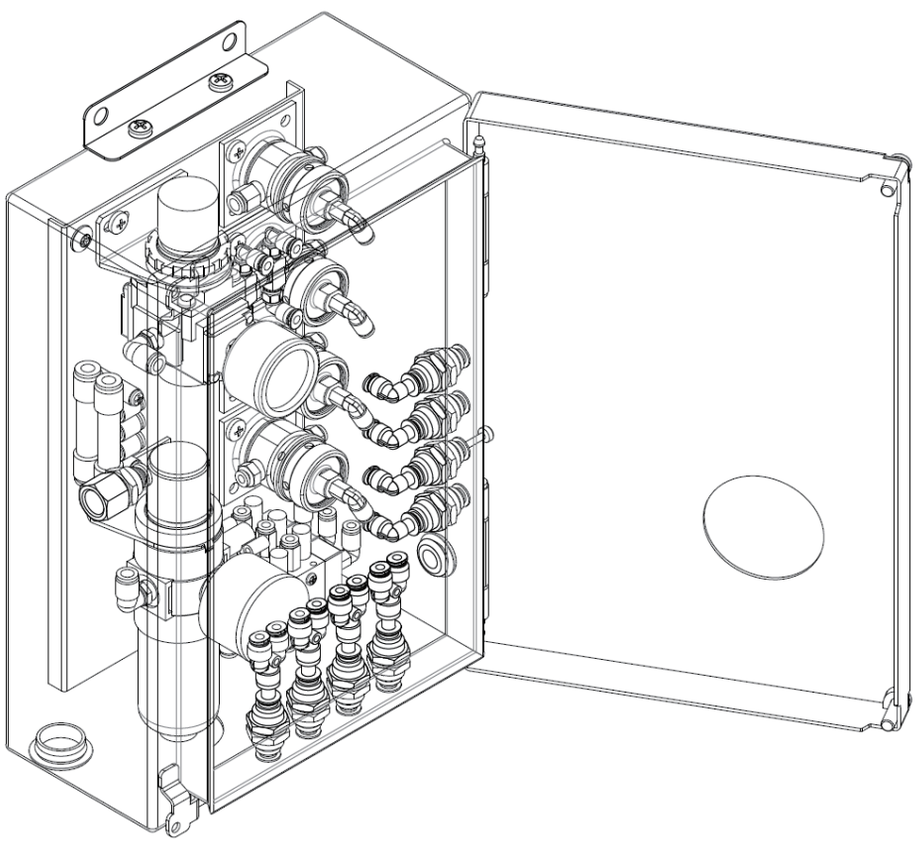
D385UIE-04

OPERATION MANUAL



For safety purposes please be sure to read and follow the instructions contained within this manual before this product installation and operation.

HLC-H2L2　HLC-H1L1

HLC-H1L0　HLC-H0L1

Introduction

Thank you for purchasing our products.

The Air Operated Level Controller outputs an air signal when it detects the liquid level.

This document describes the right usage of the product and cautions on spec. Read the document carefully before using the product.

Table of contents

If the product has remained unused for a long period or if you have any kind of misgivings about running the product please consult with your local distributor or contact our company directly

Important Items

For safe operation

● Before using the pump, be sure to read this document carefully, particularly the ″warnings and cautions,″ and be fully familiar with the correct operating procedures.

● Within this document all the warnings and cautions will be indicated by the following symbols.

WARNING If you ignore the warning described and operate the product in an improper manner, there is danger of serious bodily injury or death.

CAUTION If you ignore the caution described and operate the product in an improper manner, there is danger of personal injury or property damage.

Furthermore, to indicate the type of danger and damage, the following symbols are also used along with those mentioned above:

This symbol indicates DON'T, and will be accompanied by an explanation on something you must not do.

This symbol indicates DO, and will be accompanied by instructions on something you must do in a certain situation.

This symbol indicates important information is contained here.

For safety

⚠ WARNING

・When using compressed gas (hereinafter referred to as ″compressed air″) to drive this pump, be sure it is one of the following:

1)Compressed air supplied from an air compressor

(To drive this product, use supply air with a minimum moisture content.)

2)Nitrogen (N2) gas

The use of compressed air other than those mentioned above may cause air pollution, damage to the pump, or even an explosion.

・Before using this product, please be sure to be familiar with the precautions regarding the detected fluid and verify the volatility and the corrosion resistance of the parts that will come into contact with the fluid (wetted parts). It may damage parts and cause malfunctioning if volatile components of the fluid come inside the box from the detecting tube.

・When using this product, observe local relevant regulatory rules concerning transfer and storage of chemicals, fire prevention, labor safety standards, etc.

・Hazardous fluids (such as strong acid or alkali, flammable or toxic liquids) or gas bubbles generated by such fluids may cause serious injury or even death if accidentally inhaled or consumed or if they come into contact with the eyes or to the skin. Therefore, the following precautions are strongly advised.

*Be fully familiar with the properties of the fluid to be pumped and work in strict accordance with the operating instructions provided by the suppliers of such fluids (such as wearing goggles, gloves, mask or protective work clothes).

*When storing a hazardous fluid, strictly comply with the regulatory procedures (such as using proper containers, storage conditions, etc.).

*Always install the piping and exhaust port of this pump away from areas frequented by human and animal traffic.

⚠ CAUTION

・Always use genuine parts when replacing component parts of this product. Do not attempt to modify the components parts or replace them with anything other than genuine parts.

