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KOGANEI

ACTUATORS GENERAL CATALOG

alpha series

AUTO HAND CHANGER UNITS

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More precision

alpha series

To the pneumatic actuator we have added advanced positioning precision and high rigidity.
Koganei Alpha Series further enhances the drive module concept, supporting superior applications in FA line design, energy-saving in manufacturing, and higher performance.

AUTO HAND CHANGER UNIT

- The shaft type has either four or six connection ports as an air interface. The flange type has eight air connection ports.
- A fail-safe mechanism prevents tools from falling due to loss of air pressure.

- A repeating positioning accuracy of ±0.025mm demonstrates highly accurate performance even during continuous operation.
- Electrical interface connects to either 10-contacts (probe) or 15-contacts (D-sub connector).
- The rated load mass is 10kg (AMJM□32).

Scale 1/1

The Alpha Series Auto Hand Changer Unit performs quick and accurate automatic replacement of robotic hand tool as needed. Demonstrates improving effectiveness in the production line and lowering costs for multi-products, small-lot production.

Two types respond to all kinds of robots.

The shaft type is for horizontal articulated (scalar) robots. The flange type is for vertical articulated robots. We have prepared two types according to the robot mounting type.

No need for adjustment or teaching at time of tool change!

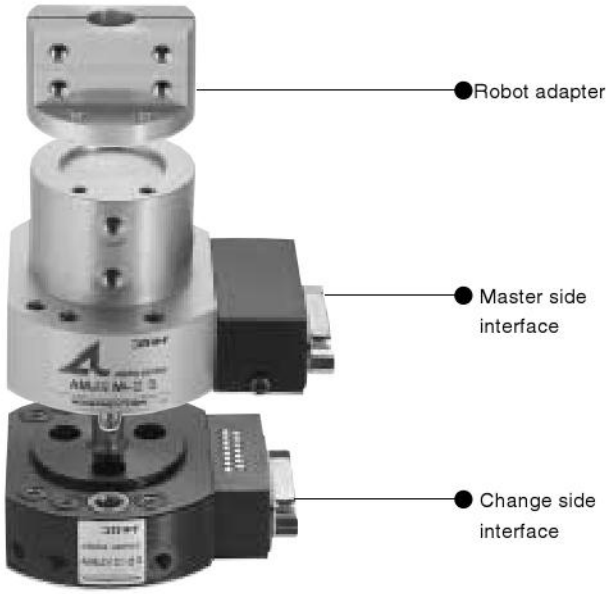
Automatically installs/removes the production line's robotic hand. Demonstrates effectiveness in reducing man-hours for tool changing, and in shortening the time required for set up changes.

A lightweight, compact design helps the robot keep its load mass.

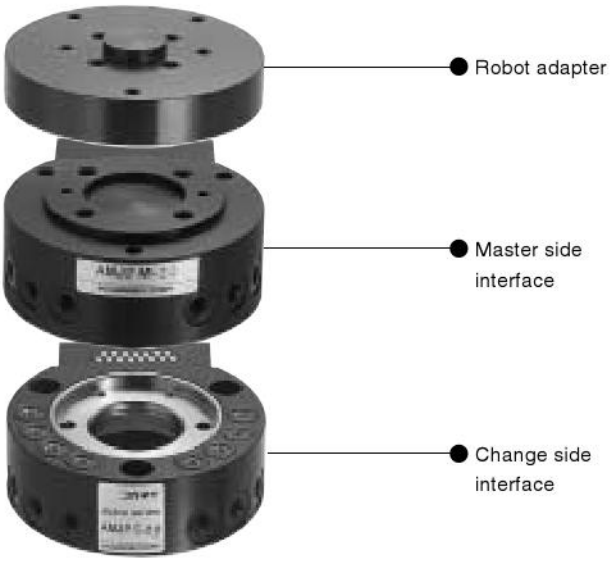
The unit, made as compact and lightweight as possible considering the robot's load mass, can be applied to the automatic changing of any production line's robotic hand tools.

Example of System Configuration

Shaft type ϕ20 and ϕ25



Flange type ϕ20 and ϕ32



SPECIFICATIONS

Specification List

■Specifications

Item \ Model			AMJS□20	AMJS□25	AMJF□20	AMJF□32
			Shaft type		Flange type	
Bore size		mm	20	25	20	32
Operating type			Double acting type (With locking device)			
Media			Air			
Operating pressure range		MPa {kgf/cm²}	0.4～0.7 {4.0～7.0}			
Proof pressure		MPa {kgf/cm²}	1.03 {10.5}			
Operating temperature range		°C	0～60			
Maximum load mass		kg	1	2	3	10
Repeating positioning accuracy		mm	±0.025			
Locating method			Pilot pin			
Linked axial force		N {kgf}	76 {7.7}	122 {12.4}	87 {8.8}	222 {22.7}
Moment resistance		N·cm {kgf·cm}	29.4 {3}	78.5 {8}	196.1 {20}	588.4 {60}
Torque resistance		N·cm {kgf·cm}	117.7 {12}	196.1 {20}	196.1 {20}	588.4 {60}
Interface	Air	Maximum operating pressure MPa {kgf/cm²}	0.7 {7.1}			
		Operating vacuum pressure kPa {mmHg}	−101.3～0 {−760～0}			
		Number of air connection ports and port size	4·M5	6·M5	8·M5	6·M5, 2·Rc1/8(8·Rc1/8)[Note]
	Electricity	Electrical contact capacity A/piece	2			
		Number of contacts, and contact type	15: D-sub connector, 10: Probe (With soldering after pressing)		15: D-sub connector	

