



RELAY KNOCKER SERIES RELAY KNOCKER CONTROL PANEL OPERATION MANUAL



HKA5000A

EXEN CORPORATION

☆ SAFETY PRECAUTIONS

- ☆ This product is a dedicated control panel for the relay knocker series.
Do not use the relay knocker control panel for any other purpose.
- ☆ Be sure to read and understand this operation manual carefully before using the product so that it can be operated safely and efficiently. Improper machine use may result in injury or machine failure. Keep this manual for further reference.
Also, read the operation manual of relay knocker carefully.
- ☆ The following symbols are DANGER, WARNING, and CAUTION instruction for the use of this product so that the product will not cause harm or damage to users or others.



DANGER

【DANGER】 indicates an imminent dangerous situation which may lead to death or serious injury.



WARNING

【WARNING】 refers to a hazard that may cause death or serious injury.



CAUTION

【CAUTION】 refers to a hazard that may cause minor or moderate injury.



(To prevent injury or damages)

-  When move this control panel, please be sure to make the selector switch into "OFF" and to change into the state where air is not supplied to the control panel. Otherwise, this relay knocker starts suddenly and there is a possibility of causing an electric shock and an unexpected injury.

-  When attaching this product to a wall, fix the mounting legs firmly with bolts. Falling the product may lead to an unexpected injury.

○ INTRODUCTION

Thank you for purchasing the relay knocker control panel.

Be sure to read this operation manual before use.

Be sure to read and understand this operation manual carefully before using the product until it can be operated safely and efficiently. Handle and maintain it appropriately for safety operation.

Keep this manual for further reference.

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○ SAFETY



(For personal protection during operation)

- Put on a safety helmet, safety gloves, and safety boots before using the control panel.



Safety helmet



Safety gloves



Safety boots



(For longer service life)

- Make sure the force of percussion does not exceed the necessary level, as excessive percussion may damage mounting parts such as the hopper.
- When applying continuous percussion at short cycles, allow an interval of at least one second.
An interval of less than one second may lead to malfunction.
Note : Set the interval 10 seconds and above for RKV/RKD120P model.
- Perform flushing by blowing air at 0.3MPa or higher into the pipe to remove foreign matter, machining dust, and burr.
- Please start piping after checking that there is no adhesion of foreign substance, machining dust and burr.
- Please use the air that passed through an air filter 5 micrometers or less. The moisture or powdering dust in piping has a possibility of causing poor operation and air leakage.
- The apparatus with direction should pipe to unite IN side of the direction of the flow of fluid and IN port displayed on the product.

- Regarding the use of sealing tape, please be sure not to get caught the tape inside the piping and not to cause air leak. When applying the sealing tape onto thread portions, avoid the 2-3 top threads. When applying liquid sealing material onto thread portions, avoid the 2-3 top threads and don't apply the excess amount. Avoid applying liquid sealing to female thread.
- In cold district use, take the suitable measures against freeze. (Air should not freeze.)
- Please use neither in the atmosphere of corrosive gas, nor the atmosphere of explosive gas.
- Please do not make valve into a scaffold or do not put heavy material.
- The bolting torque at the time of piping should be referred to the following table.

