QMS-721-ix

Vacuum device

DIE VS CVC series

DIEVS80-CVC2 Manual

Please read this manual before usage of vacuum device.
This manual may be changed without prior notice.

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Catalogue

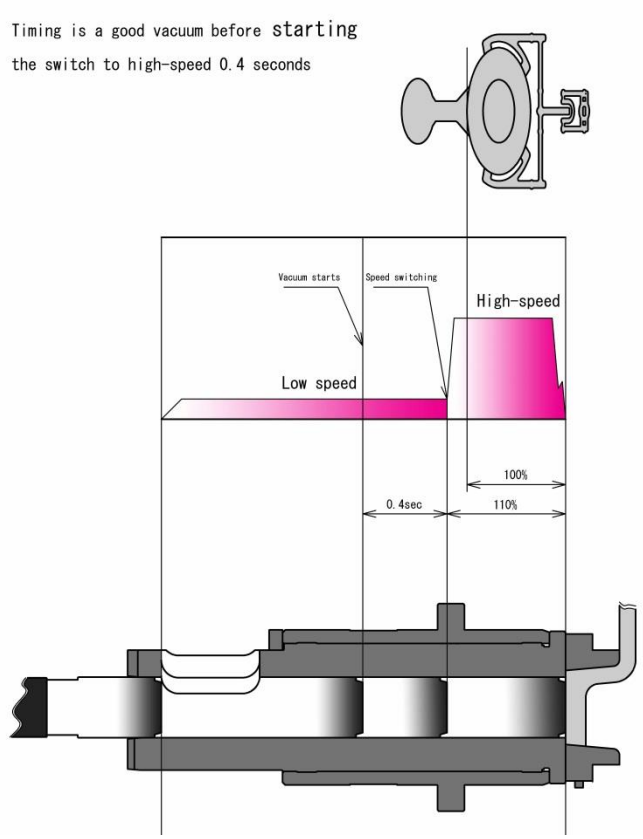
1. Before usage

1.1 Function explanation

①Vacuum suction function

<Action summary>

After accepting signal from die casting machine, vacuum device absorb gas from cavity through chill vent or vacuum valve (vacuum block).



[Cold chamber]

This function starts after accepting injection start signal or position signal.

[Hot chamber]

This function starts after accepting die close finish signal.

<Timer set >

After accepting action start signal, vacuum suction delay time and vacuum suction time acts in sequence..

[Cold chamber]

Timing of vacuum suction starts from 0.4sec before low speed changes to high speed.

[Hot chamber]

Considering injection delay time, timing of vacuum suction starts from 0.05sec after injection signal is accept.

Note：please pay attention to whether hose is connected closely.

Please pay attention to tightness of mold.

（Low tightness of mold may cause low efficiency of vacuum suction）

②Air blow function

<Action summary>

Air blow function starts after accepting extrusion signal.

Through supplying air to vacuum suction duct, air will clean movable part of valve.

Through this function, tiny substance or lubricant can be discharged in case to be involved into next circle.

This function can decrease frequency of maintenance and prolong lifespan of vacuum device.

<Timer set>

After accepting action signal, air blow delay time and air blow time will start to act according to sequence.

Please consider the time cost for taking product before set air blow delay time.

Time of spray should guarantee that alien substance or lubricant not to be involved into vacuum suction duct.

③Air for valve function

<Action summary>

This function starts after accepting high speed and no intensification signal.

Valve can be closed normally if molten metal impacts on piston under high speed intensify die casting.

When mold temperature is low or makes a try shot, the impact on piston is too weak to close valve.

Please supply air to close valve if molten metal impact is very weak or during try shot.

<Usage>

Auto operation：Please connect ON signal of high speed no intensification from die casting machine to metal connector (PIN No.4 and OUT COM).

Vacuum device can act automatically.

So long as vacuum device's power supply is ON and intensification signal is not accept, this function keeps working.

Manual operation：This function starts by touching(3.1Main screen) air for valve switch on main screen.

On this occasion, this function can act continually even without accepting signal from die casting machine.

Please do not forget to turn off switch if this function is unnecessary. （There is no vacuum suction under this function）

④Stable air function

<Action summary>

This function starts after accepting extrusion signal.

Through supply air to valve, this function can help valve act more smoothly.

Dimension of valve (especially action part) may be changed by heating.

In order to control dimension change, this function can help piston and valve to get more lubricant.

Please make proper setup in die casting machine which can guarantee piston and valve part to be sprayed lubricant for about one second.

This function can prolong lifespan of vacuum valve.

<Timer setup>

After accepting extrusion signal, stable air delay time and stable air time will act according to sequence.

However, if chill vent is used, stable air delay time and action time is zero.

⑤Cleaning function

<Action summary>

Because mold is very hot, the lubricant may change into gas immediately after spray.
This gas has bad effect on the quality of product. In order to decrease defective product, air will be supplied to vacuum suction duct after accepting die close signal.

Considering there is no outlet for gas in hot chamber, this function can only be used in cold chamber.
※7 pins specification has no cleaning function.

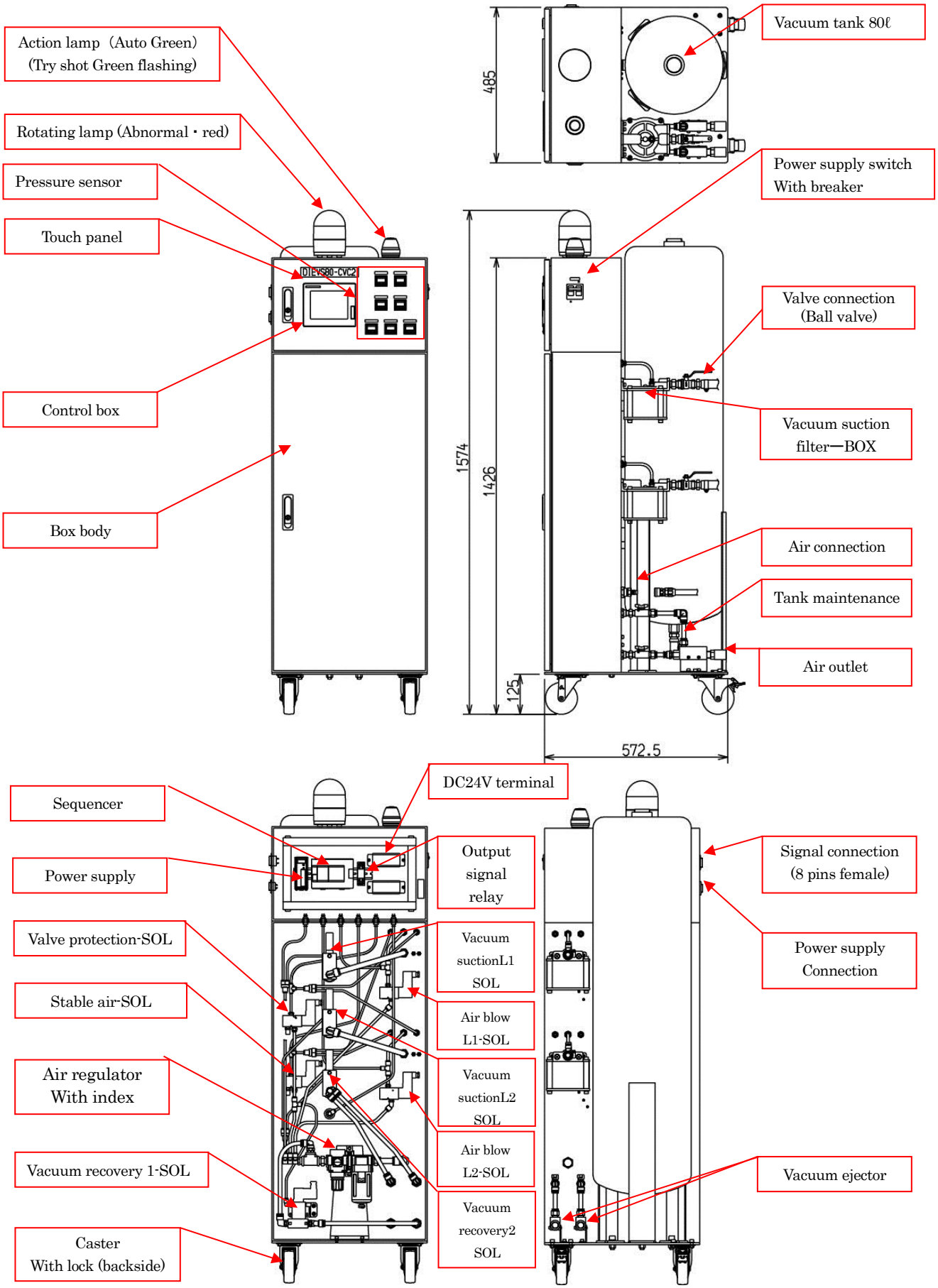
<Timer setup>

After accepting die close signal, cleaning delay time and cleaning time will act according to sequence.
Please do the time setup while considering time cost of die close.
Timing of this function is about one second after die close.