Product information

1.Specifications

Model	HLC			
	H1L1 (Level control)	H2L2 (Level control with alarm)	H1L0 (Upper limit alarm)	H0H1 (Lower limit alarm)
Operating pressure	0.2 ～ 0.7 MPa			
Detecting tube pressure	0.03 MPa			
Output pressure	0.2 ～ 0.4 Mpa ※			
Air inlet	Rc 1/4			
Output signal	Normal Open Normal Close		–	
Alarm signal	–	Normal Open		
Dimensions	H300 × W200 × D120			
Weight	5.3 kg	5.5 kg	5.1 kg	5.2 kg

※ Output pressure is same as air supply pressure when air supply pressure is 0.2 ～ 0.4Mpa.

This product does not have pressure intensifying function.

Output pressure is 0.4Mpa when air supply pressure is 0.4 ～ 0.7Mpa.

The purpose of output air is to control the air operated valve and whistles.

2.Accessories included with the controller

☐ Operation Manual ..... 1 piece

☐ Fastening bracket （Bracket × 2、Screw × 4）..... 1 set

3.Accessories (Sold separately)

☐ Detecting tube assembly : SUS304 tube of 1m length ..... 2 pieces

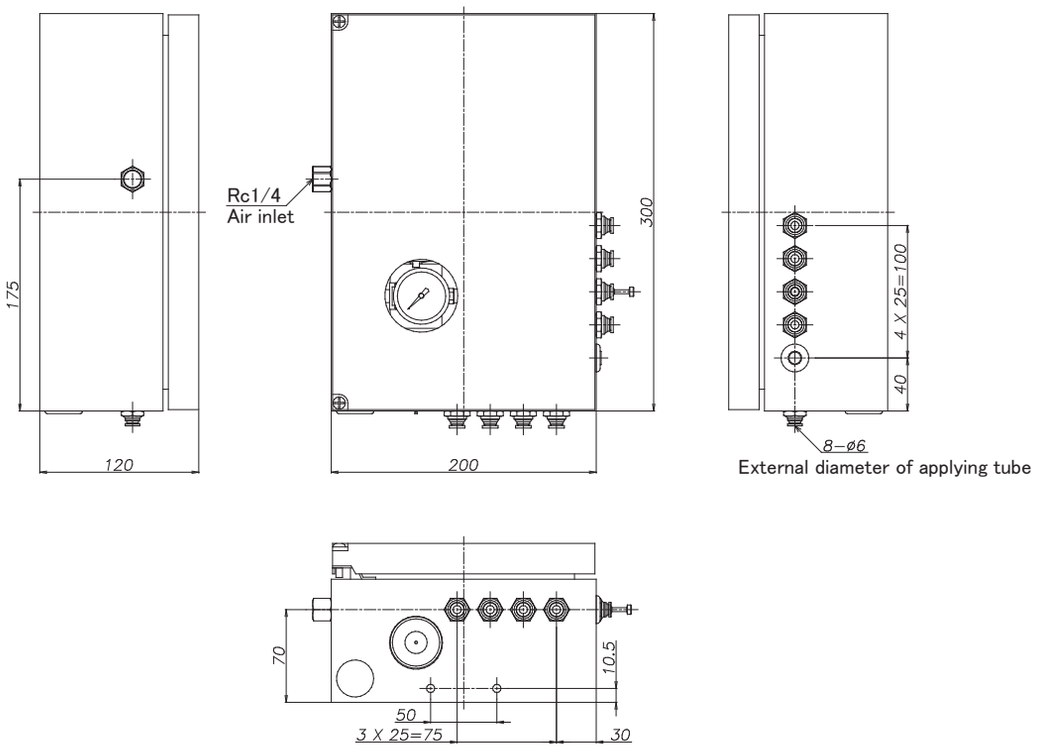
Soft nylon tube (Be aware of the corrosion resistance) ..... 2 pieces

Fixing metal fitting for detecting tube (G3/4 : SUS304) ..... 1 piece

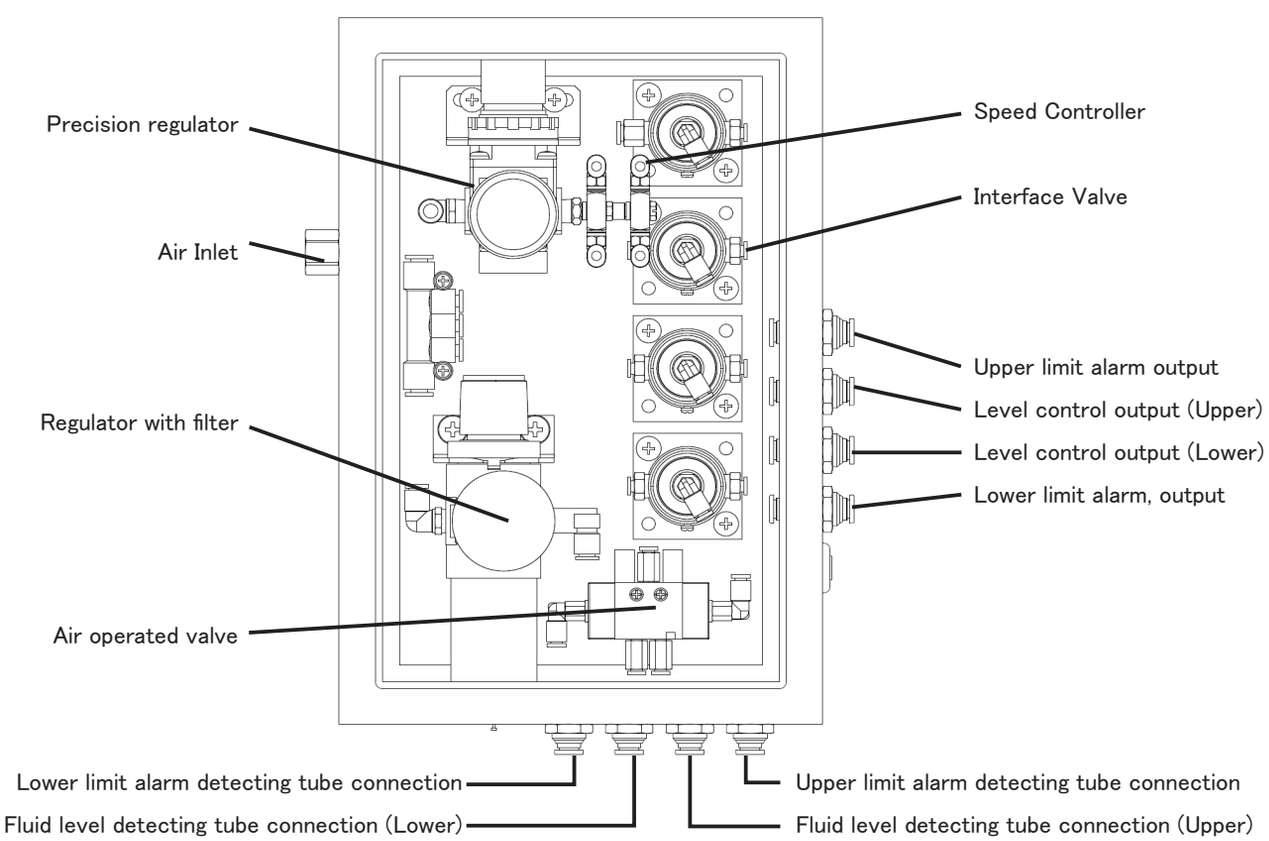
☐ Alarm whistle : Whistle with volume leveling valve ..... 1 piece

