IAI
Quality and Innovation

Electric Vacuum Pump ROBOPUMP

www.iai-automation.com

Compact electric vacuum pump

ROBOPUMP

According to the intended use 2 types can be selected

Standard Type

(Open-Air System)

Open the valve on the vacuum pipe and return it to atmospheric pressure.

Compact size
Lightweight and inexpensive

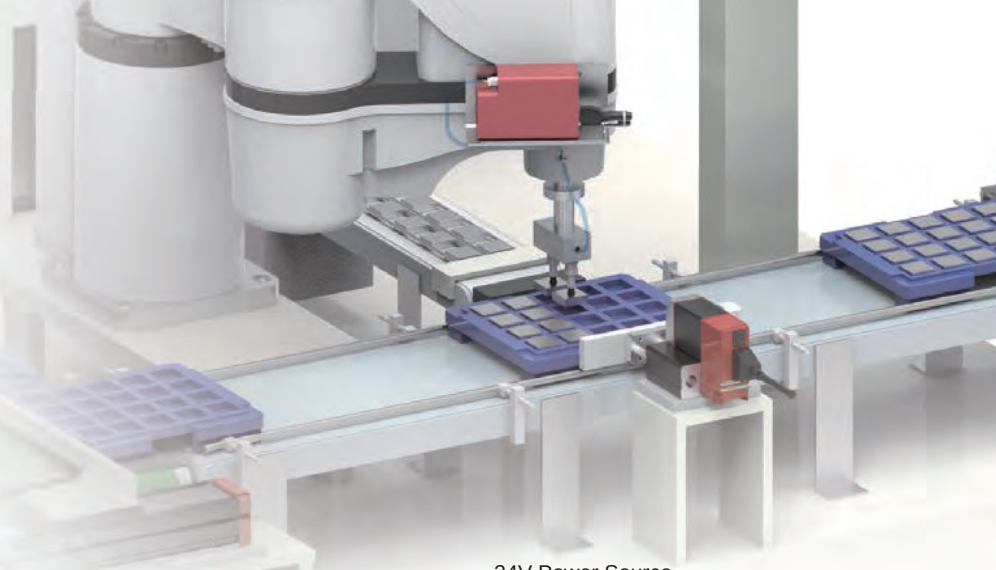
Air Blow Type

(Vacuum Fracture Method)

Apply the exhaust (positive pressure) to the vacuum pipe.

Quick and reliable removal of lightweight workpieces*

* 0.5g or less

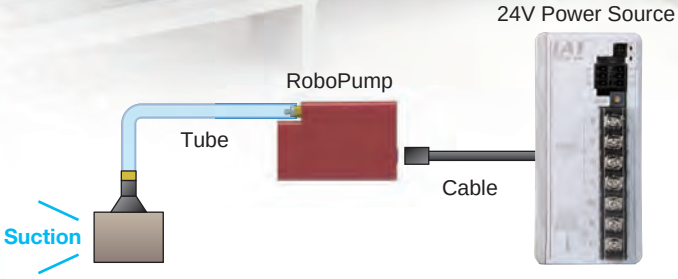


Installation is easy

It is ideal for conveying workpieces that are difficult to grip with a gripper by suction. Since it is small, it can be installed near the tip of the robot.

No need to lay pipes

No air pipes, compressors or solenoid valves are required. All you need to do is plug in the power supply.



Status confirmation • Easy to set up

RoboPump (main body)

You can display the current pressure and set the threshold value on the display panel of the main body.

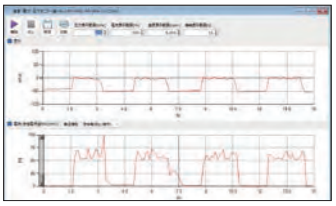
Current Pressure Display

Threshold Setting

Teaching tools

You can also check the pressure waveform and maintenance information with the teaching tool.
Operation by wireless connection is possible.

Pressure Waveform

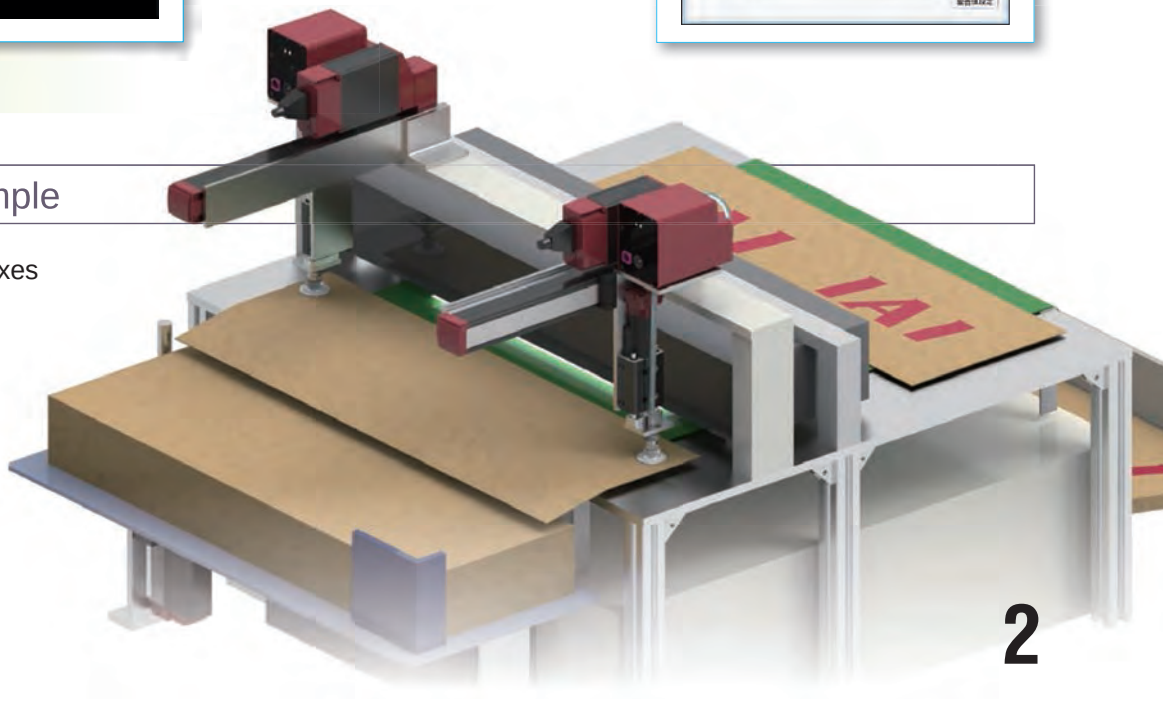


Maintenance Information

Application example

Printing on cardboard boxes

Click here for movie
(Link to website
of IAI America)



Model Specification Items

RoboPump

RP - VPM( ) - [ ] - [ ] - [ ]

- Workpiece withdrawal type
- Power & Communication cable length
- Power · I/O cable length
- Options

Left blank	Standard (open-air)
V	With air blow (vacuum fracture)

1	1m
~	~
10	10m

(every 1m)

0	No cable Power · I/O connector included *
(S)1	1m
~	~
(S)9	9m

(every 1m)

* When selecting RCON-EC connection specification (ACR), select "0".
Power · I/O connector is not included

(S): 4-way connector cable

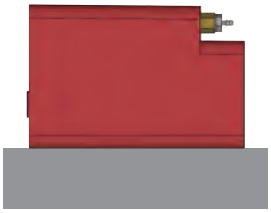
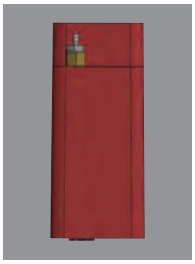
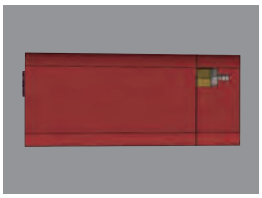
(Note) Make sure that the total length along with the actuator cable is 10m or less.

