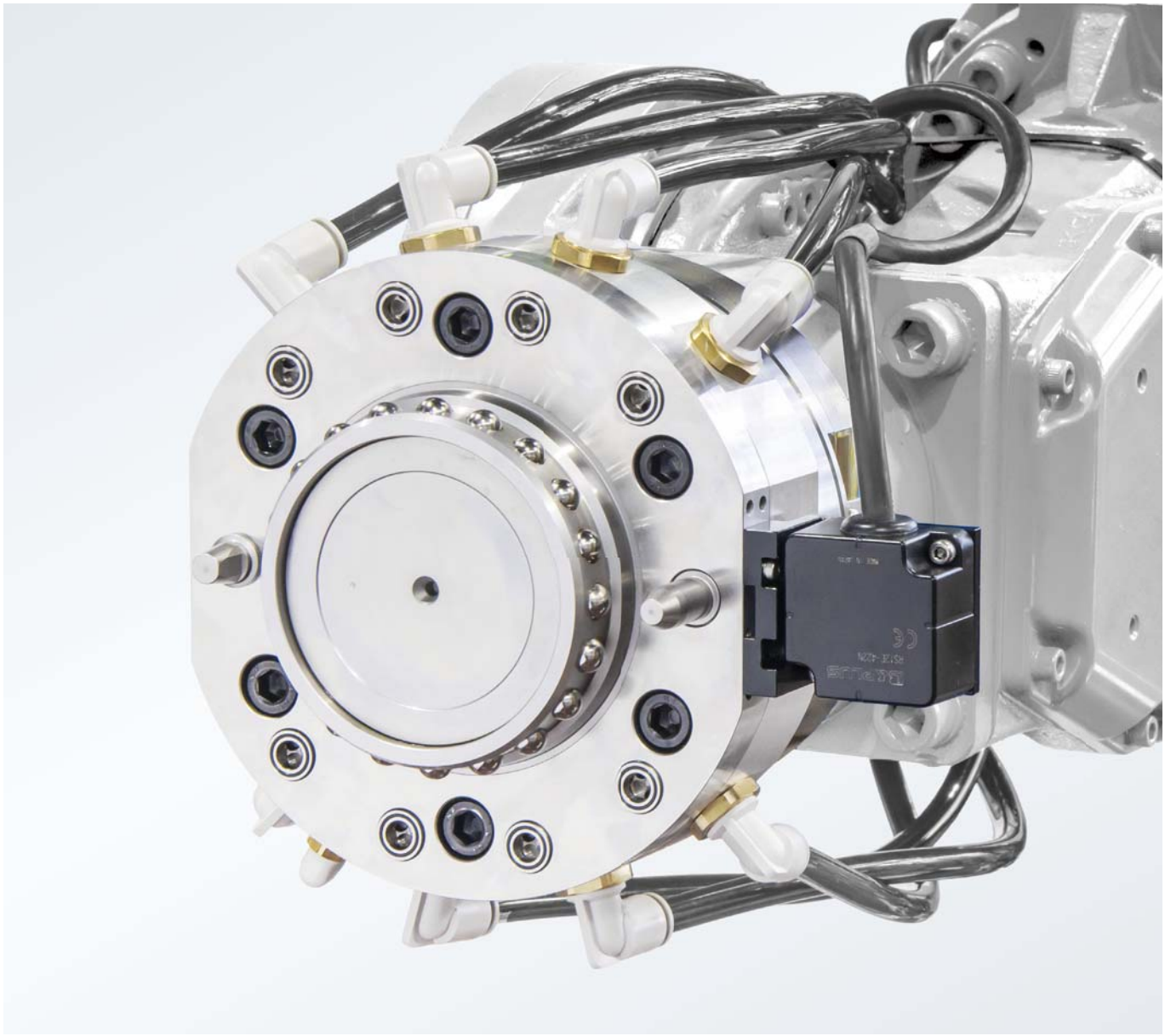
Robot tool changer

model **RHA/RHB**



Pascal

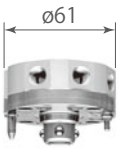
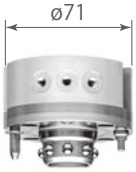
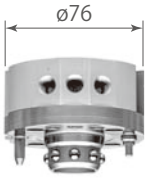
Robot tool changer

model **RHA/RHB**

Master plate

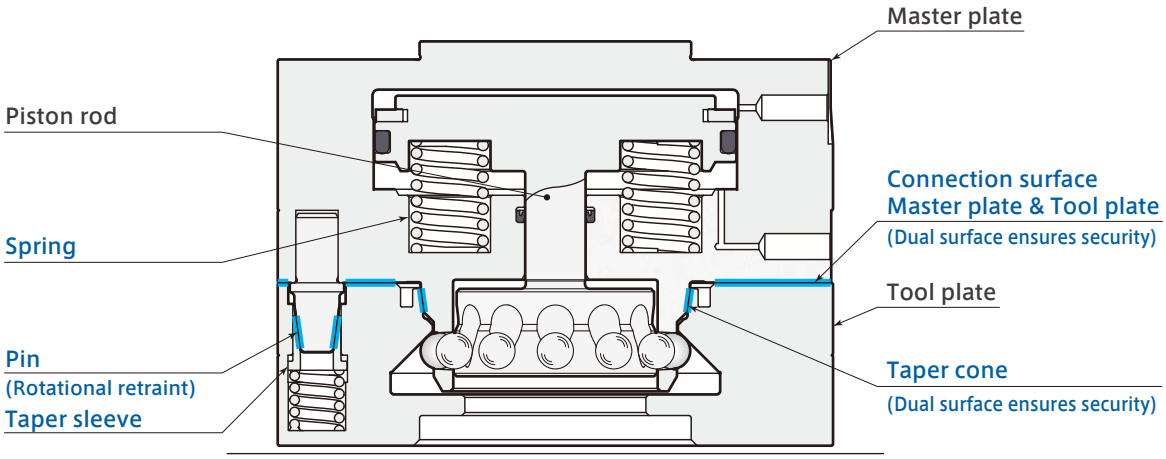
Tool plate

Payload from 5 kg up to 230 kg

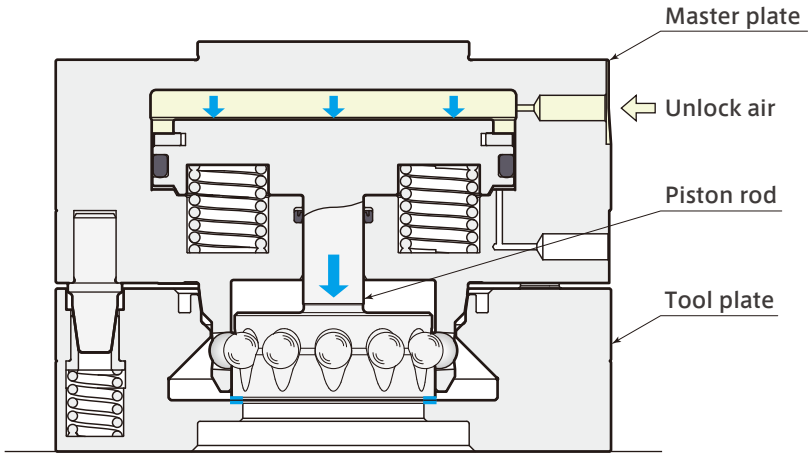
Payload 5kg	Payload 10kg	Payload 10kg	Payload 20kg	Payload 20kg
				
RHA005-M	RHA010-M	RHB010-M	RHA020-M	RHB020-M
				
RHA005-T	RHA010-T	RHB010-T	RHA020-T	RHB020-T

Extremely durable, lasting over 1million cycles

- The tool plate is securely fastened between two surfaces, the taper cone and the connection surface, while the pin restricts rotation.
- Even if the air supply is stopped, the tool plate is held in place by the force of the spring.
- A taper sleeve is provided to cover the pins that wear out as they are used more frequently, which ensures stable connect/disconnect operations (positioning repeatability 0.01mm).



- The tool plate can be detached by lifting the piston rod.



9 models with compact designs are available

Payload 40kg

RHA040-M

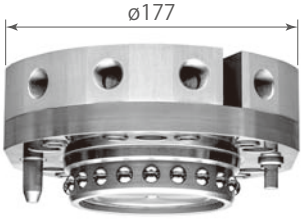
RHA040-T

Payload 80kg

RHA080-M

RHA080-T

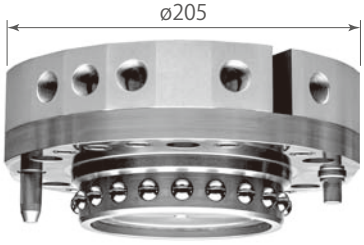
Payload 160kg



RHA160-M

RHA160-T

Payload 230kg



RHA230-M

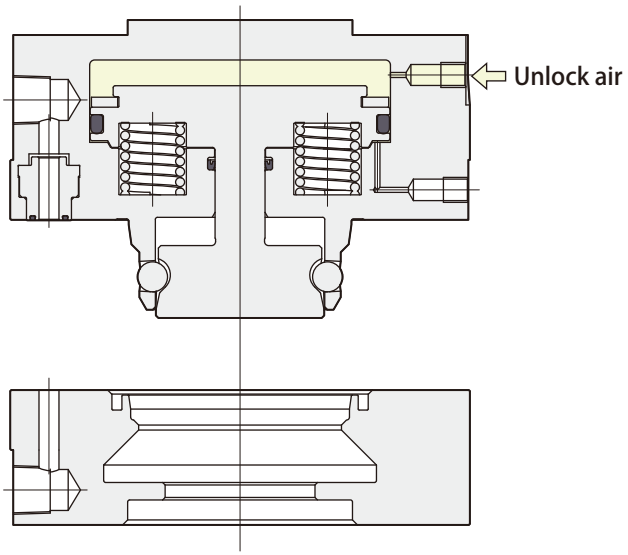
RHA230-T

Connector for air with check valve (option)

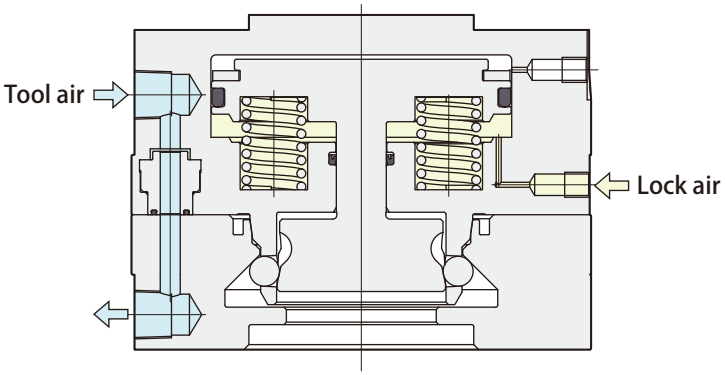
● A check valve model is available as an option for the air connector

Air connector without check valve

Disconnected

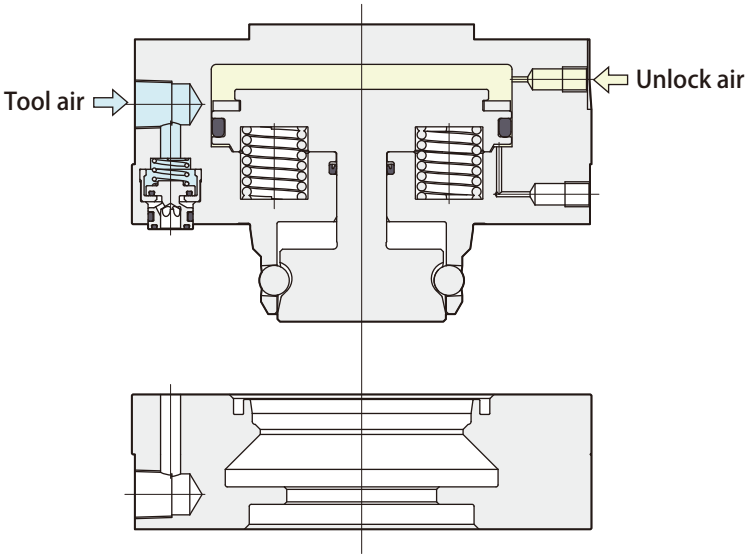


Connected

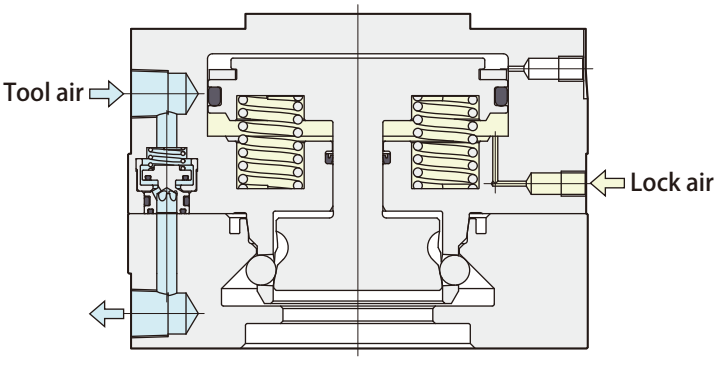


Connector for air with check valve (option)

Disconnected



Connected



Electric connector (option)

● An electric connector is available for each model as an option

Electric connector E0/E00
3A×10/20 points (with cable)
Page → 29

Circular electric connector E4
5A×14points (with cable)
Page → 30

Circular electric connector E5
13A×10points (with cable)
Page → 31

Remote sensor RN/RP/R
12 points (with cable)
Page → 33

Remote sensor RN4/RP4/R4
4 points (with cable)
Page → 35

Models and Options

Model		RHA005 Page →9	RHA010 Page →11	RHB010 Page →13	RHA020 Page →15
Master plate: M Tool plate: T					
Mass (option excluded)	M	160g	210g	295g	580g
	T	90g	120g	225g	320g
Payload		5 kg	10 kg	10 kg	20 kg
Number of ports for connector for air (Size)		4 (M5)	6 (M5)	6 (Rc1/8)	6 (M5)
Connector for air with check valve C			●		●
Expansion of connector for air A0 Page →27			●	●	●
Sensor for connecting/disconnecting SN / SP Page →28					●
Electric connector E0/ E00 Page →29		●	●	●	●
Circular electric connector E4 Page →30					●
Circular electric connector E5 Page →31					●
Remote sensor RN / RP / R Page →33			●	●	●
Remote sensor RN4 / RP4 / R4 Page →35		●	●	●	●

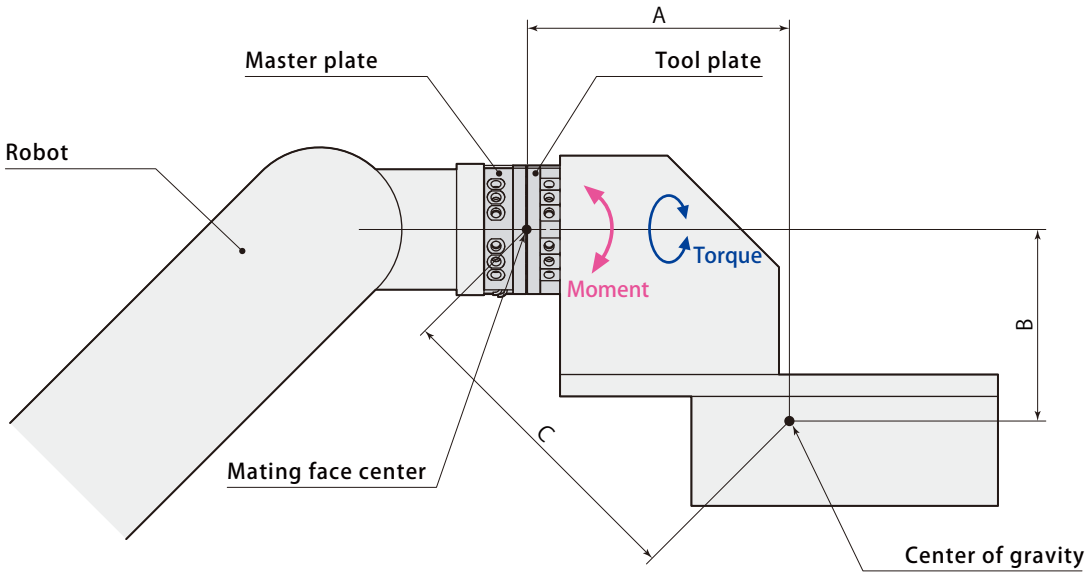
● ○ Option available. ● Refer to the respective pages for the details and model numbers of the master plate, tool plate and their options.

RHB020 Page →17	RHA040 Page →19	RHA080 Page →21	RHA160 Page →23	RHA230 Page →25
				
650g	1010g	1840g	5600g	8300g
385g	570g	890g	2800g	3800g
20 kg	40 kg	80 kg	160 kg	230 kg
6(Rc1/8)	8 (Rc1/8)	12 (Rc1/8)	8 (Rc3/8)	10 (Rc3/8)
	●	●	●	●
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●

● Contact Pascal for an adapter plate for mounting robots.

Formula

Select the right models and refer to the following formula.



Allowable torque (T) : T = Tool weight (m) x dimension B x robot max. acceleration speed
Allowable moment (M) : M = Tool weight (m) x dimension C x robot max. acceleration speed

・Calculation example

A=0.2m B=0.15m $C=\sqrt{0.2^2+0.15^2}=0.25$m
Tool weight m=25kg T =25×0.15×(2×9.80665)= 74 N・m
Robot max. acceleration speed =2G(2×9.80665m/s²) M =25×0.15×(2×9.80665)=123 N・m
⇒ **RHA040** can be selected from the table shown below.

The maximum acceleration of the robot varies depending on the usage conditions, so check with the manufacturer for details.

When turning the robot in a rotary motion, take the moment inertia into consideration.