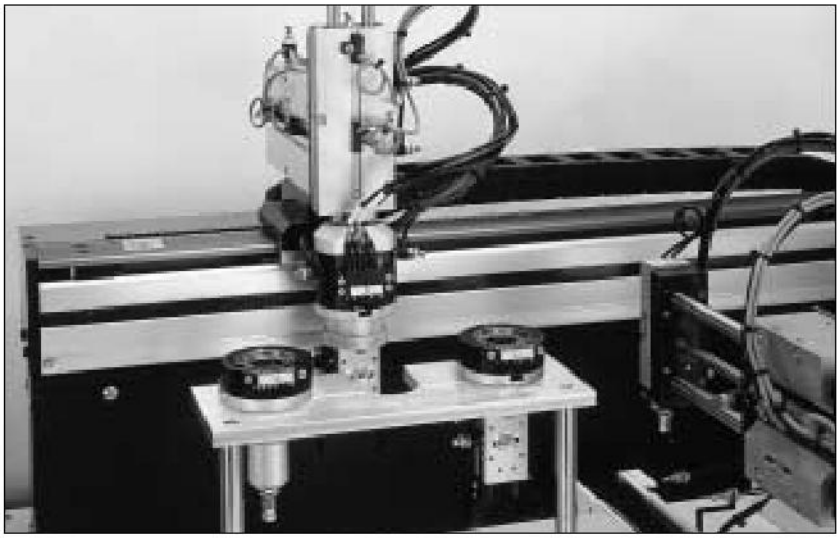
Note : For -01.

■Mass

g

Type	Bore size mm	Main body		Additional mass: Electrical contact point[Note1] D-sub connector		Additional mass: Electrical contact point[Note1] Probe		Additional mass: Robot adapter[Note2] Corresponding shaft diameter					
		For master interface	For change side interface	For master interface	For change side interface	For master interface	For change side interface	φ8	φ10	φ11	φ13	φ14	φ15
Shaft type	20	165	100	30	22	10	5	44	42	41	39	37	35
	25	310	170	30	22	10	5	60	59	58	57	55	54
Flange type	20	270	170	30	22	—		115					
	32	570	315	30	22	—		210					

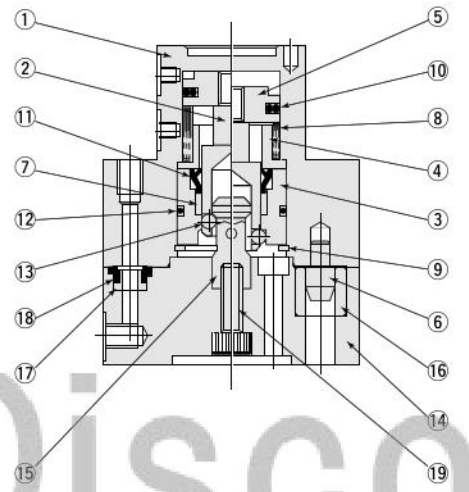
Notes 1: Includes two mounting screws.
2: Includes mounting bolt.



■Inner Construction

●Shaft type

AMJSM20＋AMJSC20



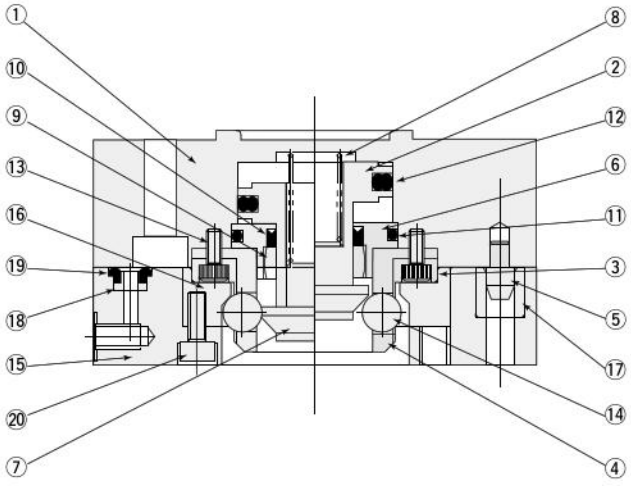
Remark : The side to the left of the body's center line shows a connected condition, while the side to the right represents a separated condition.

■Major Parts and Materials

No.	Parts	Materials	Remarks
①	Master plate	Aluminum alloy	Anodized
②	Piston rod	Carbon steel	Nitriding treated
③	Ball guide	Carbon steel	Nickel plated
④	Stopper	Carbon steel	Hard chrome plated
⑤	Piston	Stainless steel	
⑥	Pin	Carbon steel	Nitriding treated
⑦	Bushing	Copper alloy	
⑧	Spring	Piano wire	
⑨	Snap ring	Hard steel	
⑩	Piston seal	Synthetic rubber	
⑪	Rod seal	Synthetic rubber	
⑫	O-ring	Synthetic rubber	
⑬	Steel ball	Hard steel	
⑭	Tool plate	Aluminum alloy	Anodized
⑮	Center pin	Carbon steel	Nitriding treated
⑯	Bushing	Hard steel	
⑰	Seal holder	Beryllium copper	
⑱	Seal	Synthetic rubber	
⑲	Bolt	Hard steel	

●Flange type

AMJFM32＋AMJFC32



Remark : The side to the left of the body's center line shows a connected condition, while the side to the right represents a separated condition.

■Major Parts and Materials

No.	Parts	Materials	Remarks
①	Master plate	Aluminum alloy	Anodized
②	Piston rod	Stainless steel	
③	Ball guide	Stainless steel	
④	Ball holder	Stainless steel	
⑤	Pin	Carbon steel	Nitriding treated
⑥	Rod cover	Aluminum alloy	Anodized
⑦	Center pin	Carbon steel	Quenching
⑧	Spring	Piano wire	
⑨	Rod bushing	Copper alloy	
⑩	Piston seal	Synthetic rubber	
⑪	O-ring	Synthetic rubber	
⑫	Piston seal	Synthetic rubber	
⑬	Bolt	Hard steel	
⑭	Steel ball	Hard steel	
⑮	Tool plate	Aluminum alloy	Anodized
⑯	Housing	Carbon steel	Nickel plated
⑰	Bushing	Hard steel	
⑱	Seal holder	Beryllium copper	
⑲	Seal	Synthetic rubber	
⑳	Bolt	Hard steel	