Product information

4.Dimensions of Level Control Box (HLC-H2L2)



5.Inside Layout of the Level Control Box (HLC-H2L2)



6.Liquid level detection device (Interface Valves)

Interface valve is air operated valve. This valve operates by low pressure (0.03Mpa)

It supplies 0.03Mpa air from Pilot connection port. Please fix a detecting tube to the position suitable for detecting liquid surface.

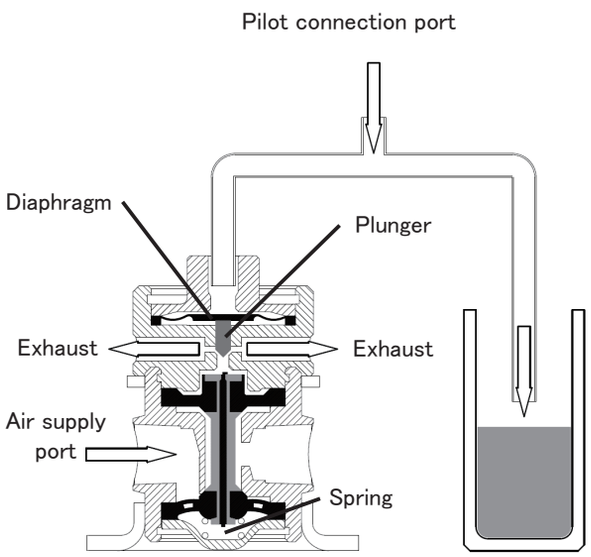


Fig.1 Normal state

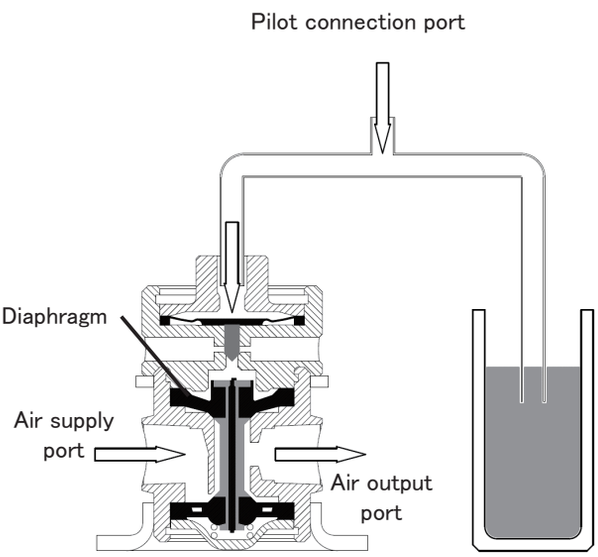


Fig.2 Operational state

In figure 1, Supply air does not output signal as the liquid surface has not touched the detecting tube. The spring at the bottom of the interface valve pushes up the diaphragm, opening the way to exhaust.

In figure 2, pilot air goes into the interface valve as the detecting tube is closed off by increasing liquid level. The pressure of pilot air in interface valve pushes down the diaphragm and plunger which shuts air circuit to exhaust port and let supply air output.

Interface valves are used for all liquid level detection (High Level, Low Level, High-alarm Level, Low-alarm Level).