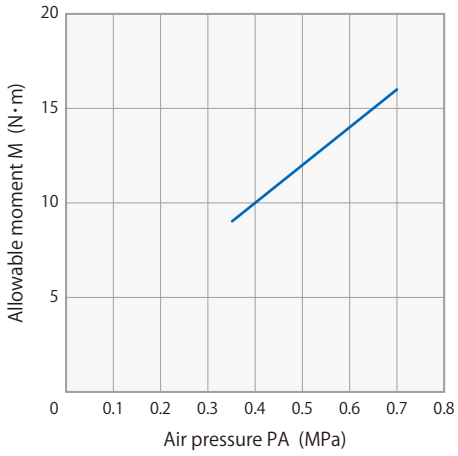
Model		RHA005	RHA010 RHB010	RHA020 RHB020	RHA040	RHA080	RHA160	RHA230
Payload	kg	5	10	20	40	80	160	230
Allowable torque	N・m	20	40	75	160	320	900	1400
Allowable moment*	N・m	12	23	70	180	400	1300	1800

*: This is value for air pressure at 0.5 MPa. For other pressures, refer to the Performance diagram for each size.

Allowable moment & Air pressure

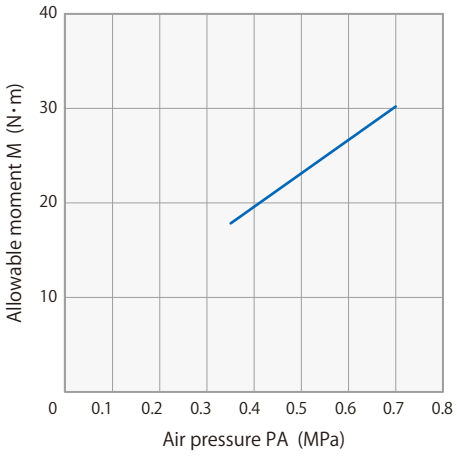
RHA005

(M = 20 x PA + 2)



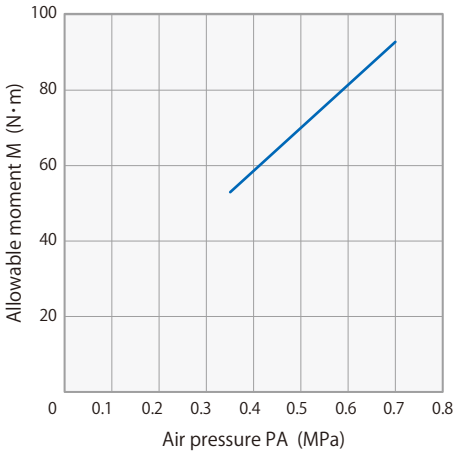
RHA010 / RHB010

(M = 36 x PA + 5)



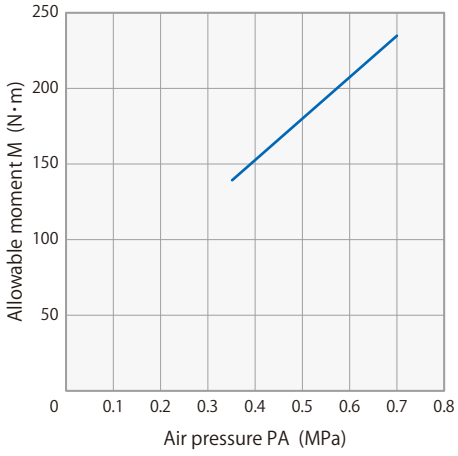
RHA020 / RHB020

(M = 114 x PA + 13)



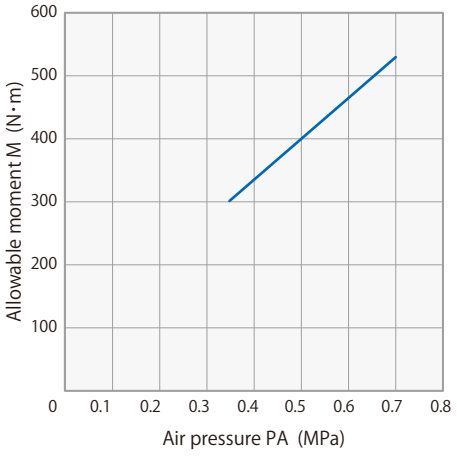
RHA040

(M = 274 x PA + 43)



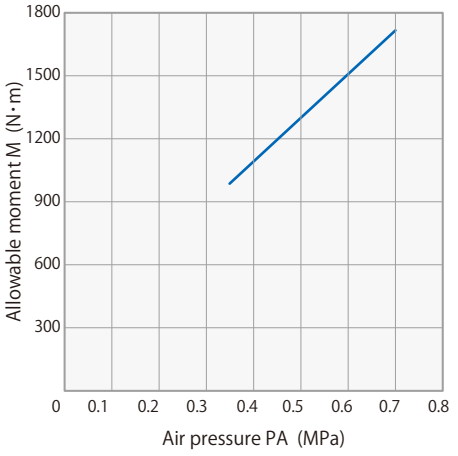
RHA080

(M = 648 x PA + 76)



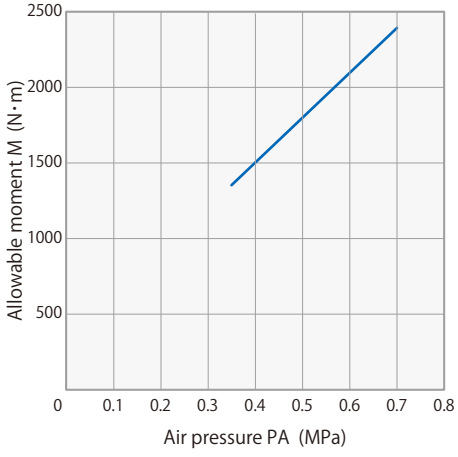
RHA160

(M = 2082 x PA + 259)

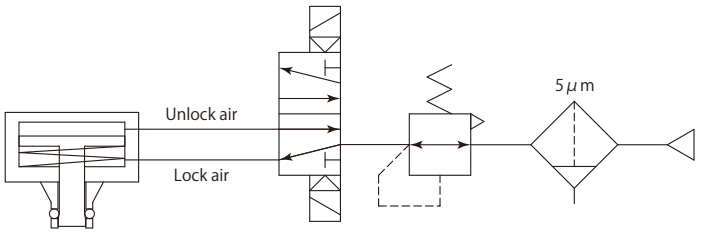


RHA230

(M = 2966 x PA + 317)



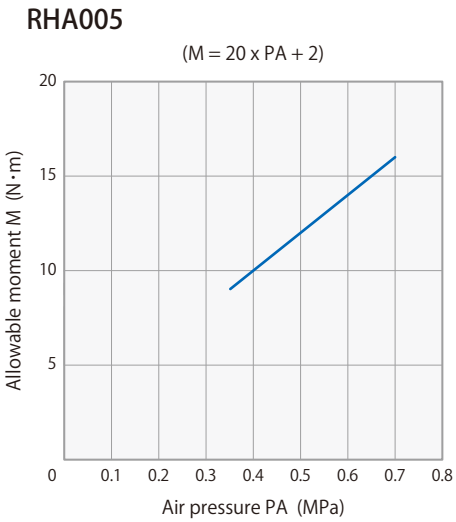
Pneumatic circuit diagram (reference)



● Operation check mut be performed with the master plate bolted.

model
RHA005 Payload 5 kg

Performance diagram



Specifications

Model			RHA005
Payload*1		kg	5
Allowable moment (Air pressure at 0.5 MPa) *2		N·m	12
Allowable torque*2		N·m	20
Tightening force	Air pressure at 0 MPa	kN	0.09
	Air pressure at 0.5 MPa	kN	0.58
Lift force	Air pressure at 0.5 MPa	kN	0.15
Repeatability		mm	0.01
Dimensions (Outer diameter × Height when connected)		mm	ø43X41
Mass	Master plate	g	160
	Tool plate	g	90
Air pressure for connecting/disconnecting operation		MPa	0.35～0.7
Connector for air	Number of ports (Size)		4 (M5)
	Working pressure	MPa	-0.09～1
Operating temperature		℃	0～70

*1：Select a model number not to exceed the allowable torque and moment, even if it was less than the payload.

*2：This value indicates the maximum. Select the right model so as not to exceed these values even for a split-second.

Option		Option symbol
Electric connector	10 points volume 3A / 1pc (with cable)	E0
	20 points volume 3A / 1pc (with cable)	E00
Remote sensor*1	4 points (with cable)	RN4 RP4 R4

*1：Refer to the web site of the company named B & Plus for details about the remote sensor.

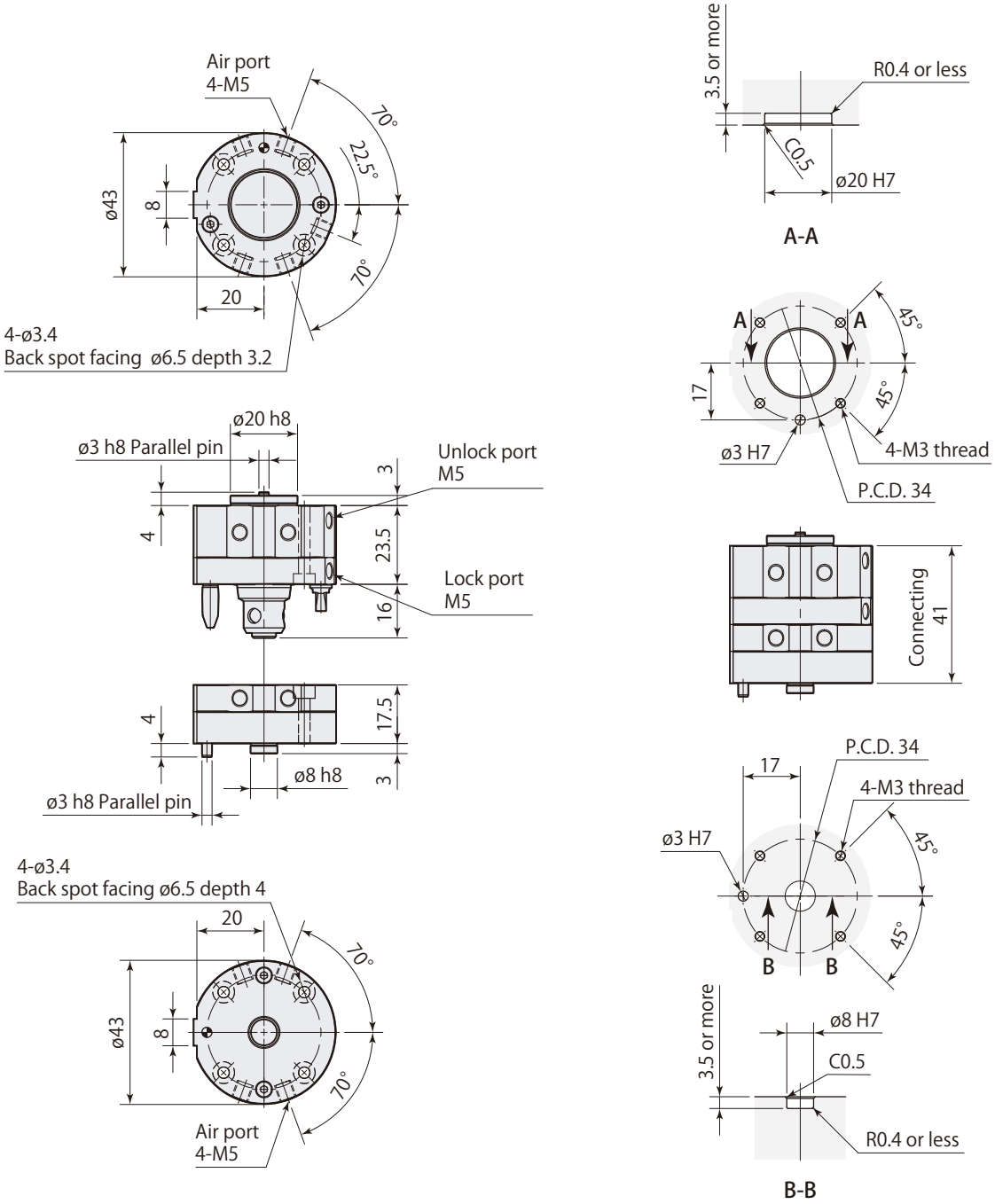
Model designation

		Connector for air(option)	Electric connector(option)
Master plate	RHA 005 - M		
Tool plate	RHA 005 - T		

No symbol	Non check valve

No symbol	Connector None
E0	3A×10 points
E00	3A×20 points
RN4	Master plate side Remote sensor (NPN output) ×4 points
RP4	Master plate side Remote sensor (PNP output) ×4 points
R4	Remote sensor of tool plate side ×4 points

Dimensions



Optionss

Electric connector
3A×10/20 points (with cable)

E0
E00

Page →29

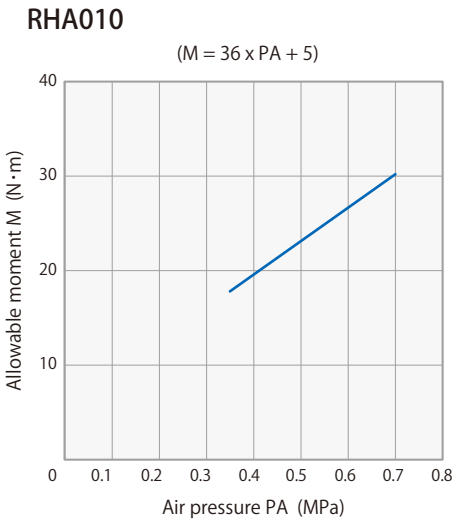
Remote sensor
4 points (with cable)

Page →35

RN4 Master plate side NPN
RP4 Master plate side PNP
R4 Tool plate side

model
RHA010 Payload 10 kg

Performance diagram



Specifications

Model			RHA010
Payload*1		kg	10
Allowable moment (Air pressure at 0.5 MPa)*2		N·m	23
Allowable torque*2		N·m	40
Tightening force	Air pressure at 0 MPa	kN	0.21
	Air pressure at 0.5 MPa	kN	1.01
Lift force	Air pressure at 0.5 MPa	kN	0.19
Repeatability		mm	0.01
Dimensions (Outer diameter × Height when connected)		mm	ø50×42(ø59×44*4)
Mass	Master plate	g	210 (315*4)
	Tool plate	g	120 (185*4)
Air pressure for connecting/disconnecting operation		MPa	0.35～0.7
Connector for air	Number of ports (Size)*3		6 (M5)
	Working pressure	MPa	-0.09～1
Operating temperature		℃	0～70

*1：Select a model number not to exceed the allowable torque and moment, even if it was less than the payload.
*2：This value indicates the maximum. Select the right model so as not to exceed these values even for a split-second.
*3：Rc1/8 also available. **Page →13**
*4：Denotes the value when model C is selected.

Option		Option symbol
Connector for air	Check valve model	C
	Add Rc1/8 × 2 ports	A0
Electric connector	10 points volume 3A / 1pc (with cable)	E0
	20 points volume 3A / 1pc (with cable)	E00
Remote sensor*1	12 points (with cable)	RN RP R
	4 points (with cable)	RN4 RP4 R4

*1：Refer to the web site of the company named B & Plus for details about the remote sensor.

Model designation

		Connector for air (option)	Electric connector (option)
Master plate	RHA 010 - M		
Tool plate	RHA 010 - T		

No symbol	Non check valve
C*	Check valve model
A0	Add Rc1/8×2

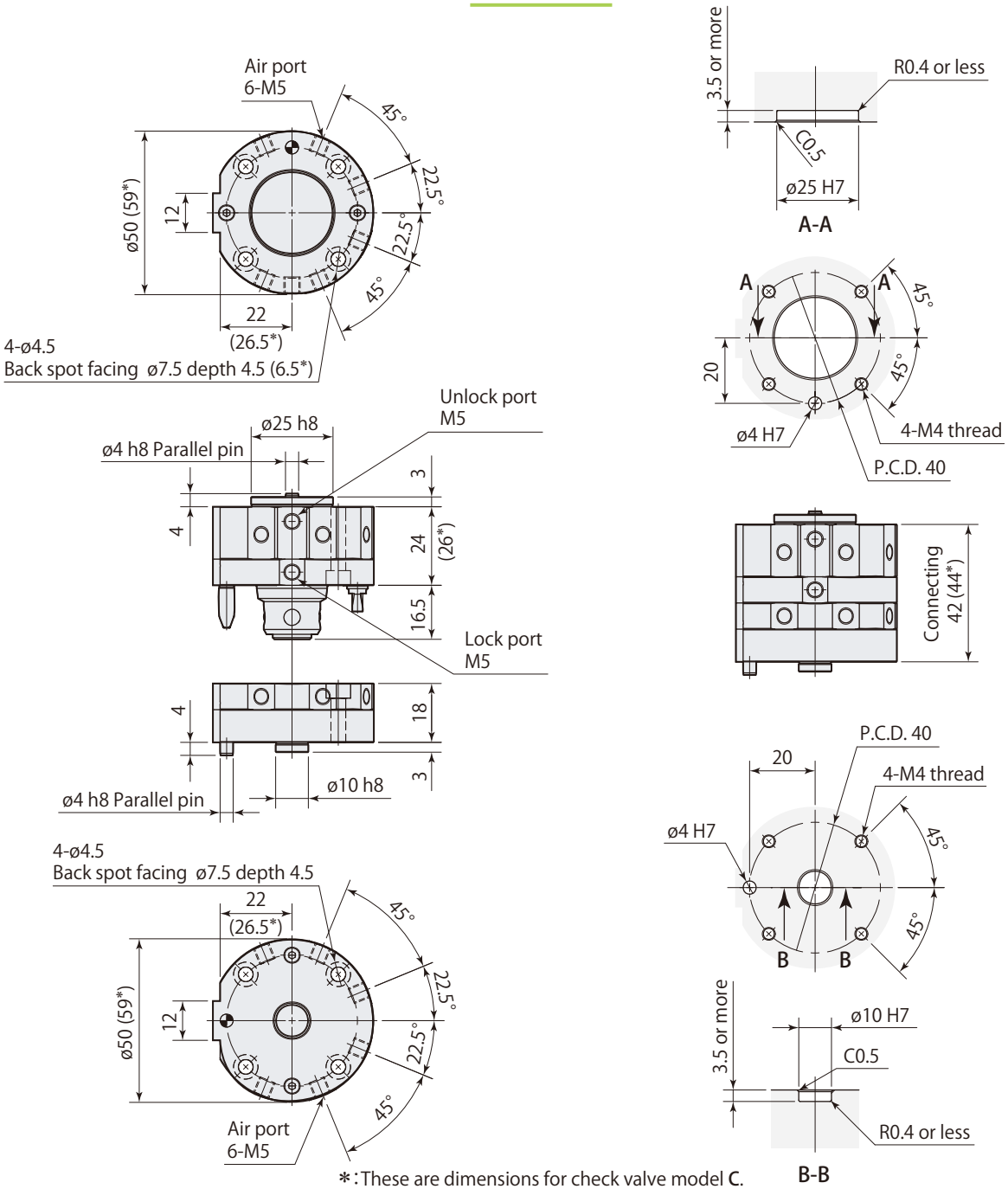
*：If the check valve model selected, both the master and tool plate must contain the symbol "C" in the model.