■Order Code Example

●Shaft type

Master interface body + electrical interface + robot adapter

AMJSM | **20** | – | **CN** | – | **RSA10**

Robot adapter for shaft type
RSA8 : For ϕ 8
RSA10 : For ϕ 10
RSA11 : For ϕ 11
RSA13 : For ϕ 13
RSA14 : For ϕ 14
RSA15 : For ϕ 15
Blank : Without robot adapter

Electrical interface
CN : D-sub connector (15P)
CP : Probe (10P)
Blank : Without electrical interface

Bore size
20 : ϕ 20
25 : ϕ 25

Alpha series
auto hand changer unit shaft type
master side interface

Change side interface body + electrical interface

AMJSC | **20** | – | **CN**

Electrical interface
CN : D-sub connector (15P)
CP : Probe (10P)
Blank : Without electrical interface

Bore size
20 : ϕ 20
25 : ϕ 25

Alpha series
auto hand changer unit shaft type
change side interface

Additional Parts (Sold Separately)

●Electrical interface

For master interface

D-sub connector (15P)
CN-AMJSM

Probe type (10P)
CP-AMJSM

For change side interface

D-sub connector (15P)
CN-AMJSC

Probe type (10P)
CP-AMJSC

●Robot adapter

RSA – | **10** | – **AMJSM** | **20**

Robot adapter size
8 : For ϕ 8
10 : For ϕ 10
11 : For ϕ 11
13 : For ϕ 13
14 : For ϕ 14
15 : For ϕ 15

Bore size
20 : ϕ 20
25 : ϕ 25

●Flange type

Master side interface body + electrical interface + robot adapter

AMJFM **32** – **01** – **CN** – **RFA25**

Bore size
20 : ϕ20
32 : ϕ32

Air interface port size
01 : 8-Rc1/8 (For ϕ32 only)
Blank : 8-M5 (For ϕ20)
6-M5, 2-Rc1/8 (For ϕ32)

Electrical interface
CN : D-sub connector (15P)
Blank : Without electrical interface

Robot adapter for flange type
RFA25 : JIS standard size P.C.D. 25
RFA40 : JIS standard size P.C.D. 40
Blank : Without robot adapter

Alpha series
auto hand changer unit
flange type master side interface

Change side interface body + electrical interface

AMJFC **32** – **01** – **CN**

Bore size
20 : ϕ20
32 : ϕ32

Air interface port size
01 : 8-Rc1/8 (For ϕ32 only)
Blank : 8-M5 (For ϕ20)
6-M5, 2-Rc1/8 (For ϕ32)

Electrical interface
CN : D-sub connector (15P)
Blank : Without electrical interface

Alpha series
auto hand changer unit
flange type change side interface

Additional Parts (Sold Separately)

●Electrical interface

For master side interface
D-sub connector (15P)
CN-AMJSM

For change side interface
D-sub connector (15P)
CN-AMJSC

Remark : Same D-sub connector is used for flange type and shaft type.

●Robot adapter

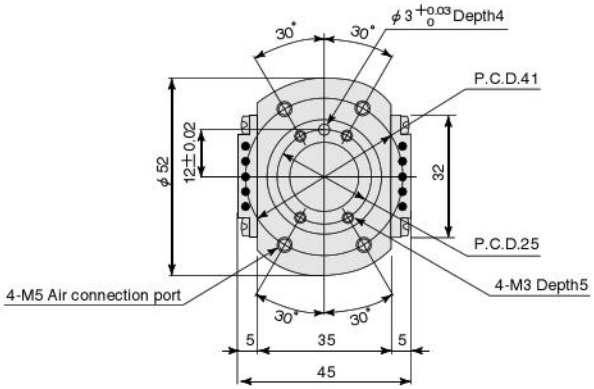
RFA – **25** – **AMJFM** **32**

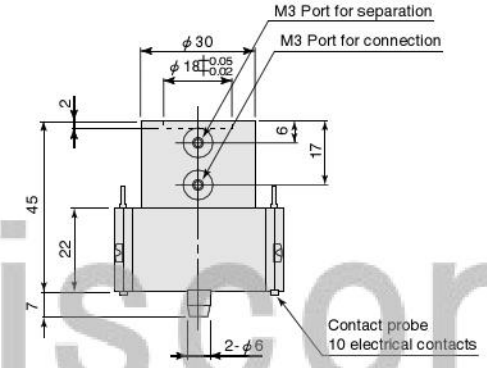
Robot adapter size
25 : JIS standard size P.C.D. 25
40 : JIS standard size P.C.D. 40

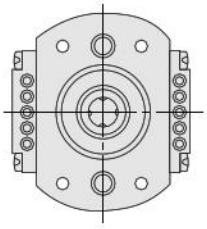
Bore size
20 : ϕ20
32 : ϕ32

Dimensions of Auto Hand Changer Unit Shaft Type ϕ 20 (Scale 1/2, unit mm)

●Master side interface body (AMJSM20-CP)