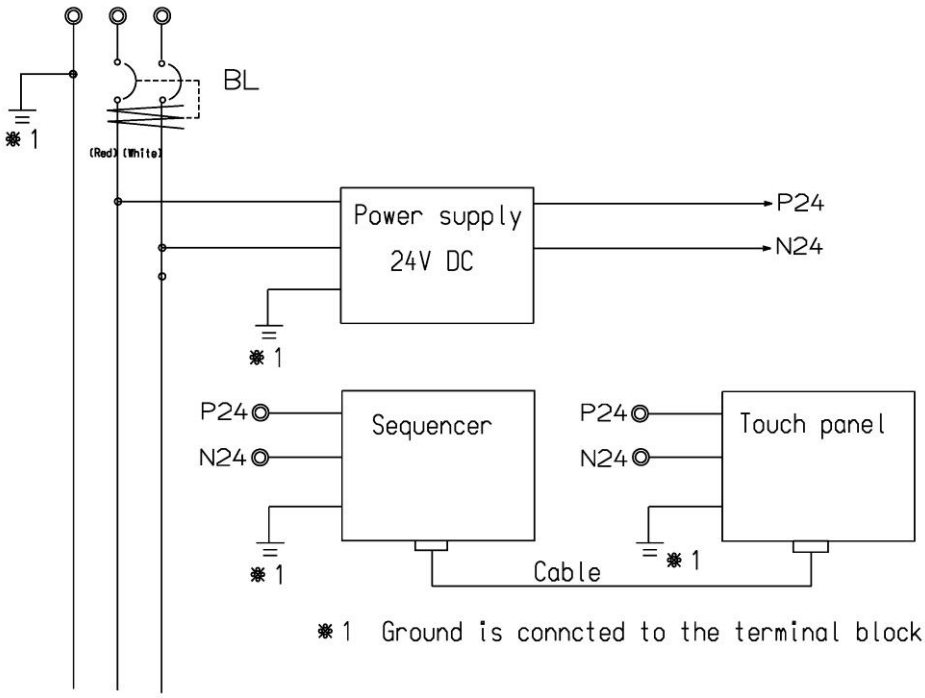
<About cleaning action time setup>

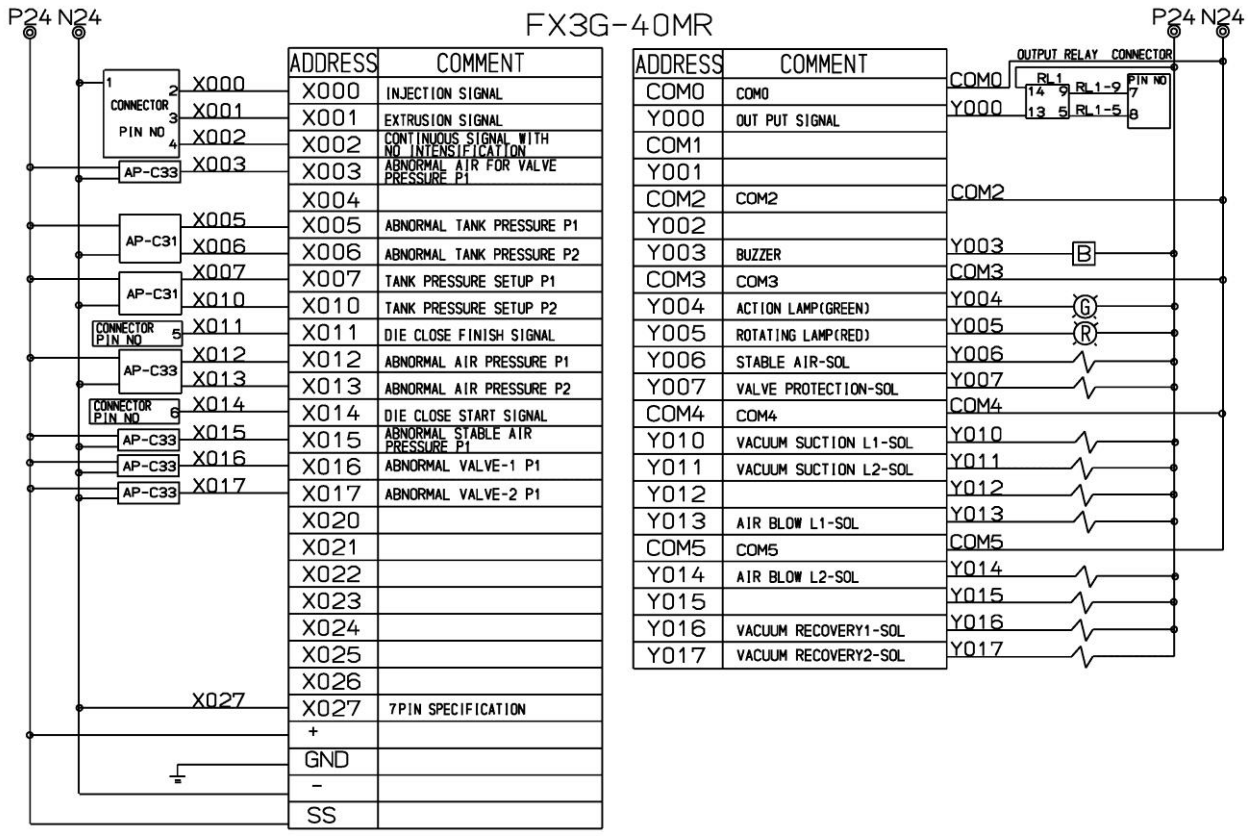
Time of this function cannot be set too long. If this function still act after injection start, it is not only to influence vacuum suction effect but also cause explosion, because too much pressure inside mold. Please pay attention to this point.

1.2 Dimension and name



1.3 Circuit





※X027：Please connect it to N024 for 7 Pins specification.

2. Device connection

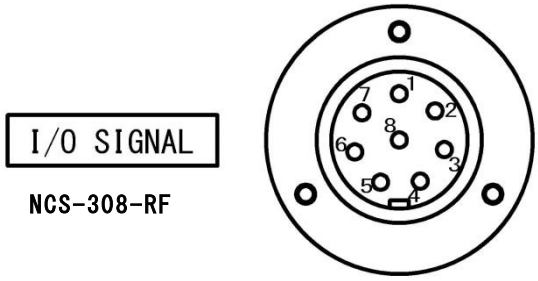
2.1 Die casting machine connection

Please make sure vacuum device can receive signals as below from die casting machine to make sure continuous action.

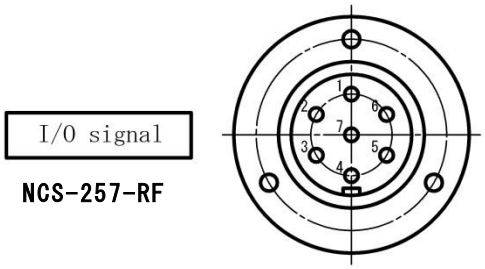
Signal connection of die casting machine side is entrusted to our customers.

①Connector for die casting machine side

[8 cores]



[7 cores]



[8 cores]