No symbol	Connector None
E0*	3A×10 points
E00	3A×20 points

*：Air connector A0 accepts only E0

RN	Master plate side Remote sensor (NPN output) ×12 points
RP	Master plate side Remote sensor (PNP output) ×12 points
R	Remote sensor of tool plate side ×12 points
RN4	Master plate side Remote sensor (NPN output) ×4 points
RP4	Master plate side Remote sensor (PNP output) ×4 points
R4	Remote sensor of tool plate side ×4 points

Dimensions



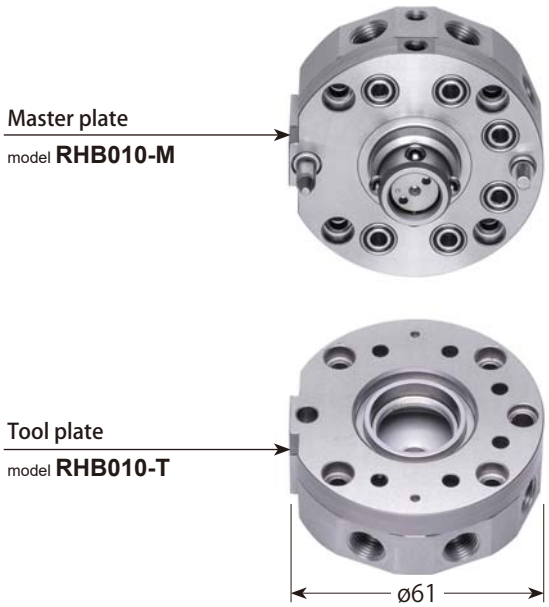
*: These are dimensions for check valve model C.

Options

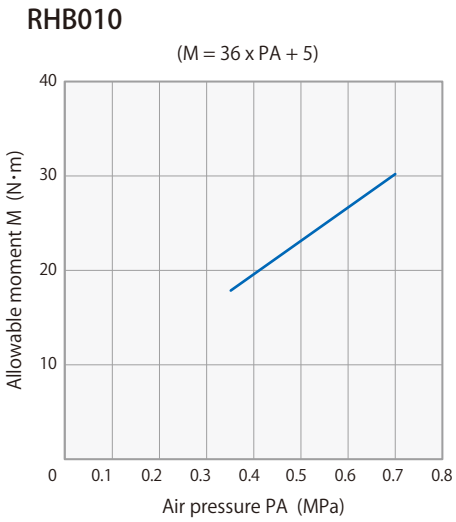
Connector for air Check valve model	Connector for air Add Rc1/8 × 2 ports	Electric connector 3A×10/20 points (with cable)	Remote sensor 12 points (with cable)	Remote sensor 4 points (with cable)
C	**A0** Page →27	**E0** **E00** Page →29	**RN** Master plate side NPN **RP** Master plate side PNP **R** Tool plate side Page →33	**RN4** Master plate side NPN **RP4** Master plate side PNP **R4** Tool plate side Page →35

model
RHB010 Payload 10 kg

RHB010 is the model that **RHA010 (Page →11)** air connection port changed to Rc1/8.



Performance diagram



Specifications

Model			RHB010
Payload*1		kg	10
Allowable moment (Air pressure at 0.5 MPa)*2		N·m	23
Allowable torque*2		N·m	40
Tightening force	Air pressure at 0 MPa	kN	0.21
	Air pressure at 0.5 MPa	kN	1.01
Lift force	Air pressure at 0.5 MPa	kN	0.19
Repeatability		mm	0.01
Dimensions (Outer diameter × Height when connected)		mm	ø61×47
Mass	Master plate	g	295
	Tool plate	g	225
Air pressure for connecting/disconnecting operation		MPa	0.4～0.7
Connector for air	Number of ports (Size)		6 (Rc1/8)
	Working pressure	MPa	-0.05～1
Operating temperature		℃	0～70

*1：Select a model that does not exceed the allowable torque and movement, even if it was less than the payload.

*2：This value indicates the maximum. Select the right model so as not to exceed these values even for a split-second.

Option		Option symbol
Connector for air	Add Rc1/8×2 ports	A0
Electric connector	10 points volume 3A / 1pc (with cable)	E0
	20 points volume 3A / 1pc (with cable)	E00
Remote sensor*1	12 points (with cable)	RN RP R
	4 points (with cable)	RN4 RP4 R4

*1：Refer to the web site of the company named B & Plus for details about the remote sensor.

Model designation

Master plate **RHB 010 - M**

Tool plate **RHB 010 - T**

Connector for air (option) | Electric connector (option)

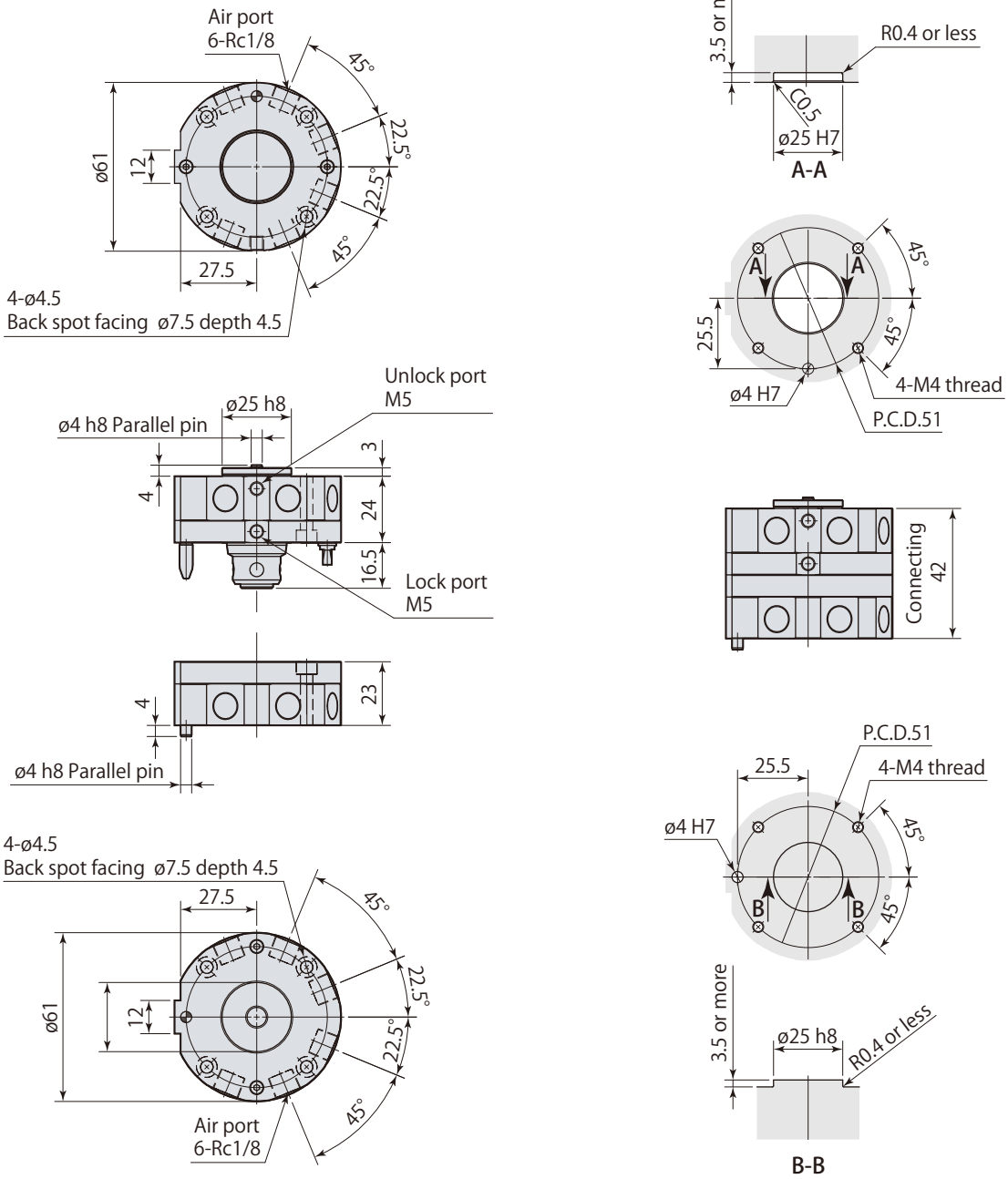
No symbol	Non check valve
A0	Add Rc1/8×2

No symbol	Connector None
E0*	3A×10 points
E00	3A×20 points

*：Air connector A0 accepts only E0

RN	Master plate side Remote sensor (NPN output) ×12 points
RP	Master plate side Remote sensor (PNP output) ×12 points
R	Remote sensor of tool plate side ×12 points
RN4	Master plate side Remote sensor (NPN output) ×4 points
RP4	Master plate side Remote sensor (PNP output) ×4 points
R4	Remote sensor of tool plate side ×4 points

Dimensions

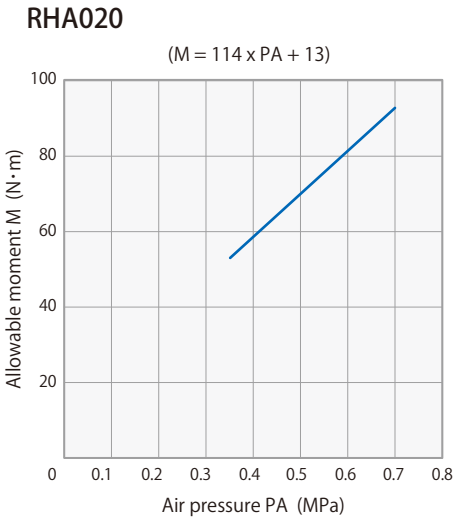


Options

Connector for air Add Rc1/8 × 2 ports	Electric connector 3A×10/20 points (with cable)	Remote sensor 12 points (with cable) Page →33	Remote sensor 4 points (with cable) Page →35
A0 Page →27	**E0** **E00** Page →29	**RN** Master plate side NPN **RP** Master plate side PNP **R** Tool plate side	**RN4** Master plate side NPN **RP4** Master plate side PNP **R4** Tool plate side

model
RHA020 Payload 20 kg

Performance diagram



Specifications

Model			RHA020
Payload*1		kg	20
Allowable moment (Air pressure at 0.5 MPa)*2		N·m	70
Allowable torque*2		N·m	75
Tightening force	Air pressure at 0 MPa	kN	0.4
	Air pressure at 0.5 MPa	kN	2.22
Lift force	Air pressure at 0.5 MPa	kN	0.47
Repeatability		mm	0.01
Dimensions (Outer diameter × Height when connected)		mm	ø71×59
Mass	Master plate	g	580
	Tool plate	g	320
Air pressure for connecting/disconnecting operation		MPa	0.4～0.7
Connector for air	Number of ports (Size)		6 (M5)
	Working pressure	MPa	-0.05～1
Operating temperature		℃	0～70

Option		Option symbol
Connector for air	Check valve model	C
	Add Rc1/8 × 2 ports	A0
Sensor for connecting / disconnecting		SN SP
Electric connector	10 points 3A / 1pc (with cable)	E0
	20 points 3A / 1pc (with cable)	E00
Circular electric connector	14 points 5A / 1pc	E4
	10 points 13A / 1pc	E5
Remote sensor*1	12 points (with cable)	RN RP R
	4 points (with cable)	RN4 RP4 R4

∗1：Select a model that does not exceed the allowable torque and movement, even if it was less than the payload.
∗2：This value indicates the maximum. Select the right model so as not to exceed these values even for a split-second.
∗3：Rc1/8 also available. **Page →17**

∗1：Refer to the web site of the company named B & Plus for details about the remote sensor.

Model designation

		Connector for air(option)	Sensor for connecting /disconnecting (option)	Electric connector(option)
Master plate	RHA 020 - M			
Tool plate	RHA 020 - T			

No symbol	Non check valve
C*	Check valve model
A0	Add Rc1/8×2

∗：Master plate only

No symbol	Sensor none
SN*	NPN output
SP*	PNP output

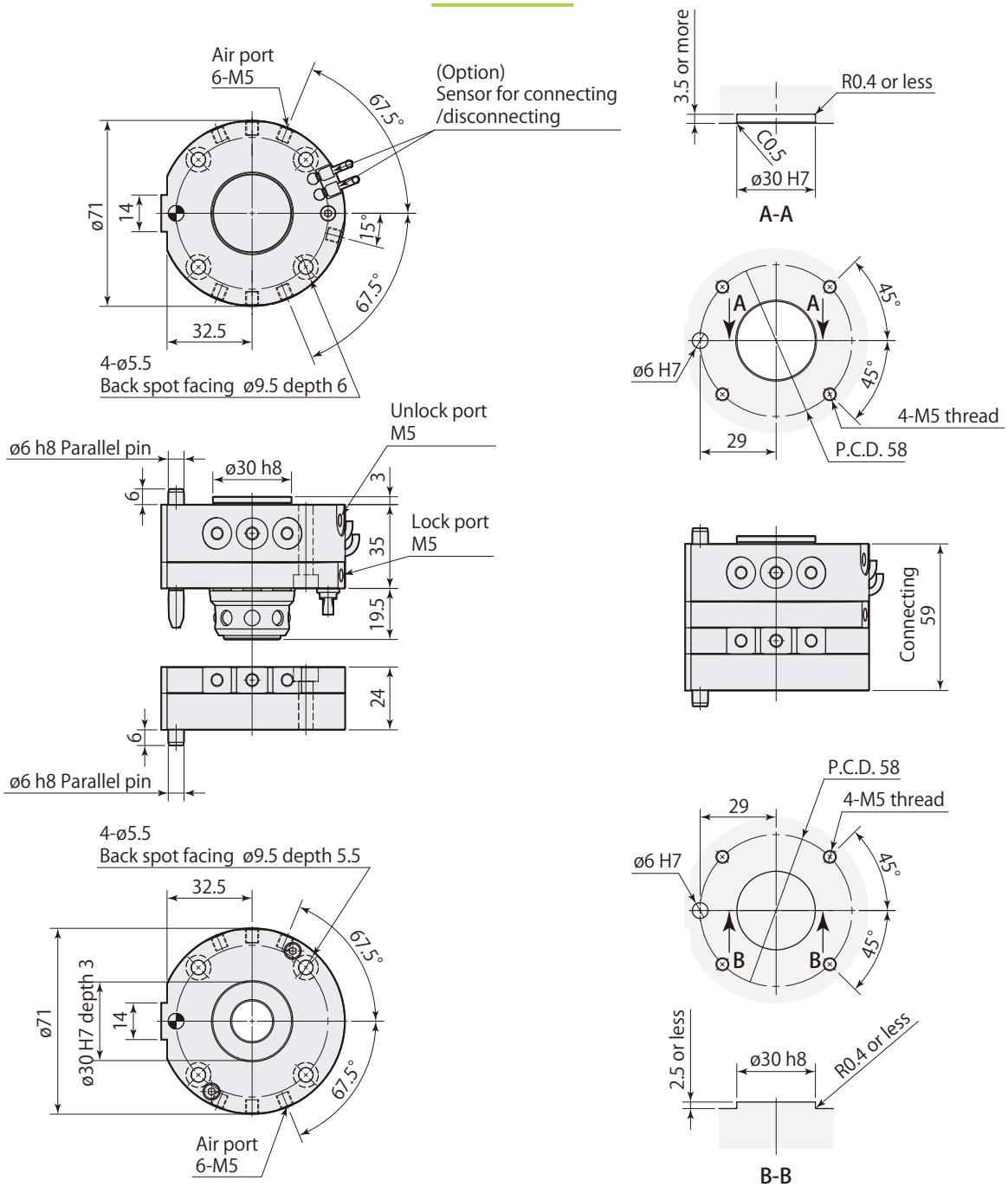
∗：Master plate only

No symbol	Connector None
E0*	3A×10 points
E00	3A×20 points
E4	5A×14 points
E5	13A×10 points