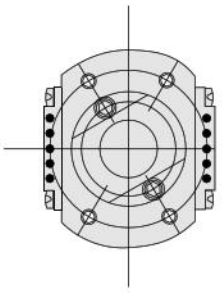


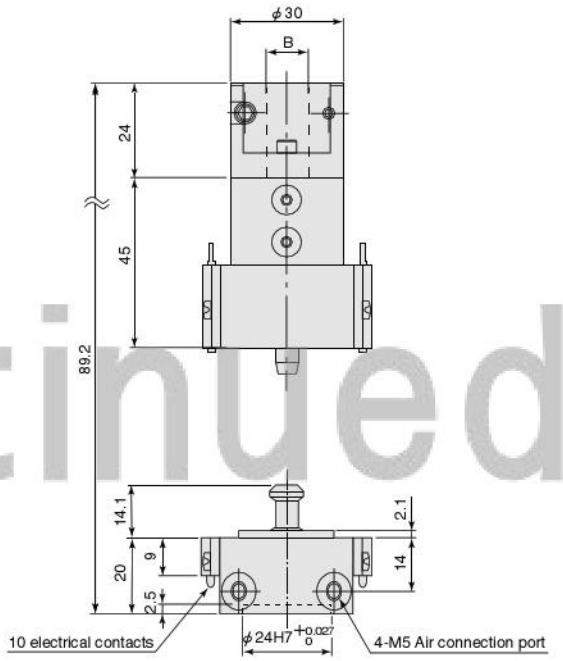


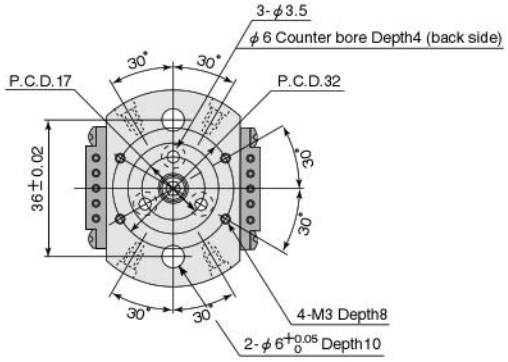


Auto hand changer unit, connection section

● Robot adapter (RSA□-AMJSM20)+ master side interface body (AMJSM20-CP)+ change side interface body (AMJSC20-CP)



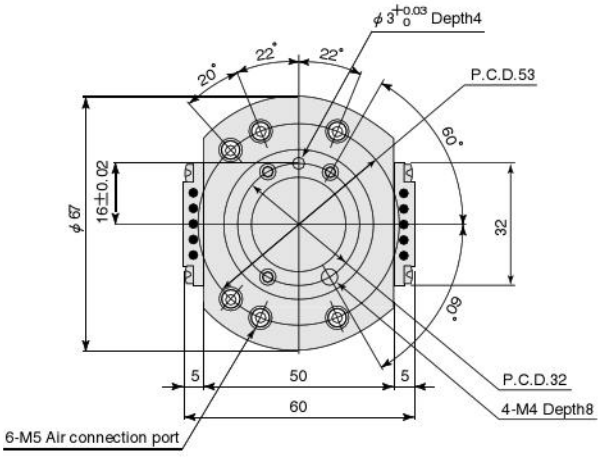


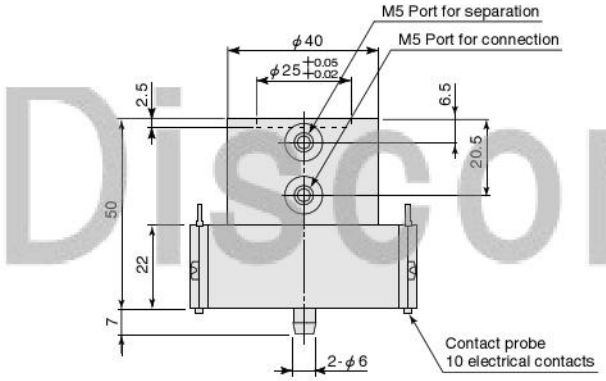


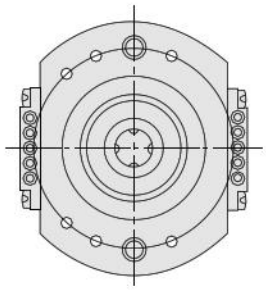
Robot adapter	B
RSA8-AMJSM20	ϕ 8H8 $^{+0.022}_{0}$
RSA10-AMJSM20	ϕ 10H8 $^{+0.022}_{0}$
RSA11-AMJSM20	ϕ 11H8 $^{+0.027}_{0}$
RSA13-AMJSM20	ϕ 13H8 $^{+0.027}_{0}$
RSA14-AMJSM20	ϕ 14H8 $^{+0.027}_{0}$
RSA15-AMJSM20	ϕ 15H8 $^{+0.027}_{0}$

Dimensions of Auto Hand Changer Unit Shaft Type ϕ25 (Scale 1/2, unit mm)

●Master side interface body (AMJSM25-CP)

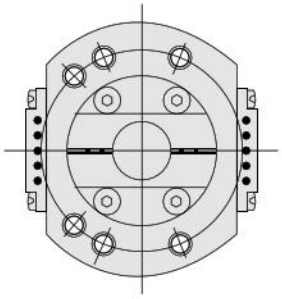


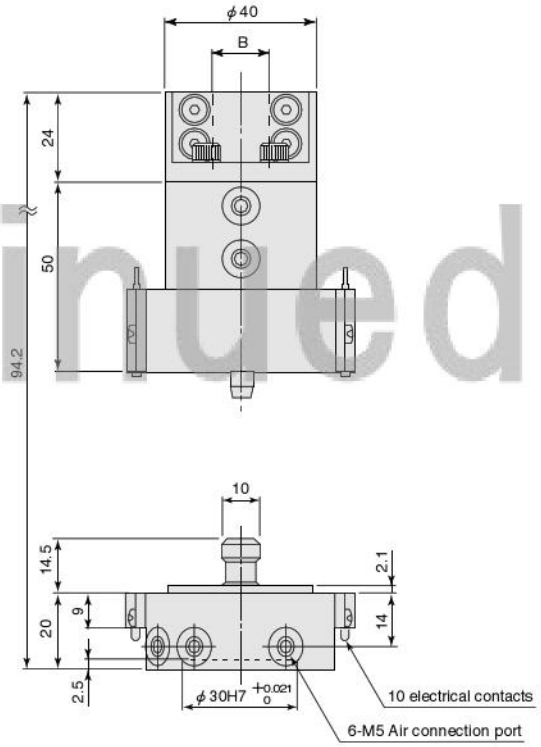


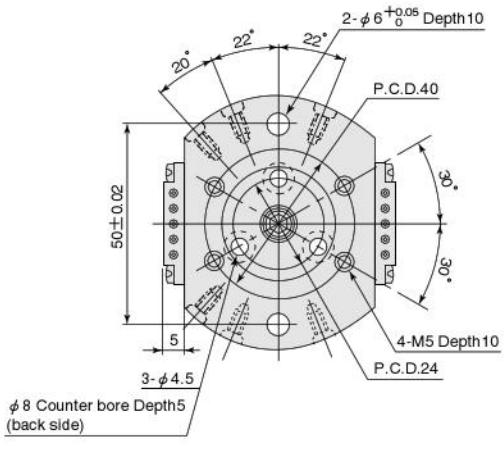


Auto hand changer unit, connection section

● Robot adapter (RSA□-AMJSM25)+ master side interface body (AMJSM25-CP)+ change side interface body (AMJSC25-CP)