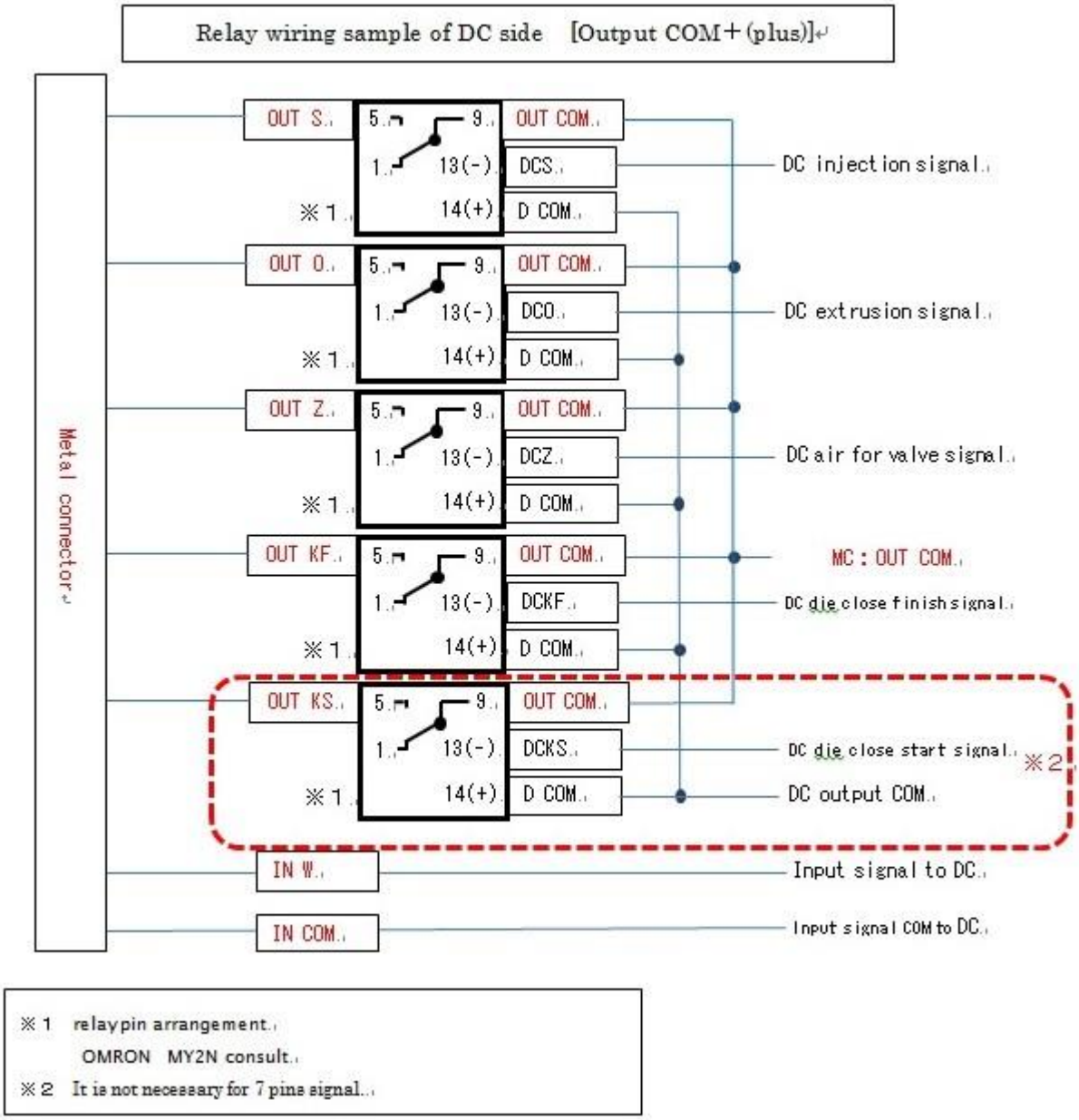
PIN №	Input・Output signal	Mark tube	Related function
1	OUT COM	OUT COM	－
2	Injection start or vacuum start signal	OUT S	Vacuum suction
3	Extrusion limited signal	OUT O	Air blow
4	Continuous signal with no intensification	OUT Z	Air for valve ※ During low speed or high speed die casting, this is continuous signal.
5	Die close finish signal	OUT KF	Cleaning finish
6	Die close start signal	OUT KS	Stroke reset　Cleaning start
7	IN COM	IN COM	－
8	Input signal	IN W	Device abnormality output/normality output

[7 cores]

PIN №	Input・Output signal	Mark tube	Related function
1	OUT COM	OUT COM	－
2	Injection start or vacuum start signal	OUT S	Vacuum suction
3	Extrusion limited signal	OUT O	Air blow、stable air
4	Continuous signal with no intensification	OUT Z	Air for valve ※ During low speed or high speed die casting, this is continuous signal.
5	Die close finish signal	OUT KF	Stroke reset
6	IN COM	IN COM	－
7	Input signal	IN W	Device abnormality output/normality output

②Die casting signal wiring

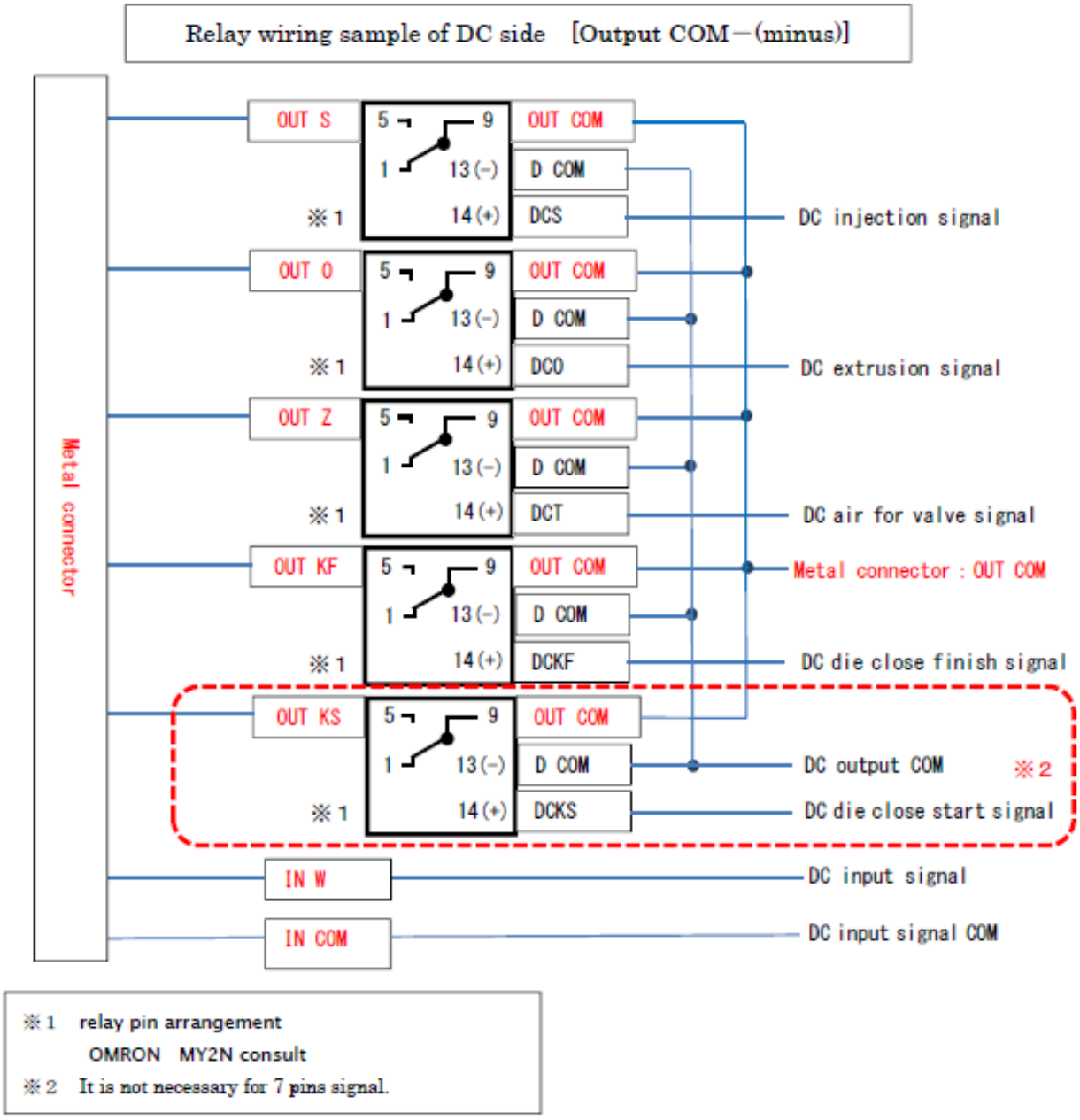
Wiring method（Relay sample 1 of die casting machine control box）



※1 relay pin arrangement.
OMRON MY2N consult.
※2 It is not necessary for 7 pins signal.

On the occasion of direct output from DC machine, please set independent system and make sure a contact with no voltage.

Wiring method (Relay sample 2 of die casting machine control box)



※1 relay pin arrangement
OMRON MY2N consult
※2 It is not necessary for 7 pins signal.

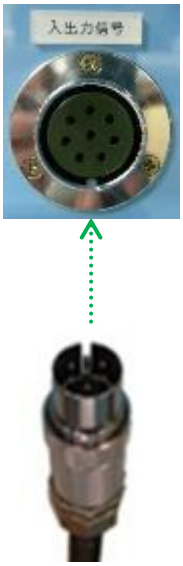
On the occasion of direct output from DC machine, please set independent system and make sure a contact with no voltage.

③Signal cable connection

●Please make sure power supply switch is off when connect power supply cable.
●After power supply cable is connected, there are electricity exists somewhere of control box, please cut off power supply when wiring work is being made.

(1)Connection and connector

Connection on the back of box body



Die casting machine

2.2 Hose connection

Vacuum valve and chill vent has different dimension of connection.
Connection of this picture shows is for vacuum valve connection.
If chill vent is used, please use coupler to change dimension of connection.

①Vacuum suction hose

<Vacuum valve or chill vent of our company>

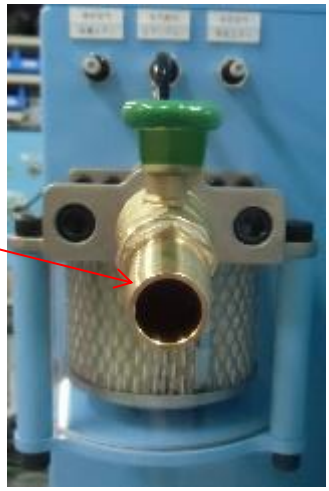
Please connect vacuum valve to hose connection of device side with hose (chemi-flex).

Please use hose band to fix it firmly.

During air blow, pressure inside hose is very high.

Please use hose band fix hose very tightly.

Vacuum suction hose connection	Inside φ14 Outside φ19



②Vacuum suction tube

<Chill vent of our company>

Please use tube（TS1209B）to connect vacuum device and chill vent.