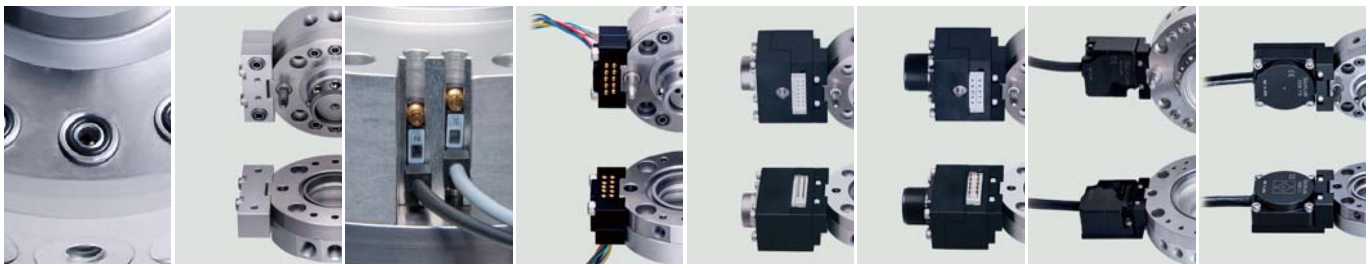
∗：Air connector A0 accepts only E0

RN	Master plate side Remote sensor (NPN output) ×12 points
RP	Master plate side Remote sensor (PNP output) ×12 points
R	Remote sensor of tool plate side ×12 points
RN4	Master plate side Remote sensor (NPN output) ×4 points
RP4	Master plate side Remote sensor (PNP output) ×4 points
R4	Remote sensor of tool plate side ×4 points

Dimensions



Options

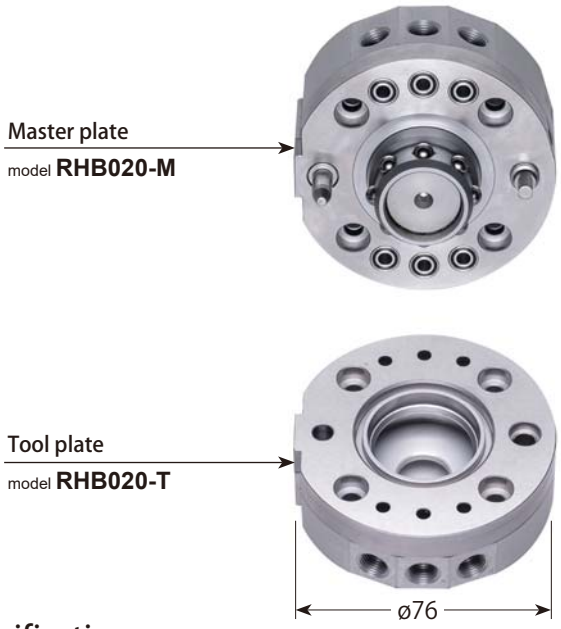


Connector for air Check valve model	Connector for air Add Rc1/8×2	Sensor for connecting/ disconnecting	Electric connector 3A×10/20 points (with cable)	Circular electric connector 5A×14 points	Circular electric connector 13A×10 points	Remote sensor 12 points (with cable)	Remote sensor 4 points (with cable)
C	**A0** Page →27	**SN** NPN **SP** PNP Page →28	**E0** **E00** Page →29	**E4** Page →30	**E5** Page →31	**RN** Master plate side NPN **RP** Master plate side PNP **R** Tool plate side Page →33	**RN4** Master plate side NPN **RP4** Master plate side PNP **R4** Tool plate side Page →35

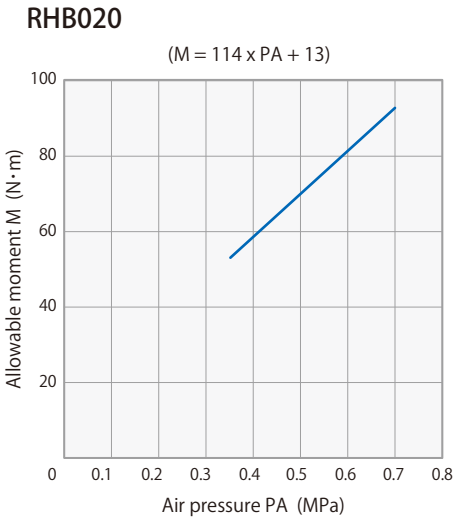
model

RHB020 Payload 20 kg

RHB020 is the model that **RHA020 (Page →15)** air connection port changed to Rc1/8.



Performance diagram



Specifications

Model			RHB020
Payload*1		kg	20
Allowable moment (Air pressure at 0.5 MPa)*2		N・m	70
Allowable torque*2		N・m	75
Tightening force	Air pressure at 0 MPa	kN	0.4
	Air pressure at 0.5 MPa	kN	2.22
Lift force	Air pressure at 0.5 MPa	kN	0.47
Repeatability		mm	0.01
Dimensions (Outer diameter × Height when connected)		mm	ø76×60
Mass	Master plate	g	650
	Tool plate	g	385
Air pressure for connecting/disconnecting operation		MPa	0.4～0.7
Connector for air	Number of ports (Size)		6 (Rc1/8)
	Working pressure	MPa	-0.05～1
Operating temperature		℃	0～70

*1：Select a model that does not exceed the allowable torque and movement, even if it was less than the payload.

*2：This value indicates the maximum. Select the right model so as not to exceed these values even for a split-second.

Option		Option symbol
Connector for air	Add Rc1/8 × 2 ports	A0
Sensor for connecting / disconnecting		SN SP
Electric connector	10 points 3A / 1pc (with cable)	E0
	20 points 3A / 1pc (with cable)	E00
Circular electric connector	14 points 5A / 1pc	E4
	10 points 13A / 1pc	E5
Remote sensor*1	12 points (with cable)	RN RP R
	4 points (with cable)	RN4 RP4 R4

*1：Refer to the web site of the company named B & Plus for details about the remote sensor.

Model designation

Master plate **RHB 020 - M**

Tool plate **RHB 020 - T**

Connector for air(option) | Sensor for connecting /disconnecting (option) | Electric connector(option)

No symbol	Non check valve
A0	Add Rc1/8×2

No symbol	Sensor none
SN*	NPN output
SP*	PNP output

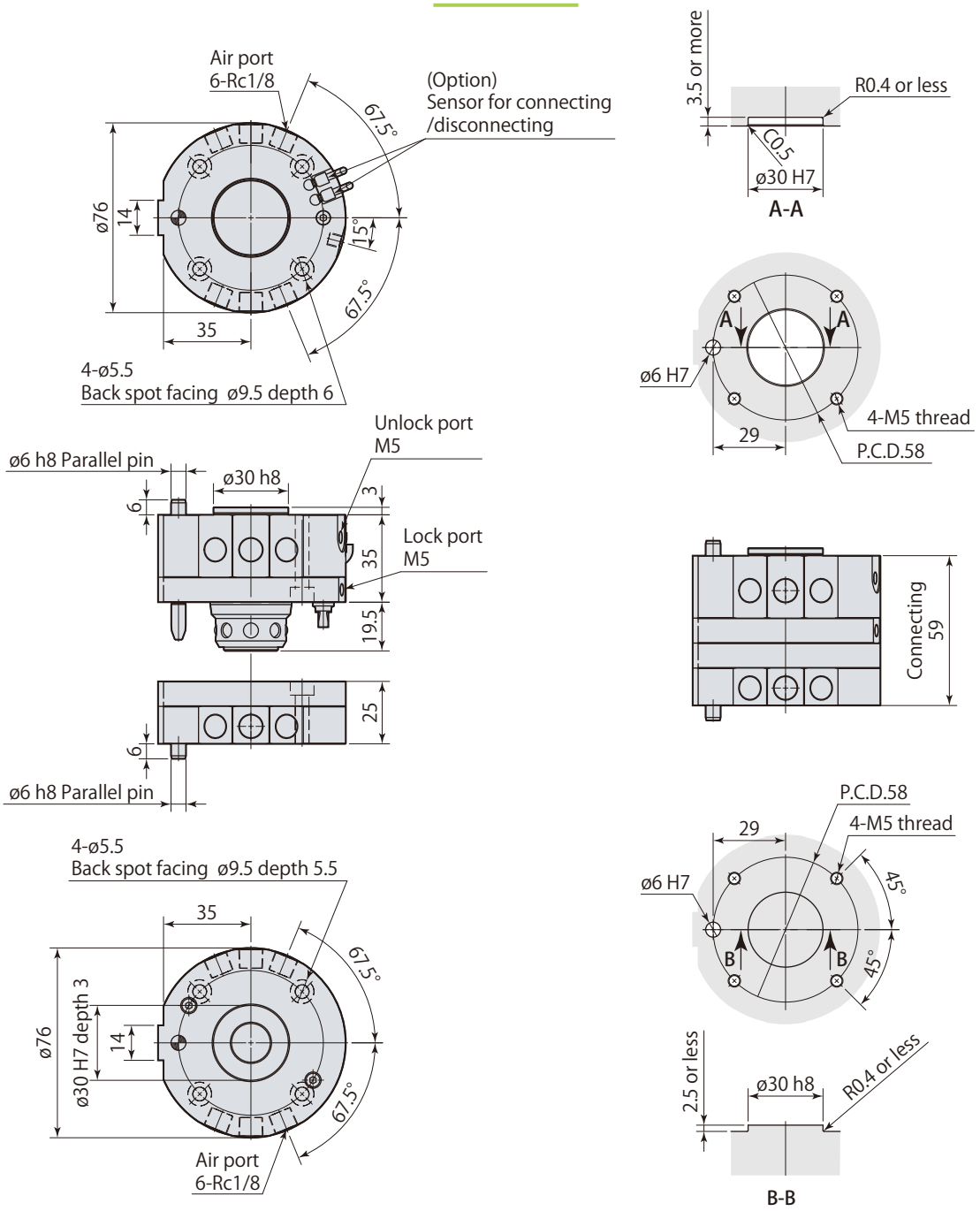
*：Master plate only

No symbol	Connector None
E0*	3A×10 points
E00	3A×20 points
E4	5A×14 points
E5	13A×10 points

*：Air connector A0 accepts only E0

RN	Master plate side Remote sensor (NPN output) ×12 points
RP	Master plate side Remote sensor (PNP output) ×12 points
R	Remote sensor of tool plate side ×12 points
RN4	Master plate side Remote sensor (NPN output) ×4 points
RP4	Master plate side Remote sensor (PNP output) ×4 points
R4	Remote sensor of tool plate side ×4 points

Dimensions

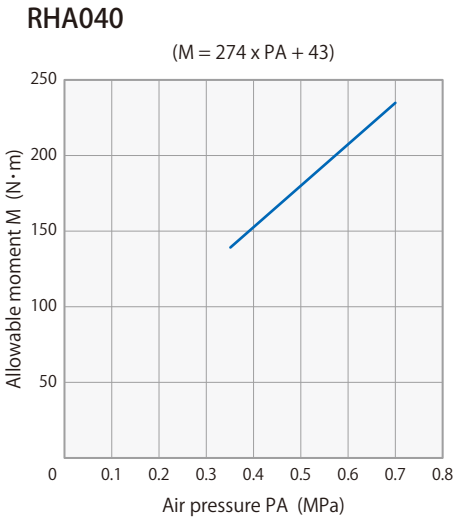


Options

Connector for air Add Rc1/8×2	Sensor for connecting/ disconnecting	Electric connector 3A×10/20 points (with cable)	Circular electric connector 5A×14 points	Circular electric connector 13A×10 points	Remote sensor 12 points (with cable)	Remote sensor 4 points (with cable)
A0	**SN** NPN **SP** PNP	**E0** **E00**	**E4**	**E5**	**RN** Master plate side NPN **RP** Master plate side PNP **R** Tool plate side	**RN4** Master plate side NPN **RP4** Master plate side PNP **R4** Tool plate side
Page →27	Page →28	Page →29	Page →30	Page →31	Page →33	Page →35

model
RHA040 Payload 40 kg

Performance diagram



Specifications

Model			RHA040
Payload*1		kg	40
Allowable moment (Air pressure at 0.5 MPa)*2		N·m	180
Allowable torque*2		N·m	160
Tightening force	Air pressure at 0 MPa	kN	0.76
	Air pressure at 0.5 MPa	kN	4.04
Lift force	Air pressure at 0.5 MPa	kN	0.71
Repeatability		mm	0.01
Dimensions (Outer diameter × Height when connected)		mm	ø92×59
Mass	Master plate	g	1010
	Tool plate	g	570
Air pressure for connecting/disconnecting operation		MPa	0.4～0.7
Connector for air	Number of ports (Size)		8 (Rc1/8)
	Working pressure	MPa	-0.05～1
Operating temperature		℃	0～70

Option		Option symbol
Connector for air	Check valve model	C
	Add Rc1/8 × 2 ports	A0
Sensor for connecting / disconnecting		SN SP
Electric connector	10 points 3A / 1pc (with cable)	E0
	20 points 3A / 1pc (with cable)	E00
Circular electric connector	14 points 5A / 1pc	E4
	10 points 13A / 1pc	E5
Remote sensor*1	12 points (with cable)	RN RP R
	4 points (with cable)	RN4 RP4 R4

*1：Select a model that does not exceed the allowable torque and movement, even if it was less than the payload.

*2：This value indicates the maximum. Select the right model so as not to exceed these values even for a split-second.

*1：Refer to the web site of the company named B & Plus for details about the remote sensor.

Model designation

Master plate **RHA 040 - M**

Tool plate **RHA 040 - T**

Connector for air(option)	Sensor for connecting /disconnecting (option)	Electric connector(option)

No symbol	Non check valve
C*	Check valve model
A0	Add Rc1/8×2

*：Master plate only

No symbol	Sensor none
SN*	NPN output
SP*	PNP output

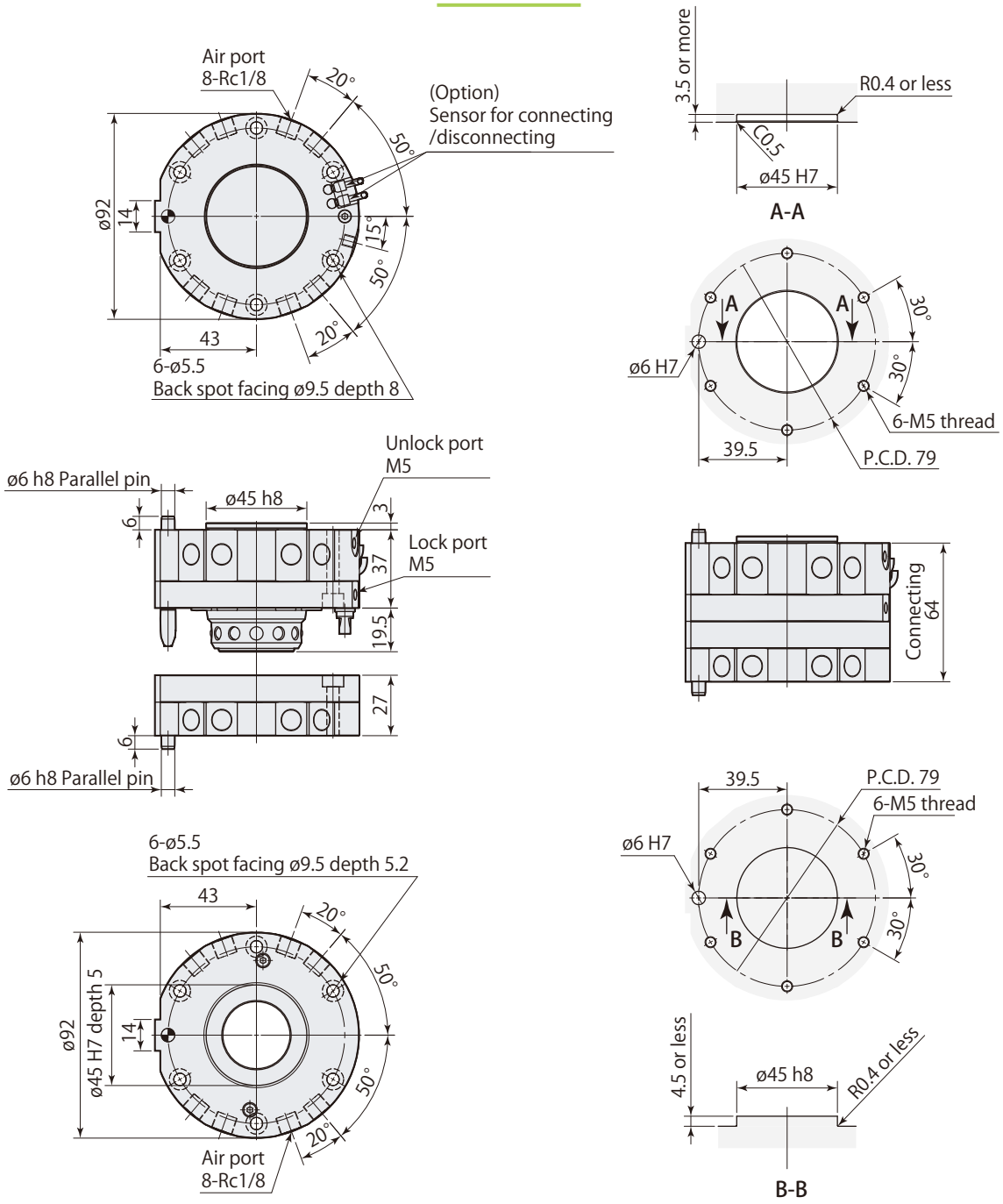
*：Master plate only

No symbol	Connector None
E0*	3A×10 points
E00	3A×20 points
E4	5A×14 points
E5	13A×10 points

