Self Control Valve

HICV® Series PAT.

HIGH INTELLIGENT CONTROL VALVE

The HICV Series of self control valves are highly accurate, maintaining a constant rate of outlet pressure and flow regardless of variations in pressure at the point of entry.

ADVANCE

Creation of reliable system

Before the advent of the HICV series,

the flow rate was unstable due to pressure fluctuations, constantly affecting product yield...

The HICV Series valves are highly accurate valves that maintain stable outlet pressure and flow rate, that are not affected by pressure fluctuations on the inlet side.

Before

Ultra high performance valve that and flow rate, independent of inlet

HICV Series Line-up

Self Control Valve

HICV® POWER

- Liquid-contact surface material is PTFE and PFA. O-rings and metal parts are free from contact fluid.
- The pressure and flowrate can be maintained at the desired preset value by the setting air pressure.
- There are no restrictions on installation configurations.

After the advent of the HICV series,
stable pressure and flow rate can be maintained, resulting in the greatly improved product reliability.

maintain stable outlet pressure
pressure fluctuation

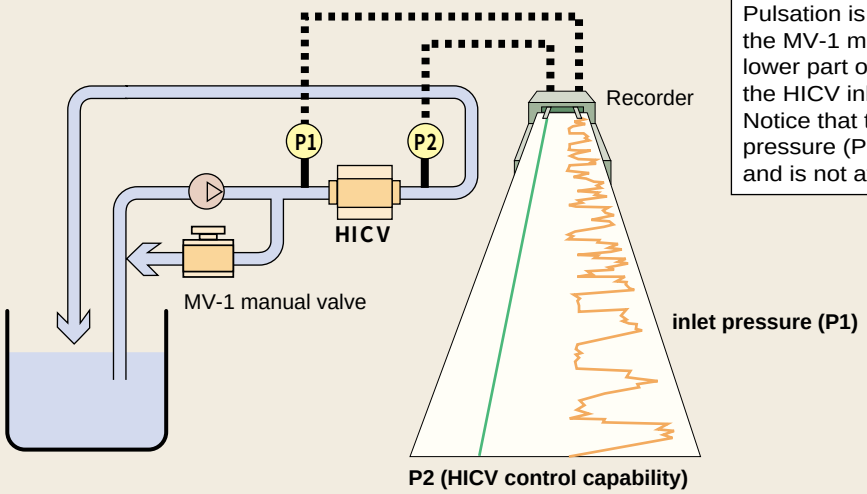
After

HIGH INTELLIGENT CONTROL VALVE

Features, Internal Structure & Operation Principle of the HICV series

1 Features

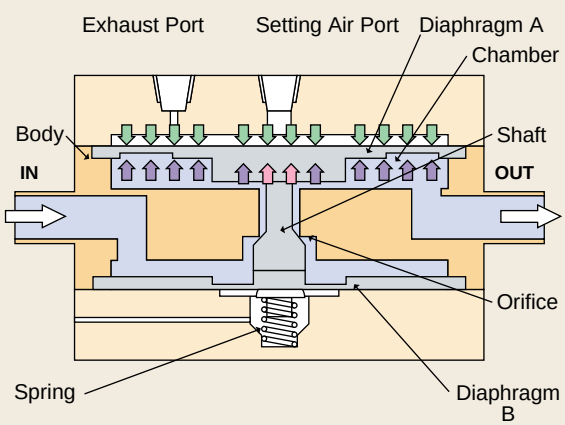
- All wetted path are made of PTFE or PFA. This valve is appropriate for high purity ultra pure water and high purity chemical which are often used in semiconductor industry.
- The HICV Series valves are control valves that maintain stable outlet pressure, that are not affected by inlet pressure fluctuations.
- HICV valve is the control valve which can adjust the pressure of the output by the set air pressure.
- Other existing valves are not able to keep constant flow rate when the pressure of input side is not constant, however, it is possible to maintain constant flow rate by using the HICV valve.



The chart on the left shows the HICV control capability. Pulsation is created by operating the MV-1 manual valve in the lower part of the system to vary the HICV inlet pressure (P1). Notice that the HICV's outlet pressure (P2) remains stable, and is not affected by pulsation.