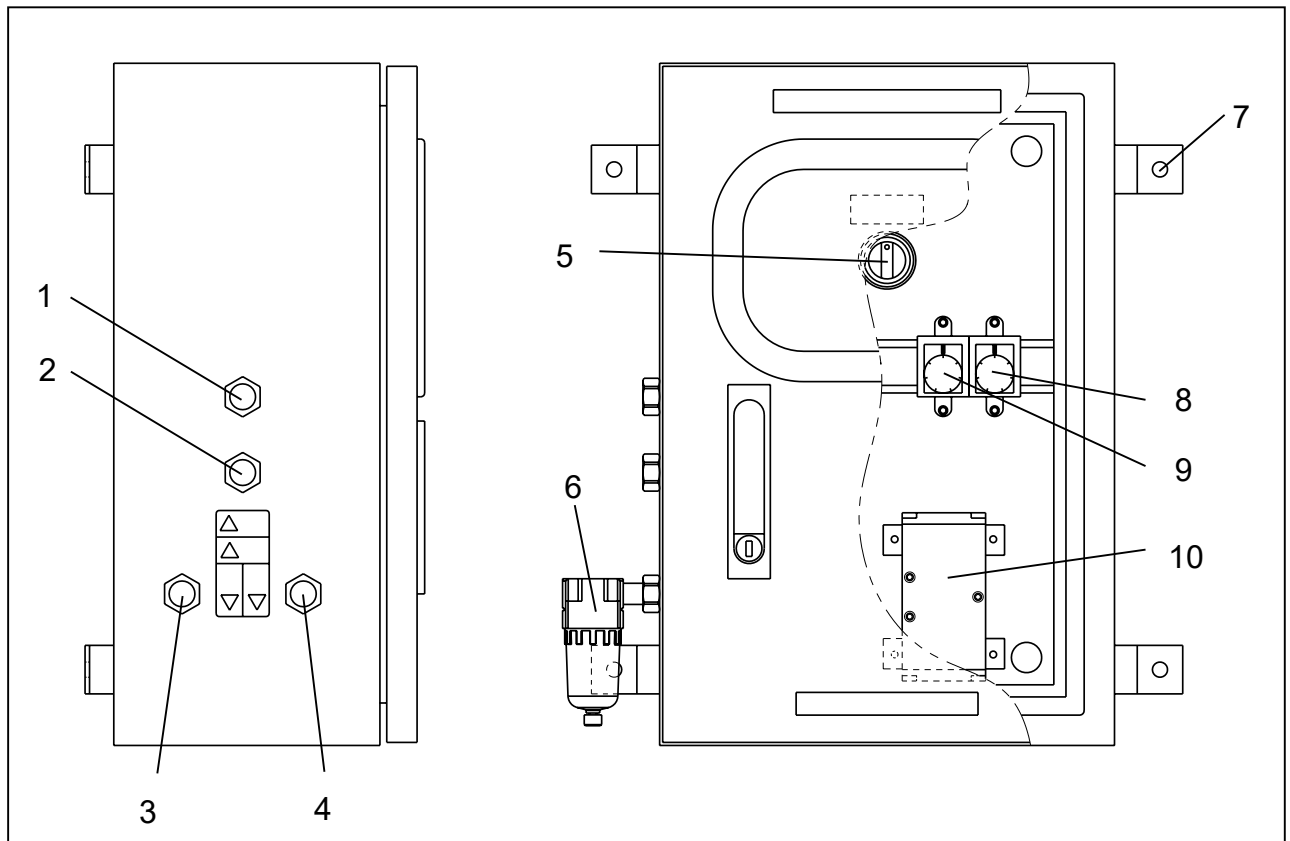
When the main part material is aluminum

Diameter of piping	Recommended bolting torque for piping (N·m)
Rc1/8	7 — 9
Rc1/4	12 — 14
Rc3/8	22 — 24
Rc1/2	28 — 30
Rc3/4	31 — 33

When the main part materials are metal other than aluminum

Diameter of piping	Recommended bolting torque for piping (N·m)
Rc1/8	18 — 20
Rc1/4	23 — 25
Rc3/8	31 — 33
Rc1/2	41 — 43
Rc3/4	62 — 65

