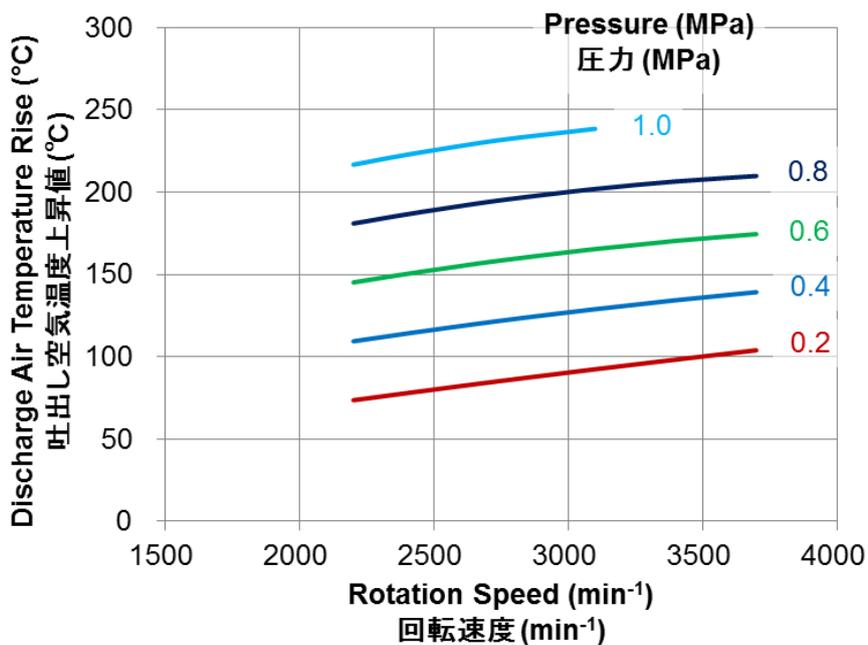
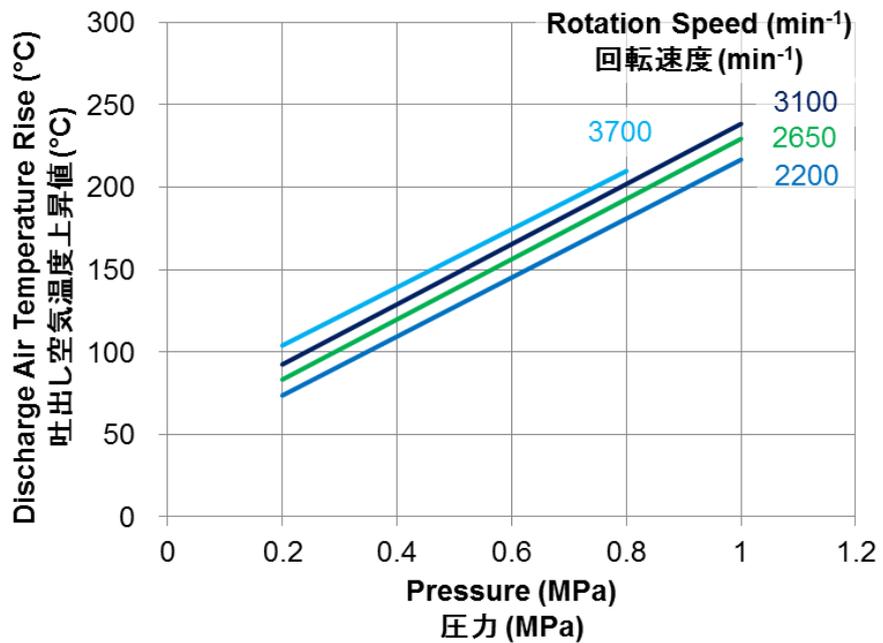


Performance Curve

Note:

- 1) Capacity FAD is converted value to the suction condition at suction pressure 101.3 kPa(abs) (14.7 psia), temperature 20°C (68°F), relative humidity 65%.
- 2) Performance curves are for reference. Refer to the section 1 about rated value. Contact Hitachi about the performance not described in the figures.