2 Internal Structure and Operation Principle

When the pressure of the input side is increased and the pressure in the chamber is higher than the set air, the diaphragm is pushed upward. At the same time, the shaft is pull up and the flow path will be narrower. It will cause the pressure in the chamber to be lower. On the other hand, when the pressure in the chamber is lower than the pressure of the set air, the shaft is pushed down and the flow path will be wider. The shaft of the HICV valve moves up and down to keep the pressure in the chamber (the pressure of the output) constant. (Self-control) However, the flow rate varies when any change occurs in the pressure loss on the outlet side.

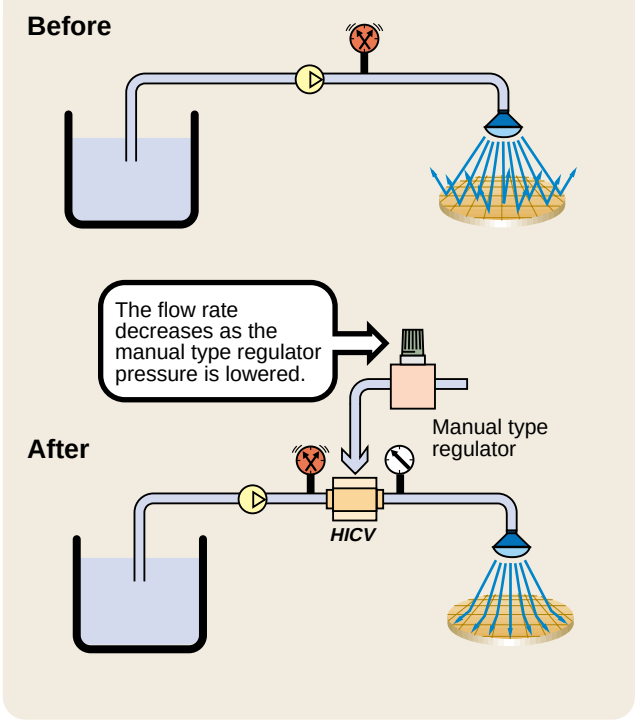


Notes Metal parts are free from contact with fluid. And HICV does not have rubbing parts.

HIGH INTELLIGENT CONTROL VALVE

HICV's Effective Application Examples

1 General Use



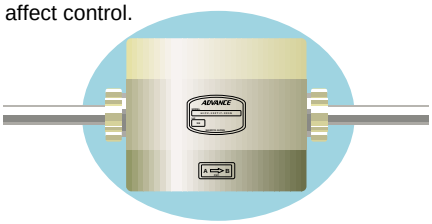
Once installed, the required quantity can be consistently supplied.

Without the HICV installed, pressure fluctuation in the utility line is large. This prevents fluids being supplied to the point of use at a constant rate. However, constant supply cannot be realized by the constant supply pump and pulse damper because pulsation cannot be removed completely.

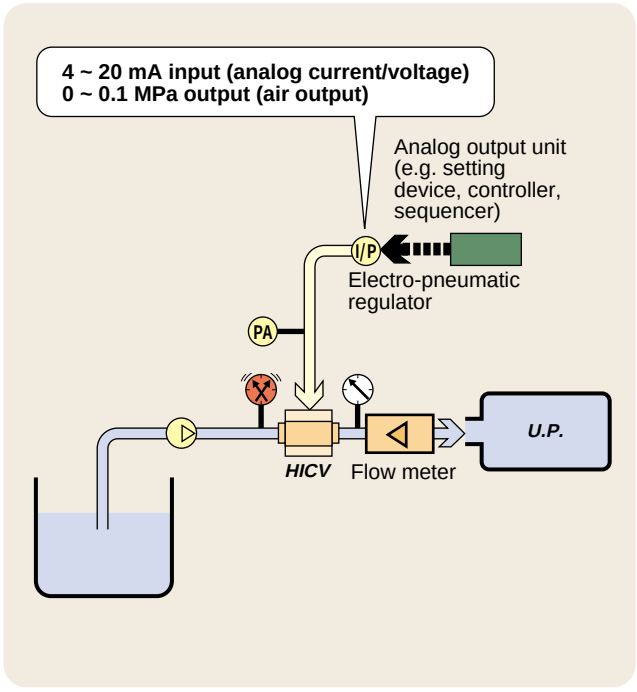
Once the HICV is installed to the utility line, pressure on the outlet side becomes consistent, regardless of pressure fluctuation on the inlet side, thus the required quantity can be supplied consistently. This simple combination achieves a high level of control, enhancing equipment performance and accuracy.