○ NAMES OF PARTS

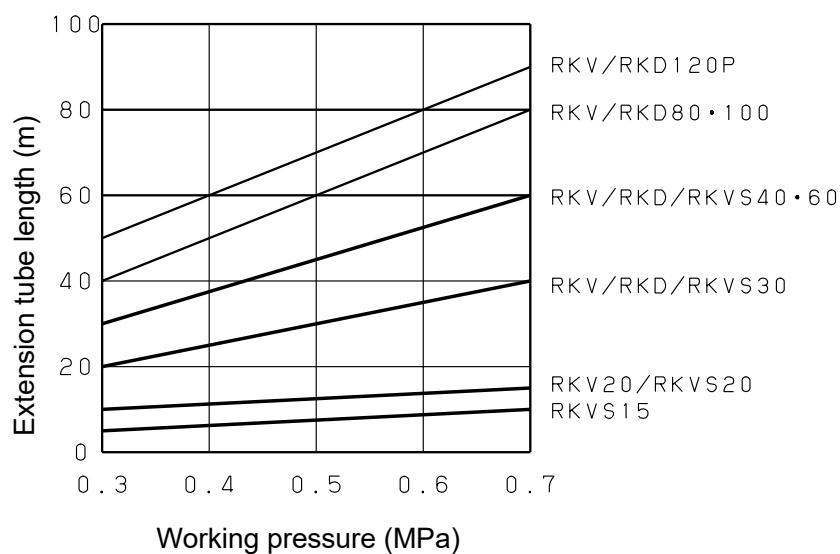


1	System A	6	Air filter
2	System B	7	Mounting legs
3	Air supply port	8	ON timer
4	Exhaust port	9	OFF timer
5	Selector switch	10	Master valve

○ THE LENGTH OF EXTENSION TUBES

- In order to efficiently use the relay knocker in a wide range of impact pressure including low and high impact, install the extension tubes for it as short as possible. Check the model to be used and the air pressure to decide the tube length. The total length of tubes should not exceed the limit line shown in the chart "The Length of Extension Tube length".

■ "Extension tube length" (per system)



Note

- The chart shows the total usable length of tubes for per system. If the total length of tubes exceeds the limit on the charts, it may cause malfunction and decrease in impact pressure.

*Use below the limit line.

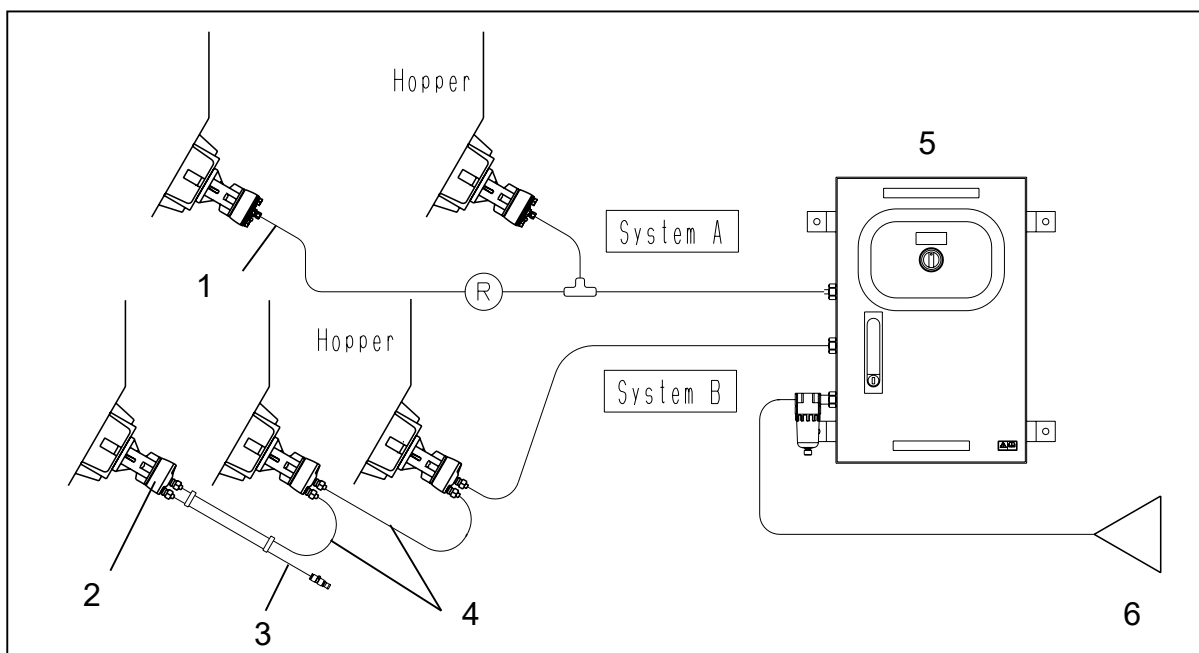
- Do not use relay knocker more than recommended number of units, as the machine's capacity decreases.
- Use ϕ 8mm nylon or urethane tube for extension. (Use ϕ 6mm tube for RKV20P and RKVS20, and ϕ 4mm tube for RKVS15)