Left blank	NPN specification, no option
ACR	RCON-EC connection specification *1
PN	PNP specification (connected via I/F box) *1
TMD2	2-circuit power supply spec. (connected via I/F box) *1
WL	Wireless communication spec. (connected via I/F box) *2

*1 If "ACR" is selected, "PN" and "TMD2" options cannot be selected. (I/O for the "ACR" option is NPN only; compatible with 2-circuit power supply as standard)

*2 Selectable when RCON-EC connection specification "ACR" has not been selected.
(For wireless communication purchase interface box 2 and cable separately)

Mounting Orientation

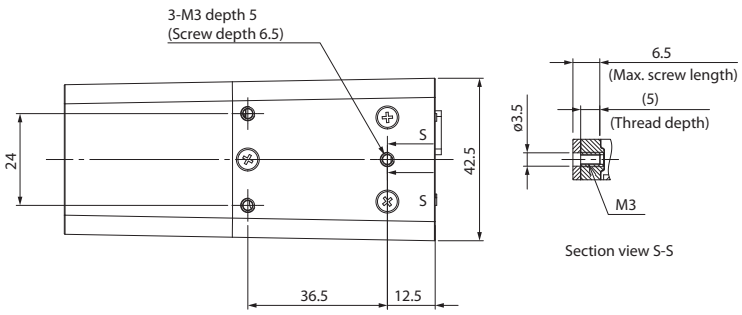
	Mounting orientation			
				
Type	Horizontal flat	Vertical	Horizontal side	Horizontal ceiling
VPM	○	—	—	—
VPMV				

○ : Can be mounted
— : Cannot be mounted

Mounting Method

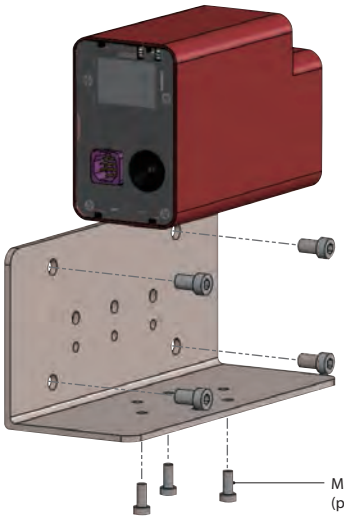
• Mounting using threaded holes on the bottom

[For VPM standard specification]

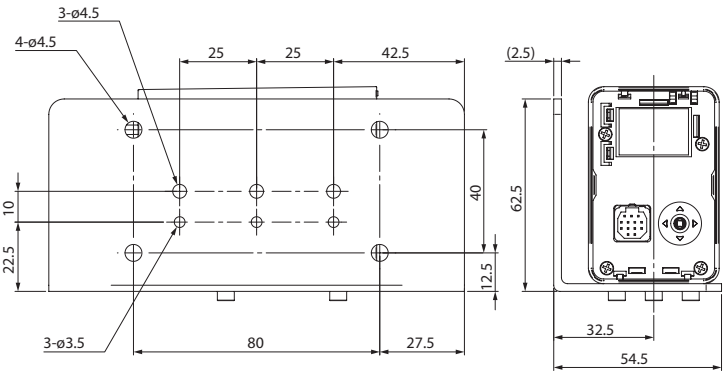


• Mounting using side mounting brackets (optional)

* Side mounting holes are an example. Please see page 10 for details of the bracket.



[For VPM standard specification]



RP-VPM

Pump | 24v Pulse Motor

Model Specification Items

RP	–	VPM	–		–		–	
Series		Type		Power & Communication cable length		Power · I/O cable length		Options
		VPM: Vacuum pump (standard)		1 ~ 10: 1 m ~ 10 m		Power · I/O cable length below		See options below

CE RoHS 10

Horizontal | Vertical | Side | Ceiling

Selection Notes

(1) Pay close attention to the installation method and mounting orientation. Please refer to P. 4 for details.

(2) The expected service life of the product is 10 million cycles from adsorption to desorption.

Power & Communication cable length

Cable code	Cable length
1 ~ 3	1 ~ 3m
4 ~ 5	4 ~ 5m
6 ~ 10	6 ~ 10m (Note 1)

(Note 1) When connecting via the interface box, 9m is the maximum length available.
(Note) Make sure that the total length along with the power · I/O cable is 10m or less.
(Note) Robot cable is standard.

Power · I/O cable length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads)
0	Without cable	Terminal block supplied (Note 1)
1 ~ 3	1 ~ 3m	CB-EC-PWBIO□□□-RB supplied
4 ~ 5	4 ~ 5m	
6 ~ 9	6 ~ 9m	

(Note 1) Only terminal block connector is included.
When selecting RCON-EC connection specification (ACR) as an option, select "0".
Terminal block connector is not included. Refer to P. 16 for details.
(Note) Robot cable is standard.

4-way connector cable

Cable code	Cable length	User wiring specification (flying leads)
S1 ~ S3	1 ~ 3m	CB-EC2-PWBIO□□□-RB supplied
S4 ~ S5	4 ~ 5m	
S6 ~ S9	6 ~ 9m	

(Note) Robot cable is standard.

Options * Please check the Options reference pages to confirm each option.

Name	Option code	Reference page
RCON-EC connection specification (Note 1) (Note 2)	**ACR**	9
PNP specification (Note 1)	**PN**	9
—	**–**	—
Split motor and controller power supply specification (Note 1)	**TMD2**	9
Wireless communication specification (Note 2)	**WL**	9

(Note 1) If the RCON-EC connection specification (ACR) is selected, the PNP specification (PN) and split motor and controller power supply specification (TMD2) cannot be selected. Additionally, interface box and conversion cable are not included.
(Note 2) If the RCON-EC connection specification (ACR) is selected, the wireless communication specification (WL) cannot be selected.
For wireless communication with RCON-EC connection (WL), purchase the separately sold optional interface box, conversion cable, and power · I/O cable. Refer to P. 13 for details.