2.3 Discharge Air Temperature Rise



Discharge Air Temperature Rise

Note:

- 1) Measurement point of discharge air temperature is outlet of the delivery pipe. Refer to the section 4.5 about the cautions of discharge air temperature.
- 2) Discharge Air Temperature Rise is temperature rise from suction air. It is based on the condition that no restriction of cooling air exhaust, and increases depending on installation environment.
- 3) Discharge Air Temperature Rise is for reference and not guaranteed value.

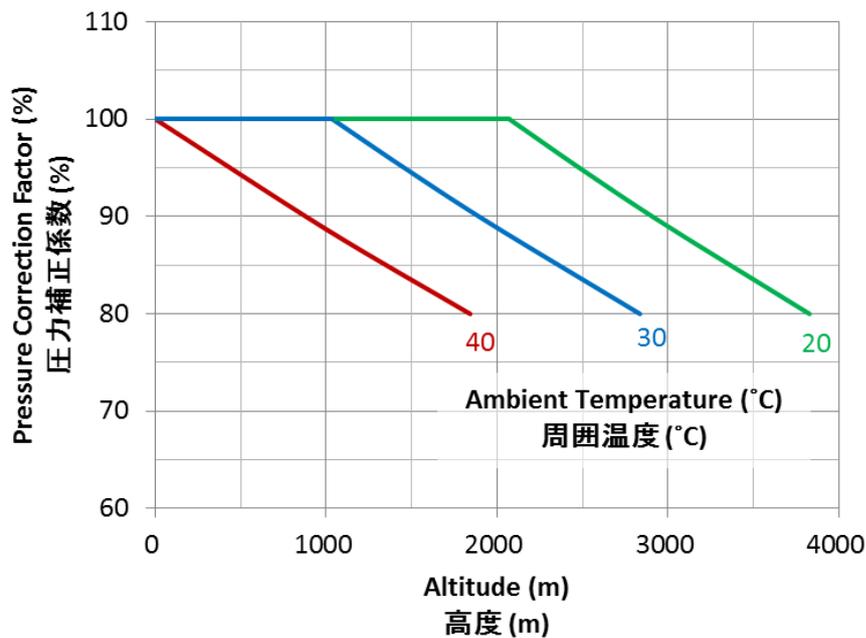
3 Restrictions on Use

3.1 Use Environment

- Follow the instructions below about use environment.
 - Do not expose the compressor to rain water or high humidity where condensation occurs.
 - Do not expose the compressor to salty air, significant oil mists, or bromine.
 - Do not expose the compressor to corrosive gas such as acid, chlorine, ozone, sulfurous acid, and ammonia, or organic solvent such as benzene, and toluene.
 - Do not run the compressor in an environment of explosive or flammable gas such as acetylene, propane gas, organic solvent, or explosive dust such as saw dust.
 - Operation in dust environment such as iron powder, sand dust, powdered dust, wood chips, textile waste, stone powder, or fine iron powder fumes, causes reduction of the compressor life. Shorten the maintenance and inspection term in section 5 in dust environment.

3.2 Limitation by Altitude

- Maximum pressure of the compressor is limited by altitude and ambient temperature. Correct the maximum pressure on section 2 by using the correction factor with reference to the following chart.



Limitation by Altitude

3.3 Limitation by Ambient Temperature

- Allowable ambient temperature for operation is not greater than 40°C (104°F). Contact Hitachi about the operation in ambient temperature over 40°C (104°F).

4 Instructions for Installation

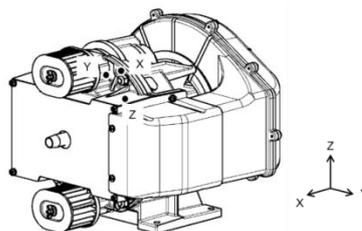
- The instructions for installation below relates to general usage. Follow local laws and regulations in the region the compressor to be used.
- Refer to section 1 about general specifications, section 2.1 about working range, section 3 about restrictions on use.

4.1 Safety Protection

- Ensure enough strength of peripheral parts. Be careful that the resonance of peripheral parts, especially pipes, occurs when the compressor starting-up.
- Ensure enough heat-resistance of peripheral parts, because of high temperature discharge air.
- Install a safety valve to avoid failure caused by abnormal high pressure.
- Install safety protection device from rotating objects such as belts and pulleys.
- Install safety protection device from hot parts such as discharge pipe.
- Safety protection device to avoid excessive discharge air temperature rise is recommended to be installed.