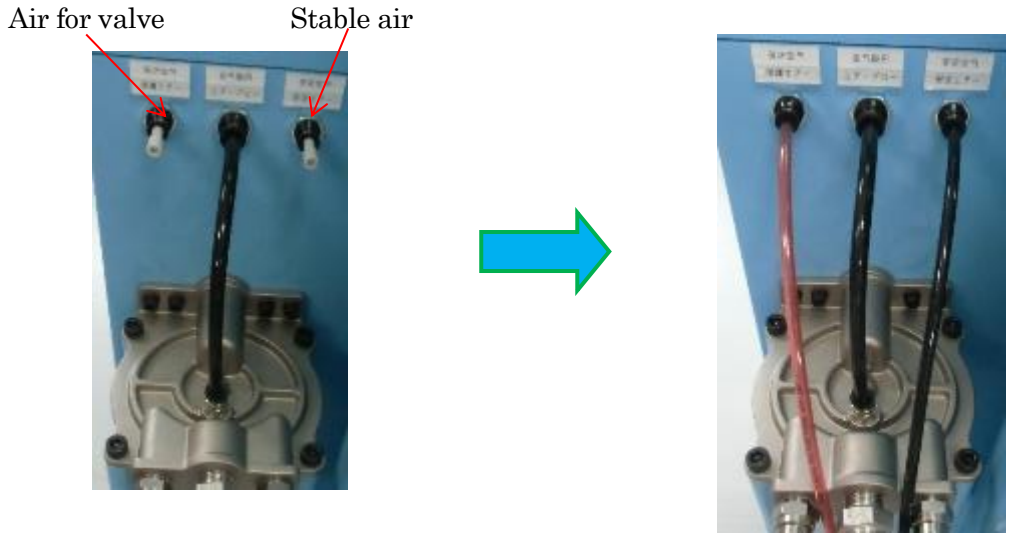
If fixation is not enough, air leakage may cause vacuum die casting failure.

Chill vent connection	φ12

③Air for valve・stable air tube

If vacuum valve of other company is used, please use plug to block these connections.

	Vacuum valve used	Chill vent used
Dimension	Inside diameter φ4 Outside diameter φ6	—
Maker	PISCO	SMC
Connection model	Air for valve ：PM6 For stable air：PM6	Air for valve ：KQ2P-06 For stable air：KQ2P-06
Product name	TU0604R(red) （air for valve） TU0604B(black)（for stable air）	No connection



Please insert tube firmly in case drop off.

2.3 Air hose connection

①Air supply pressure

	80L
Air pressure	Above 0.5MPa
Air supply ability	150ℓ/min
Connection hose	Inside diameter above φ11 air hose

Please connect air supply hose to this connection.

②Air supply pressure confirmation

After connection, please check the value of air regulator, 0.5Mpa is requested.

Adjusted handle is unlocked.

If memory value is lower than 0.5MPa, please prepare air compressor separately.

If memory value is higher than 0.5MPa, please rotate adjusted handle clockwise.

If supply air pressure is around 0.5MPa, but the memory is lower than 0.5MPa, please rotate adjusted handle anticlockwise.

③Air supply pressure sensor

Air pressure sensor
P1: MIN value
P2: MAX value

If actual value is higher or lower than setup, abnormal signal will be output.

- Please refer to 8.Original setup.
- Please refer to 3.17 Abnormality display screen.

3. Operation screen

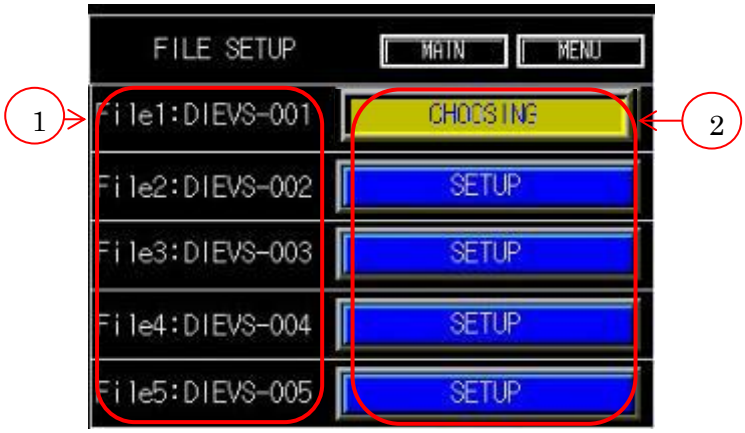
3.1 Main screen

№	Name	Explanation
1	Operation state display	Device action state
2	Setup state display	Time setup of each files display. “A” : Auto switch state（please refer to 3.16） “L1” : Selected system state display（3.5 Select vacuum system） “L2” : Selected system state display（3.5 Select vacuum system） “8P”:Numbers of core to DC machine (8P:8 pins or 7P:7pins) “S”: Abnormal stable air pressure check（please refer to 3.18）
3	Auto operation	Button for auto operation
4	File setup	Button for file setup screen
5	Select vacuum system	Button for vacuum system selection
6	Ready	It shows whether tank pressure is ready for production or not
7	Air for valve switch	Switch of air for valve function
8	Auto operation stop button	Button of auto operation stop ※After press this button, warning message of Auto operation stop comes out firstly, then press ok .
9	Abnormality detection time setup	Button of abnormality detection time setup
10	Menu	Button of switch to menu screen

※Under 7 pins specification, there is no cleaning subject.

3.2 File setup screen

Five action files can be set.

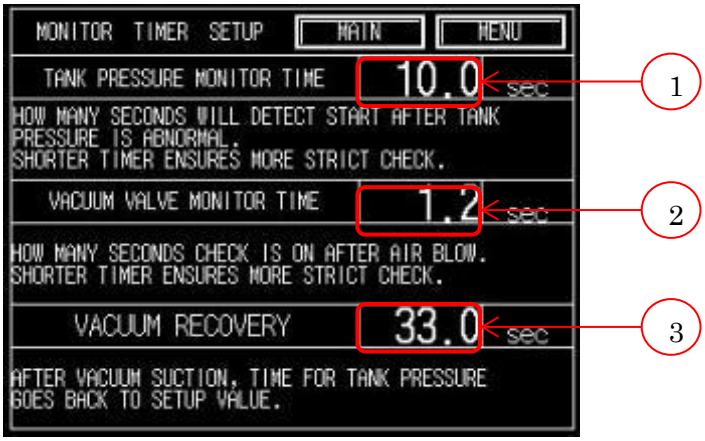


№	Name	Explanation
1	File name	Name of each file is displayed
2	File setup button	Switch to time setup screen

3.3 Action time setup screen

№	Name	Explanation
1	File name setup	File name setup by touching here
2	Cleaning delay time and action time	After accepting die close start signal, cleaning delay time and cleaning time start according to sequence. （Please refer to 1.1 function explanation ⑤ function ）
		※When 7 pins is selected, cleaning delay time and cleaning time is not on display.
3	Vacuum suction delay time and action time	After accepting injection signal, vacuum suction delay time and vacuum suction time start according to sequence. （Please refer to 1.1 function explanation ）
4	Air blow delay time and action time	After accepting extrusion signal, air blow delay time and air blow time start according to sequence. Please set up lubricant spray time in die casting machine side. （This function and lubricant spray start at the same time）
		Please make sure there is no more lubricant in valve and chill vent than necessary.
		L1・L2 need to be set separately. (Please refer to 1.1 function explanation)
5	Stable air delay time and action time	After accepting extrusion signal, stable air delay time and stable air start according to sequence. （Please refer to 1.1 function explanation④ air function ）
6	File name setup screen	File name can be set in this screen. Number 0～9 Alphabet A～Z（Capital letter only） “．”、“－”
7	Data change button	Selected file becomes effective. After press data change button, picture ⑧ shows.