Brackets (sold separately)

Name	Model	Reference page
Side Attachment Bracket	RP-BKT-VPM	10
Cable Support Bracket	RP-FST-VPM	9

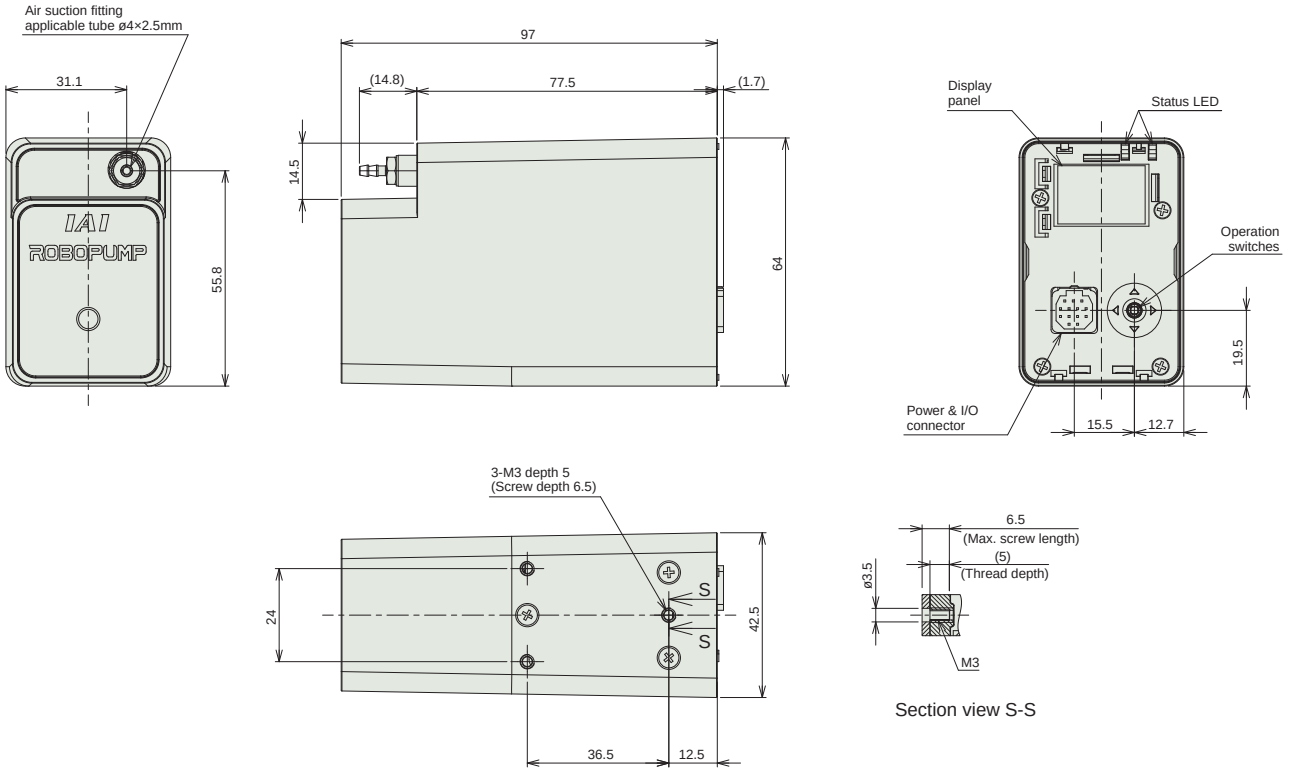
Main Specifications

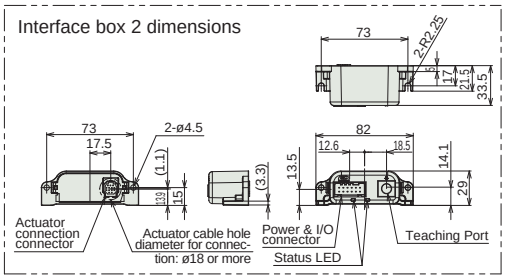
Item	Description
Vacuum pressure	-50kPa or less
Generated flow volume	1.8L/min or more (20°C/1atm)
Electromagnetic valve operation (desorption) time	0.3sec

Item	Description
Withdrawal method	Vent to atmosphere
Pump type	Diaphragm pump system
Ambient operating temperature, humidity	0 to 40°C, 85% RH or less (no condensation)
Ingress protection	IP20
Overseas standards	CE marking, RoHS directive
Motor type	Pulse motor (ø35) (Power capacity : Rated 0.8A, max. 1.3A)
Encoder type	Incremental
Power supply voltage	DC24V±10%

Dimensions

CAD drawings can be downloaded from our website.
www.iai-automation.com





■ Mass

Item	Description
Mass	320g

RP-VPMV

Pump | 24v Pulse Motor

Model Specification Items

RP	–	VPMV	–		–		–	
Series		Type		Power & Communication cable length		Power · I/O cable length		Options
		VPM: Vacuum pump with air blow		1 ~ 10: 1 m ~ 10 m		Power · I/O cable length below		See options below

Horizontal | Vertical | Side | Ceiling

Selection Notes

(1) Pay close attention to the installation method and mounting orientation. Please refer to P. 4 for details.

(2) The expected service life of the product is 10 million cycles from adsorption to desorption.

Power & Communication cable length

Cable code	Cable length
1 ~ 3	1 ~ 3m
4 ~ 5	4 ~ 5m
6 ~ 10	6 ~ 10m (Note 1)

(Note 1) When connecting via the interface box, 9m is the maximum length available.
(Note) Make sure that the total length along with the power · I/O cable is 10m or less.
(Note) Robot cable is standard.

Power · I/O cable length

Standard connector cable

Cable code	Cable length	User wiring specification (flying leads)
0	Without cable	Terminal block supplied (Note 1)
1 ~ 3	1 ~ 3m	CB-EC-PWBIO□□□-RB supplied
4 ~ 5	4 ~ 5m	
6 ~ 9	6 ~ 9m	

(Note 1) Only terminal block connector is included.
When selecting RCON-EC connection specification (ACR) as an option, select "0".
Terminal block connector is not included. Refer to P. 16 for details.
(Note) Robot cable is standard.

4-way connector cable

Cable code	Cable length	User wiring specification (flying leads)
S1 ~ S3	1 ~ 3m	CB-EC2-PWBIO□□□-RB supplied
S4 ~ S5	4 ~ 5m	
S6 ~ S9	6 ~ 9m	

(Note) Robot cable is standard.

Options * Please check the Options reference pages to confirm each option.

Name	Option code	Reference page
RCON-EC connection specification (Note 1) (Note 2)	**ACR**	9
PNP specification (Note 1)	**PN**	9
—	**—**	—
Split motor and controller power supply specification (Note 1)	**TMD2**	9
Wireless communication specification (Note 2)	**WL**	9

(Note 1) If the RCON-EC connection specification (ACR) is selected, the PNP specification (PN) and split motor and controller power supply specification (TMD2) cannot be selected. Additionally, interface box and conversion cable are not included.
(Note 2) If the RCON-EC connection specification (ACR) is selected, the wireless communication specification (WL) cannot be selected.
For wireless communication with RCON-EC connection (WL), purchase the separately sold optional interface box, conversion cable, and power · I/O cable. Refer to P. 13 for details.