Note

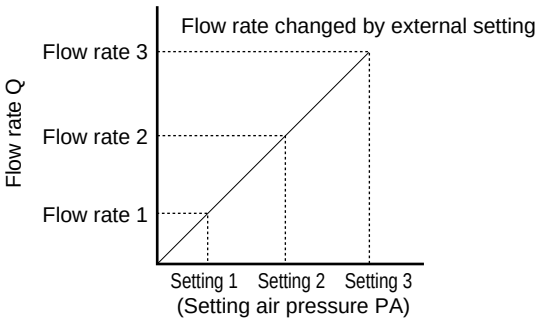
Boiling fluid or air bubbles may adversely affect control.



2 Changing flow rate externally



Utilizing this characteristic, the amount of fluid supplied to the use point can be adjusted by pre-determining the required flow rate and pressure for several locations, and changing the output signal from the sequencer or computer as necessary.

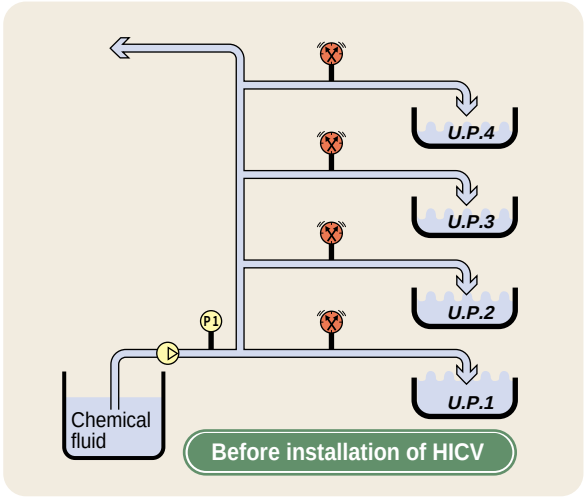


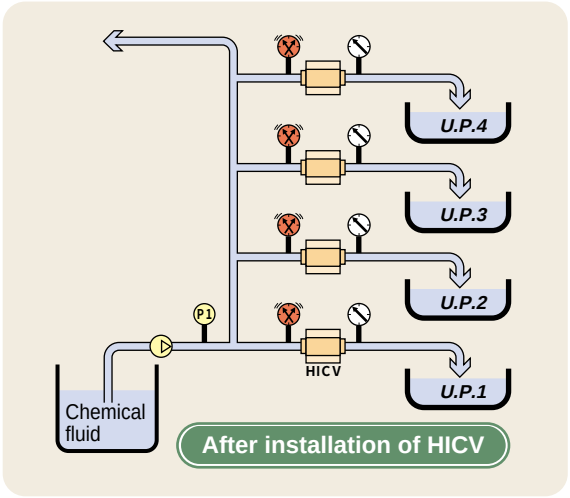
The HICV is capable of not only supplying a fixed amount of fluid but also performing feedback control for flow rate, pressure, concentration, temperature, etc. While measuring them. When controlling the flow rate, for instance, the value measured by the flowmeter is input to the controller, the difference between the actual flow rate and the required flow rate is calculated, and output is fed back to the HICV via the electro-pneumatic regulator.

HIGH INTELLIGENT CONTROL VALVE

HICV Effective Application Examples

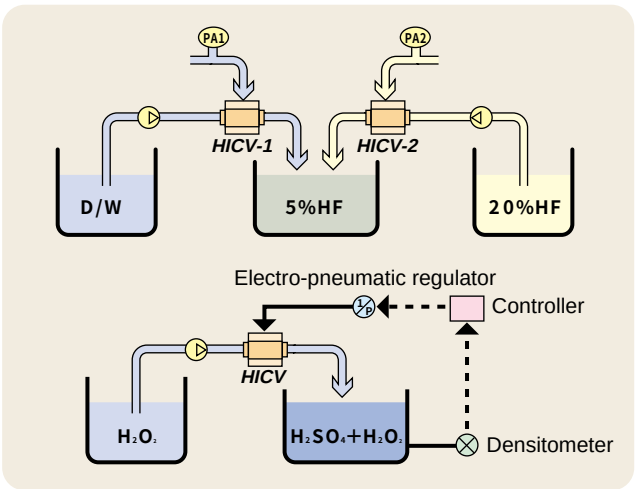
3 Ultra pure water and Chemical Fluid Stable Supply





When HICVs are installed in Ultra pure water and chemical fluid utility lines, these can be stably supplied to the point of use (U.P.) without being affected by mutual interference among points of use. For example, when there are four points of use, as in the illustration above, the line pressure P1 when only one U.P.is activated is higher than when all four U.P.s are activated, resulting in more Ultra pure water and chemical fluid than necessary being supplied.
Further, even when all points of use are activated, the pressure of the point of use closest to the utility supply source is higher. This hampers stable supply of Ultra pure water and chemical fluid to the far end of the utility. To solve these problems, HICVs are installed at the inlet of each point of use, making pressure on the outlet side constant, regardless of pressure fluctuation on the inlet side. Ultra pure water and chemical fluid can therefore be supplied stably to the far end of the utility line, resulting in improved utility efficiency.
Moreover, the flow rate at each point of use can be set as desired. This can save unnecessary flow, resulting in a reduction in the total consumption in the plant.