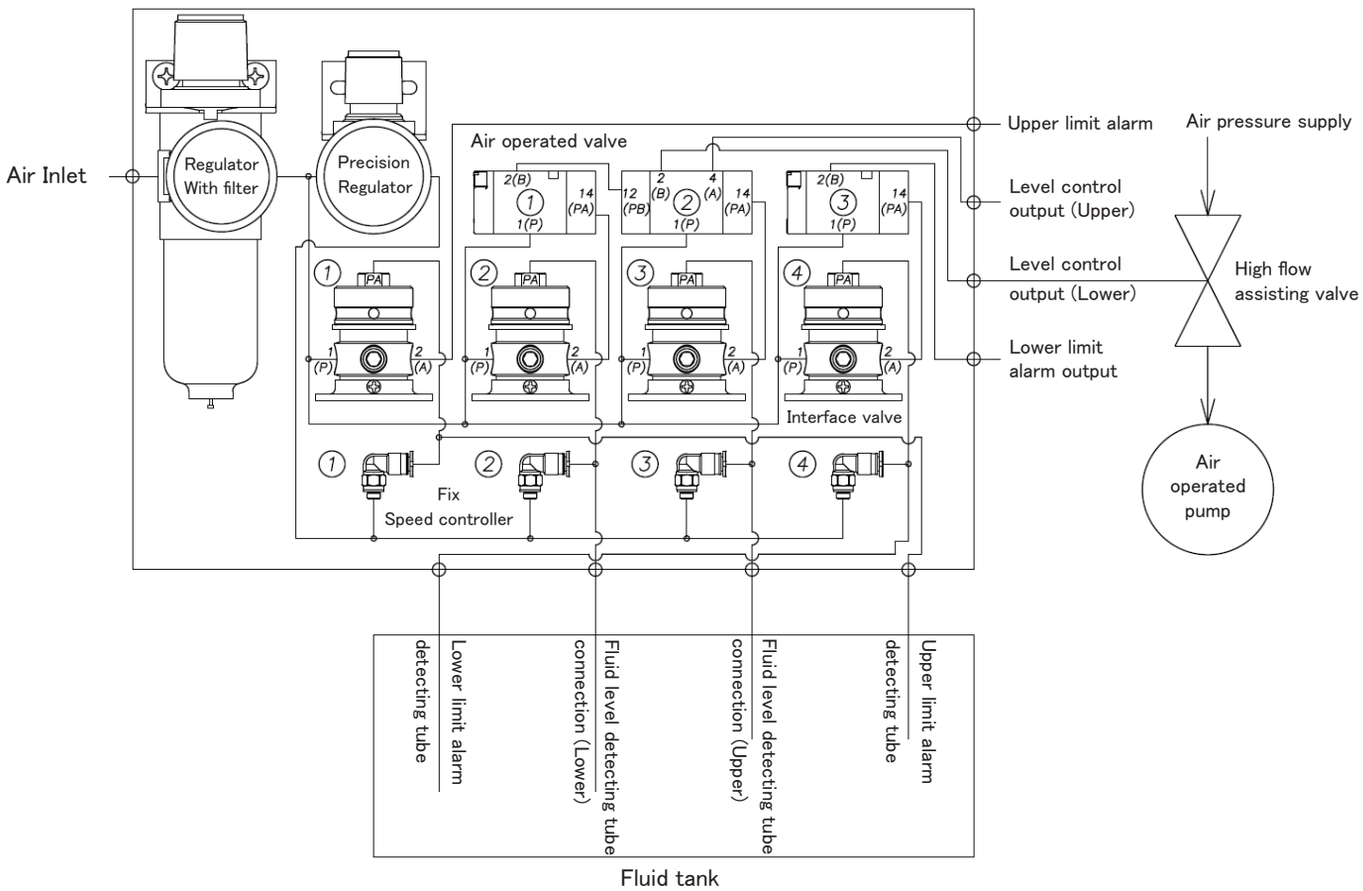
CAUTION

The diaphragms are made from thin rubber in order to detect low pressure and might get damaged by thinner, etc.

Alkaline and acid liquid also might cause the damage of diaphragms.

The unit keeps blowing air from the detecting tube when in use. If stop the unit for a prolonged period, please pull out the tube.

7.Piping diagram of Level Control Box (HLC-H2L2)



Install unit table

Install unit	HLC-H2L2	HLC-H1L1	HLC-H1L0	HLC-H0L1
Air operate valve	①, ②, ③	①, ②	-	③
Interface valve	①, ②, ③, ④	②, ③	①	④
Speed controller	①, ②, ③, ④	②, ③	①	④

When using the level control output, using the air operated valve together is recommended.

When using the air operated devices (Diaphragm pumps or Piston pumps), 3 port valve is recommended as air operated valve.

3 port valve can certainly start and stop pumps because it makes air pressure 0 in the pipe of operating supply side.

Installation

1.Installing

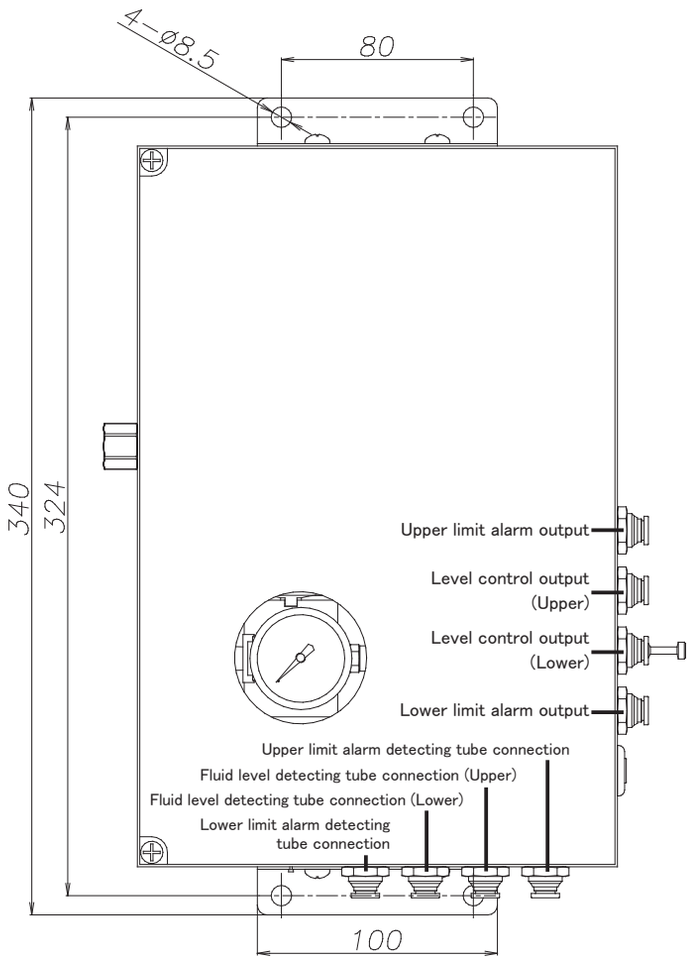
Do not install the box outside. All models are not rainproof.
It may cause malfunction because moisture in the operating air might freeze when it reaches below 0 degrees.
Please use bracket in the accessories if necessary.