Brackets (sold separately)

Name	Model	Reference page
Side Attachment Bracket	RP-BKT-VPM	10
Cable Support Bracket	RP-FST-VPM	9

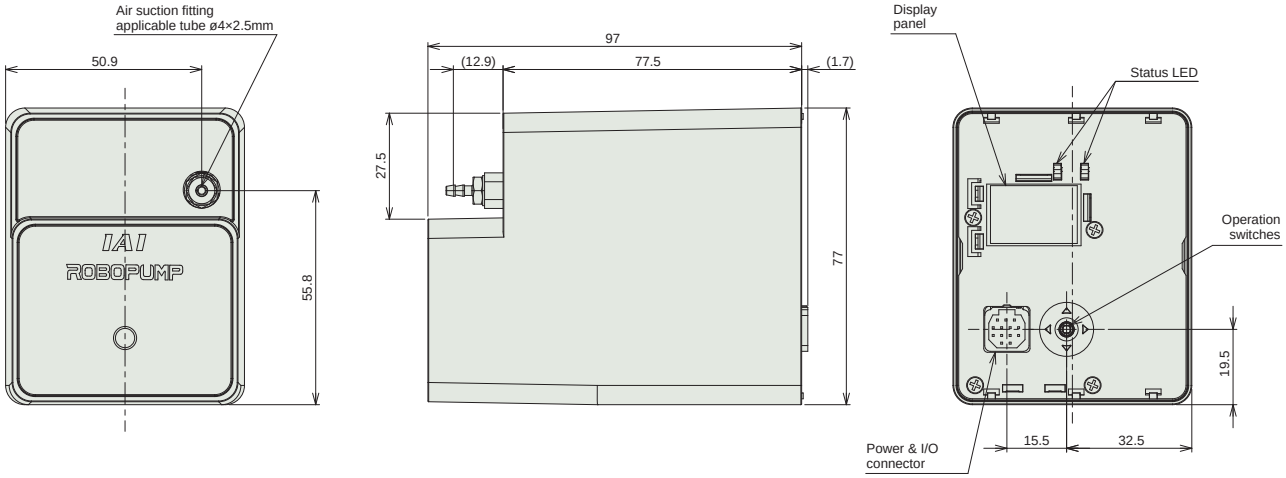
Main Specifications

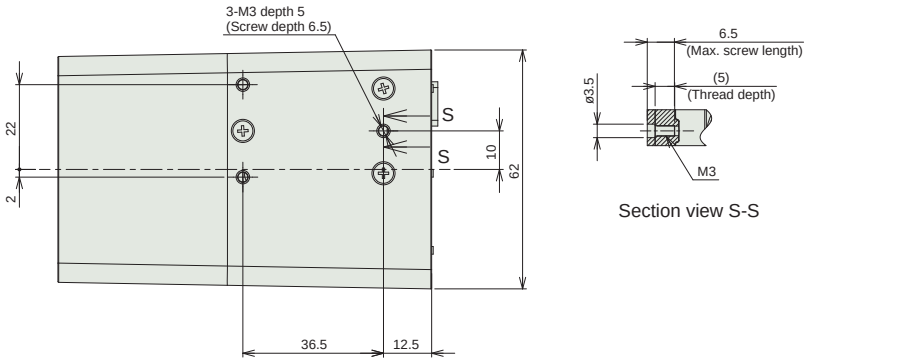
Item		Description
Vacuum pressure	(negative pressure)	-50kPa or less
	(positive pressure)	+30kPa or more
Generated flow volume	(negative pressure)	1.1L/min or more (20°C/1atm)
	(positive pressure)	1.1L/min or more (20°C/1atm)
Desorption (air blow) time		0.3~10sec

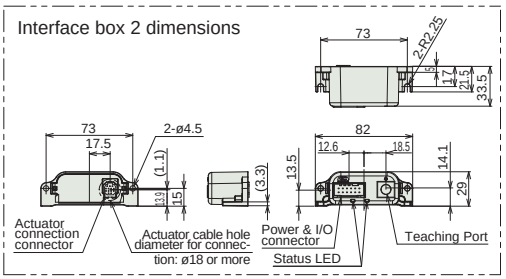
Item	Description
Withdrawal method	Vacuum fracture
Pump type	Diaphragm pump system
Ambient operating temperature, humidity	0 to 40°C, 85% RH or less (no condensation)
Ingress protection	IP20
Overseas standards	CE marking, RoHS directive
Motor type	Pulse motor (ø35) (Power capacity : Rated 0.8A, max. 1.3A)
Encoder type	Incremental
Power supply voltage	DC24V±10%

Dimensions

CAD drawings can be downloaded from our website.
www.iai-automation.com







Mass

Item	Description
Mass	400g

Dimensions

RCON-EC connection specification

*Cannot be selected with the TMD2 and PN options (the ACR option includes the split motor and controller power supply specification).

Model **ACR** Applicable models All models

Description This option should be selected to connect over an R-unit to a field network.

*If this option is selected, the power supply must be a split motor and controller power supply and the input/output specification must be NPN. Therefore, it cannot be selected with the TMD2 or PN options.

PNP specification

*Cannot be ordered simultaneously with the ACR option, which is NPN specification.

Model **PN** Applicable models All models

Description The input/output specification for connecting external devices is NPN specification as standard.
By specifying this option, the input/output specification can be set to the PNP specification.

Split motor and controller power supply specification

*Cannot be selected with the ACR option (the RCON-EC connection specification is a split motor and controller power supply specification).

Model **TMD2** Applicable models All models

Description This option has a stop input for the RoboPump.
Select this option to allow shutting down the drive power only.
Please refer to P. 16 for more information on wiring.

Wireless communication specification

Model **WL** Applicable models All models

Description This option enables support for wireless communication. Specifying this option enables wireless communication with the TB-03 teaching pendant and the Wireless Teaching Controller.
The start point, end point, and AVD can be adjusted via wireless communication.

Single item option

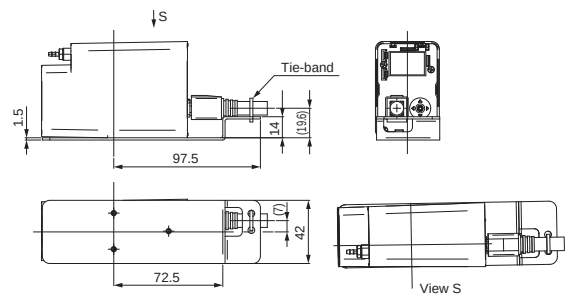
Cable Support Bracket

Model **RP-FST-VPM**

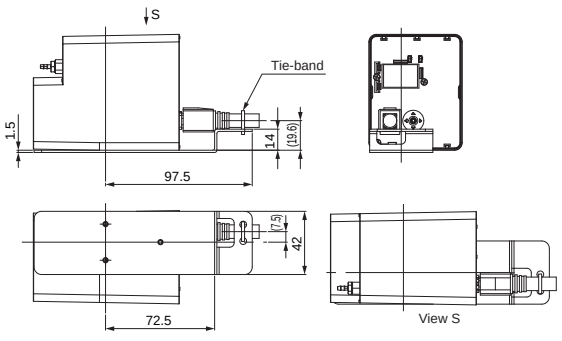
Description This is a metal fitting for securing the cable near the connector with a cable tie.
*It is not assembly shipment, so please install it according to the drawing.