3.4 Abnormality detection time setup screen



Valve monitor sensor
P1: detect value
(P2 as same as P1)

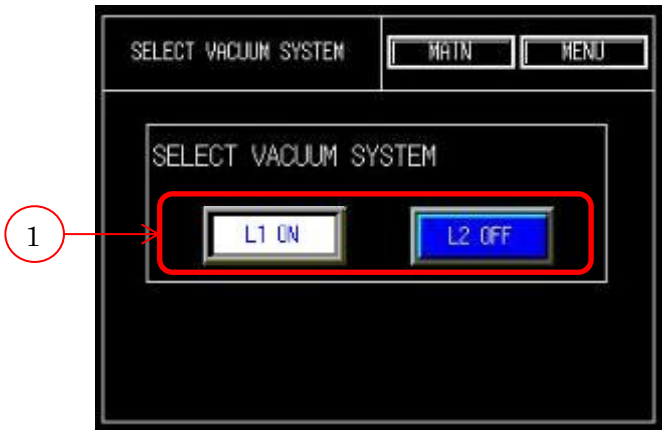
Tank pressure setup sensor
P1: MIN value
P2: MAX value

Abnormal tank pressure sensor
P1: MIN value

④
Abnormal air for value pressure
P1: detect value
(P2 as same as

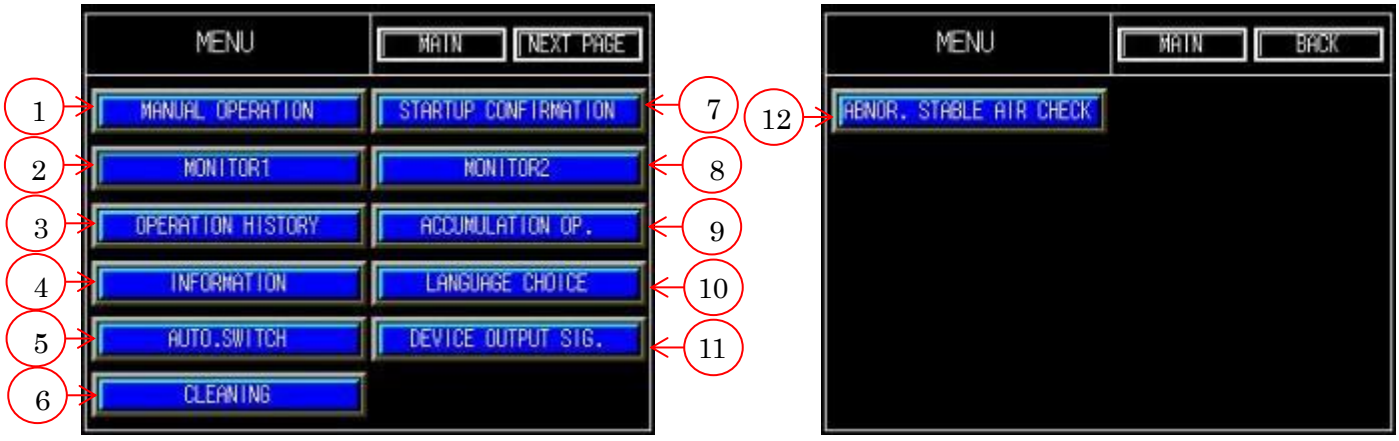
№	Name	Explanation
1	Tank pressure monitor time	Time setup for abnormal tank pressure signal output. Time of tank pressure return to MIN value after vacuum suction or tank pressure return to MAX value after vacuum recovery.
2	Vacuum valve monitor time	After product is removed, air blow starts. After air blow, if pressure of valve is higher than valve monitor sensor P1's value, time for abnormal signal output costs. Please make sure value here is ZERO when chill vent is used.
3	Vacuum recovery time	After vacuum suction, time for tank pressure returns to tank pressure setup sensor P2'value. If there is no problem for vacuum recovery time setup, there might be something wrong in vacuum recovery duct.
4	Abnormal air for valve pressure	If pressure is lower than air for valve setup value, abnormal signal will be output. (please refer to 2.2Hose connection③Air for valve・stable air) (please refer to 3.17 abnormality display screen)

3.5 Select vacuum system



№	Name	Explanation
1	Select system button	You can select which system to use. Both L1 and L2 cannot be off at the same time. (When L2 is off, L1 must be on.)

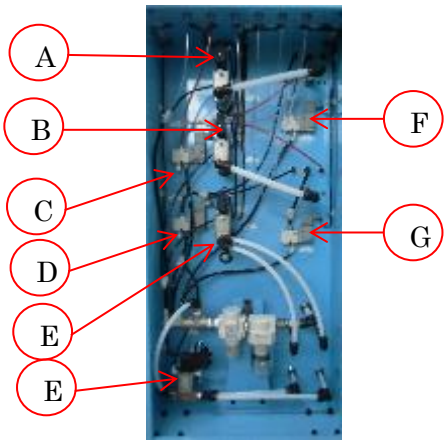
3.6 Menu setup screen



№	Name	Explanation
1	Manual	Button for manual screen operation.
2	Monitor 1	Button for monitor 1 screen.
3	Operation history	Button for action history screen.
4	information	Button for vacuum device information screen.
5	Auto switch	Button for auto switch screen.
6	Cleaning	Button for cleaning screen.
7	Startup confirmation	Button for startup confirmation screen.
8	Monitor 2	Button for monitor 2.
9	Accumulated action history	Button for accumulated action history screen.
10	Language choice	Button for language switch screen.
11	Device output signal	Button for device output signal.
12	Abnormal stable air check	Button for abnormal stable air check.

※Under 7 pins specification, there is no cleaning subject.

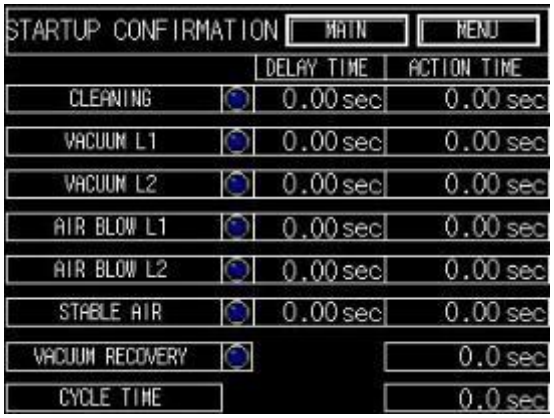
3.7 Manual screen



№	Name	Explanation
1	Vacuum recovery button	Button for vacuum recovery. E solenoid is ON/OFF.
2	Vacuum suction L1 button	Button for vacuum suction. A solenoid is ON/OFF.
3	Vacuum suction L2 button	Button for vacuum suction. B solenoid is ON/OFF.
4	Cleaning button	Button for cleaning. F,G solenoid is ON/OFF.
5	Valve prot. air button	Button of air for valve. C solenoid is ON/OFF.
6	Air blow L1 button	Button for L1 air blow. F solenoid is ON/OFF.
7	Air blow L2 button	Button for L2 air blow. G solenoid is ON/OFF.
8	Stable air button	Button for stable air. D solenoid is ON/OFF.

※Under 7 pins specification, there is no cleaning subject.

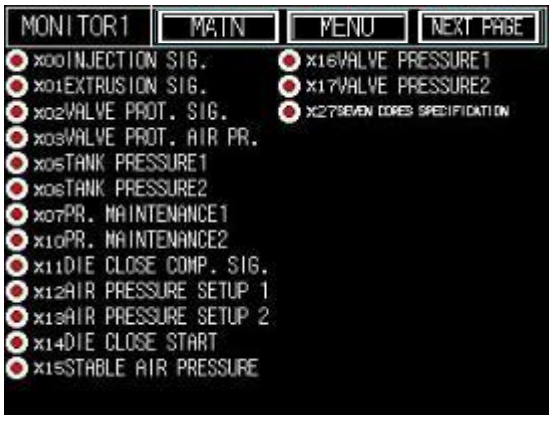
3.8 Startup confirmation screen



Delay time and action time of all functions can be confirmed on this screen.

※Under 7 pins specification, there is no cleaning subject.

3.9 Monitor 1 screen



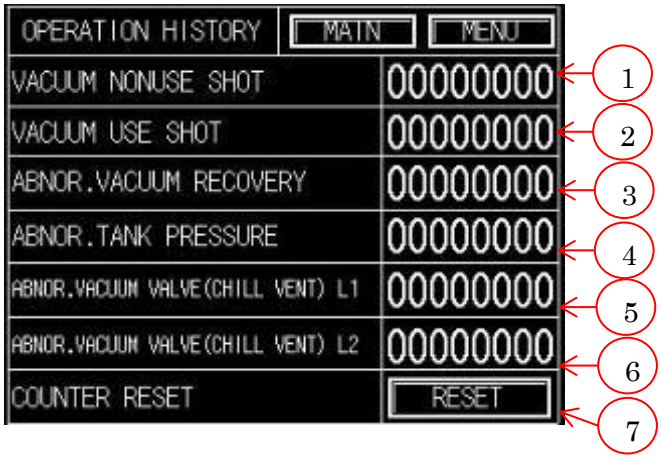
Input and output signal can be confirmed on this screen.

3.10 Monitor 2 screen

Length of all signals can be confirmed on this screen.

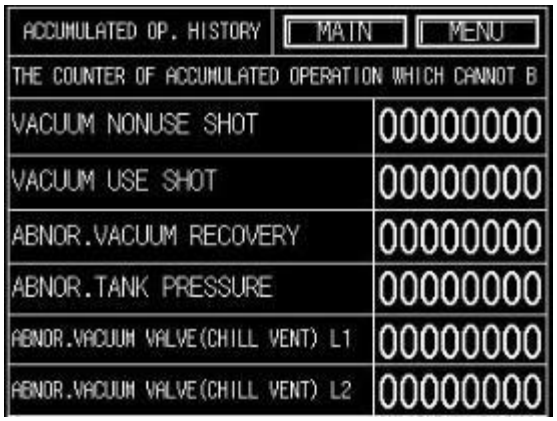
※Under 7 pins specification, there is no cleaning subject.