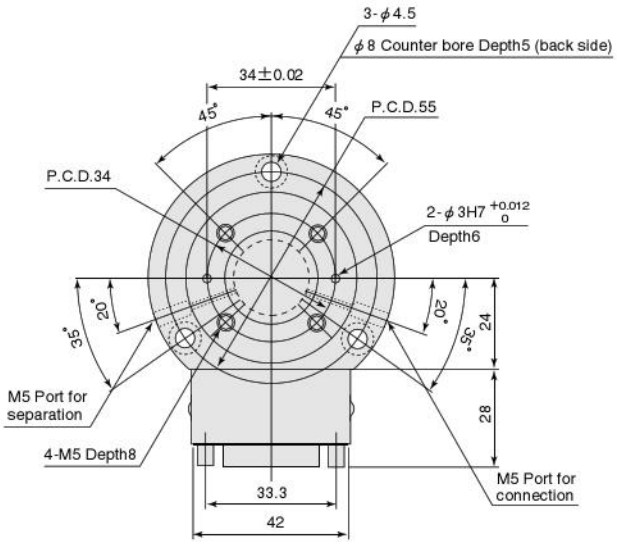


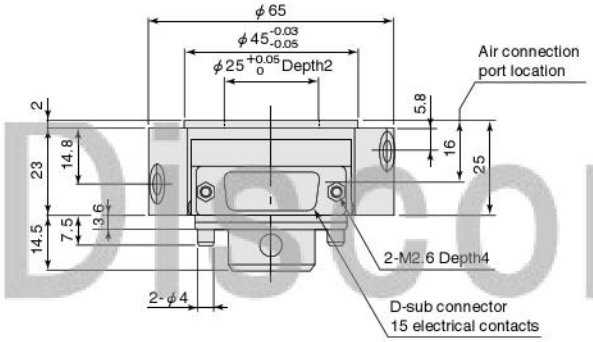


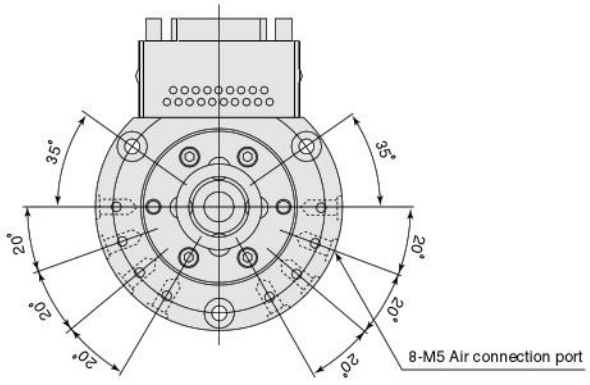
Robot adapter	B
RSA8-AMJSM25	ϕ 8H8 $^{+0.022}_{0}$
RSA10-AMJSM25	ϕ 10H8 $^{+0.022}_{0}$
RSA11-AMJSM25	ϕ 11H8 $^{+0.027}_{0}$
RSA13-AMJSM25	ϕ 13H8 $^{+0.027}_{0}$
RSA14-AMJSM25	ϕ 14H8 $^{+0.027}_{0}$
RSA15-AMJSM25	ϕ 15H8 $^{+0.027}_{0}$

Dimensions of Auto Hand Changer Unit Flange Type ϕ20 (Scale 1/2, unit mm)

●Master side interface body (AMJFM20-CN)