Be sure to secure the detecting tube properly. Please select pipes of suitable material if it does not have sufficient corrosion resistance.

Please connect nylon tube in all the way.

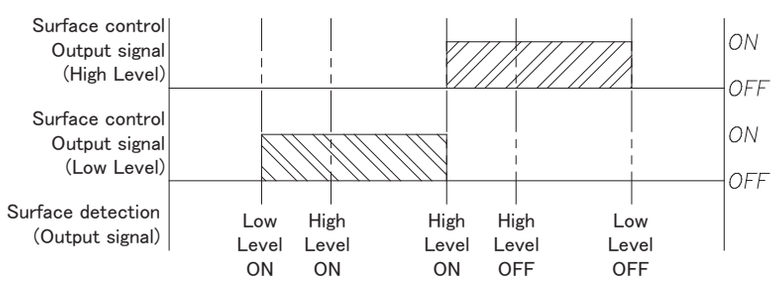
Please confirm the connectionts with other equipment.

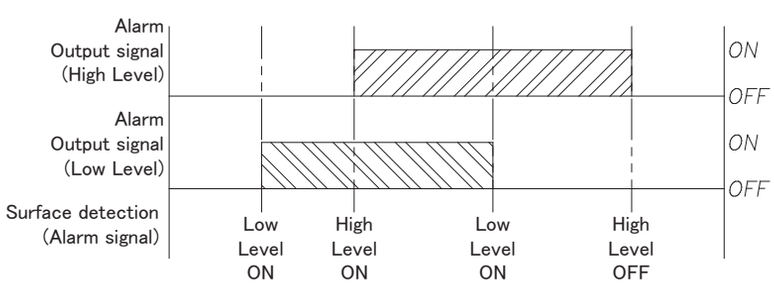
Please configure wholly to avoid any accidents
in the case of the malfunction of the equipment.
Please use a liquid preventing wall etc. as a step for overflow if necessary.



2.Test operation

After having checked the individually, please test all operation.
Connect a compressed air to air supply port and confirm pressure gauge (front of the box) value is 0.4Mpa.
Put the detecting tube in the water or close detecting tube with finger. And check output of air from the output ports.
Please check for reference to relations (detecting surface and output signal)