3.11 Action history screen



№	Name	Explanation
1	Vacuum suction shot	Vacuum suction shot history
2	No vacuum suction shot	No vacuum suction shot history
3	Abnormal vacuum recovery	Abnormal vacuum recovery history
4	Abnormal vacuum tank pressure	Abnormal vacuum tank pressure history
5	Abnormal L1 valve (chill vent)	Abnormality history of L1.
6	Abnormal L2 valve (chill vent)	Abnormality history of L2.
7	Counter reset	History reset button of 1～6 subject

3.12 Accumulated action history screen

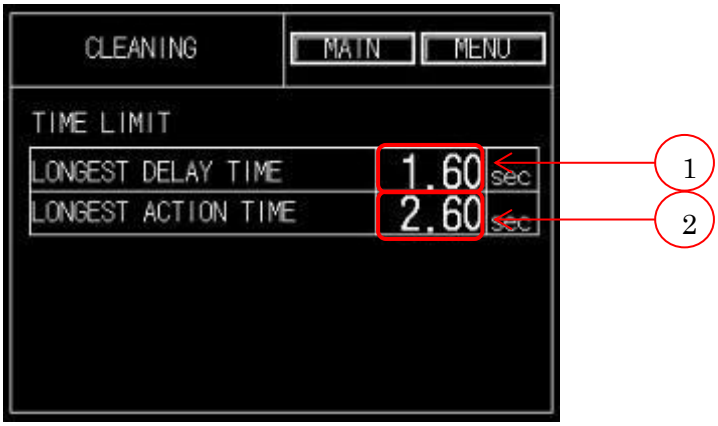


Accumulated action history from the beginning of usage（cannot be reset）

3.13 Language switch screen

Device language can switch to Japanese, English and Chinese.

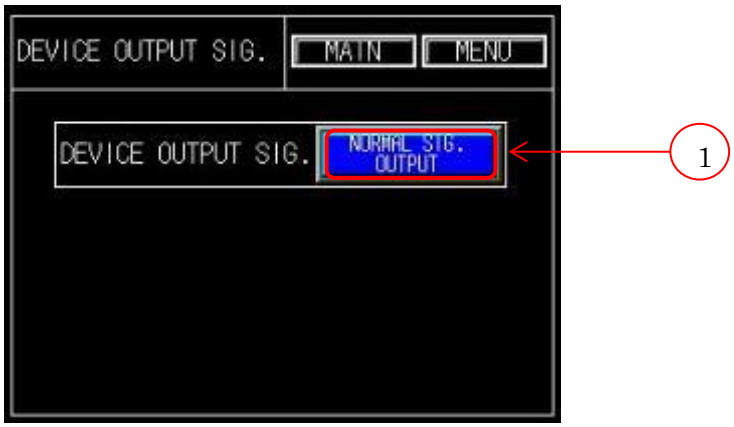
3.14 Cleaning screen



№	Name	Explanation
1	Longest delay time	3.3 Through action time setup screen, longest action delay time can be set. (1.1Function explanation ⑤Cleaning function)
2	Longest action time	3.3 Through action time setup screen, longest action time can be set. (1.1Function explanation ⑤Cleaning function))

※Under 7 pins specification, there is no cleaning subject.

3.15 Device output signal screen

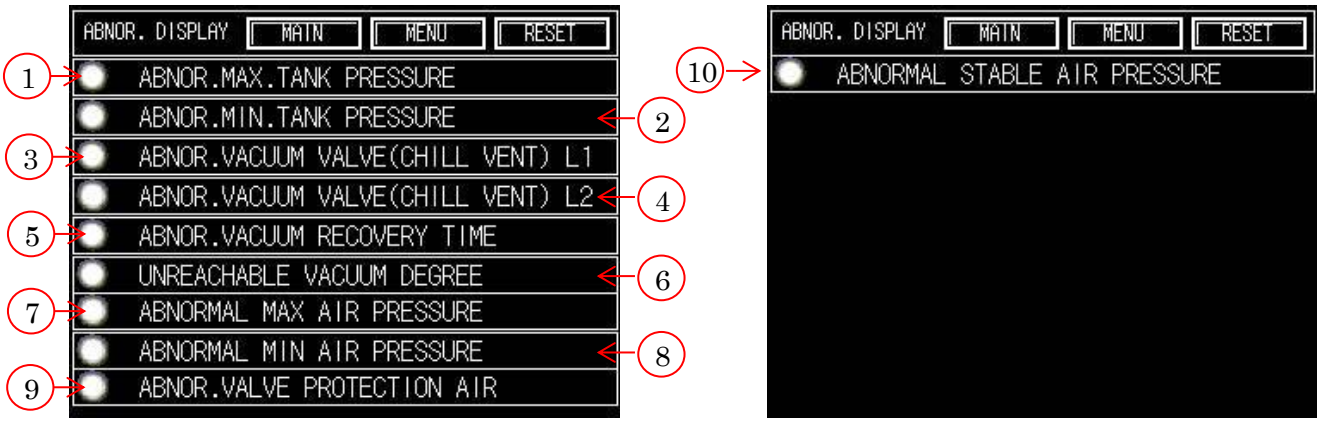


№	Name	Explanation
1	Device output signal	Normal signal/abnormal signal can be switched

3.16 Auto switch screen

№	Name	Explanation
1	Auto switch	Auto switch : “USE” After accepting die close start signal from die casting machine, even vacuum device is on automatic stop state, it can still do vacuum suction automatically. Auto switch : “NONUSE” ‘Auto operation stop’ vacuum device cannot do vacuum suction even if accepting die close start signal from die casting machine.

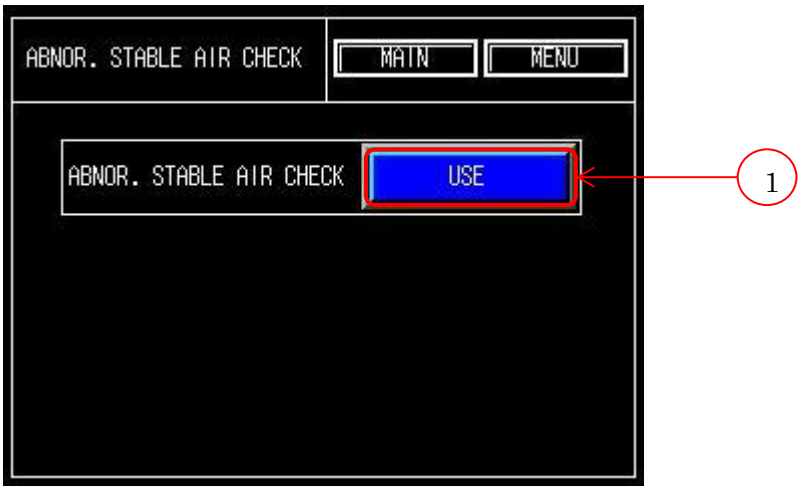
3.17 Abnormality display screen



№	Name	Explanation
1	Abnormal MAX value of tank pressure	If tank pressure is higher than “tank pressure abnormality sensor” P2’s setup value, warning on display.
2	Abnormal MIN value of tank pressure	If tank pressure is lower than “tank pressure abnormality sensor”P1’s setup value, warning on display.
3	Abnormal L1 valve(chill vent)	If actual value one second after air blow is higher than P1’s set value, L1 warning on display.
4	Abnormal L2 valve(chill vent)	If actual value one second after air blow is higher than P1’s set value, L1 warning on display.
5	Abnormal vacuum recovery time	Abnormal signal will be output if vacuum degree cannot return to setup value in certain time, warning on display.
6	Unreachable vacuum degree	From injection signal of first cycle to injection signal of next cycle is received, tank pressure cannot return to setup value (P2), warning on display.
7	Abnormal MAX air pressure	Air pressure of factory side is monitored. Abnormal signal will be output if actual value is higher than P2’s setup.
8	Abnormal MIN air pressure	Air pressure of factory side is monitored. Abnormal signal will be output if actual value is lower than P1’s setup.
9	Abnormal valve protection air	Please confirm air pressure of factory side (Please refer to 2.2 Hose connection)
10	Abnormal stable air	If tube of stable air and air for valve connection is wrong, alarm will output.

※7.When abnormal signal is output, please refer to above chart.

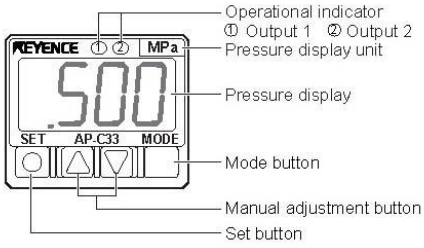
3.18 Abnormal stable air check



№	Name	Explanation
1	Abnormal stable air check	Abnormal stable air check：“USE” When vacuum valve or chill vent of our company is used, please set this function as USE. If valve protection and stable air piping is connected wrongly, alarm message shows on two conditions. Condition①Timing from Auto operation stop to Auto operation, this function starts to work. Condition②Auto switch is「USE」. After die close start signal is accept, this function starts to work. (The first circle has no cleaning action) Abnormal stable air check：“NONUSE” If vacuum valve or chill vent of other company is used, this function cannot be used. There is no abnormal stable air check.

4. Sensor setup

4.1 Pressure sensor



Actual pressure is displayed by this sensor.
Operation method of AP-C33, AP-C31 is same.

①Pressure sensor zero point proofreading

Please open pressure sensor duct and make it in atmospheric pressure.