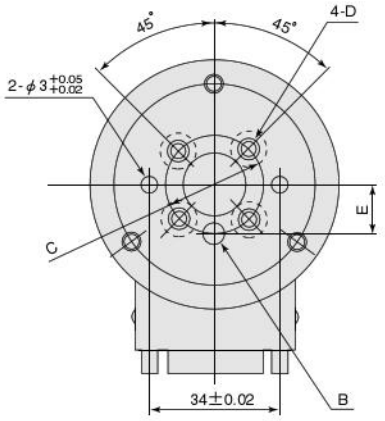


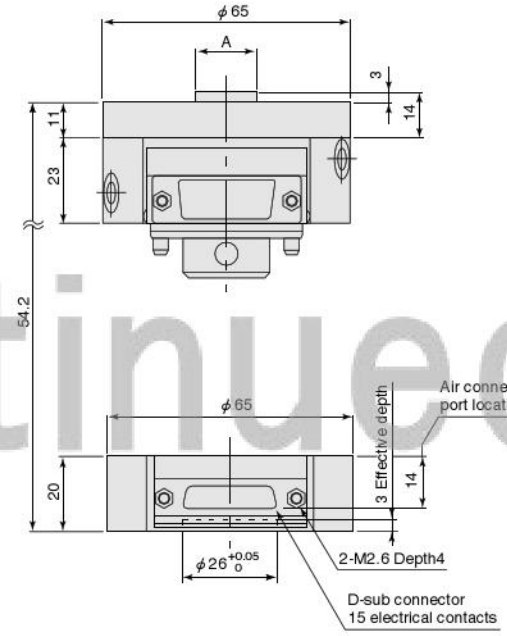


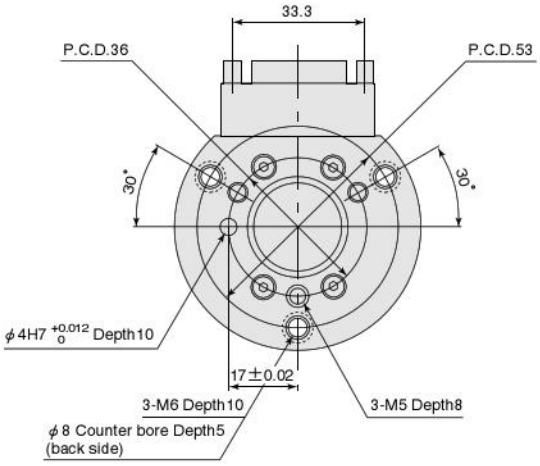


Auto hand changer unit, connection section

● Robot adapter (RFA□-AMJFM20)+ master side interface body (AMJFM20-CN)+ change side interface body (AMJFC20-CN)





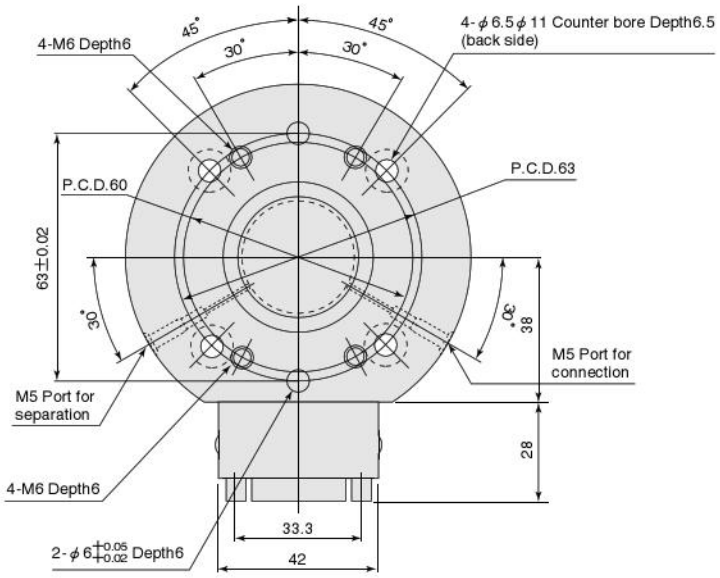


Robot adapter	A	B	C
RFA25-AMJFM20	$\phi 16^{-0.02}_{-0.05}$	$\phi 4^{+0.05}_{+0.02}$	ϕ25
RFA40-AMJFM20	$\phi 25^{-0.02}_{-0.05}$	$\phi 6^{+0.05}_{+0.02}$	ϕ40

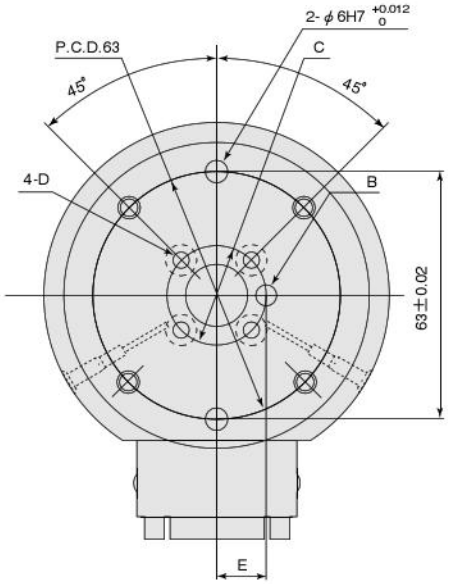
Robot adapter	D	E
RFA25-AMJFM20	ϕ4.5, ϕ8 Counter bore Depth7.5 (Back side)	12.5±0.02
RFA40-AMJFM20	ϕ6.5, ϕ11 Counter bore Depth9 (Back side)	20±0.02

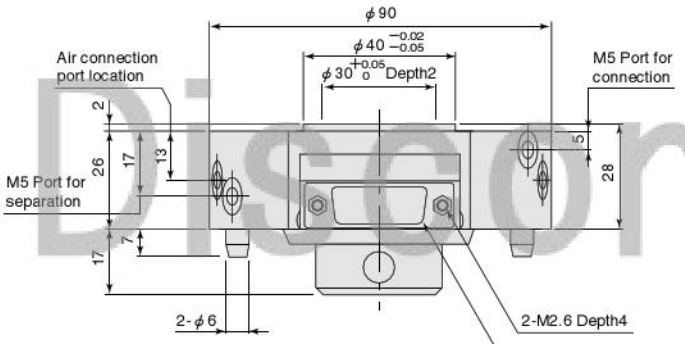
Dimensions of Auto Hand Changer Unit Flange Type ϕ 32 (Scale 1/2, unit mm)

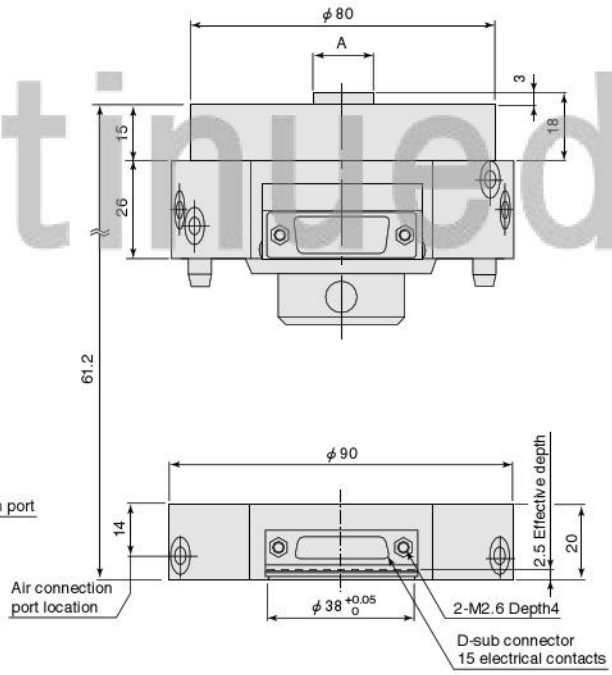
●Master side interface body (AMJFM32-CN)