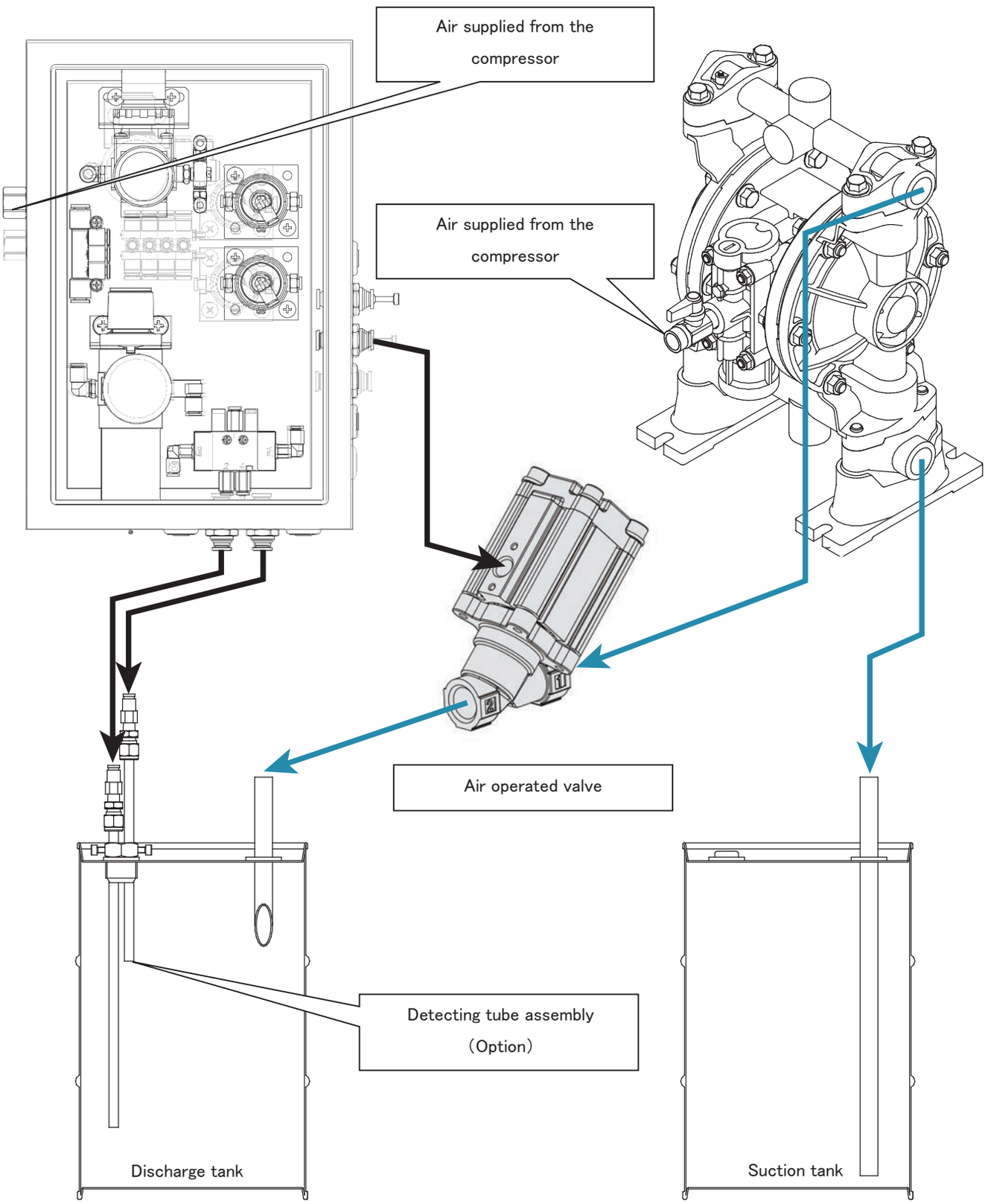


When both liquid surface detection(High Level and Low level) are open, the surface control output signal (Low Level) gives signal.
If block out only the High Level surface detection, both output surface control (high and low) may give signal (not correct case)
In this case, please block both detection tubes (High and Low). And, check the output signal again (reset)
The High-alarm Level output and the Low-alarm Level output are the independent control output signal.

Installation

3.Example of installation of the Level controller (HLC-H1L1) and pump.

Detecting the liquid level turns on or off the discharge side of the diaphragm pump. (The air is always supplied to the diaphragm pump.)

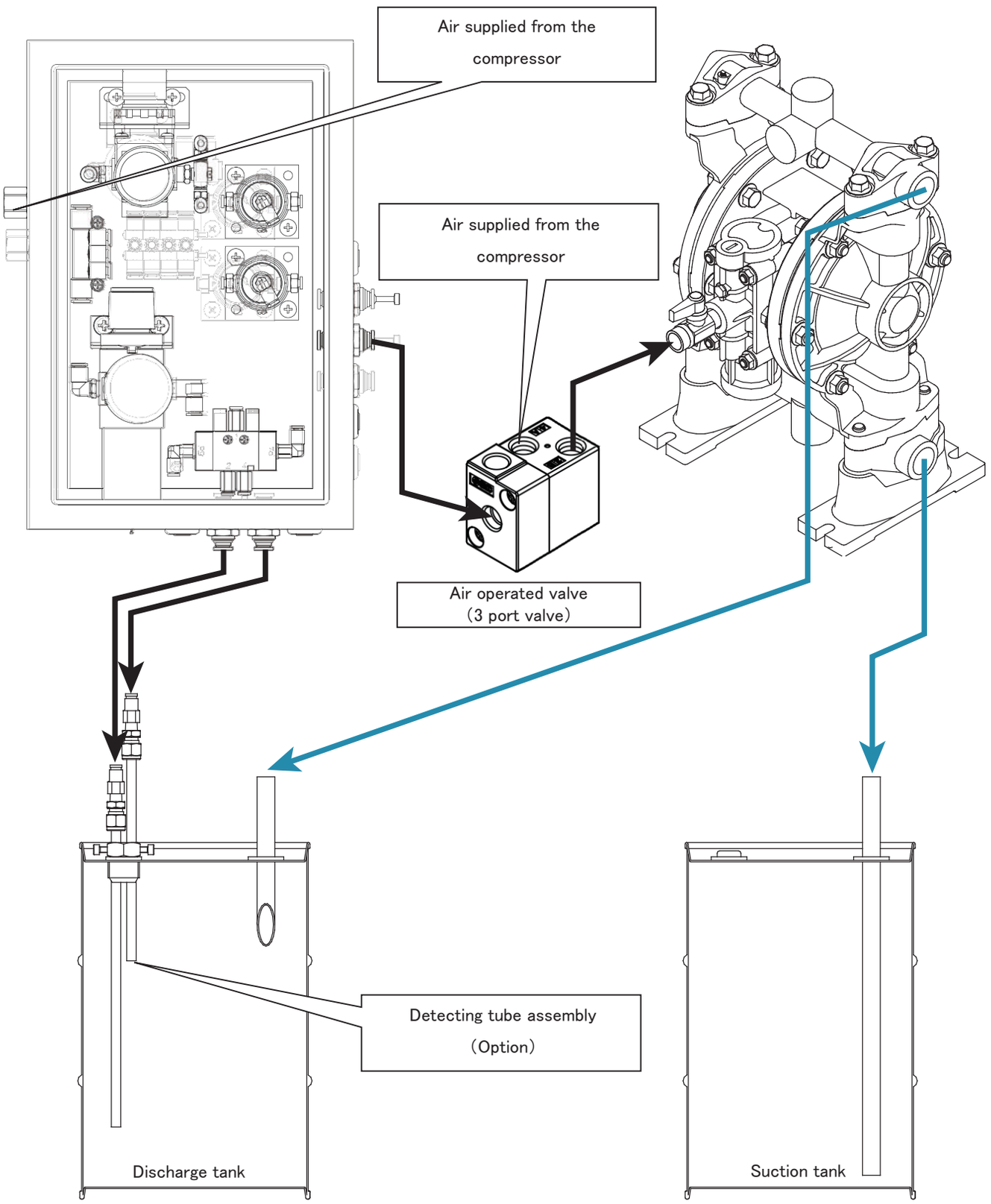


Please close the output by a plug if it is not used for a level control. (To avoid a reduction of a used output)

Installation

Example of installation of the Level controller (HLC-H1L1) and pump.