4 Chemical Mixing and Spiking Application



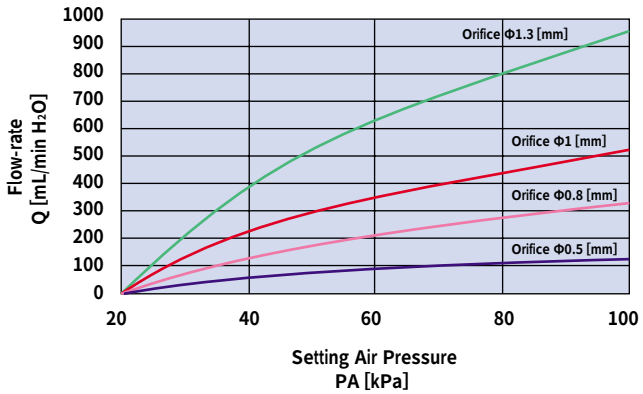
1.Applicable to chemical mixing and H_2O_2 spiking application

●Dilution of HF
When diluting HF to the desired concentration, install the HICV in the Ultra pure water line and HF line and set the appropriate mixing rate.

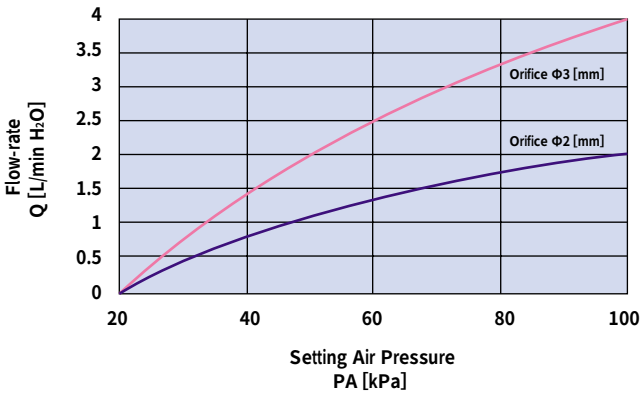
●H_2O_2 spiking application using the HICV enables supply of a fixed amount of H_2O_2 when required. Integrating a concentration sensor makes automatic concentration control possible.

Flow Rate Selection Table

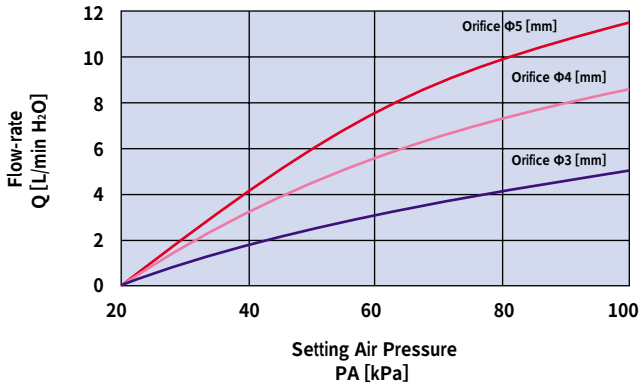
Setting Air Pressure and Flow-rate (PA-Q)
HICV-065



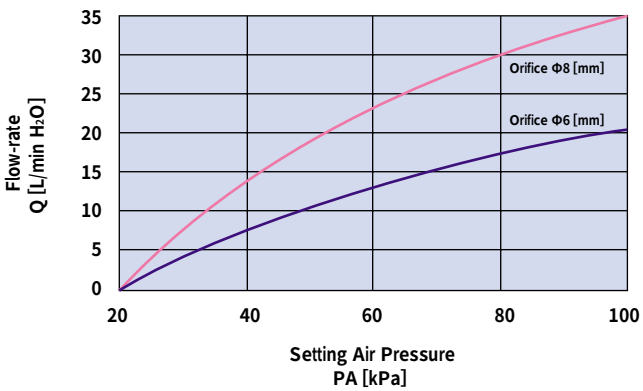
Setting Air Pressure and Flow-rate (PA-Q)
HICV-090-Tm10,TiS