4.2 Fixing and Connection

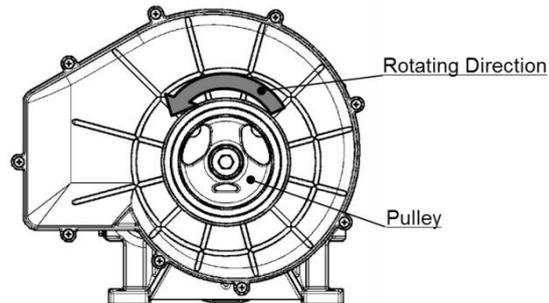
- Install the compressor to the horizontal and solid location.
- Suppress the vibration to allowable level by installing vibration suppression device such as rubber vibration isolators.
 - Allowable acceleration: not greater than 30 m/s^2
 - Allowable amplitude: not greater than $250 \mu\text{m}$ (half amplitude)
- Vibration suppression device to protect the compressor from external vibration is recommended to be installed.
- Do not install heavy parts to the discharge port to avoid failure caused by vibration.
- Follow the following procedures to tighten the discharge pipe.
 - 1) Tighten the discharge pipe with hands until it stops rotating. Do not use a wrench at this stage.
 - 2) Put a reference line on the discharge pipe in order to count the number of turns.
 - 3) Tighten the discharge pipe with additional 3 to 3.5 turns using a wrench.
- Ensure heat resistance, strength and allowable bending radius of the flexible tube or rubber hose to be used for the connection of air circuit.
- Install a check valve and prevent reverse rotation more than 1 second when the compressor stops, to avoid failure caused by reverse flow of compressed air.
- Prevent drain from flowing back to the compressor and install draining device and countermeasure for freeze, because drain occurs when compressed air cooled.
- Do not prevent flow of cooling air excessively when installing the aftercooler on the exhaust path of the compressor. Refer to section 4.5 about minimum required air flow.



Recommended Measurement points of Vibration

4.3 Belt and Rotating Direction

- Use the belt showing on section 1 for connecting the compressor and a motor.
- Use the belt on proper tension to avoid decrease in bearing life.
 - allowable tension: 25.5-28.4 N
- Arrange the rotating direction counter clock wise seen by pulley side.