(Unit mass: 0.074kg / Material: stainless steel)

[Standard]



[With air blow]

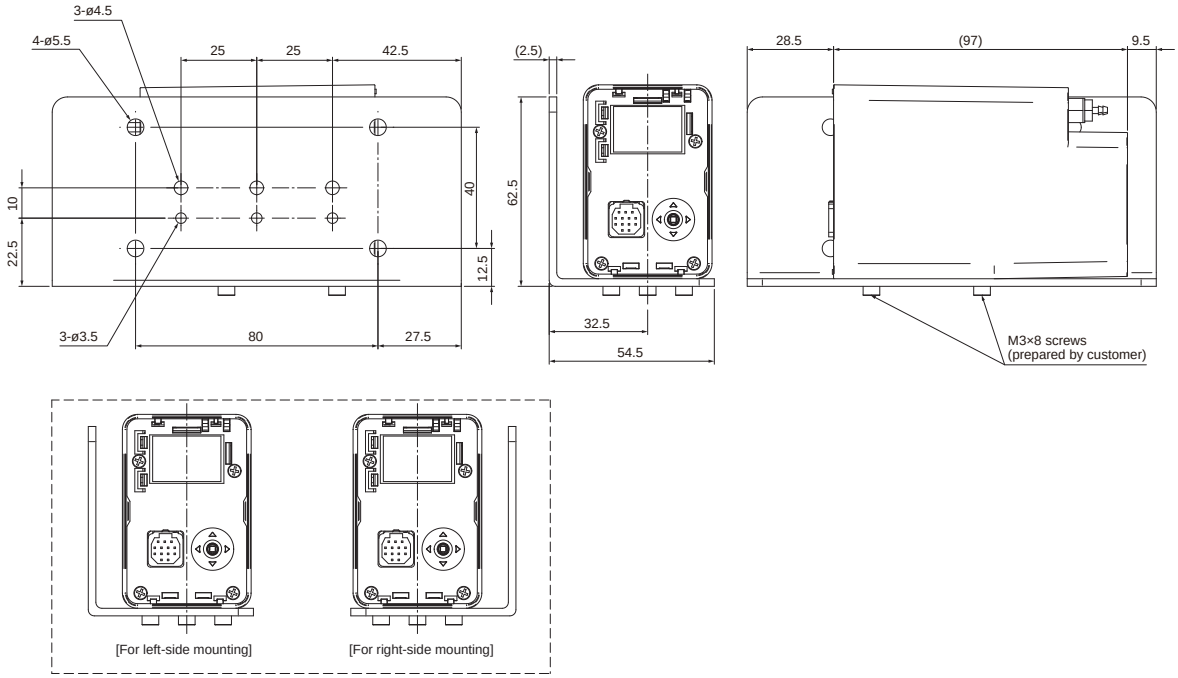


Side Attachment Bracket

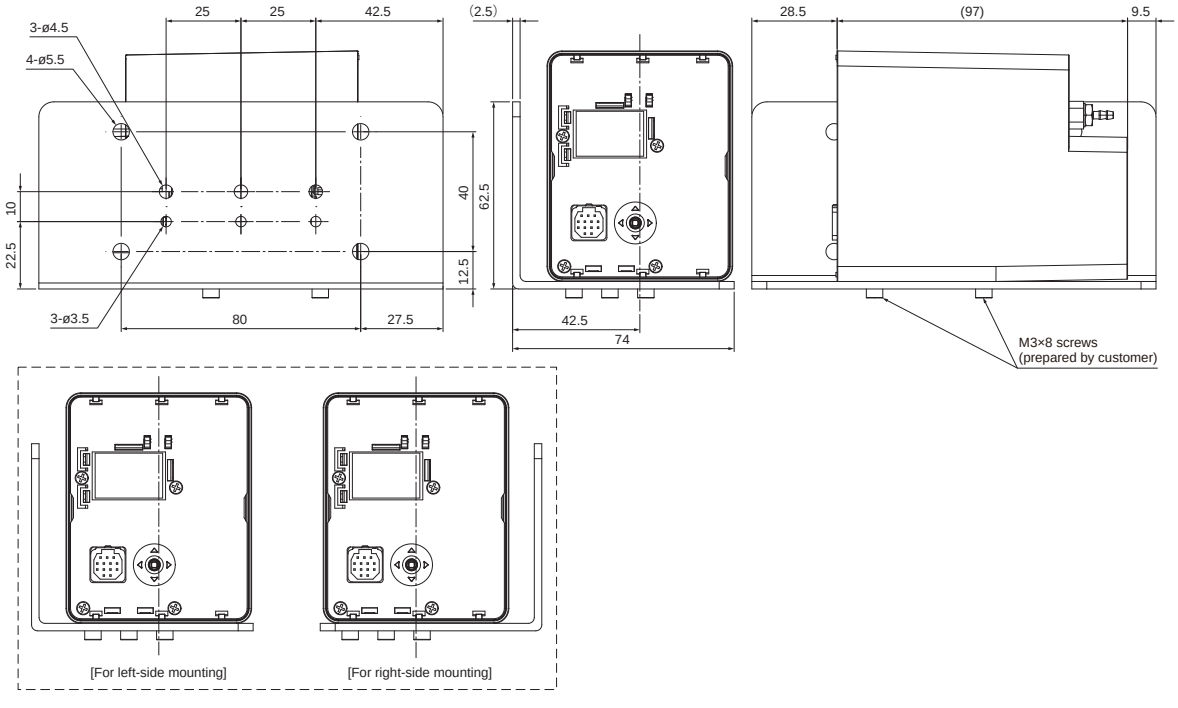
Model **RP-BKT-VPM** (Standard)
RP-BKT-VPMV (With air blow)

Description This bracket is used for installing the RoboPump on the side.
When using the cable support bracket (RP-FST-VPM) together, the cable support bracket has to be installed between the RoboPump body and the side mounting bracket.
*It is not assembly shipment, so please install it according to the drawing.

[Standard] (Unit mass: 0.305kg / Material: stainless steel)

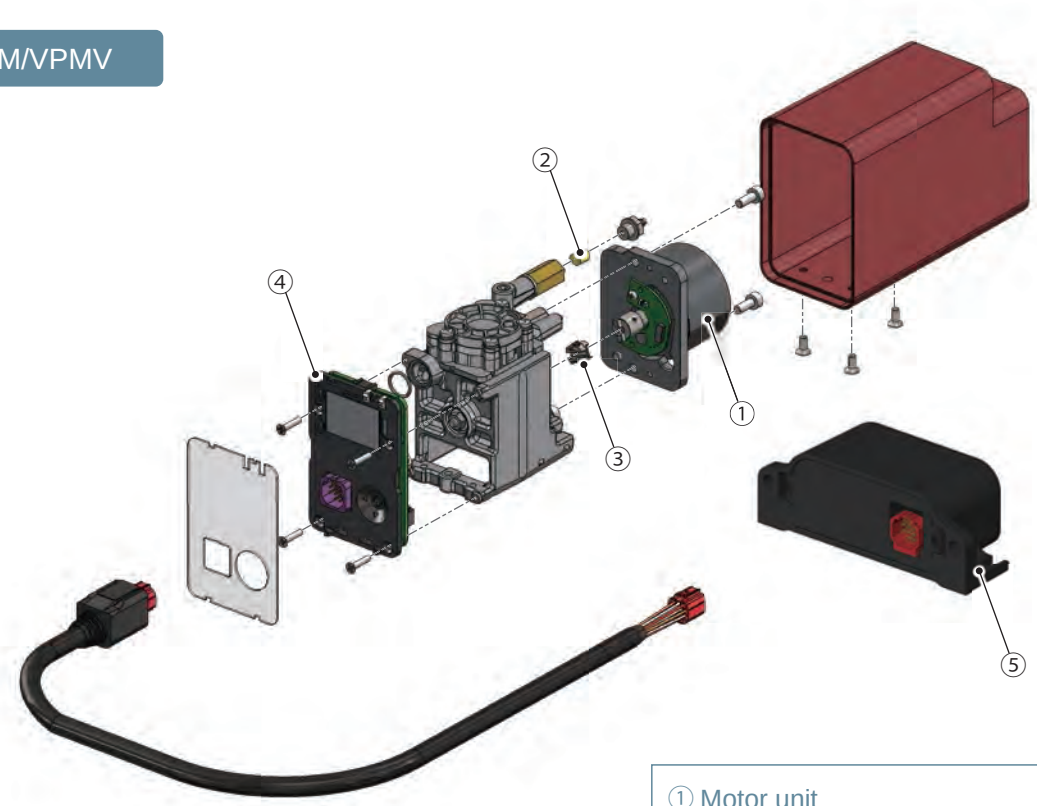


[With air blow] (Unit mass: 0.358kg / Material: stainless steel)



Maintenance Parts

VPM/VPMV



① Motor unit
② Suction filter
③ Coupling spacer
④ Front panel assembly
⑤ Interface box 2

The numbers in the table correspond to the numbers in the maintenance parts schematic diagram.
(Note) Mounting screws are not included with maintenance parts. Please contact our sales department before making any modifications.