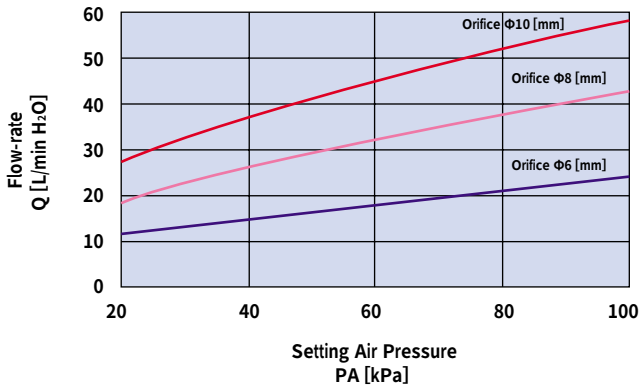
Setting Air Pressure and Flow-rate (PA-Q)
HICV-110



Setting Air Pressure and Flow-rate (PA-Q)
HICV-130



Setting Air Pressure and Flow-rate (PA-Q)
HICV-170



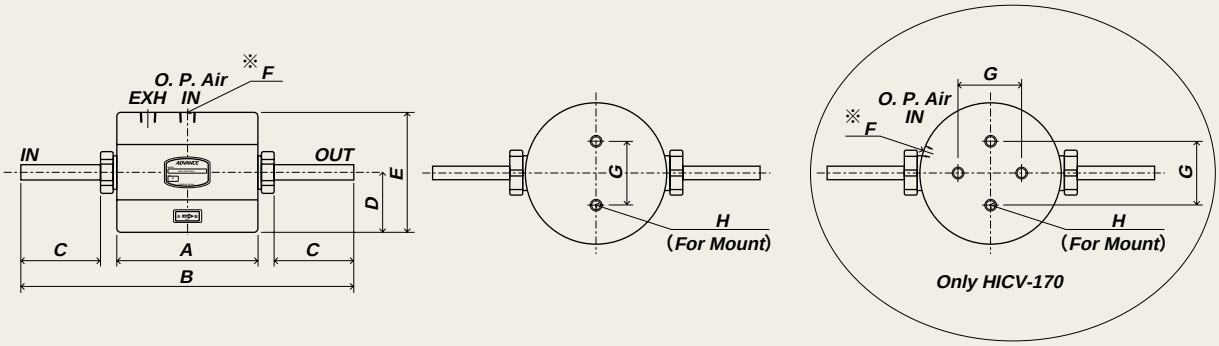
Measurement Method
The present data is measured in level tset circuit.
Setting orifice at the lower stream
Controlled fluid : Ultra pure water
Data is for reference.

General Specifications of HICV Series (for reference)

Connection (Piping)	PFA Tube
Controlled Fluid	Ultra pure water, Liquid chemical
Fluid Pressure	Inlet-Pressure 0.3 [MPa] (MAX)
	Outlet-Pressure 0.1 [MPa] (MAX)
Fluid Temperature	10～40 [℃] (HICV-065,-130 **10～90 [℃]**)
Amibient Temperature	0～40 [℃]
Setting Air Pressure Range	0.1 [MPa] (MAX)
Liquid-contact Surface Material	Body:PTFE Diaphragm:PTFE Shaft:PTFE Tube:PFA
Note	Enough difference pressure (0.05MPa) is necessary
	Difference pressure: Between the inlet-pressure and the outlet-pressure
	Use the precision regulator for setting out pressure
Related Law and Regulations	To export this product falls under law of trading control

HIGH INTELLIGENT CONTROL VALVE

Outline Drawing



List Of Model No.