○ OPERATIONS

⚠ Notes

1. When a foreign substance comes into master valve, improper operation may be happened. Certainly use air filter that attached to the control panel.
2. Flush the tube before piping.
3. Although two systems of relay knocker can be connected to the HKA control panel, the actions of pressure accumulation / percussion are alternated in system A and system B.
*If only one system is used with the systems A and B, place a plug in the unused system.
4. When arranging relay piping, please set the ON timer as 1second or more. When the tube length of relay piping becomes longer or the number of knockers in relay piping increase, please set the ON timer further till all the knockers become working.

■ Plumbing Examples



- ▶ 1. N2 tube $\phi 8 \times \phi 6$ 2. Relay knocker 3. Dummy tube 4. Relay tube
5. Control panel HKA model 6. Compressor

Ⓜ : Regulator use when individual adjustment pressure required.

■ Operating procedure

- Supply air to the control panel and following procedure.

1. Manual Operation

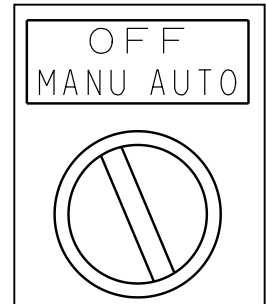
1. Turn the selector switch to the "Manu" position.

Note : The relay knocker connected to system A will start percussions. Air will be supplied to the relay knocker connected to system B.

2. Wait for 5 to 10 seconds with holding the selector switch at the "Manu" position as it is.

3. Turn the selector switch to the "OFF" position

Note : The relay knocker connected to system B will start percussions, and the other connected to system A will be supplied with air.



2. Automatic operation

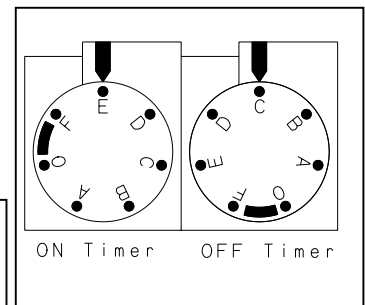
1. Set up impaction interval by dials on the "ON and OFF timers".

- Setting the Impact Interval

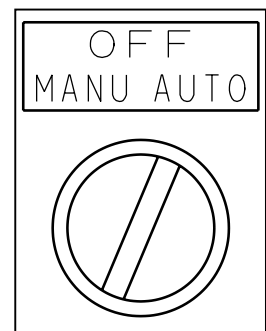
Before use, measure the impaction interval (time) as set ON and OFF timers to the positions shown the right.

Note : Do not set up the impaction interval shorter than one second.