① Motor unit

Type	Model
VPM/VPMV	RP-MUVPM

② Suction filter

Type	Model
VPM/VPMV	RP-FL-VPM

③ Coupling spacer

Type	Model
VPM/VPMV	CPG-RP-VPM

④ Front panel assembly

Type	Model
VPM	FPA-RP-VPM
VPMV	FPA-RP-VPMV

⑤ -1 Interface box 2 (basic model)

Type	Wireless	I/O	Model
VPM/VPMV	No	NPN	EC-CVN-CB
		PNP	EC-CVP-CB
	WL	NPN	EC-CVNWL-CB
		PNP	EC-CVPWL-CB

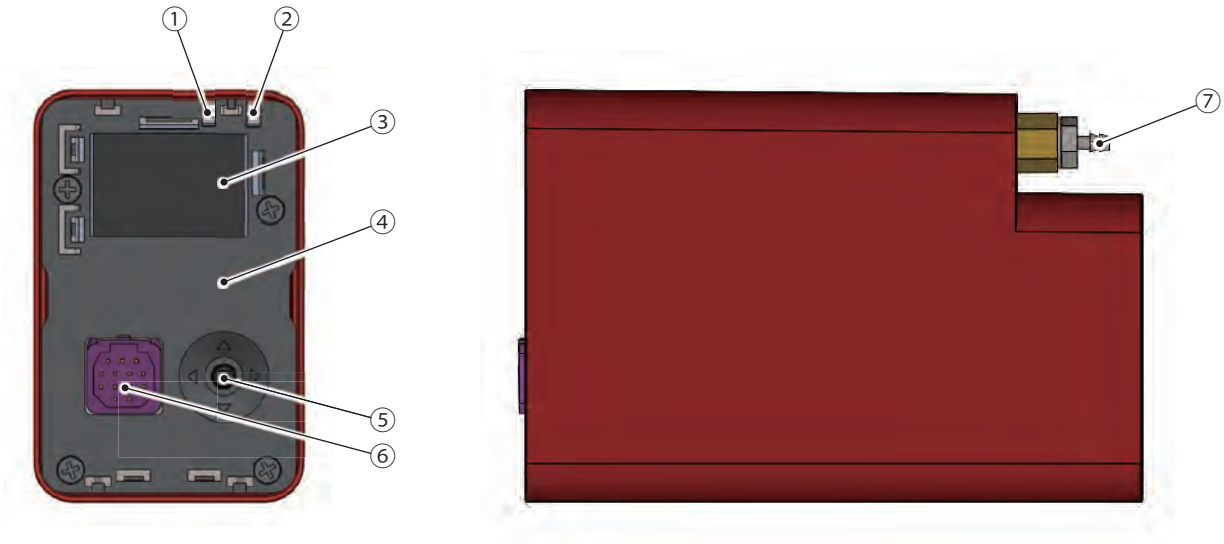
⑤ -2 Interface box 2 for 2-circuit power supply

Type	Wireless	I/O	Model
VPM/VPMV	No	NPN	EC-CVN-CB-TMD2
		PNP	EC-CVP-CB-TMD2
	WL	NPN	EC-CVNWL-CB-TMD2
		PNP	EC-CVPWL-CB-TMD2

⑤ -3 Interface box 2 for 2-circuit power supply with RCON-EC connection spec. (model option: ACR)

Type	Wireless	I/O	Model
VPM/VPMV	WL	NPN REC	EC-CVNWL-CB-ACR

Front / Back Panel Components



① Wireless status LED

Display info	Display LED	Function
Status LED	Green light	The current pressure is below the adsorption confirmation level
	Red light	Alarm triggered or stop command from the teaching tool (*) Motor voltage dropping
	Orange light	Initializing at power-on (green and red lights on simultaneously)
	Lights OFF	Power not supplied

(*) The stop function is only active when the teaching tool is connected via a cable.

② Display status LED

Display info	Display LED	Function
Wireless status indicator (WL)	Green light	Wireless connection status (ON 150ms / OFF 150ms)
	Red light	Wireless hardware malfunction (ON 200ms / OFF 200ms)
	Orange light	Initializing at power-on (green and red lights on simultaneously)
	Lights OFF	Initializing wireless hardware, wireless not connected or connecting via TP port

③ Display panel

This is an OLED display.
It currently displays pressure readings and alarm codes.

④ Front panel sheet

This is a cover designed to protect the front panel.

⑤ Operation switch

This is a lever-type control switch with four directions plus one push.

⑥ Operation switch connector

This is a connector for connecting power and communication cables.