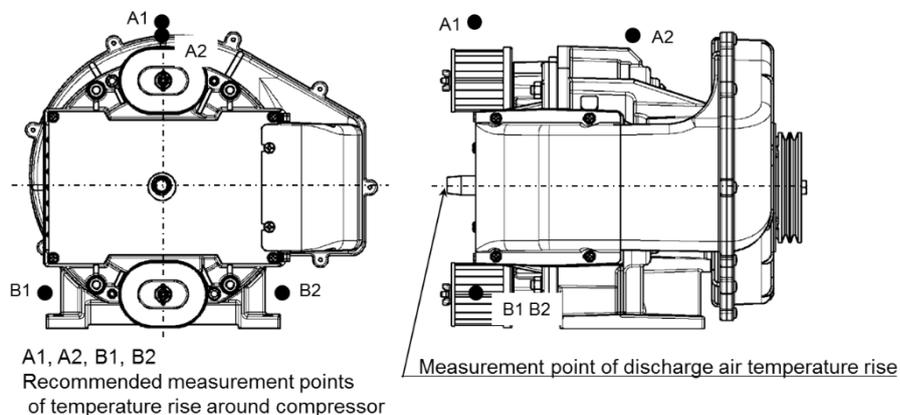
Rotating Direction

4.4 Control

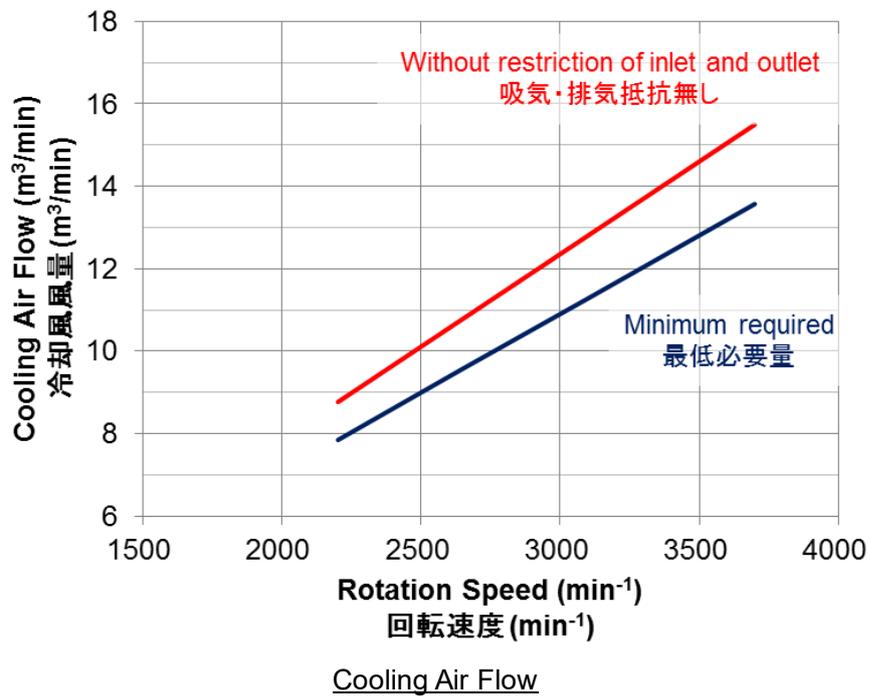
- Use pressure on the discharge port as standard for the pressure control. Correct the pressure regarding to the loss of the pressure between discharge port and measured pressure if it occurs.
- Install safety protection, such as a thermal protector for a motor, in accordance with local laws and regulations in the region the compressor to be used.

4.5 Cabinet

- Arrange air inlet and outlet of a compressor cabinet as temperature rise around the compressor within 130 mm (5 inch) is within 10°C (18°F) from ambient temperature.
- Install an additional cooling fan to ventilate a cabinet if temperature rise around the compressor within 130 mm (5 inch) exceeds 10°C (18°F).
- The compressor is cooled by built-in cooling fan and cooling air flow decreases depending on cabinet design. Keep minimum required cooling air flow shown in the following chart.
- Prevent exhaust cooling air flow from circulating to the compressor.
- Keep discharge air temperature rise from ambient temperature below 240°C (432°F). Thermal sensor to measure discharge air temperature is recommended to be installed.



Measurement Points of Temperature



Note:

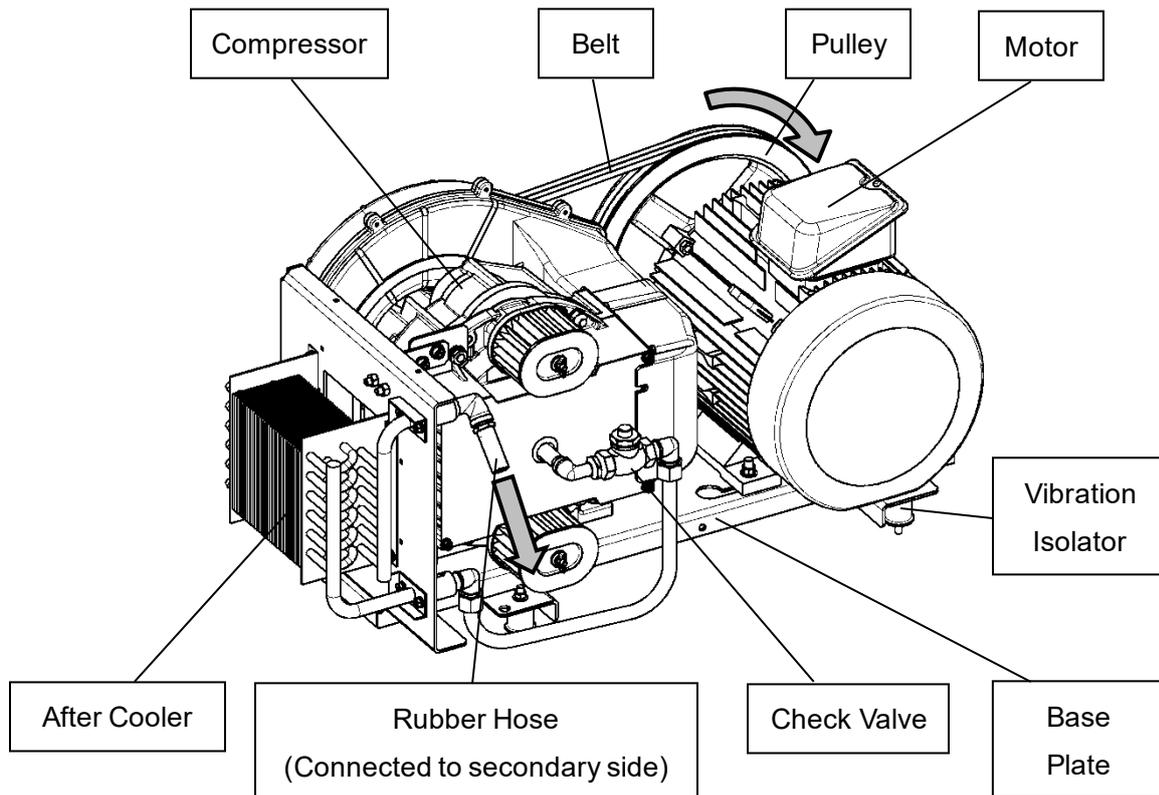
- 1) Cooling air flow is volumetric flow rate converted to the suction condition, and for reference. Temperature of exhaust air flow varies with pressure and rotation speed.

4.6 Dust Environment

- Operation in dust environment causes reduction of the compressor life. Take countermeasures for dust such as cabinet with inlet filter.
- Countermeasures such as installing pre-filter or dust-proof cover could reduce the influence of dust. Contact Hitachi for detailed information.

4.7 Example Arrangement of Installation

- Example arrangement shown in the following figure shows a part of peripheral equipment. Install safety protection and other required peripheral equipment by referring to the instructions mentioned above.



Example Arrangement of Installation

5 Maintenance and Inspection

5.1 Maintenance in Standard Usage

- Perform maintenance and inspection in accordance with the following tables.
- Perform maintenance and inspection in accordance with operating hours or term whichever comes first.
- The schedule of intermediate maintenance and compressor replacement depends on the maximum pressure. Determine the period of the intermediate maintenance and the compressor replacement in refer to the following table B.
- The maintenance and inspection schedule shown in the table A and B applies to the operation in standard usage. Refer to section 5.2 when annual average ambient temperature exceeds 25°C (77°F), or control pressure exceeds the pressure shown in the table of standard usage, or load factor exceeds 80%.
- Intermediate maintenance and compressor replacement must be conducted by the customer authorized by Hitachi. Contact Hitachi for detailed information about maintenance procedure.
- Use Hitachi genuine grease and parts specified for this product. Contact Hitachi for parts supply.

Table A

Item	Procedure	Maintenance and Inspection Schedule					Remarks
		Daily	Every 500 hours. or 2 months.	Every 2500 hours or 1 year	Intermediate Maintenance Refer to Table B	Compressor Replacement Refer to Table B	
General	Inspection for excessive noise or vibration	○					
Suction Filter	Cleaning or Replacement		○	●			
Cooling Fan and Scroll Fins	Cleaning				○		
Bearings on Orbiting Scroll	Greasing				●		Replace compressor if any damage
Other Bearings	Inspection				○		
Tip Seals and Face Seal Brushes	Replacement				●		
Complete Compressor	Replacement					●	