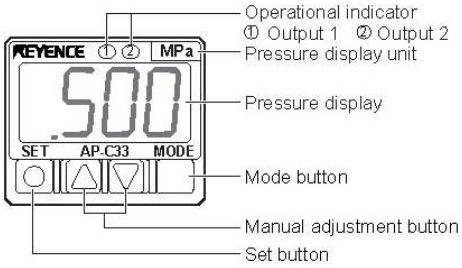
※Please open tank cock to proofread tank pressure setup sensor and tank pressure abnormality sensor.

※Please remove air hose to proofread air for valve pressure sensor and abnormal valve detection sensor.

Please close ball valve after proofreading.

②Proofreading method

Press these two▼▲buttons for three seconds and value becomes zero. Please do this on each sensor.



③Pressure sensor setup confirmation

(1)Please press either of these two buttons▼▲once.

(2) P1⇔ setup value display alternatively.

(3) On this occasion, press mode button again, P2 ⇔ setup value display alternatively.

Please do not change setup value.

If setup value has to be changed, please refer to this chapter.

Please write down setup value in shipping document.

④Setup value modification

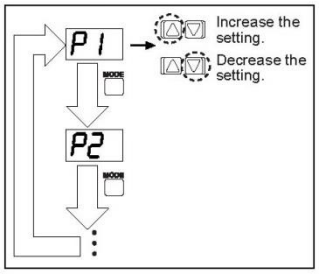
Modification of P1's setup value

When P1⇔setup value displayed alternatively,

Press ▲to raise setup value.

Press ▼to reduce setup value.

Value modification of P2 is as same as P1.



⑤Key lock method （operation lock）

In order to avoid error operation, key of sensor can be locked.

Pre  and  or  at the same time  is displayed and key of sensor are locked.

※Release of key lock is on contrary to key lock.

5. Maintenance

5.1 Check and consumable exchange

※Detail of consumable exchange, please refer to
"5.4 EXCHANGE COMPONENT LIST"

Hose

Tube

①Hose

- Chemi-flex
- Tube for chill vent
- Polyurethane tube of air for valve or stable air

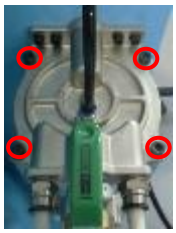
All these tube are consumable, please check it and exchange it if there is injury.

②Vacuum suction duct filter box

This filter box can avoid lubricant comes into vacuum tank.
If filter box is clogged, it may cause malfunction of vacuum device.
Please check it one month once.
If there is too much lubricant accumulated inside this filter, please adjust air blow time and lubricant spray time.

Note：please turn off power supply of device while do the maintenance.

[Check・Exchange method]



Remove four bolts

Remove transparent cover

Transparent cover

Remove bolt

Dismantlement finish

[Filter -big]
If it is dirty, please exchange it.
Note：Please do not wash this filter.
The frequency of exchange is about three months once.

③Air regulator filter

Try to stabilize supply air pressure, vacuum device install with air regulator.

In order to avoid alien substance comes into tank, filter is inside this regulator.

This filter is clogged by air compressor oil easily, please exchange it as follows

（According to different environment, frequency of exchange is about three months once. ）

[Check]

Check this filter through filter window.

Air regulator

[Exchange method]

(1)Remove air hose from air connection.

(2)Please confirm whether value of regulator is zero or not.

(3)Dismantle filter.

①Pull down

②Rotate

After Filter cover is removed

After filter is removed

Please release black lock then rotate black cover right or left 45°.

Then remove cover of filter, press bottom of filter and rotate it clockwise.

Exchange the filter and assemble it on contrary to dismantlement.

Note：Please do not rotate filter compulsorily, it may damage it.

Lift filter while release lock may make dismantlement more easily.

If it is too difficult to remove this cover, please rotate cover right and left slightly.

[Filter middle]

Filter installment state

filter component

[Filter sample]

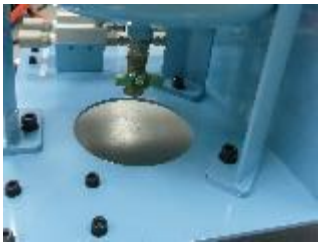
used new

(4) After exchange, please assemble it on contrary to dismantlement.

(5) Discharge of water and oil of tank

Please discharge water and oil of tank one month once.
Too much water or oil may cause volume of tank becomes small, abnormal MIN tank pressure may happen more frequently.

Otherwise, please close ball valve before operation.



※Like right picture shows , please open this ball valve and leave it open for some time in atmospheric pressure.

※Please make sure vacuum device is on manual operation mode or turn off power supply.

5.2 Vacuum ejector

This vacuum device has two ejectors.

Please use one ejector once a time.

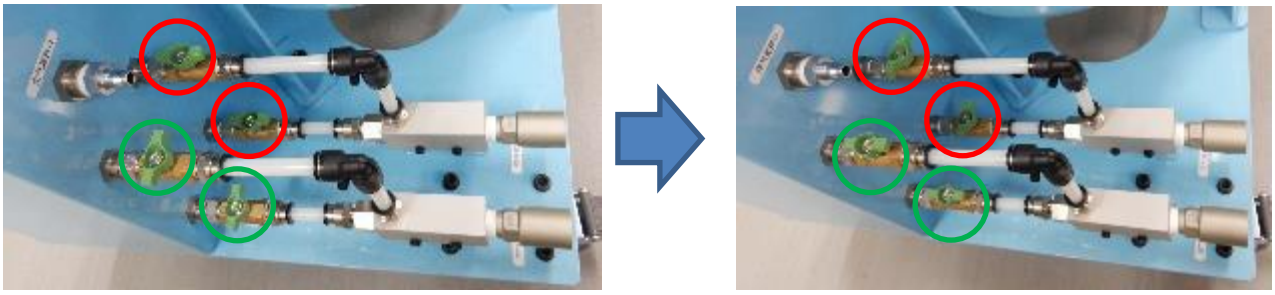
When vacuum recovery time takes longer and longer, please clean using ejector and use the other one to do vacuum die casting.

※If four ball valves of two systems are closed at the same time, vacuum device cannot work normally.

[Vacuum recovery switch method]

Vacuum recovery switch

When you stand behind vacuum device and want to use vacuum recovery on the left side,



Red frame part：Please close these two ball valves

Green frame part：Please open these two ball valves

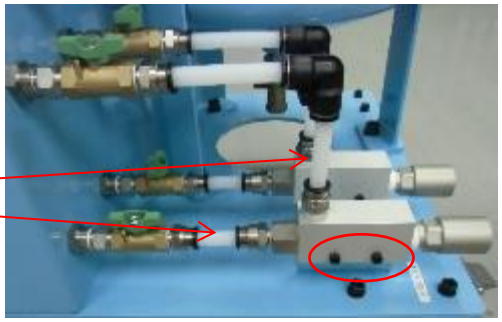
※When select system is changed, please close or open ball valves correspondingly.

[Maintenance sequence]

①Remove

(1)Please remove two bolts of ejector.

(2)Please remove two tubes of ejector.

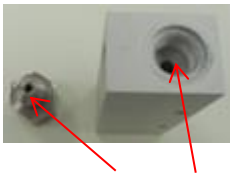


②Clean

(1)Please clean air duct with parts cleaner.

Remove ejector

Dismantle



Clean air duct

③Installment

(1)Please wrap seal tape in connection in case air leakage.

(2)Please assemble it on contrary to dismantlement.

(3)The material of ejector is very soft, please be careful not to damage it.

5.3 Exchange component list

	Hose				
№	Parts name	Parts code	Maker	Number	Remark
1	Vacuum suction hose	Chemi-flex φ19×φ26	Japan chemical	1	Vacuum valve is used only
2	Vacuum suction tube	TS1209B	SMC	2	For multiple chill vent
3	Heat resistance tube	SFT1210-C	PISCO	2	For multiple chill vent
4	Air hose	AH-11(11×16)	CHIYODATSUSHO	1	For air supply
5	Air duct tube	TU0604B	SMC	1	For stable air
6	Air duct tube	TU0604R	SMC	1	For air for valve
7	Hose band	HOSBS22N	MISUMI	2	For hose fixation
8	Tube coupler	KQ2H12-00A	SMC	2	For chill vent usage

	Filter				
№	Parts name	Parts code	Maker	Number	Remark
9	Filter - big	842	Solberg	1	For Vacuum filter box
10	Filter - middle	AF40P-060S	SMC	1	For air regulator
11	O ring (big)	G125(black)	AW MACH	2	For vacuum filter-box
12	O ring (small)	G70(black)	AW MACH	2	For vacuum filter-box
13	Residual pressure control pin	12CV2-901-99	Die Engineering	1	For stable air filter

※The length of cable、hose and tube can be specified by customers before order.