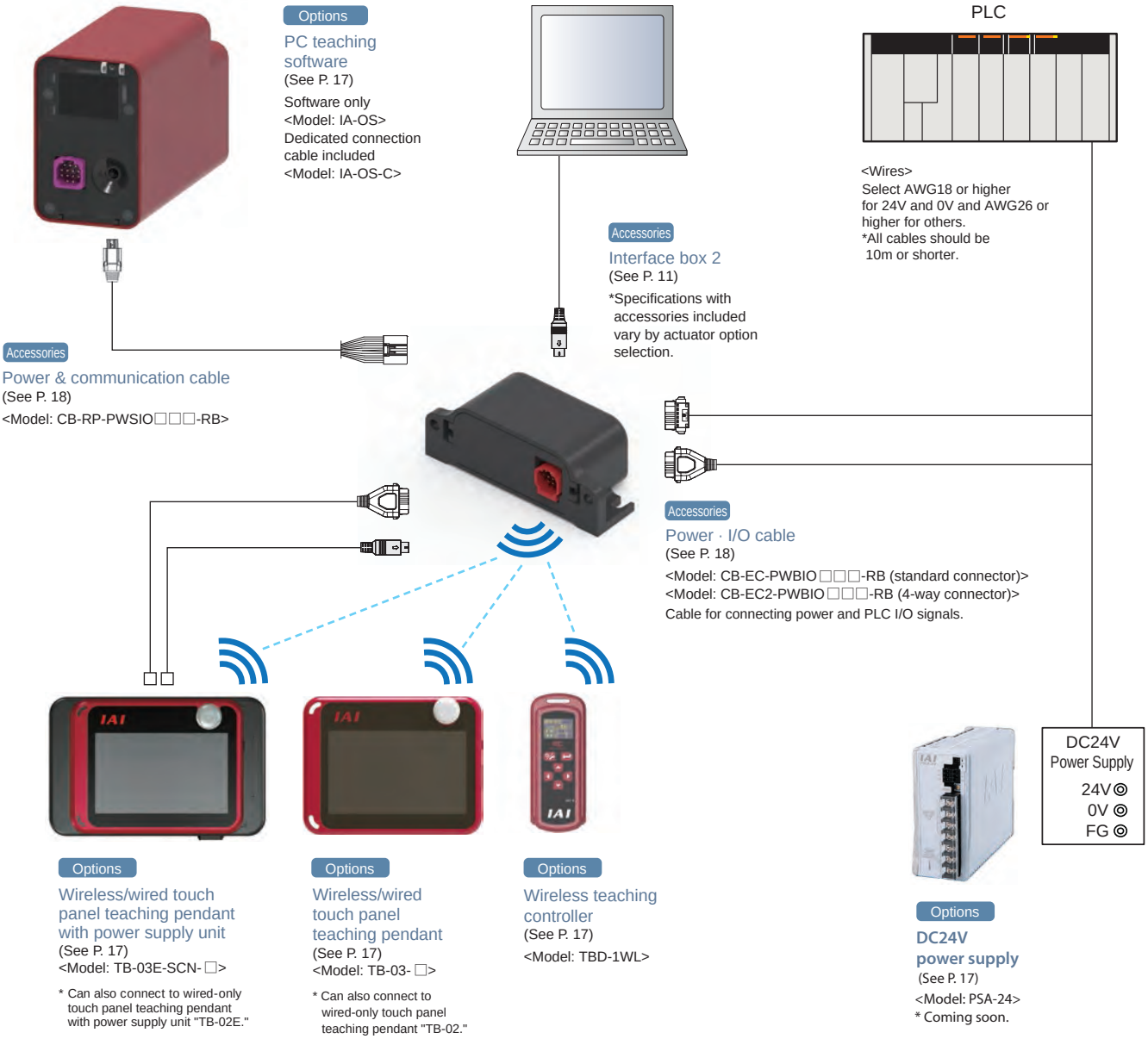
⑦ Air suction joint

This is a connector for attaching a suction tube.

System Configuration

<PLC direct connection>

* Even without teaching tools, it can be set with the operation switch on the main unit



List of Accessories

■ Power · I/O Cable, Connectors

[Standard connector]

Product category		Accessories
Power · I/O cable length (selected with actuator model)	RCON-EC connection specification (ACR) selection	
0	No	Power · I/O connector (1-1871940-6)
	Yes	-
1 ~ 10	No	Power · I/O cable (CB-EC-PWBIO□□□-RB)

[4-way connector]

Product category		Accessories
Power · I/O cable length (selected with actuator model)	RCON-EC connection specification (ACR) selection	
S1 ~ S10	No	Power · I/O cable (CB-EC2-PWBIO□□□-RB)

<R-unit (EC connection unit) connection>

(When the teaching tool is connected by wire)

Accessories

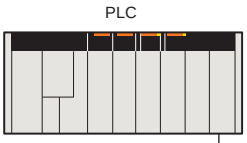
Power & communication cable
(See P. 18)
<Model: CB-RP-PWSIO□□□-RB>

Options

PC teaching software
(See P. 17)
Software only
<Model: IA-OS>
Dedicated connection cable included
<Model: IA-OS-C>
Software for programming only
<Model: IA-101>
Program-specific connection cable included
<Model: IA-101-X-□>

Options

Wireless/wired touch panel teaching pendant
(See P. 17)
<Model: TB-03- □>



PLC

R-unit

(EC connection unit)
<Model: RCON-EC-4>

(When teaching tools are connected wirelessly)

Accessories

Power & communication cable
(See P. 18)
<Model: CB-RP-PWSIO□□□-RB>

Options

Power · I/O cable
(See P. 18)
<Model: CB-EC-PWBIO□□□-RB (standard connector)>
<Model: CB-EC2-PWBIO□□□-RB (4-way connector)>

Options

Interface box 2

Options

Wireless/wired touch panel teaching pendant
(See P. 17)
<Model: TB-03- □>

Options

Wireless teaching controller
(See P. 17)
<Model: TBD-1WL>

DC24V
Power Supply
24V
0V
FG

Options

DC24V power supply
(See P. 17)
<Model: PSA-24>
* Coming soon.

<XSEL2 (EC connection module) connection>

Accessories

Power & communication cable
(See P. 18)
<Model: CB-RP-PWSIO□□□-RB>

XSEL2

(IO slot type)
"EL": EC connection module

DC24V
Power Supply
24V
0V
FG

Options

PC teaching software
(See P. 17)
Software for programming only
<Model: IA-101>
Program-specific connection cable included
<Model: IA-101-X-□>

Options

Wireless/wired touch panel teaching pendant
(See P. 17)
<Model: TB-03- □>

Options

DC24V power supply
(See P. 17)
<Model: PSA-24>
* Coming soon.

Electrical Equipment Specifications

Item	Specification
Power supply voltage	24VDC ±10%
Power supply current (Note 1)	Rated 0.8A, max. 1.3A
Power capacity	Rated 19.2W, max. 31.2W
Generated heat	2W
Inrush current (Note 2)	2A
Momentary power failure resistance	Max. 500μs
Motor size	ø35
Motor rotary speed	3600rpm
Motor rated current	0.5A
Supported encoders	Incremental encoder (16384 pulse/rev)
Teaching port specifications	RS-485 1ch (Modbus protocol compliant) (When interface box used)
Interface specifications (power input common with body)	3 input points: desorption comand, adsorption command, alarm clear 3 ouput points: desorption confirmation signal, adsorption confirmation signal, alarm
Display panel	OLED (29 × 22.5 × 1.65mm)
Data setting, input method	• PC software (IA-OS) • Teaching pendant TB-02, TB-03 • Display panel and operation switches on main body
Overvoltage category	I
Pollution degree	II
Insulation resistance	500VDC 10MΩ
Electric shock protection mechanism	Class 3
Cooling method	Natural air cooling

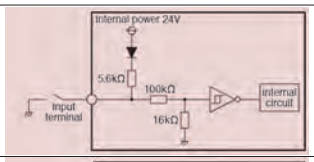
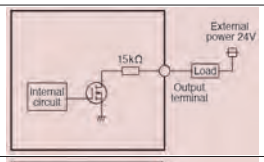
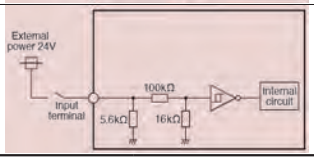
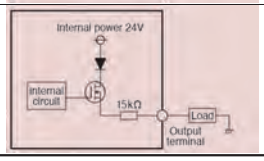
(Note 1) The power supply current includes 0.3A of the control power supply.
(Note 2) Inrush current will flow for approximately 5ms after the power is turned on (at 40°C). The value of inrush current differs depending on the impedance of the power supply line.

Solenoid Valve Method

The RoboPump normally use a double solenoid method.
Change parameter No. 5 ("PIO pattern selection") to use the single solenoid method or the double solenoid 2 method.