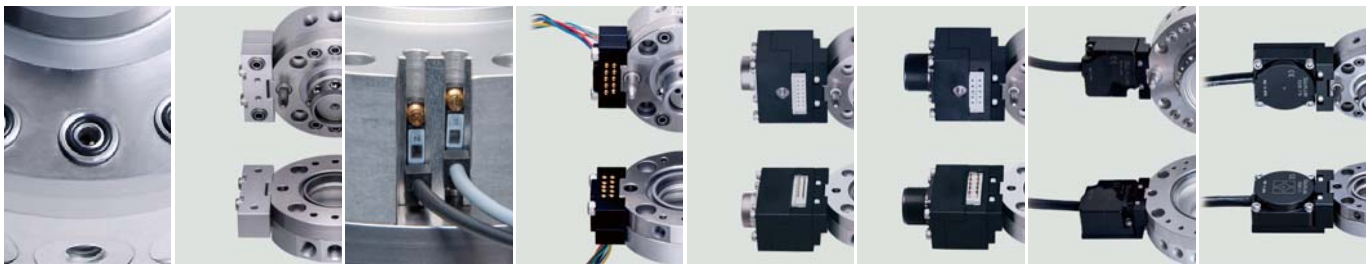
*：Air connector A0 accepts only E0

RN	Master plate side Remote sensor (NPN output) ×12 points
RP	Master plate side Remote sensor (PNP output) ×12 points
R	Remote sensor of tool plate side ×12 points
RN4	Master plate side Remote sensor (NPN output) ×4 points
RP4	Master plate side Remote sensor (PNP output) ×4 points
R4	Remote sensor of tool plate side ×4 points

Dimensions



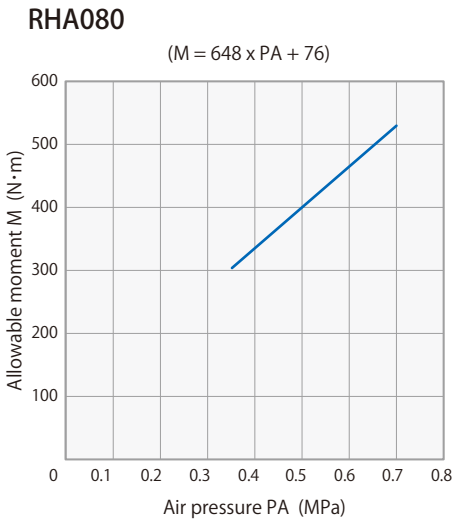
Options



Connector for air Check valve model	Connector for air Add Rc1/8×2	Sensor for connecting/ disconnecting	Electric connector 3A×10/20 points (with cable)	Circular electric connector 5A×14 points	Circular electric connector 13A×10 points	Remote sensor 12 points (with cable)	Remote sensor 4 points (with cable)
C	**A0**	**SN** NPN **SP** PNP	**E0** **E00**	**E4**	**E5**	**RN** Master plate side NPN **RP** Master plate side PNP **R** Tool plate side	**RN4** Master plate side NPN **RP4** Master plate side PNP **R4** Tool plate side
	Page →27	Page →28	Page →29	Page →30	Page →31	Page →33	Page →35

model
RHA080 Payload 80 kg

Performance diagram



Specifications

Model			RHA080
Payload*1		kg	80
Allowable moment (Air pressure at 0.5 MPa)*2		N·m	400
Allowable torque*2		N·m	320
Tightening force	Air pressure at 0 MPa	kN	1.53
	Air pressure at 0.5 MPa	kN	8.08
Lift force	Air pressure at 0.5 MPa	kN	1.55
Repeatability		mm	0.01
Dimensions (Outer diameter × Height when connected)		mm	ø118×68.5
Mass	Master plate	g	1840
	Tool plate	g	890
Air pressure for connecting/disconnecting operation		MPa	0.4～0.7
Connector for air	Number of ports (Size)		12 (Rc1/8)
	Working pressure	MPa	-0.05～1
Operating temperature		℃	0～70

Option		Option symbol
Connector for air	Check valve model	C
	Add Rc1/8 × 2 ports	A0
Sensor for connecting / disconnecting		SN SP
Electric connector	10 points 3A / 1pc (with cable)	E0
	20 points 3A / 1pc (with cable)	E00
Circular electric connector	14 points 5A / 1pc	E4
	10 points 13A / 1pc	E5
Remote sensor*1	12 points (with cable)	RN RP R
	4 points (with cable)	RN4 RP4 R4

*1：Select a model that does not exceed the allowable torque and movement, even if it was less than the payload.

*2：This value indicates the maximum. Select the right model so as not to exceed these values even for a split-second.

*1：Refer to the web site of the company named B & Plus for details about the remote sensor.

Model designation

		Connector for air(option)	Sensor for connecting /disconnecting (option)	Electric connector(option)
Master plate	RHA 080 - M			
Tool plate	RHA 080 - T			

No symbol	Non check valve
C*	Check valve model
A0	Add Rc1/8×2

*：Master plate only

No symbol	Sensor none
SN*	NPN output
SP*	PNP output

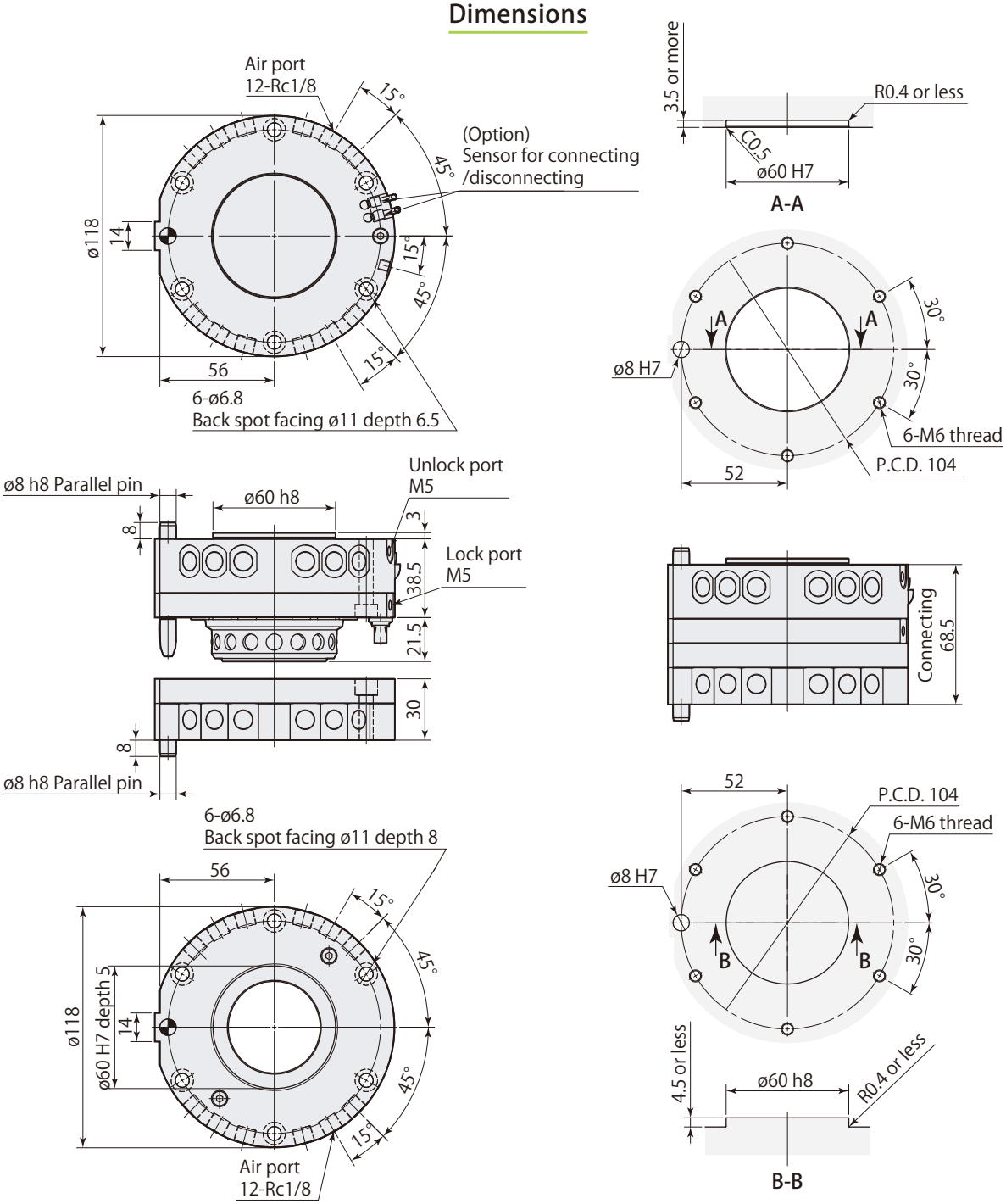
*：Master plate only

No symbol	Connector None
E0*	3A×10 points
E00	3A×20 points
E4	5A×14 points
E5	13A×10 points

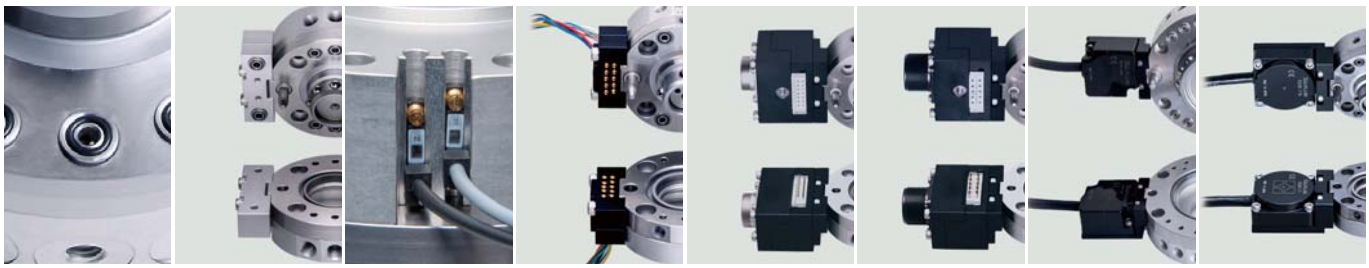
*：Air connector A0 accepts only E0

RN	Master plate side Remote sensor (NPN output) ×12 points
RP	Master plate side Remote sensor (PNP output) ×12 points
R	Remote sensor of tool plate side ×12 points
RN4	Master plate side Remote sensor (NPN output) ×4 points
RP4	Master plate side Remote sensor (PNP output) ×4 points
R4	Remote sensor of tool plate side ×4 points

Dimensions

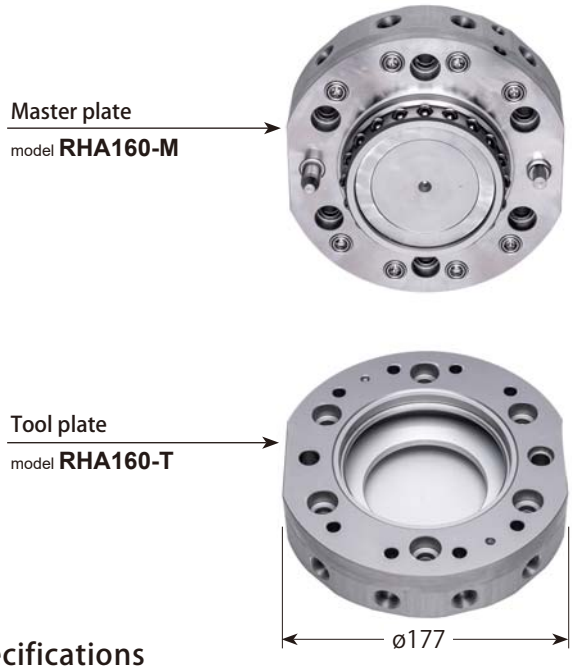


Options



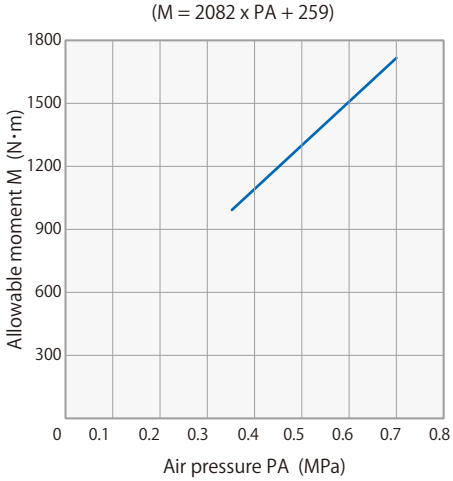
Connector for air Check valve model	Connector for air Add Rc1/8×2	Sensor for connecting/ disconnecting	Electric connector 3A×10/20 points (with cable)	Circular electric connector 5A×14 points	Circular electric connector 13A×10 points	Remote sensor 12 points (with cable)	Remote sensor 4 points (with cable)
C	**A0** Page →27	**SN** NPN **SP** PNP Page →28	**E0** **E00** Page →29	**E4** Page →30	**E5** Page →31	**RN** Master plate side NPN **RP** Master plate side PNP **R** Tool plate side Page →33	**RN4** Master plate side NPN **RP4** Master plate side PNP **R4** Tool plate side Page →35

model
RHA160 Payload 160 kg



Performance diagram

RHA160



Specifications

Model			RHA160
Payload*1		kg	160
Allowable moment (Air pressure at 0.5 MPa)*2		N·m	1300
Allowable torque*2		N·m	900
Tightening force	Air pressure at 0 MPa	kN	3.27
	Air pressure at 0.5 MPa	kN	16.41
Lift force	Air pressure at 0.5 MPa	kN	3.01
Repeatability		mm	0.01
Dimensions (Outer diameter × Height when connected)		mm	ø177×88.5
Mass	Master plate	g	5600
	Tool plate	g	2800
Air pressure for connecting/disconnecting operation		MPa	0.4～0.7
Connector for air	Number of ports (Size)		8 (Rc3/8)
	Working pressure	MPa	-0.05～1
Operating temperature		℃	0～70

Option		Option symbol
Connector for air	Check valve model	C
	Add Rc1/8 × 2 ports	A0
Sensor for connecting / disconnecting		SN SP
Electric connector	10 points 3A / 1pc (with cable)	E0
	20 points 3A / 1pc (with cable)	E00
Circular electric connector	14 points 5A / 1pc	E4
	10 points 13A / 1pc	E5
Remote sensor*1	12 points (with cable)	RN RP R
	4 points (with cable)	RN4 RP4 R4

*1：Select a model that does not exceed the allowable torque and movement, even if it was less than the payload.

*2：This value indicates the maximum. Select the right model so as not to exceed these values even for a split-second.

*1：Refer to the web site of the company named B & Plus for details about the remote sensor.

Model designation

		Connector for air(option)	Sensor for connecting /disconnecting (option)	Electric connector(option)
Master plate	RHA 160 - M			
Tool plate	RHA 160 - T			

No symbol	Non check valve
C*	Check valve model
A0	Add Rc1/8×2

*：Master plate only

No symbol	Sensor none
SN*	NPN output
SP*	PNP output

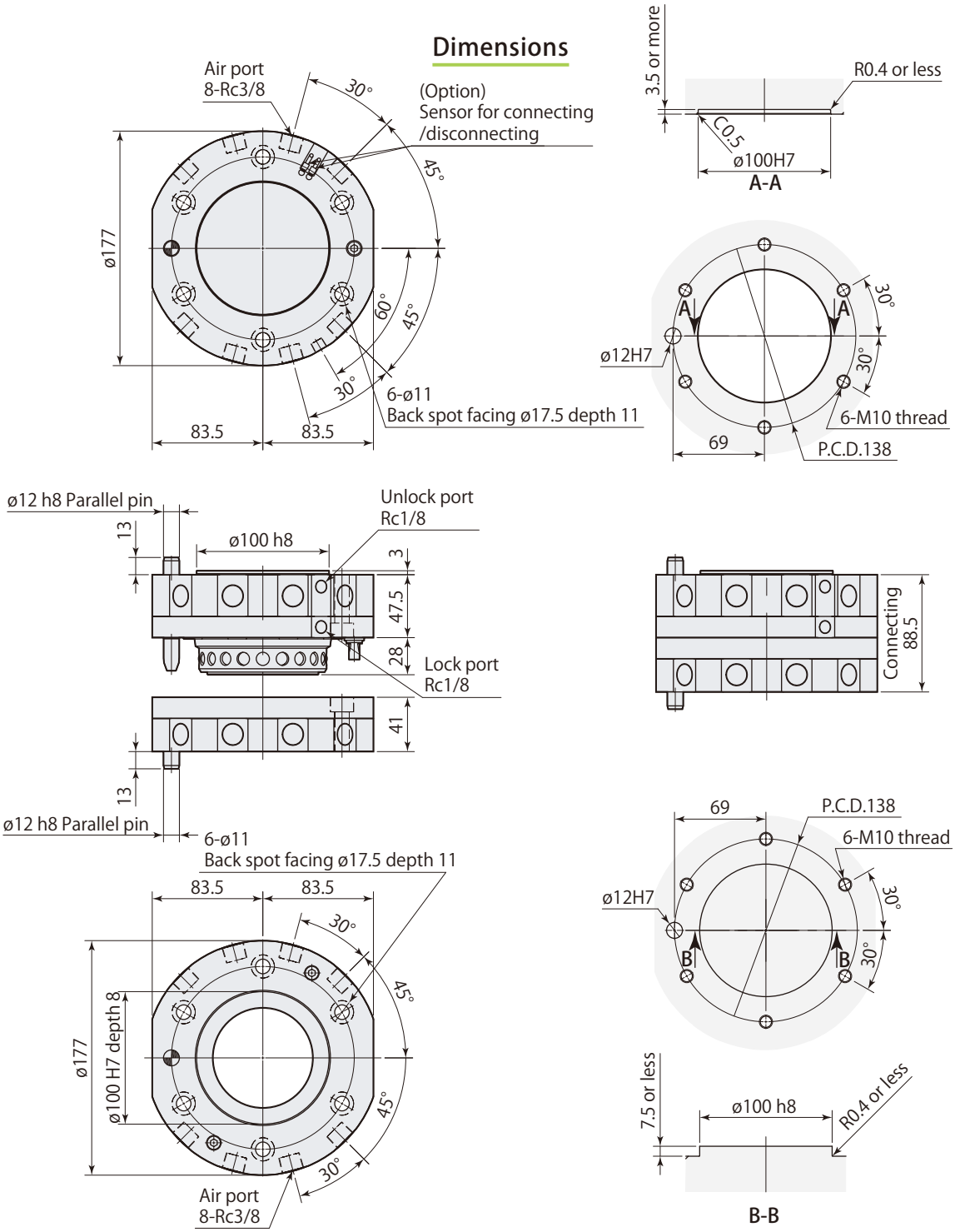
*：Master plate only

No symbol	Connector None
E0*	3A×10 points
E00	3A×20 points
E4	5A×14 points
E5	13A×10 points