6. Vacuum device specification

Model : DIEVS80-CVC2

Subject		Specification
Vacuum	Highest vacuum degree	About -85kPa※1
	Continuous vacuum degree	-73kPa～-75kPa※2
	Vacuum method	By vacuum ejector
	Vacuum suction control	Solenoid control
	Vacuum tank volume	80ℓ
Air	Air pressure	Above 0.5MPa※3
	Usage volume	MAX 150ℓ/min
	Connection	Plug Nitto　40PM
	Connection hose	Inside diameter above φ11air hose
Power supply	Voltage	Single phase AC100V～AC220V　50Hz/60Hz
	Connection	Round terminal
	Protect circuit	Circuit with protector
	Inside voltage	DC24V※4
signal	Body box connection	Metal connector（Female）　8p
	Die casting machine side	Input/output connector※5※6or　direct connection※6
	connection	Special signal cable
	Input signal※7	Injection start signal or inject position signal
		Extrusion signal
		Die close start signal（8 pins speculation only）
		Die close finish signal
	Output signal	Abnormal signal
Additional function	Function name	Air blow・Cleaning air・Valve protection air ・Stable air
	Function control	Solenoid control
Operation display		Touch panel
Dimension　(Length×width×height)		485mm×572.5mm×1574mm（include pilot lamp）
Weight		118kg

※1.This vacuum degree doesn't　suit continuous die casting.
※2.Please set vacuum degree in this scope during continuous die casting.
※3.If it is lower than 0.5MPa, vacuum suction cannot exert completely.
　　Please prepare compressor particularly.
※4.All the machine of this equipment is DC24V.
※5.The installation of I/O connector is necessary.
※6.According to die casting machine, relay is necessary on some occasions.
※7.A point is no voltage, please do not input any signal of voltage.

7. Trouble shooting

№	Content	Solution
1	Abnormal MAX tank pressure	・If tank pressure is higher than “tank pressure abnormality sensor” P2’s value, alarm will be output. ・Please confirm tank pressure sensor. ・Please confirm tank pressure abnormality sensor P2’s setup value. (If it is higher than P2, alarm will be output.) ・Please confirm tank pressure setup sensor P2’s setup value. (Vacuum device reduce pressure to P2’s setup value) ・Please open tank cock and reduce pressure. ・Please confirm tank pressure monitor time setup .(3.4 Abnormality detection time setup screen)
2	Abnormal MIN tank pressure	・If tank pressure is lower than “tank pressure abnormality sensor” P1’s setup value and near atmosphere pressure , alarm will be output. ・Please confirm tank pressure sensor. ・Please confirm tank pressure abnormality sensor P1’s setup value.(If it is lower than P1, abnormal signal will be output.) ・Please confirm tank pressure setup sensor P2’s setup value. (Vacuum device reduce pressure to P2’s setup value) ・Please confirm sensor value after vacuum suction(Compare to normal action value) If actual value is lower than setup value : There might be some leak in vacuum suction duct. ・Through menu screen(3.7 Manual operation screen), do vacuum recovery to reduce pressure to setup value. Please compare this time to normal action time. ・Please confirm tank pressure monitor time setup.(3.4 Abnormality detection time setup screen)
3	Abnormal vacuum recovery time	If vacuum degree cannot return to setup value, alarm will be output. ・Please confirm whether there is leakage in vacuum suction hose. (3.4 Abnormality detection time setup screen)
4	Unreachable vacuum degree	From injection signal is accept of one circle to injection signal is accept of second circle, tank pressure cannot back to tank setup value(P2),abnormal signal will be output. ・Please confirm whether there is leak in vacuum suction hose. ・Please confirm whether there is accumulation of lubricant inside tank. (Open tank cock) ・Please confirm whether there is abnormality in (ejector、pump、solenoid valve).

№	Content	Solution
5	Abnormal valve protection air	Please confirm air supply of factory side. (2.2Hose connection)
6	Abnormal L1 vacuum valve (chill vent)	If valve is clogged, actual value during air blow will be higher than P1's set value. ・Please confirm chill vent is clogged or not.
7	Abnormal L2 vacuum valve (chill vent)	Solution is as same as No. 6.
8	Tank pressure value is a little strange	①Please open tank cock and confirm the value of "tank pressure abnormality sensor" and "tank pressure setup sensor" is back to zero or not. (Please open and close tank cock several times repeatedly. Tank pressure cannot be zero, if open tank cock for just once.) ②If sensor value is not zero , please do zero proofreading beforehand. (4.1 Pressure sensor)
9	It costs more time to do vacuum recovery (slower than before)	① Please open tank cock and make sure tank pressure is zero. ② Through manual operation screen(3.7 Manual operation screen), do vacuum recovery and record how many minutes cost to reach setup value.(If it costs too much time, please clean vacuum recovery duct.)
10	Abnormal MAX air pressure	①Please confirm air pressure of factory side. ②Please confirm P2 of air pressure sensor in front of control box. Please make sure P2's setup is higher than MAX factory air pressure.
11	Abnormal MIN air pressure	①Please confirm air pressure of factory side. ②Please make sure P1'setup is lower than air regulator (1.2 Dimension and name)and lower than actual air pressure of during air blow.
12	Abnormal stable air	①If valve of our company is not used, please make sure「Abnormal stable air」setup is「NONUSE」 (Please refer to 3.19Abnormal stable air check) ②If valve of our company is used, please make sure stable air tube and air for valve tube is connected correctly.

8. Original setup

[Device data]

Device information	File 1	
Cleaning delay time	0.00	
Cleaning time	0.00	
Vacuum suction delay time	0.40	
Vacuum suction time	2.00	
Air blow delay time	1.00	
Air blow time	2.00	
Stable air delay time	1.00	
Stable air time	1.50	
Tank pressure monitor time	10	
Vacuum valve monitor time	1.2	
Vacuum recovery time	23	
Abnormal air for valve pressure	P1	0.3
	P2	0.3
Abnormal valve detection	P1	0.12
	P2	0.12
Abnormal tank pressure	P1	-65.0
	P2	-77.0
Tank pressure setup	P1	-74.0
	P2	-75.0
Air pressure sensor setup	P1	0.35
	P2	0.7
Abnormal stable air check	P1	0.2
	P2	0.2

When chill vent is used, how to set abnormal valve sensor?

※Value below is on the premise of our company's chill vent is used.
Value may change greatly according to actual usage environment.
※φ12 tube SMC TS1209B SOFTNYLON specification
※Regular air pressure :0.5MPa
Chill vent one used : 0.3MPa
Chill vent two used : 0.24MPa

Keyence pressure sensor mode (before delivery) setup value]

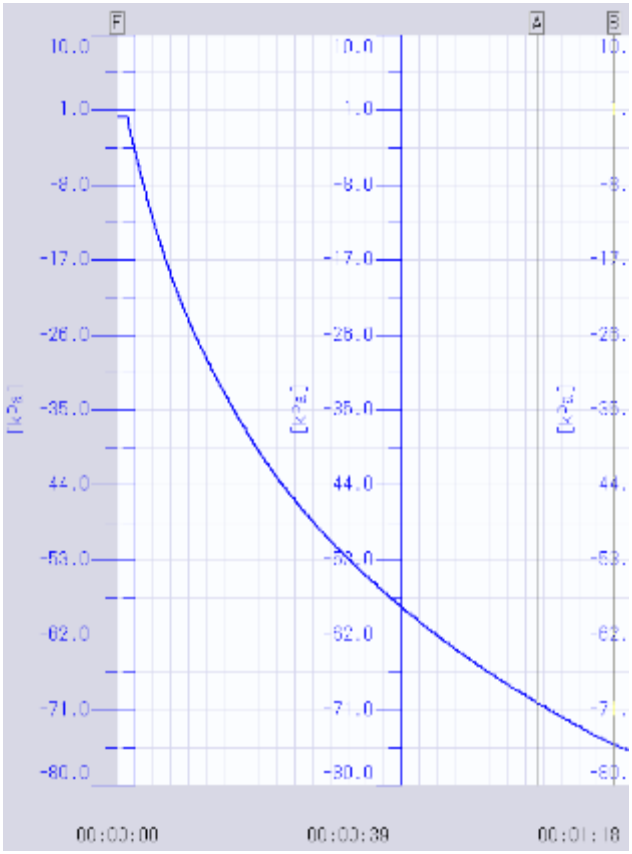
<AP-C33> for plus pressure
F-1 → Std → noo → in → 100 → ron → nor

For air pressure
F-1 → Std → noo → in → 100 → rGr→ nor

<AP-C31>for minus pressure
F-1 → Std → noo → in → 100 → rGr → nor

[Ejector data recovery graph]　Original data

Air pressure of factory side is 0.5MPa、tank pressure from -70.0kPa to -75.0kPa　costs 13.0 s .
Ejector（**CV-20HS** ）of this device used suits to air pressure which ranges from 0.45MPa to 0.5MPa.
If air pressure is higher than standard, it costs more time for vacuum recovery.
※Please use only one ejector once a time.



カーソル情報 - DATA$0698_00000001_000001.krd

選択波形	1)TH_CH1:タンク内圧	kPa
カーソルA	0 00:01:11.000	-70.0
カーソルB	0 00:01:24.000	-75.0
カーソルA-B	-0 00:00:13.000	5.0

[Bundled item]

Bundled item list will be afforded after vacuum device usage environment is confirmed.