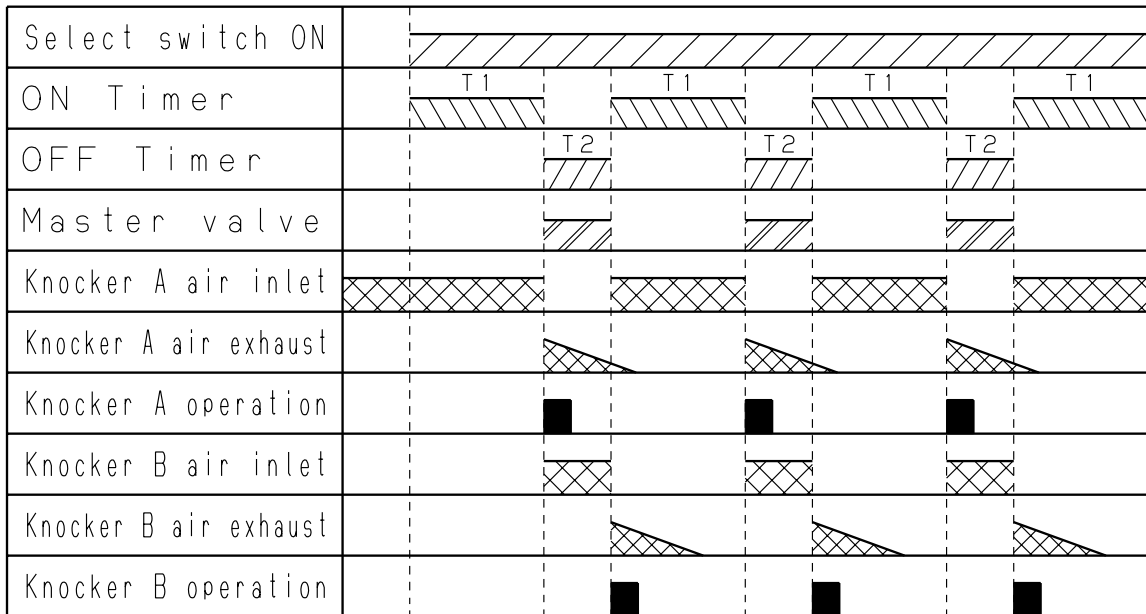
An interval of less than one second may lead to malfunction.



2. Turn the selector switch to the "Auto" position.
Procedures are repeated as indicated in the timing chart on the next page.



■ Timing chart



■ Operation procedure

- When the selector switch is set to "Auto", the "ON timer" is activated.

Note : Since system A is normally open, air has been previously supplied.
- After the T1 period has elapsed, the system A relay knocker receives an impact, the master valve operates at the same time, and the "OFF timer" activated.

Note : Air is supplied into the system B relay knocker during T2 time.
- After T2 period, the relay knocker of the system B impacts, it simultaneously switches to the "ON timer" and the master valve returns to its original position.
- These procedures are continuously repeated.

○ INSPECTION

- Be sure to check the followings periodically to prevent any trouble as much as possible during use.
- 1. Is there any damage or scratches on the N2 tubes?
- 2. Is the N2 tube clogged?
- 3. Can the selector switch be made the shift to “Auto” or “Manu” correctly?
(selector switch is always off at the time of shipment.)
- 4. Does the timer work normally?
- 5. Does the relay knocker impact normally?

○ TROUBLESHOOTING

Phenomenon	Sign	Cause	Solution
Relay knockers percuss	Air is exhausted. (Low Impulsive force)	Air leakage due to damaged N2 tube	Repair or replace the N2 tube
		Master valve failure	Repair or replace the master valve
		Air pressure drop	Inspect and adjust the regulator and compressor.
	Abnormal impact interval	Timer malfunction	Repair or replace the timer
Relay knockers do not percuss	Air is exhausted	Air leakage due to damaged N2 tube	Repair or replace the N2 tube
		Master valve failure	Repair or replace the master valve
		Air pressure drop	Inspect and adjust the regulator and compressor.
	Air is not exhausted	Master valve failure	Repair or replace the master valve
		Timer failure	Repair or replace the timer
		Selector switch failure	Repair or replace the selector switch