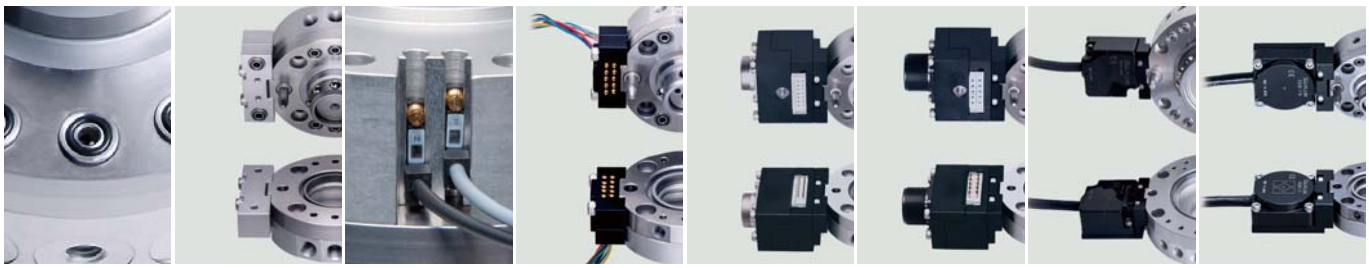
*：Air connector A0 accepts only E0

RN	Master plate side Remote sensor (NPN output) ×12 points
RP	Master plate side Remote sensor (PNP output) ×12 points
R	Remote sensor of tool plate side ×12 points
RN4	Master plate side Remote sensor (NPN output) ×4 points
RP4	Master plate side Remote sensor (PNP output) ×4 points
R4	Remote sensor of tool plate side ×4 points

Dimensions



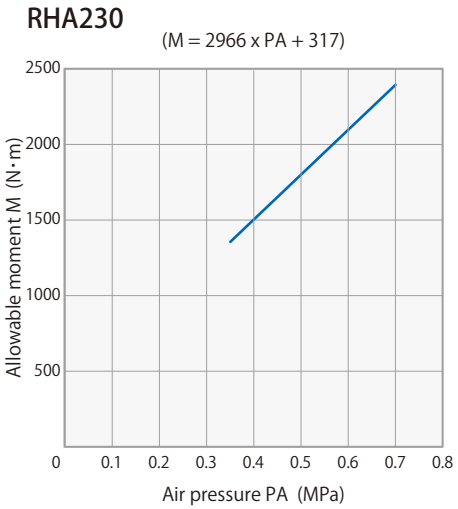
Options



Connector for air Check valve model	Connector for air Add Rc1/8×2	Sensor for connecting/ disconnecting	Electric connector 3A×10/20 points (with cable)	Circular electric connector 5A×14 points	Circular electric connector 13A×10 points	Remote sensor 12 points (with cable)	Remote sensor 4 points (with cable)
C	**A0** Page →27	**SN** NPN **SP** PNP Page →28	**E0** **E00** Page →29	**E4** Page →30	**E5** Page →31	**RN** Master plate side NPN **RP** Master plate side PNP **R** Tool plate side Page →33	**RN4** Master plate side NPN **RP4** Master plate side PNP **R4** Tool plate side Page →35

model
RHA230 Payload 230 kg

Performance diagram



Specifications

Model			RHA230
Payload*1		kg	230
Allowable moment (Air pressure at 0.5 MPa)*2		N·m	1800
Allowable torque*2		N·m	1400
Tightening force	Air pressure at 0 MPa	kN	4.09
	Air pressure at 0.5 MPa	kN	23.23
Lift force	Air pressure at 0.5 MPa	kN	5.61
Repeatability		mm	0.01
Dimensions (Outer diameter × Height when connected)		mm	ø205×95.5
Mass	Master plate	g	8300
	Tool plate	g	3800
Air pressure for connecting/disconnecting operation		MPa	0.4～0.7
Connector for air	Number of ports (Size)		10 (Rc3/8)
	Working pressure	MPa	-0.05～1
Operating temperature		℃	0～70

Option		Option symbol
Connector for air	Check valve model	C
	Add Rc1/8 × 2 ports	A0
Sensor for connecting / disconnecting		SN SP
Electric connector	10 points 3A / 1pc (with cable)	E0
	20 points 3A / 1pc (with cable)	E00
Circular electric connector	14 points 5A / 1pc	E4
	10 points 13A / 1pc	E5
Remote sensor*1	12 points (with cable)	RN RP R
	4 points (with cable)	RN4 RP4 R4

*1：Select a model that does not exceed the allowable torque and movement, even if it was less than the payload.

*2：This value indicates the maximum. Select the right model so as not to exceed these values even for a split-second.

*1：Refer to the web site of the company named B & Plus for details about the remote sensor.

Model designation

		Connector for air(option)	Sensor for connecting /disconnecting (option)	Electric connector(option)
Master plate	RHA 230 - M			
Tool plate	RHA 230 - T			

No symbol	Non check valve
C*	Check valve model
A0	Add Rc1/8×2

*：Master plate only

No symbol	Sensor none
SN*	NPN output
SP*	PNP output

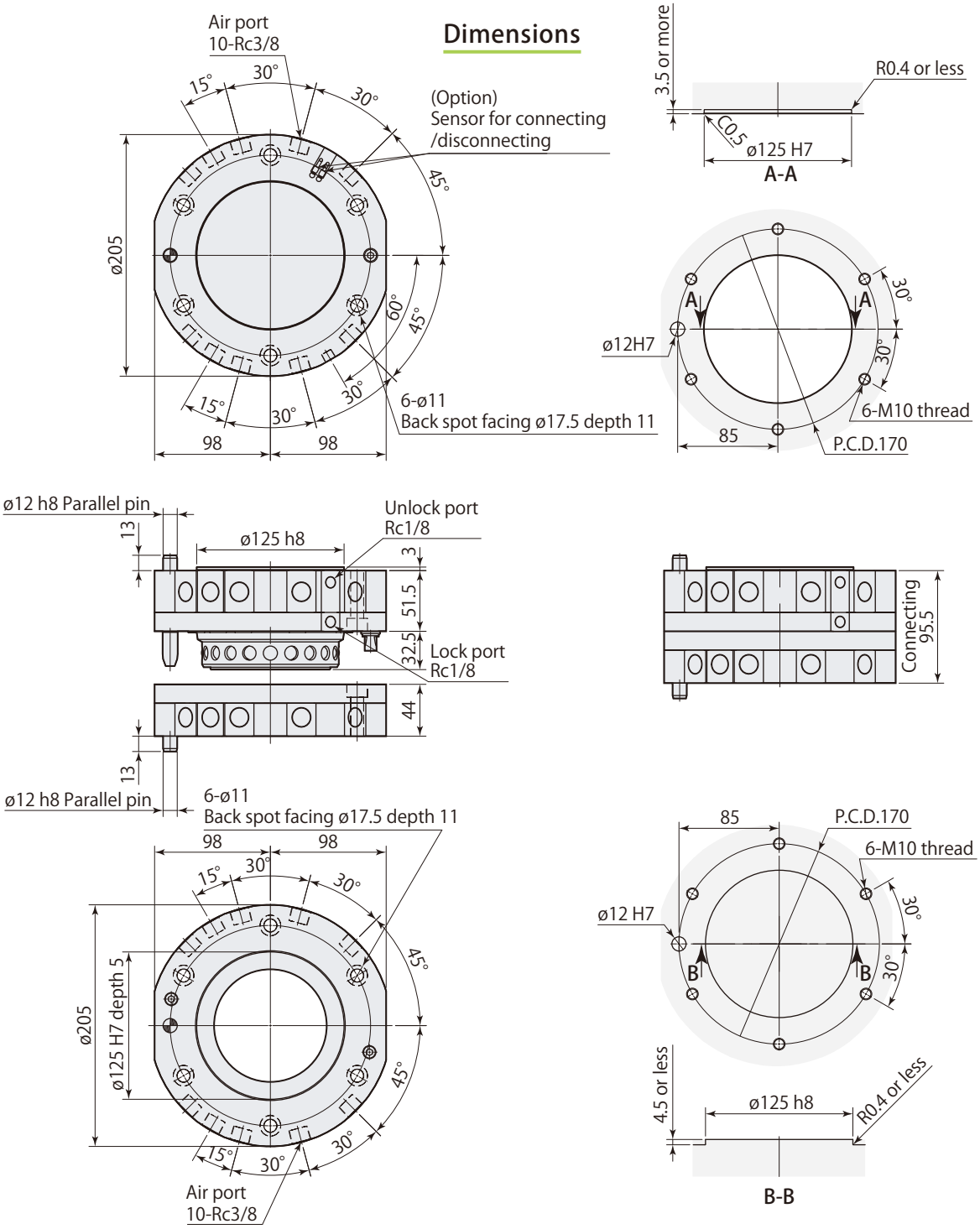
*：Master plate only

No symbol	Connector None
E0*	3A×10 points
E00	3A×20 points
E4	5A×14 points
E5	13A×10 points

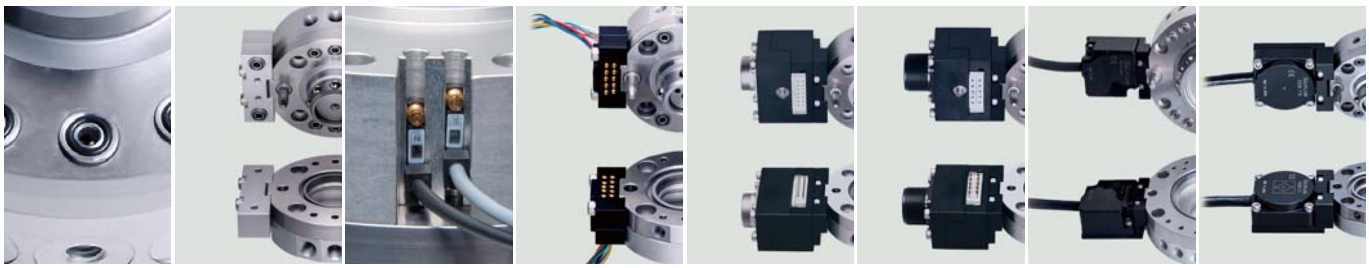
*：Air connector A0 accepts only E0

RN	Master plate side Remote sensor (NPN output) ×12 points
RP	Master plate side Remote sensor (PNP output) ×12 points
R	Remote sensor of tool plate side ×12 points
RN4	Master plate side Remote sensor (NPN output) ×4 points
RP4	Master plate side Remote sensor (PNP output) ×4 points
R4	Remote sensor of tool plate side ×4 points

Dimensions



Options



Connector for air Check valve model	Connector for air Add Rc1/8×2	Sensor for connecting/ disconnecting	Electric connector 3A×10/20 points (with cable)	Circular electric connector 5A×14 points	Circular electric connector 13A×10 points	Remote sensor 12 points (with cable)	Remote sensor 4 points (with cable)
C	**A0** Page →27	**SN** NPN **SP** PNP Page →28	**E0** **E00** Page →29	**E4** Page →30	**E5** Page →31	**RN** Master plate side NPN **RP** Master plate side PNP **R** Tool plate side Page →33	**RN4** Master plate side NPN **RP4** Master plate side PNP **R4** Tool plate side Page →35

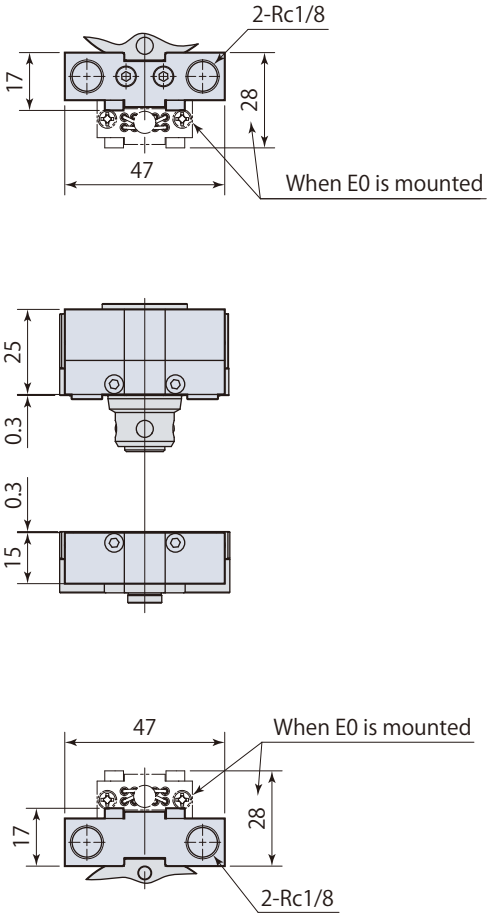
Air connector addition

Specifications

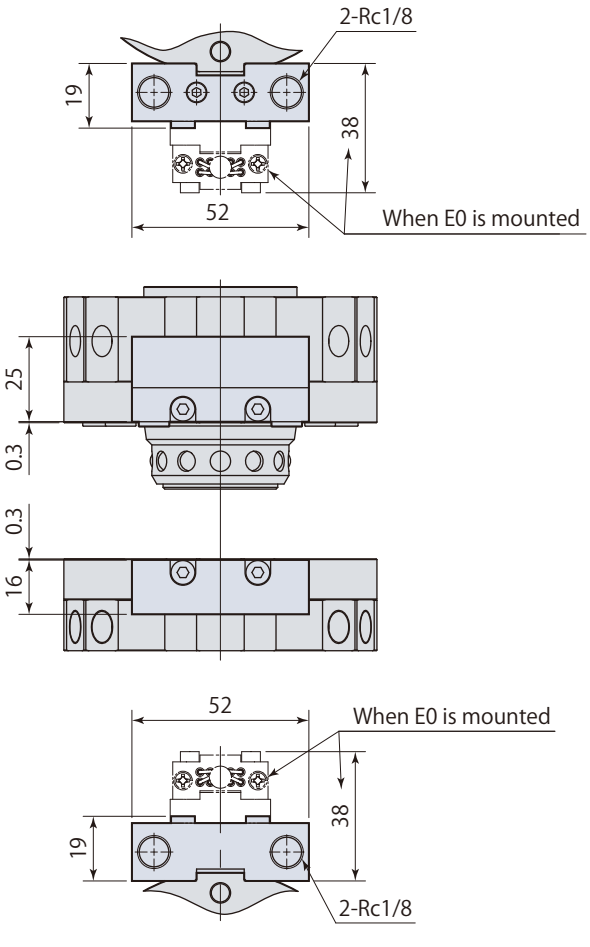
Number of ports (Size)		2 (Rc1/8)
Working pressure		-0.09 ～ 1 MPa
Mass	Master plate side	48g*1 / 63g*2
	Tool plate side	42g*1 / 36g*2

∗1：RHA/RHB010
∗2：RHA/RHB020～230
Connector E0 is mountable.