○ : Inspection, or Cleaning ● : Greasing, or Replacement

Table B

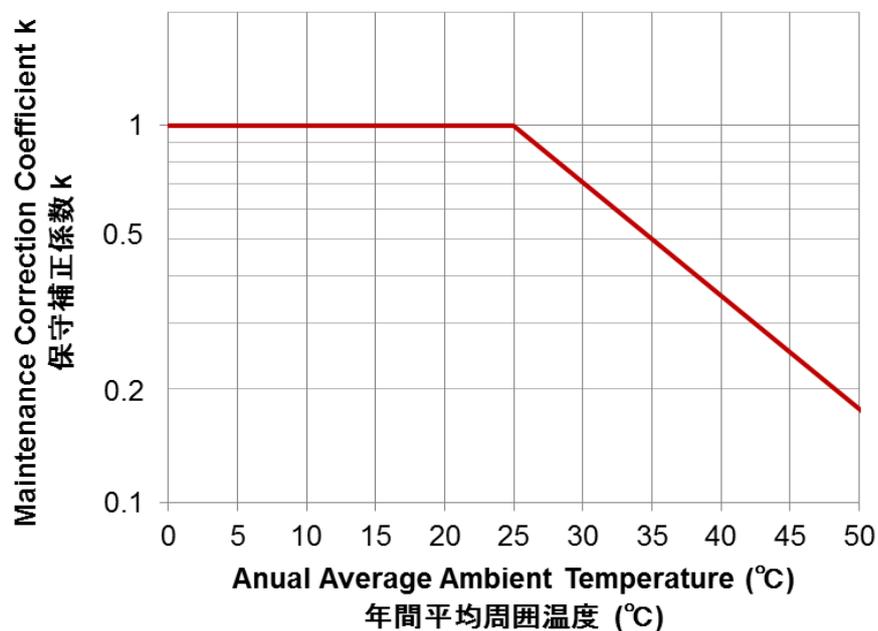
Maximum pressure	Maintenance and Inspection Schedule	
	Intermediate Maintenance	Compressor Replacement
0.8 MPa (116 psig) or less	10000 hours or 4 years	Every 20000 hours or 8 years
Above 0.8 MPa (116 psig) 1.0 MPa (145 psig) or less	Every 5000 hours or 2 years	Every 15000 hours or 6 years

Standard Usage

Maximum pressure	Standard Usage			
	Control Pressure	Load Factor	Ambient Temperature	Use Environment
0.8 MPa (116 psig) or less	0.65-0.8 MPa (94-116 psig) or less	80% or less	Annual average ambient temperature 25°C (77°F) or less	Refer to section 3.1
Above 0.8 MPa (116 psig) 1.0 MPa (145 psig) or less				

5.2 Maintenance Schedule Correction

- Schedule of intermediate maintenance and compressor replacement needs to be corrected when annual average ambient temperature exceeds 25°C (77°F). Determine the maintenance schedule with reference to the following procedure.
 - Determine maintenance correction coefficient k with reference to the following chart when annual average ambient temperature exceeds 25°C (77°F).
 - Determine the corrected maintenance schedule using the following formula.
 - Corrected Maintenance Schedule = k × Standard Maintenance Schedule
- Schedule of intermediate maintenance and compressor replacement needs to be corrected when control pressure exceeds the pressure shown in the table of standard usage in section 5.1, or load factor exceeds 80%. Contact Hitachi for detailed information.



Maintenance Correction Coefficient

6 Warranty

- The compressor shall be repaired free of charge if any failure or defect occurs under normal operating conditions described in this document.
- Warranty Period: Within 12 months from the start of the operation or 2500 operating hours or 18 months from ETD (estimated time of departure), whichever comes first.
- The warranty provided above cannot apply on the following condition.
 - Failure or defect caused by disasters (such as fire, earthquake, flood and storm).
 - Failure or defect caused by transportation, storage and installation after delivery.
 - Failure or defect caused by peripheral parts other than the compressor or power source.
 - Failure or defect caused by using non-genuine grease or parts.
 - Modification of the compressor.
 - The operation outside the scope of specifications in section 1 and 2.
 - The operation outside the scope of restrictions in section 3.
 - Failure or defect caused by improper installation against section 4.
 - The operation without maintenance and inspection in section 5.
 - Without information of the failure or defect, such as production number, and condition of disrepair.
 - Without information of the usage, such as operating period, operating hours, control pressure, and rotating speed.
- Any secondary or indirect loss, such as loss of production and sales, due to the failure or defect of the compressor is out of warranty.

7 Appendix

- Outline Drawing: 3K-10559-3