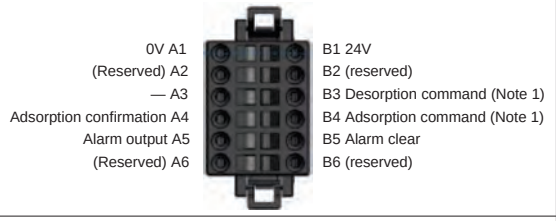
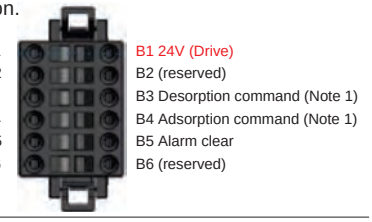
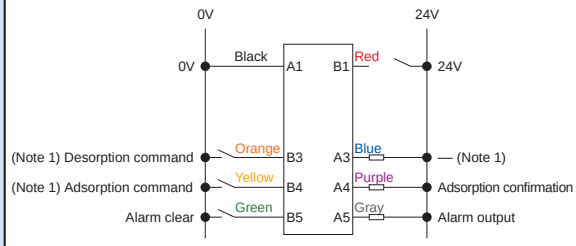
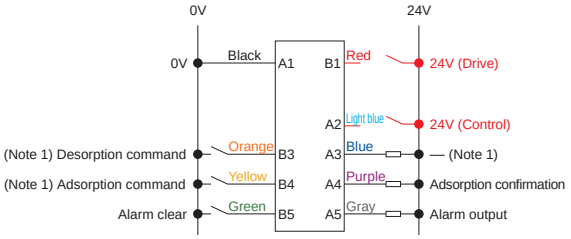
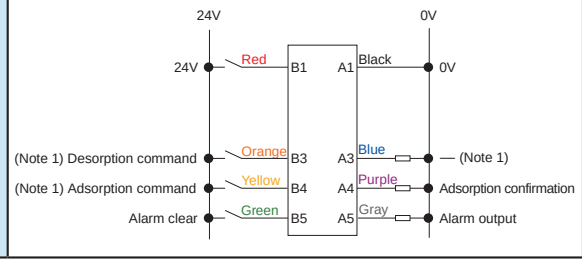
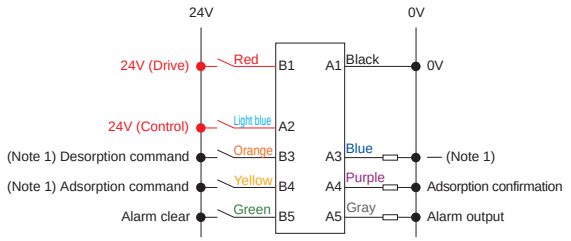
<Caution>
Operation cannot be performed using the single solenoid method when operating connected to RCON-EC.

I/O (Input/Output) Specification

I/O		Input		Output	
Specifications		Input voltage	24VDC ±10%	Load voltage	24VDC ±10%
		Input current	5mA per circuit	Maximum load current	50mA/1 point
		ON/OFF voltage	ON voltage: Min. 18VDC OFF voltage: Max. 6VDC	Residual voltage	2V or less
		Leakage current	Max. 1mA/1 point	Leakage current	Max. 0.1mA/1 point
Isolation method		Non-isolated from external circuit		Non-isolated from external circuit	
I/O logic	NPN				
	PNP				

(Note) Isolation method is non-isolated. When grounding an external device (such as a PLC) connected to RoboPump, use the same ground as RoboPump.

I/O Specification Wiring Diagram

I/O		Standard specification	Double power circuit specification (option model: TMD2)
Power / I/O connector			Drive power and control power are separate for the TMD2 specification. 
I/O logic	NPN		
	PNP		

(Note 1) Switching to the single solenoid method will change B3 to "Unused" and B4 to "Adsorption/desorption command"; switching to the double solenoid 2 method will change A3 to "Desorption confirmation".

I/O Signal Table

Power · I/O connector pin assignment			
Pin No.	Connector nameplate name	Signal abbreviation	Function overview
B3 (Note 1)	Desorption command	ST0	Desorption command signal ON: Desorption mode
B4 (Note 1)	Adsorption command	ST1	Adsorption command signal ON: Adsorption mode
B5	Alarm clear	RES	ON to clear alarm
A3 (Note 1)	—	—	—
A4	Adsorption confirmation	PE1	ON：Vacuum pressure reaches adsorption confirmationl level OFF: Vacuum pressure reaches the release confirmation level
A5	Alarm	*ALM	Alarm detection (b-contact)
B1 (Note 2)	24V	24V	24V input
A1	0V	0V	0V input
A2 (Note 2)	(24V)	(24V)	24V input

(Note 1) Switching to the single solenoid method will change B3 to "Unused" and B4 to "Adsorption/desorption command."; switching to the double solenoid 2 method will change A3 to "Desorption confirmation (PIO)".
However, the power · I/O connector display will still read "B3: Desorption" and "B4: Adsorption."
(Note 2) B1 is 24V (Drive) and A2 is 24V (Control) for the split motor and controller power supply specification (TMD2).

Options

Teaching pendant

* Please refer to the single catalogue for detailed specifications.

Name	Model	Image
Wireless teaching controller	TBD-1WL-☐	
Wireless/wired touch panel teaching pendant	TB-03-☐	
Wireless/wired touch panel teaching pendant with power supply unit	TB-03E-☐	

PC teaching software (Windows only)

* Please refer to the general catalogue extract controller for detailed specifications.

Specification		Model	Image
For positioning	Software only (no connection cable)	IA-OS	
	With an external device communication cable + USB conversion adapter + USB cable	IA-OS-C	
For programming	Software only	IA-101-N	
	With RS-232C cable + connector conversion cable + USB conversion adapter + USB cable	IA-101-X-USBMW-JS	

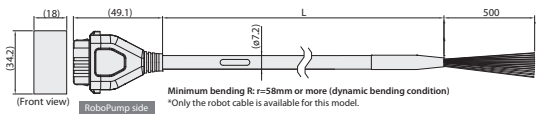
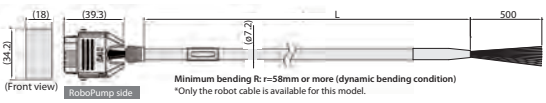
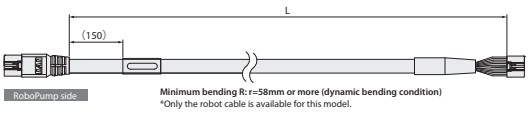
24V power supply

* Please refer to the general catalogue extract controller for detailed specifications.

Specification	Model	Image
Without fan	PSA-24	
With fan	PSA-24L	

Maintenance Parts (Cables)

When placing an order for a replacement cable after purchasing a product, please use the model name shown below.

Type	Model	External dimensions
Power / I/O cable (User-wired specification)	CB-EC-PWBIO□□□-RB	1m ~ 3m / 4m ~ 5m / 6m ~ 10m 
Power / I/O cable (User-wired specification, four-way connector)	CB-EC2-PWBIO□□□-RB	1m ~ 3m / 4m ~ 5m / 6m ~ 10m 
Power & communication cable	CB-RP-PWSIO□□□-RB	1m ~ 3m / 4m ~ 5m / 6m ~ 10m 

* For assembly of the four-way connector, please contact IAI.

* Please indicate the cable length (L) in □□□, e.g. 050 = 5m

RP-VPM/VPMV Series
Catalogue No. 0426-E

The information contained in this catalog is subject to change without notice for the purpose of product inprovement

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