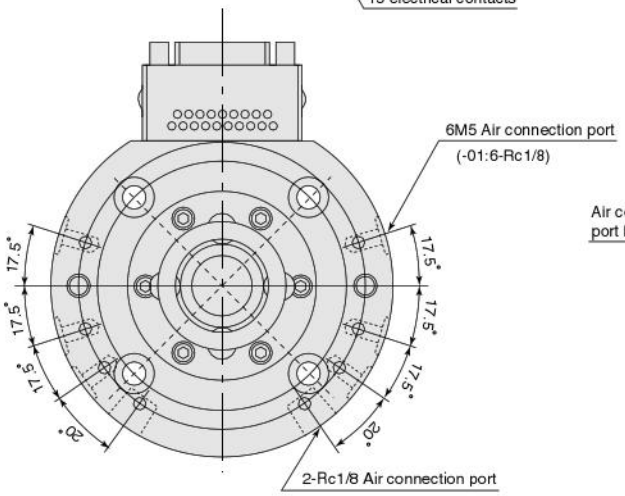


● Robot adapter (RFA□-AMJFM32)+ master side interface body (AMJFM32-CN)+ change side interface body (AMJSC32-CP)

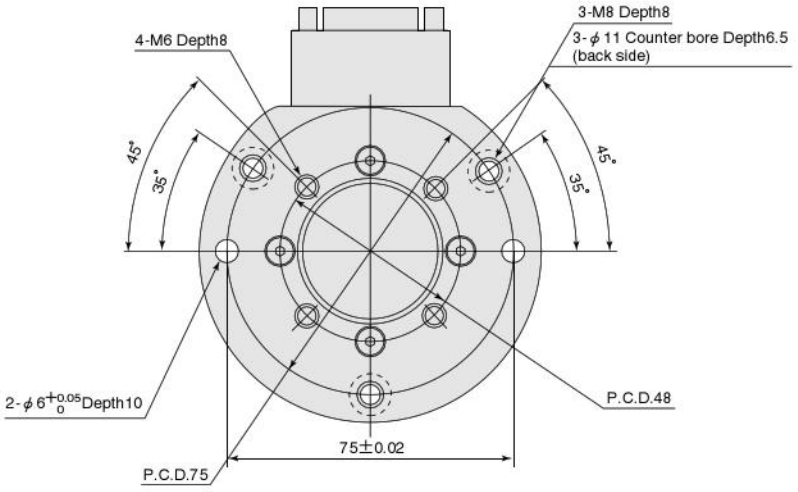








Auto hand changer unit, connection section



Robot adapter	A	B	C
RFA25-AMJFM32	ϕ 16 −0.02 −0.05	ϕ 4 +0.05 +0.02	ϕ 25
RFA40-AMJFM32	ϕ 25 −0.02 −0.05	ϕ 6 +0.05 +0.02	ϕ 40

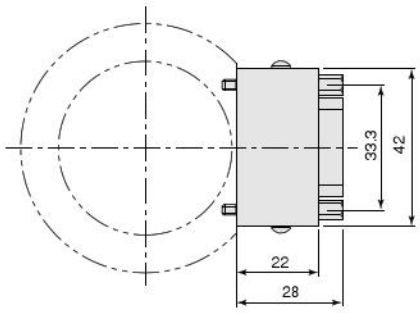
Robot adapter	D	E
RFA25-AMJFM32	ϕ 4.5, ϕ 8 Counter bore Depth7 (Back side)	12.5±0.02
RFA40-AMJFM32	ϕ 6.5, ϕ 11 Counter bore Depth9 (Back side)	20±0.02

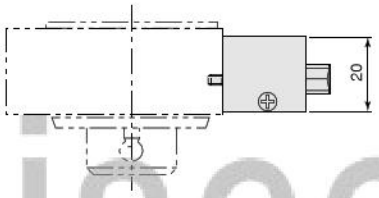
■Dimensions of Electrical Interface

● D-sub connector (for shaft type and flange type)

CN-AMJSM

For master side interface

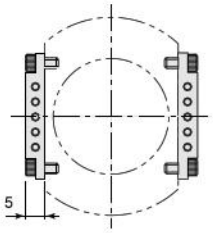


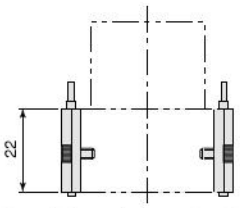


●Probe (for shaft type)

CP-AMJSM

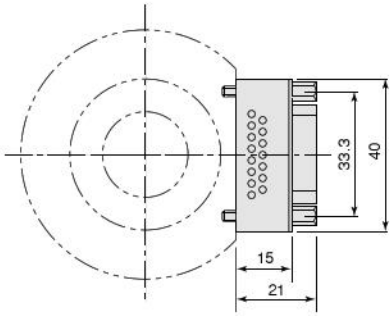
For master side interface

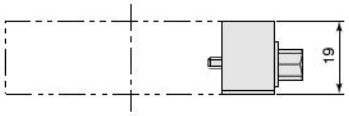




CN-AMJSC

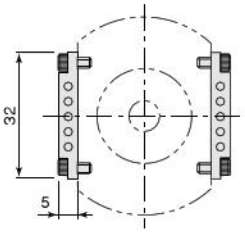
For change side interface

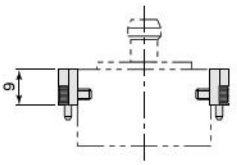




CP-AMJSC

For change side interface



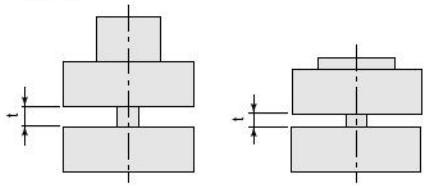


■Handling Instructions, and Precautions

Mounting

Connecting method

1. While supplying air to the port for separation, bring the master side part to a position over the change side part.
2. Bring the master side part close to the change side part, insert the pilot pin into a locating hole on the change side, and bring the master side part close enough that the t dimension is at or below the values shown below.



mm

Model	t
AMJSM20	1
AMJSM25	1
AMJFM20	1.3
AMJFM32	2

3. Supply air to the port for connection, and complete the connection.
4. For the connection, the degree of parallelism between the master side part and the change side part should be 5/100 or less.