Detecting the liquid level turns on or off the air supply to the diaphragm pump.



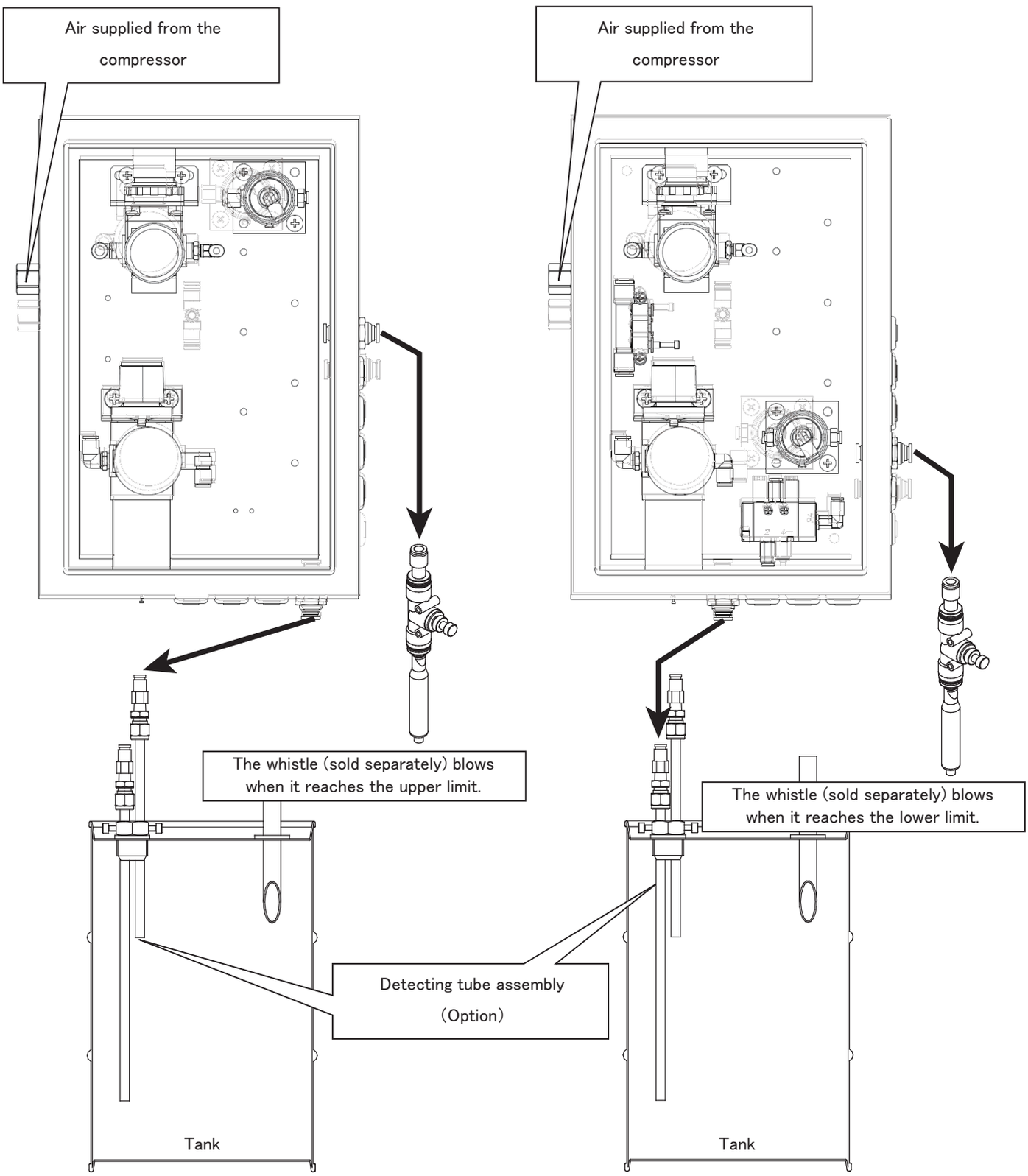
Please close the output by a plug if it is not used for a level control. (To avoid a reduction of a used output)

Installation

Example of installation of upper and lower limit alarm

Upper limit alarm will output signal when the liquid is above the tip of the upper level detecting tube.

Lower limit alarm will output signal when the liquid is below the tip of the lower level detecting tube.