RHA010
RHB010



RHA020/040/080/160/230
RHB020



Sensor for connecting/disconnecting Detects lock/unlock

Specifications

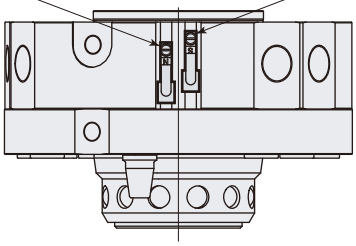
Symbol	SN	SP
Power-supply voltage	DC 5 ～ 24V	
Output specifications	NPN	PNP
Output current	MAX. 15 mA	MAX. 80 mA
Current consumption	MAX. 4 mA	MAX. 12 mA
Cable	Lock：Black Length 1 m	
	Unlock：Gray Length 1 m	

Locking confirmation sensor

Made by ASA Electronics
Symbol SN：ACH02LN(NPN)
Symbol SP：ACH02LPN(PNP)

Unlocking confirmation sensor

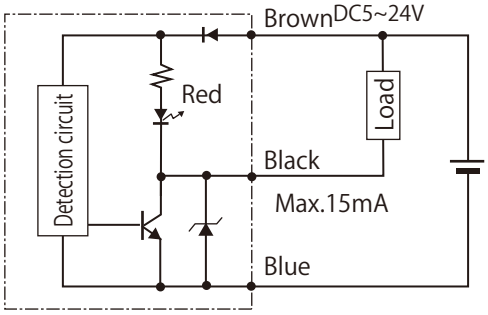
Made by ASA Electronics
Symbol SN：ACH02LS(NPN)
Symbol SP：ACH02LPS(PNP)



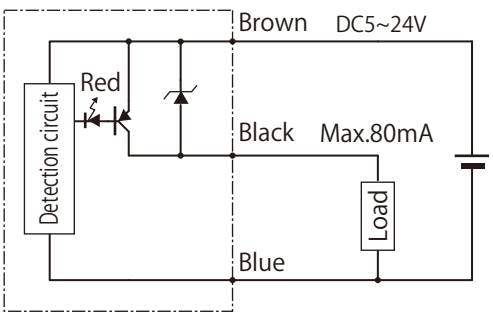
Sensor signal

Status	Unlock	Lock	Full stroke
Lock sensor	OFF	ON	ON
Unlock sensor	ON	ON	OFF

Symbol：SN(NPN)



Symbol：SP(PNP)



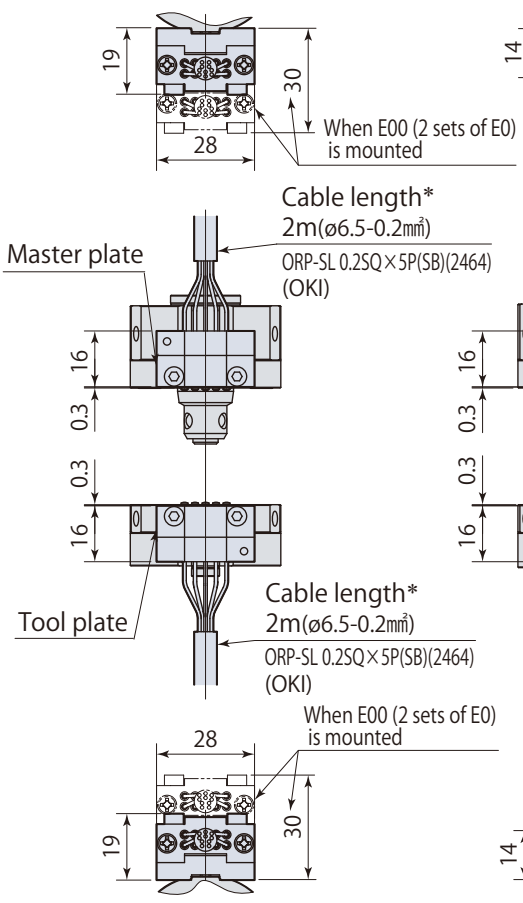
Electric connector 3A×10 points (with cable)

Specifications

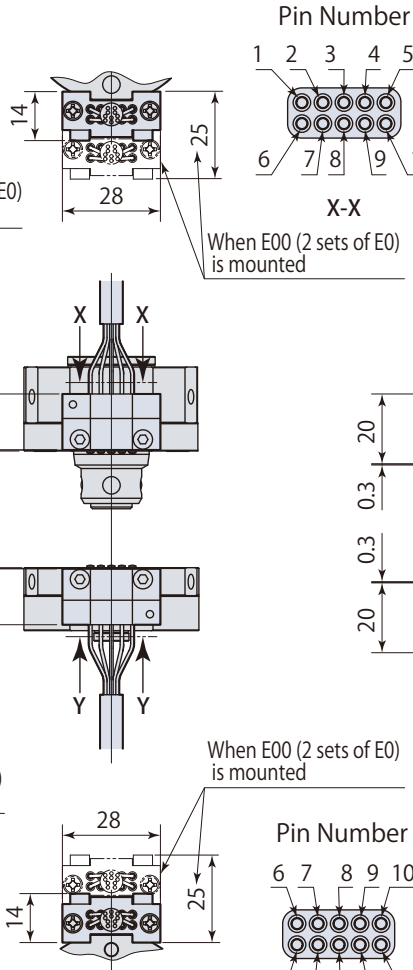
Rating (per 1 piece)		3A DC 24V
Number of contact points		10
Total volume		9A
Mass	Master plate	145g*1 / 135g*2 / 150g*3
	Tool plate	145g*1 / 135g*2 / 150g*3

*1 : RHA005. Including bracket and cable.
*2 : RHA010. Including cable.
*3 : RHA020～230. Including bracket and cable.

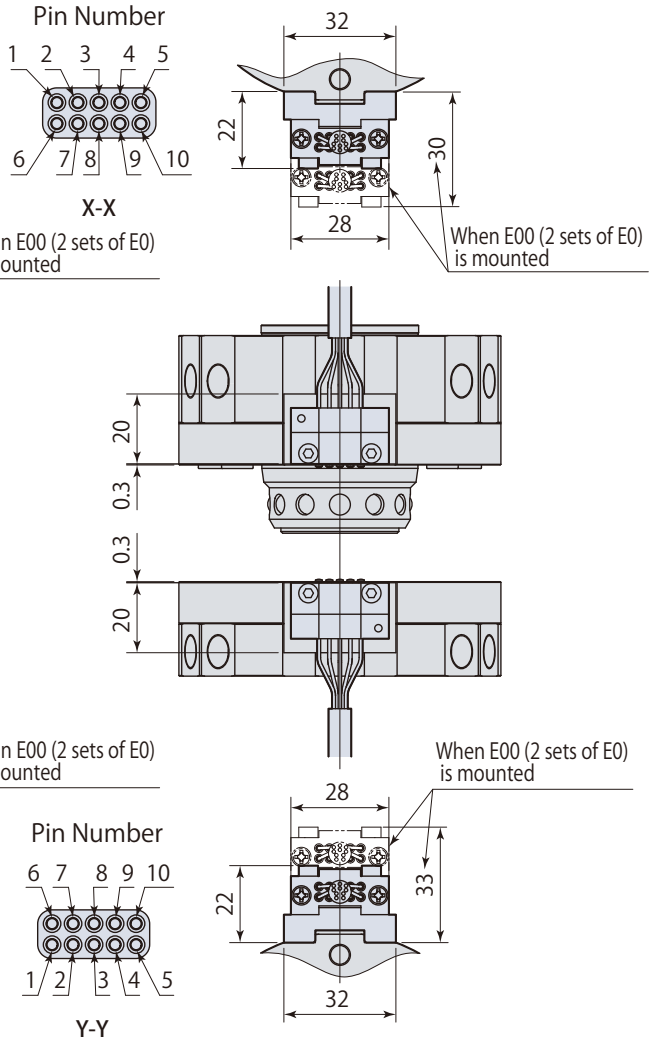
RHA005



RHA010
RHB010



RHA020/040/080/160/230
RHB020



Pin number	1	2	3	4	5	6	7	8	9	10
Wire color	BU	WH	YE	BN	GN	BK	RD	GY	VT	OG

*: Cable bending radius Fixed wiring: 4 times of cable diameter. Movable part wiring: 8 times of cable diameter.

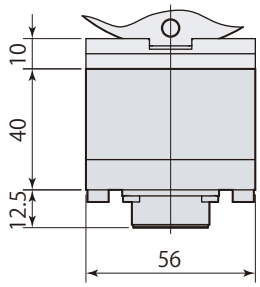
Circular electric connector 5A×14 points

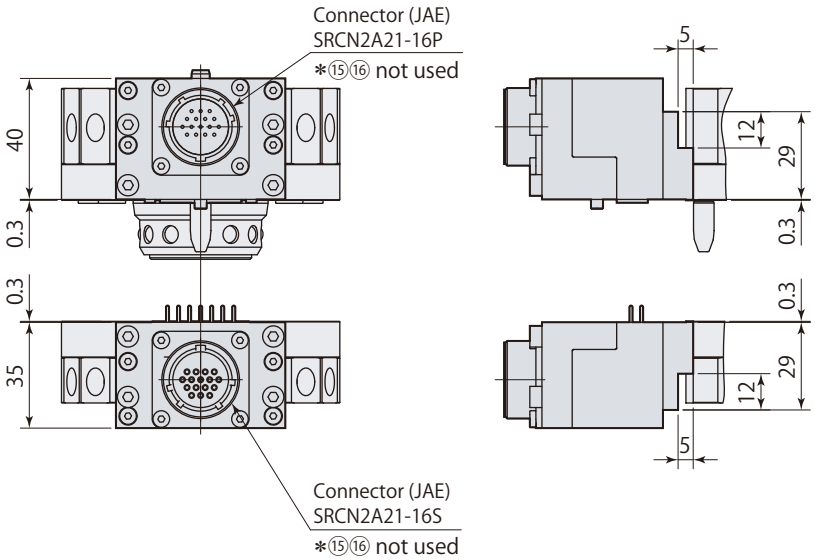
Specifications

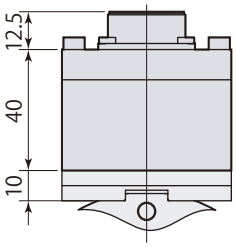
Rating (per 1 piece)		5A AC/DC 200V
Number of contact points		14
Total volume		30 A
Mass*	Master plate	245 g
	Tool plate	230 g

*: Including bracket.

Connect/Disconnect operations must be performed with the power shut-off. Failure to follow this instruction may cause the malfunction.







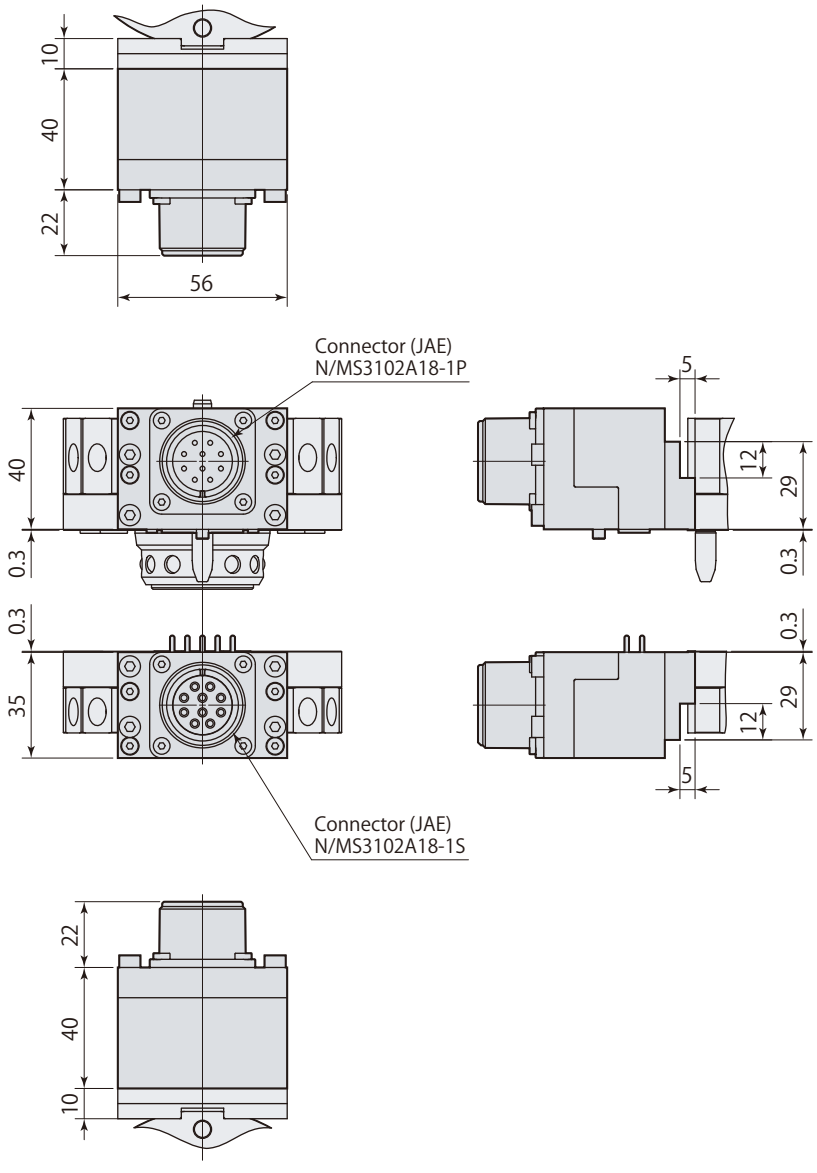
Circular electric connector 13A×10 points

Specifications

Rating (per 1 piece)		13A AC/DC 200V
Number of contact points		10
Total volume		57 A
Mass*	Master plate	255 g
	Tool plate	240 g

*: Including bracket.

Connect/Disconnect operations must be performed with the power shut-off. Failure to follow this instruction may cause the malfunction.



Remote sensor 12 points (with cable)

Specifications*1

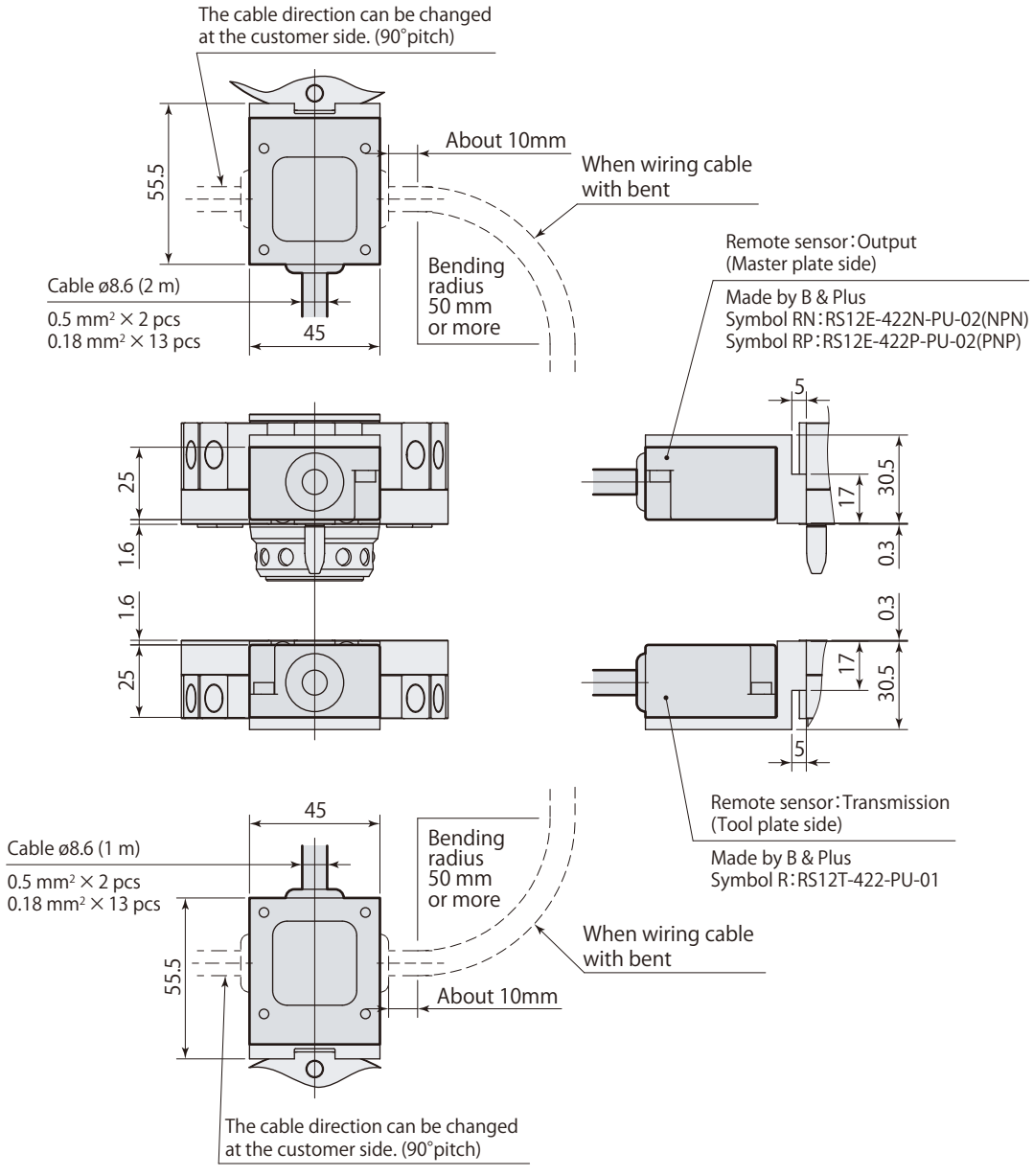
Tool plate side	
Symbol	R
Drive voltage	12V±1.5V DC
Total drive current	≦ 230mA
No. of input signals	12
Mass*2	230 g

Master plate side		
Symbol	RN	RP
Output specifications	NPN	PNP
Supply voltage	24V DC±10% (Including ripple)	
Current consumption	≦ 600mA	
No. of output signals	12 + 1 (Inzone)	
Load current	≦ 50mA/1 Output	
Mass*2	340 g	

*1 : Refer to the web site of the company named B & Plus for details about the remote sensor.
*2 : Includes bracket and cable.

Applicable sensor

Supply voltage : 12V±1.5V DC	Total current consumption : ≦ 230mA	Residual voltage : ≦ 3.5V



Wiring color

RS12T-422-PU-			
+12 V output	WH		
0 V output	Pale BU		
Polarity switching POL	BK		
Input 1 (SI1)	BN	Input 7 (SI7)	VT
Input 2 (SI2)	RD	Input 8 (SI8)	GY
Input 3 (SI3)	OG	Input 9 (SI9)	BN＊■■
Input 4 (SI4)	YE	Input 10 (SI10)	RD＊■■
Input 5 (SI5)	GN	Input 11 (SI11)	OG＊■■
Input 6 (SI5)	BU	Input 12 (SI12)	YE＊■■

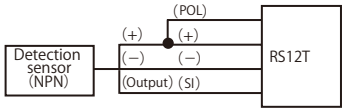
RS12E-422N/P-PU-			
+24 V input	WH		
0 V input	Pale BU		
In zone	BK		
Output 1 (SO1)	BN	Output 7 (SO7)	VT
Output 2 (SO2)	RD	Output 8 (SO8)	GY
Output 3 (SO3)	OG	Output 9 (SO9)	BN＊■■
Output 4 (SO4)	YE	Output 10 (SO10)	RD＊■■
Output 5 (SO5)	GN	Output 11 (SO11)	OG＊■■
Output 6 (SO5)	BU	Output 12 (SO12)	YE＊■■

Polarity switching POL is wiring for switching the polarity (NPN / PNP) of the sensor connected to the transmission section.
Check the wiring diagram and wire according to the sensor to be connected. If it is not wired, no signal will be detected.