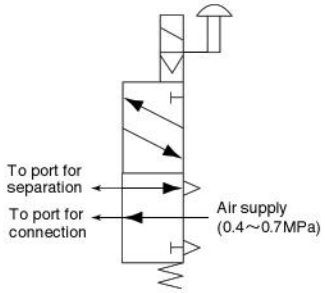
Separating method

1. With the auto hand changer unit at the separating position, supply air to the port for separation.
2. Lift up the master side part so that it is at or higher than the figures shown below, even at its lowest point, and then move it.

mm

Model	t
AMJSM20	22
AMJSM25	22
AMJFM20	16
AMJFM32	19

Cautions: 1. Although a spring is installed in the master side part to prevent the change side part from falling, for safety, supply air to the port for connection. If using a single solenoid 5-port solenoid valve, follow the piping shown below.



2. Do not supply air or electrical signals from the master side part to the change side part during separating or connecting operations.

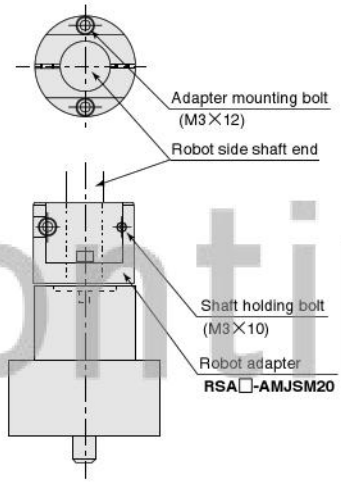
Air connection port

Use a 3-port valve or 3-position (all port block) valve for the air supply valve.
Do not supply air when units are separated.

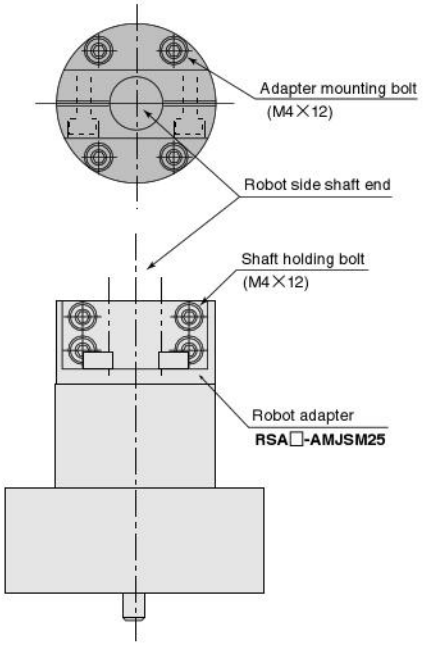
Mounting the robot adapter

●Shaft type

Attach the robot adapter to **AMJSM20**, and tighten two M3×12 hexagon socket head cap bolts evenly with a maximum tightening torque of 196N·cm {20kgf·cm}.
Mount the AMJ unit to the shaft of the assembly robot, and tighten two M3×10 hexagon socket head cap screws evenly with a maximum tightening torque of 196N·cm {20kgf·cm}.



Attach the robot adapter to **AMJSM25**, and tighten four M4×12 hexagon socket head cap screws evenly with a maximum tightening torque of 333.4N·cm {34kgf·cm}.
Mount the auto hand change unit to the shaft of the assembly robot, and tighten four M4×12 hexagon socket head cap screws evenly with a maximum tightening torque of 333.4 N·cm {34kgf·cm}.



●Flange type

Tighten the adapter mounting bolt with the maximum tightening torque shown below.

Model	Size	Number	Maximum tightening torque
RFA25-AMJFM20	M4×10	4	333.4N·cm {34kgf·cm}
RFA40-AMJFM20	M6× 8	4	480.2N·cm {49kgf·cm}
RFA25-AMJFM32	M4×12	4	333.4N·cm {34kgf·cm}
RFA40-AMJFM32	M6×12	4	480.2N·cm {49kgf·cm}

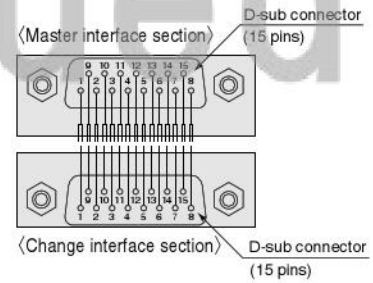
Electrical interface

●Probe type (-CP)

Connect to each probe contact pin with soldering.

●D-sub connector (-CN)

When connecting the master and change side section, connection should be completed so that the pin numbers of the 15 electrical contact pins corresponds to both the master and change side parts.
Use the following connectors or their equivalents for the D-sub connector.
Daiichi Denshi Kogyo Co., Ltd.,
Product No. **17JE-23150**
Hirose Co., Ltd., Product No. **HDAB-15P**



Caution: Do not send electrical signals from the master side to the change side during separating and connecting operations.

General precautions

Piping

Always thoroughly flush out (blow with compressed air) the piping before connecting it to the auto hand changer unit. Entering metal chips, sealing tape, rust, etc., generated during plumbing could cause air leakage or other malfunctions.

Atmosphere

Do not use in environments containing any of the following substances:
Organic solvents, phosphorus acid ester type hydraulic oil, sulfurous acid gas, chlorine gas, acids

Media

Use air for media. Consult us for the use of any other media.