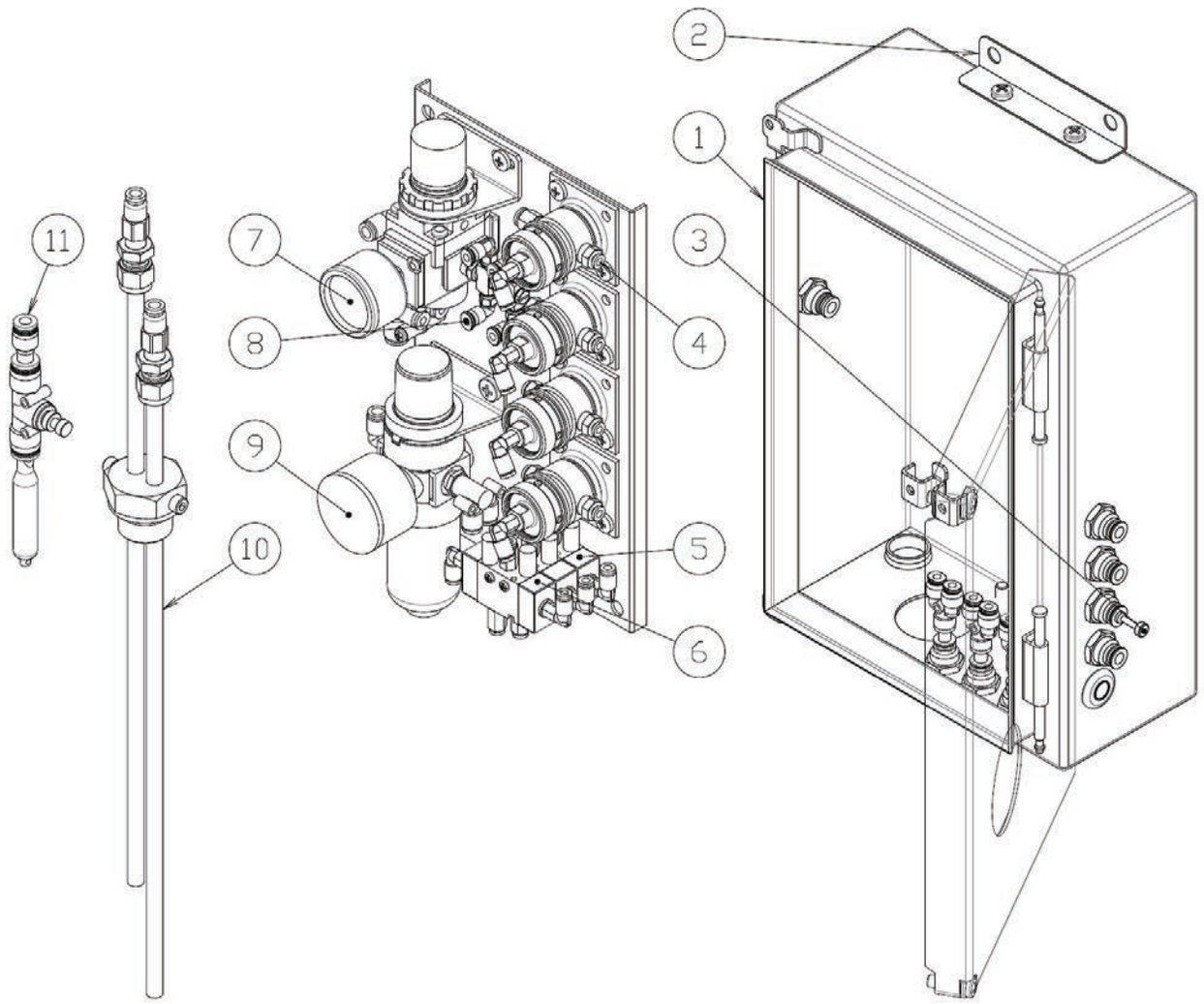
Please adjust the output flow rate and volume properly when using a whistle (sold separately).

Maintenance

・Daily maintenance checks

1) The bottom of the filter regulator is visible. Please push the drain valve and remove the liquid around the bottom of the regulator. Be careful not to enter liquid into eyes.
2) There is a pressure gauge in the control box that can be seen from outside. Regulator valve is preset as 0.4Mpa. Please confirm if the pressure gauge indicates 0.4Mpa
3) Diaphragm pumps and piston pumps consume a large amount of air. Make sure the control box is supplied with enough air if the air is supplied from the same piping. The air amount may be insufficient when the needle of the control box is swinging.
4) It may cause malfunction if the air amount supplied to the control box is not sufficient.
5) Please confirm if the detecting tube is secured when it works unstable. It does not work stable when the detecting tube is leaned or unstable.
6) The detecting distance of the detecting tube is about 3cm from the tip of the tube. But it could vary from 2cm ～ 8cm. Please keep spacing over 6 cm between the tip of the upper detecting tube and the lower detecting tube.
7) The air continuously comes up about 0.03Mpa from the bottom of the detecting tube. This can be noticed by the movement of bubbles inside. However, the bubbles will not be visible if the detecting tube is approximately 300cm below the liquid surface or more. (Specific gravity: 1g/c m^3) The detecting tube works even if the bubbles are not visible.
8) It may cause deterioration of a diaphragm if the gas comes into the interface from the detecting tube when using the high volatility fluid and the air supply to the control box is stopped.
9) The detecting tube is designed to 6mm. It will not be in detecting state if the piping is thin or broken on the way. It may take time to detect if the detecting tube is far from the control box.
10) Please select parts considering the corrosion resistance and the air volume.

Parts list



No.	Item No.	Parts Name	HLC-H2L2	HLC-H1L1	HCL-H1L0	HCL-H0L1
1	1C10038MK	Level control box	☑	☑	☑	☑
2	1C90027MM	Bracket box	Accessory			
3	1C90006MB	Fitting plug（ϕ 6）	☑	☑	☐	☐
4	1C90014MP	Interface valve	☑	☑	☑	☑
5	1C90015MB	Air operated valve1	☑	☑	☐	☐
6	1C90016MB	Air operated valve 2	☑	☑	☐	☑
7	1C90012MP	Precision regulator	☑	☑	☑	☑
8	1C90045MB	Speed controller	☑	☑	☑	☑
9	1C90011MP	Regulator with filter	☑	☑	☑	☑
10	1C10041MK	Detecting tube assembly	Sold separately			
11	1C10042MK	Whistle assembly	Sold separately			

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