○ SPECIFICATIONS

■ Specifications

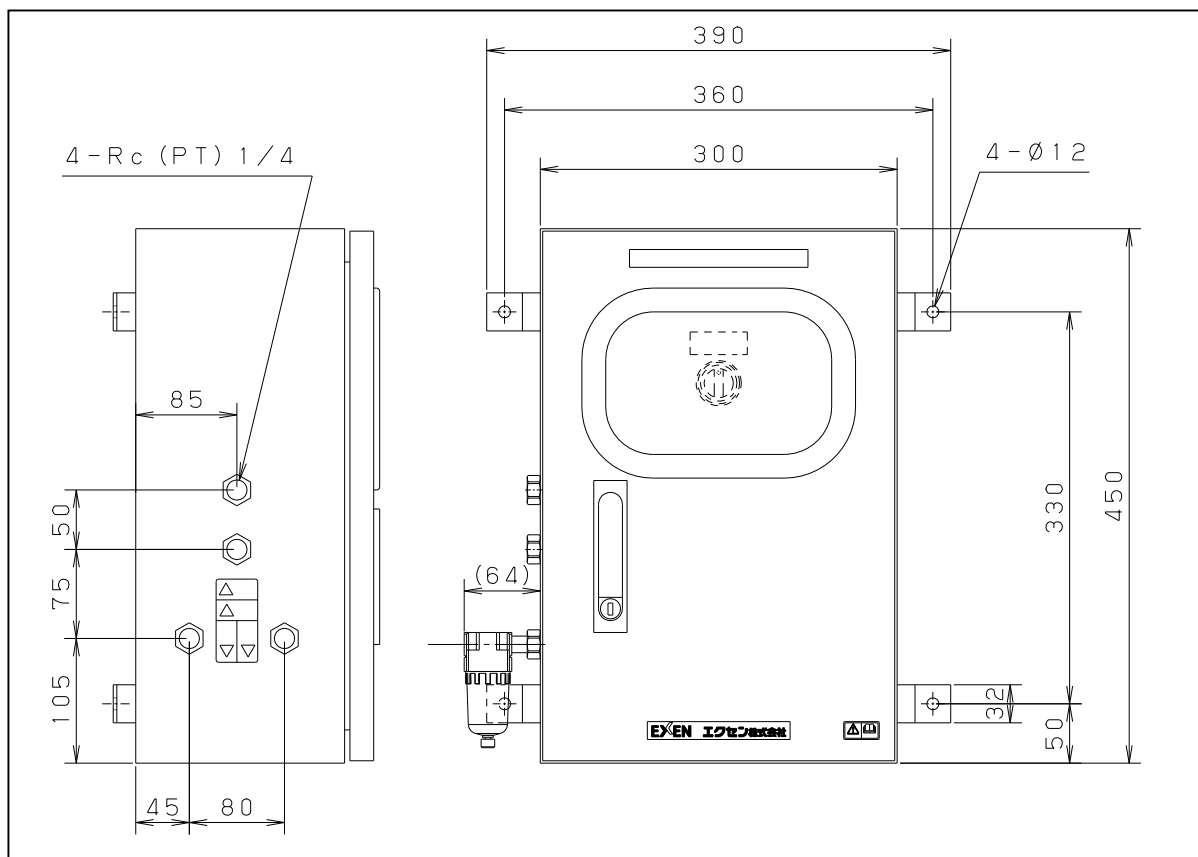
Model	Structure	Timer's set time	Working pressure (MPa)	Mass (kg)
HKA5000A	Waterproof and dustproof structure Protection class IP44 Indoor/Outdoor	ON timer 10 sec. — 180 sec. OFF timer 0.1 sec. — 30 sec.	0.3—0.7	12.0

Note : Set times of each timers are not exactly equal. Measure the set time for confirmation.

■ Number of the units can be operated

Model	Number of the units can be operated	Remarks
HKA5000A	RKVS15	10 units
	RKV/RKVS20	8 units
	RKV/RKD/RKVS30	8 units
	RKV/RKD/RKVS40	6 units
	RKV/RKD/RKVS60	6 units
	RKV/RKD80	4 units
	RKV/RKD100	4 units
	RKV/RKD120	2 units
		The number of units which can be used in per system (Standard piping)

■ Dimension drawing



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