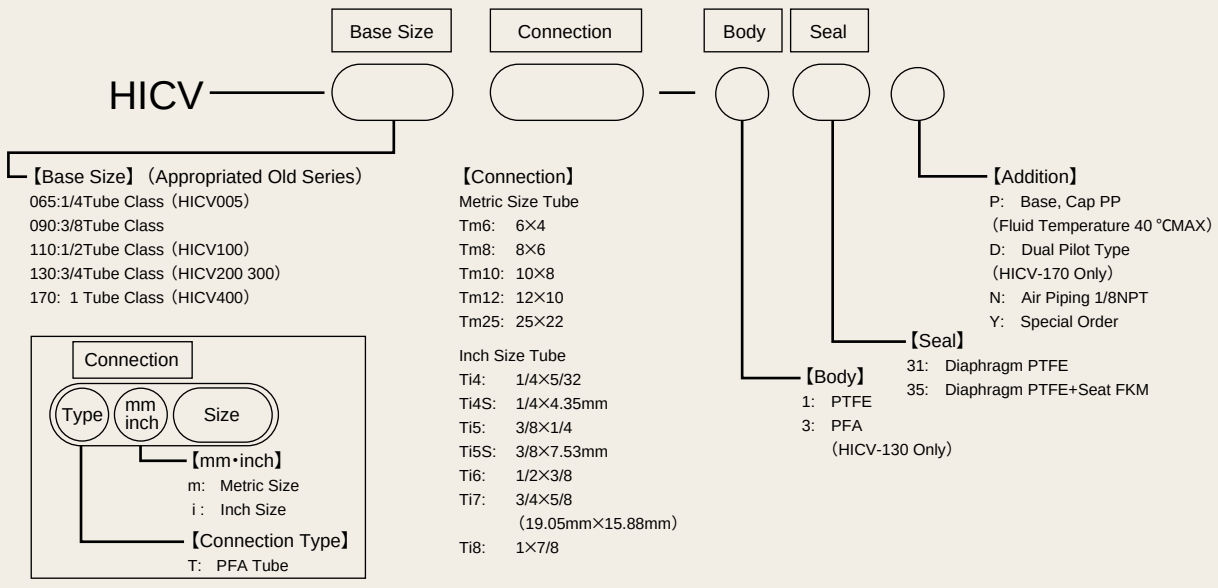
[mm]

Series No.	Model No.	Tube Size (O.D.×I.D.)	A	B	C	D	E	F	G	H	Old Series
HICV-065	HICV-065Tm6-131N	6×4	Φ65	210	66.5	28	53	2-1/8NPT	30	2-M6 depth10	HICV005
	HICV-065Ti4-131N	6.35×3.95									
Recommend Flow Range	HICV-065Ti4S-131N	6.35×4.35									
100～800mL/min	HICV-065Tm8-131N	8×6									
HICV-090	HICV-090Tm10-131PN	10×8	Φ90	210	50	37.5	75	2-1/8NPT	40	2-M8 depth12	
	HICV-090Ti5-131PN	9.53×6.35									
Recommend Flow Range	HICV-090Ti5S-131PN	9.53×7.53									
1～5L/min	HICV-090Tm8-131PN	8×6									
HICV-110	HICV-110Tm12-131PN	12×10	Φ110	300	85	38	76	2-1/8NPT	60	2-M8 depth12	HICV100
	HICV-110Ti6-131PN	12.7×9.53									
Recommend Flow Range	HICV-110Tm12-135PN	12×10									
2～10L/min	HICV-110Ti6-135PN	12.7×9.53									
HICV-130	HICV-130Ti7-331N	19.05×15.88	Φ130	300	76	45	90	2-1/8NPT	60	2-M8 depth12	HICV200 (HICV300)
Recommend Flow Range	HICV-130Ti7-335N	19.05×15.88									
4～20L/min											
HICV-170	HICV-170Tm25-131PDN	25×22	Φ170	350	79	60	120	3-1/8NPT	80	4-M8 depth16	HICV400
Recommend Flow Range	HICV-170Ti8-131PDN	25.4×22.2									
15～45L/min											

HICV-090	HICV-090Tm6-131PN	6×4	Φ90	210	54	35	70	2-1/8NPT	40	2-M8 depth12	HICV020
Recommend Flow Range	HICV-090Ti4-131PN	6.35×3.95									
0.5～2L/min	HICV-090Ti4S-131PN	6.35×4.35									
HICV-090	HICV-090Tm12-131PN	12×10	Φ90	210	50	37.5	75	2-1/8NPT	40	2-M8 depth12	HICV050
Recommend Flow Range	HICV-090Ti6-131PN	12.7×9.53									
1～5L/min											

※We have Rc1/8 air piping type（portion F）

HICV Series Model No. Construction（for reference）



ADVANCE ELECTRIC CO.,INC.

1139-1 KUMANOUE, KAGIYA-CHO, KASUGAI, AICHI 480-0304 JAPAN
PHONE:+81-568-88-7300／FAX:+81-568-88-7373
http://www.advance-e.co.jp e-mail info@advance-e.co.jp