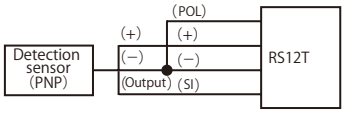
At the time of shipment from the factory, the unused core wire of the cable is cut. If the cable is shortened due to wiring reasons, the unused core wire will be exposed, so be careful not to short-circuit it.
The unused lines are GN＊, BU＊, and VT＊.(＊ is the line with ■■ printed on the core wire of each color)

Wiring diagram

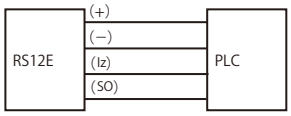
3-wire NPN type detection sensor connection



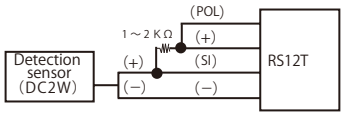
3-wire PNP type detection sensor connection



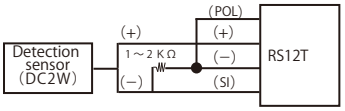
Connection to external PLC



2-wire NPN type detection sensor connection



2-wire PNP type detection sensor connection

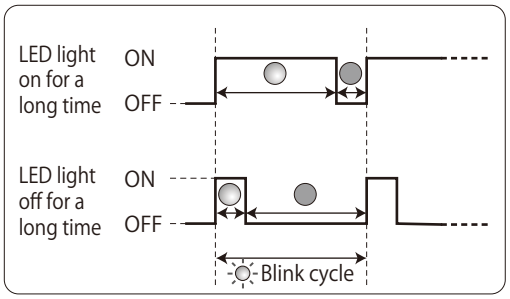


When wiring the power supply and signal lines, carefully check the wiring diagram and wire correctly.
When connecting a DC 2-wire sensor, wire a resistor of about 1 to 2 KΩ.

LED indication

Status LED (Green)

LED	Blinking	Pattern	Meaning
On ●	—	—	Power is supplied.
Off ○	—	—	Power is not supplied.
Blink ☼	Slow (1.5 sec.)	LED light off for a long time	Anomalous temperature.
Blink ☼		LED light on for a long time	Oscillation circuit overcurrent.
Blink ☼	Mid speed (0.6 sec.)	LED light off for a long time	Supply voltage is high.
Blink ☼		LED light on for a long time	Supply voltage is low.
Blink ☼	High (0.2 sec.)	The LED flashes at the same interval	Short circuit protection.

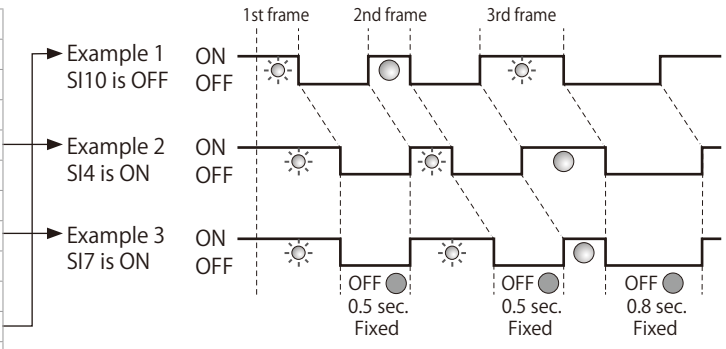


Inzone LED (Orange)

When the master plate and tool plate are on opposing sides, the inzone LED is lit to signal this.
When the output signal from each sensor and flash accordingly.

Output	1st frame
ON	Blinking ☼ 0.6 sec.
OFF	Blinking ☼ 0.3 sec.

Signal	2nd frame	3rd frame	
1	Blinking ☼ 0.3 sec.	Blink ☼	0.3 sec.
2			0.6 sec.
3		ON ●	0.3 sec.
4			0.6 sec.
5	Blinking ☼ 0.8 sec.	Blink ☼	0.3 sec.
6			0.6 sec.
7		ON ●	0.3 sec.
8			0.6 sec.
9	Lighting ● 0.3 sec.	Blink ☼	0.3 sec.
10			0.6 sec.
11		ON ●	0.3 sec.
12			0.6 sec.



Remote sensor 4 points (with cable)

Specifications*1

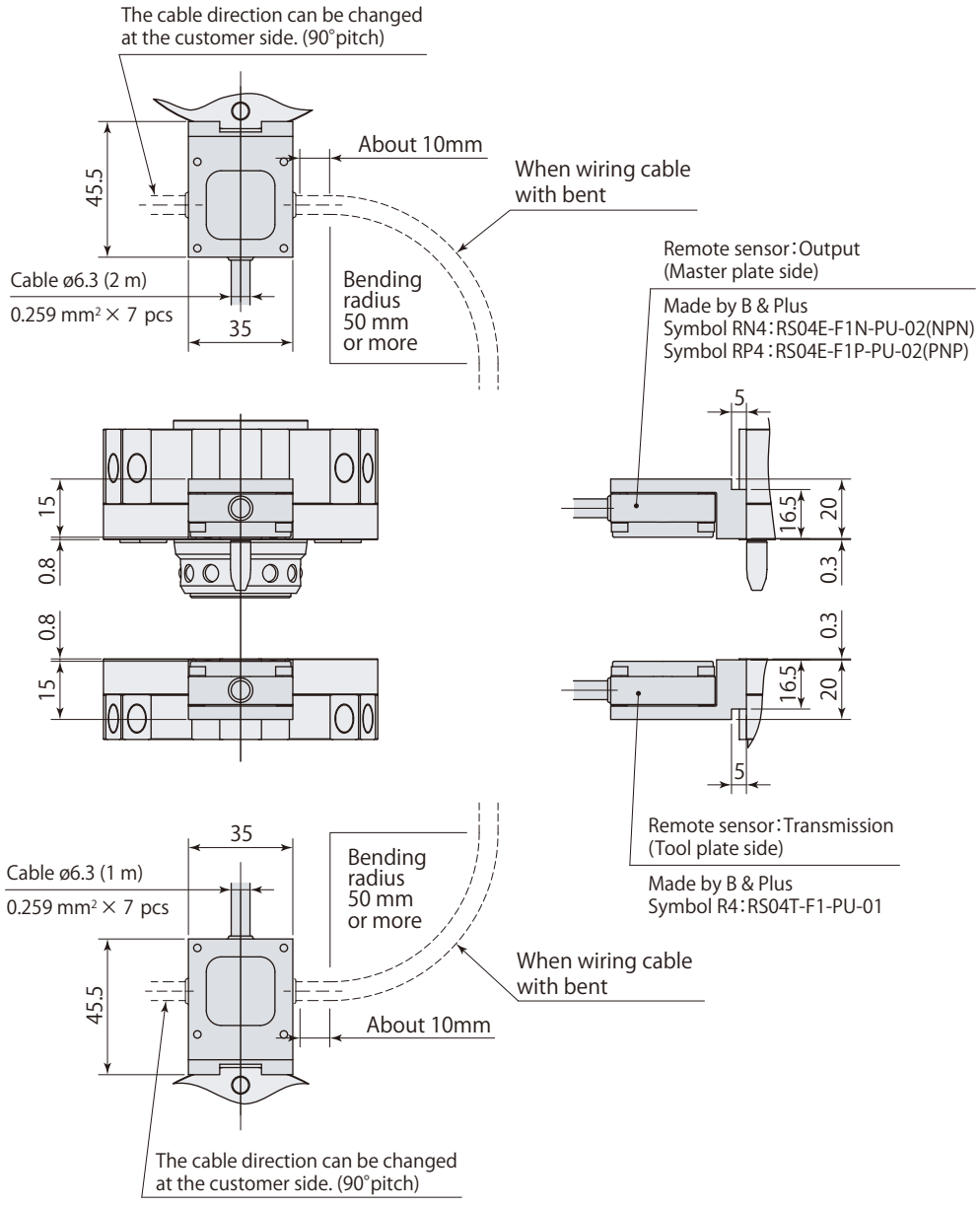
Tool plate side	
Symbol	R
Drive voltage	12V±1.5V DC
Total drive current	≦ 60mA
No. of input signals	4
Mass*2	120 g

Master plate side		
Symbol	RN	RP
Output specifications	NPN	PNP
Supply voltage	24V DC±10% (Including ripple)	
Current consumption	≦ 200mA	
No. of output signals	4 + 1 (Inzone)	
Load current	≦ 50mA/1 Output	
Mass*2	180 g	

*1：Refer to the web site of the company named B & Plus for details about the remote sensor.
*2：Includes bracket and cable.

Applicable sensor

Supply voltage：12V±1.5V DC	Total current consumption：≦ 60mA	Residual voltage：≦ 3.5V



Wire color

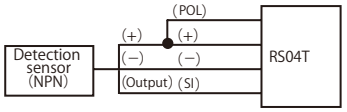
RS04T-F1-PU-	
+12 V output	White
0 V output	Blue
Polarity switching POL	Black
Input 1 (SI1)	Brown
Input 2 (SI2)	Red
Input 3 (SI3)	Yellow
Input 4 (SI4)	Green

RS04E-F1N/P-PU-	
+24 V input	White
0 V input	Blue
In zone	Black
Output 1 (SO1)	Brown
Output 2 (SO2)	Red
Output 3 (SO3)	Yellow
Output 4 (SO4)	Green

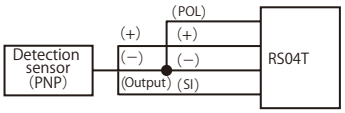
Polarity switching POL is wiring for switching the polarity (NPN / PNP) of the sensor connected to the transmission section.
Check the wiring diagram and wire according to the sensor to be connected. If it is not wired, no signal will be detected.

Wiring diagram

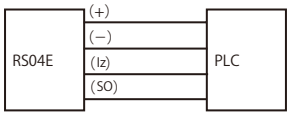
3-wire NPN type detection sensor connection



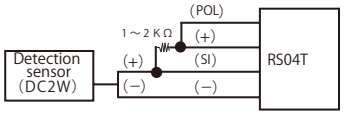
3-wire PNP type detection sensor connection



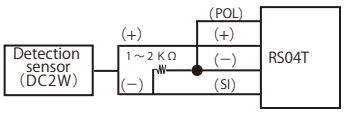
Connection to external PLC



2-wire NPN type detection sensor connection



2-wire PNP type detection sensor connection

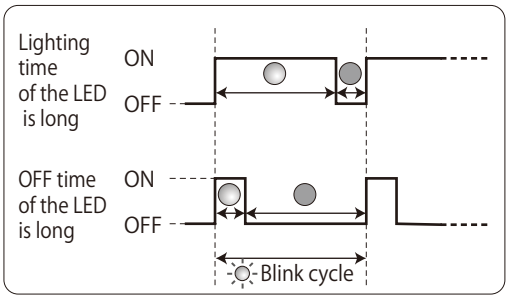


When wiring the power supply and signal lines, carefully check the wiring diagram and wire correctly.
When connecting a DC 2-wire sensor, wire a resistor of about 1 to 2 KΩ.

LED indication

Status LED (Green)

LED	Blinking	Pattern	Meaning
On	—	—	Power is supplied.
Off	—	—	Power is not supplied.
Blink	Slow (1.5 sec.)	LED light off for a long time	Anomalous temperature.
Blink	Mid speed (0.6 sec.)	LED light off for a long time	Supply voltage is high.
Blink		LED light on for a long time	Supply voltage is low.
Blink	High (0.2 sec.)	The LED flashes at the same interval	Short circuit protection.



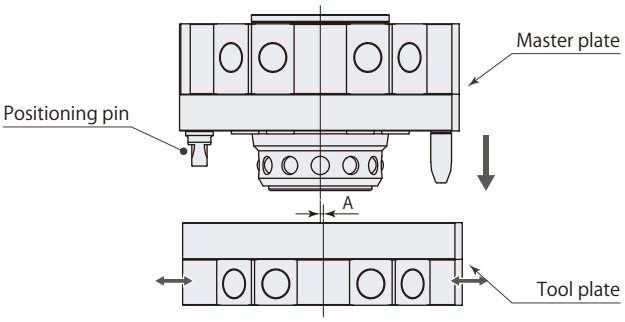
Inzone LED (Orange)

When the master plate and tool plate are on opposing sides, the inzone LED is lit to signal this.

Configuration conditions

When replacing a tool, please refer to the following guidelines to configure the tool plate.
Each condition denotes single occurance of misalignment.

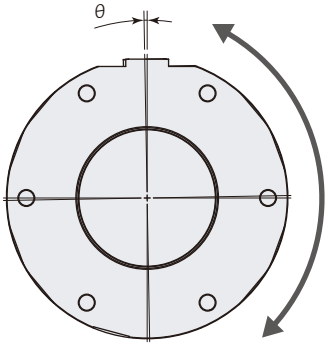
Allowable eccentricity（A）



Model		RHA / RHB						
		005	010	020	040	080	160	230
Allowable eccentricity A	mm	±0.8		±1	±1.5		±2	

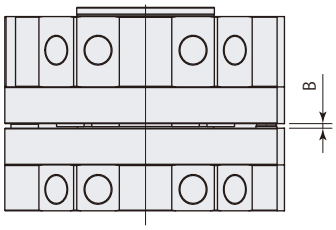
When the master plate approaches, the positioning pin is used for final alignment. The tool plate should not be completely fixed to the tool stand, but should have some margin.

Allowable turning angle



Model	RHA / RHB						
	005	010	020	040	080	160	230
Allowable turning angle θ	±3°	±2°					

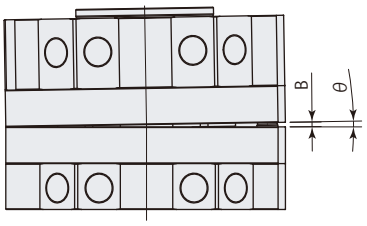
Allowable clearance（B）



Model		RHA / RHB						
		005	010	020	040	080	160	230
Lift stroke	mm	0.8			1			
Allowable gap B	mm	Lift stroke + 0.5						

If the clearance is less than the above, pull up the tool plate to lock it. It is not necessary to teach the robot so that both plates are in close contact with each other, but set it as close to the lift amount as possible. Special attention is required when the air pressure is provided at 0.4MPa or less, also when check valve model is selected.

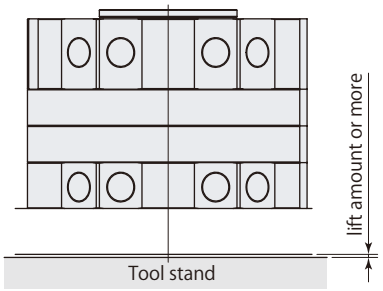
Allowable slant angle



Model		RHA / RHB						
		005	010	020	040	080	160	230
Allowable slant angle θ		1.5°		1°	0.9°	0.7°	0.5°	0.4°
Allowable gap B	mm	Lift stroke + 0.5						

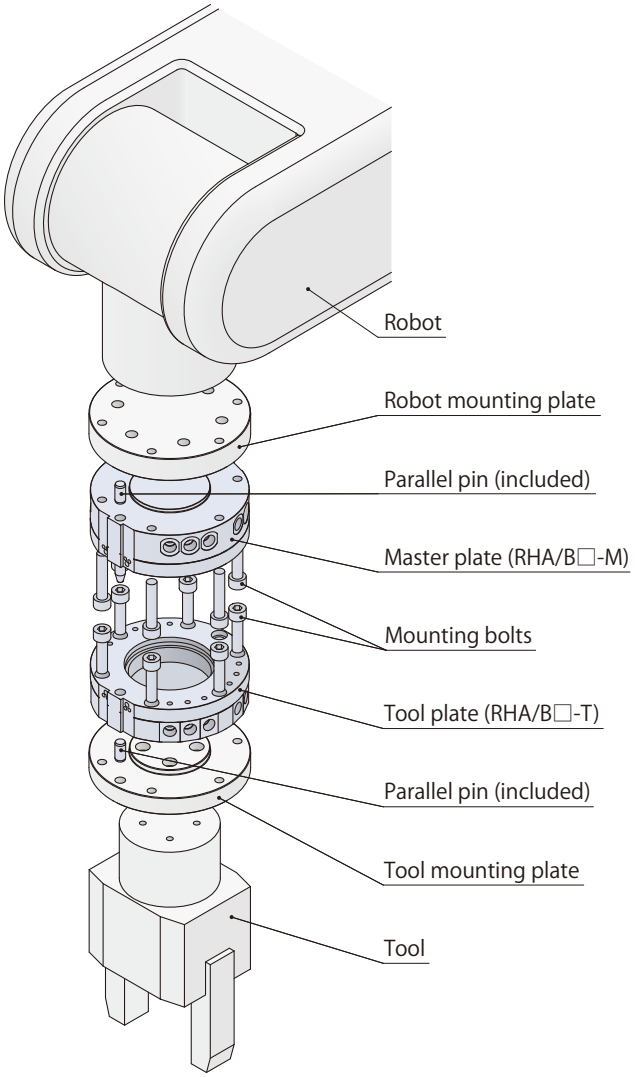
Teach the robot until the allowable tilt is less than the above and less than the allowable clearance (B).

During separation gap



Model		RHA / RHB						
		005	010	020	040	080	160	230
Lift stroke	mm	0.8			1			

Perform the separation operation with a clearance between the tool stand and the lift amount or more.



Use a parallel pin when mounting. The pins are shipped together with the product.

Model	RHA / RHB						
	005	**010**	**020**	**040**	**080**	**160**	**230**
Bolt size	M3	M4	M5	M5	M6	M10	M10
Number of bolts	4	4	4	6	6	6	6
Recommended tightening torque of mounting bolts N•m (ISO R898 class 12.9)	1.4	3.5	7	7	11.5	55	55

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