Invention & Innovation
NITTA

B-ATC-02E
Automatic Tool Changer

NITTAOMEGA
AUTOMATIC TOOL CHANGER

General catalog

NITTA CORPORATION

⚠ **Safety precautions** To use the product safely, please read the instruction manual carefully before use.

*Acknowledgment: Kawasaki Heavy Industries, Ltd., Fanuc Corporation, Nachi-Fujikoshi Corporation, Yaskawa Electric Corporation

NITTA CORPORATION

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New proposals for automation through “coupling” technologies

In practical scenes of manufacturing, automation and mechanization have been increasingly promoted in pursuit of ever excellent productivity.
The NITTAOMEGA is a series of automatic tool changers (ATC) for industrial robots equipped with Nitta’s proprietary cam lock mechanism.
The series of products is designed to contribute to increased multi-functionality, versatility, and productivity of diverse manufacturing lines by properly connecting and disconnecting power, pneumatic, and hydraulic sources required for each tool to allow switching of multiple tools on a single robot.

Contents

There are still a plenty of potentialities.

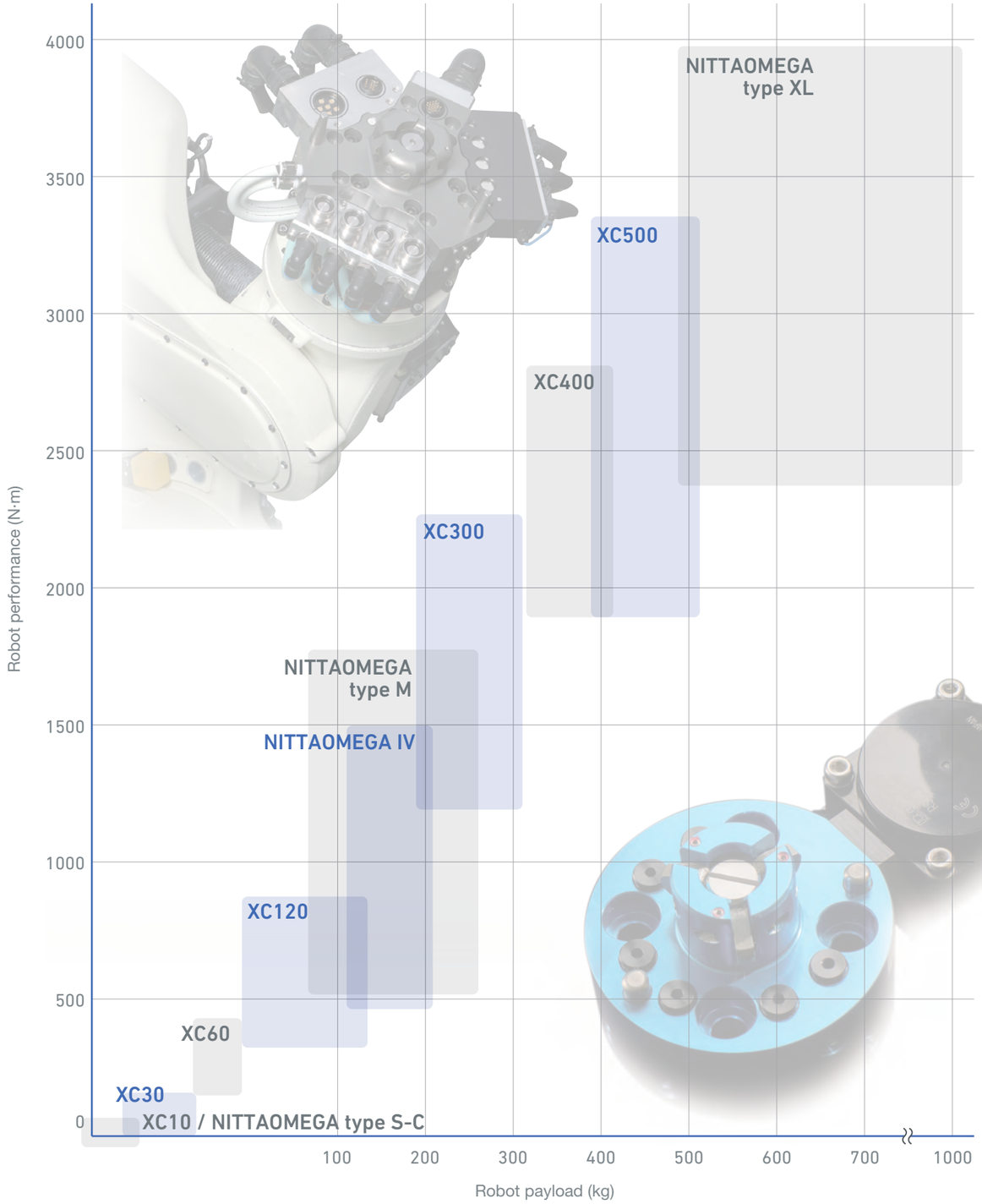
Industrial robots have been introduced to a variety of manufacturing lines. However, do we really get the best out of the robots?

The access key to the potentialities is “tight holding”

The NITTAOMEGA series of automatic tool changer equipped with the cam lock mechanism offers the new functionality of “tool exchange” by safe and robust coupling. Tight holding by cam lock draws the best out of industrial robots employed for diverse manufacturing lines.

NITTAOMEGA Lineup

NITTAOMEGA product lineup



Model code

Interpretation of model codes

◆Example adaptor part number: **B R 20 - 0 PS10**

Payload (kg)	Type name		Symbol
5-10	NITTAOMEGA	type S-C	SC
10		XC10	T
30		XC30	N
60		XC60	E
120		XC120	5
200		IV	B
50-250		type M	MO
300		XC300	4
400		XC400	2
500		XC500	
500-1000		type XL	

Robot side/Tool side	
Robot side	R
Tool side	T

Specification
No. of signal pins

Specification
No. of air ports

Specification
Configuration symbol

☞ Please refer to each model page for standard NITTAOMEGA part number.

◆Example module part number: **OM R W 06 - 670**

Applicable ATC type	Symbol
NITTAOMEGA IV, NITTAOMEGA XC300, NITTAOMEGA XC400, NITTAOMEGA XC500, NITTAOMEGA type XL	OM
NITTAOMEGA type M (Compatible with the above ATC with a conversion bracket.)	CT
NITTAOMEGA XC10	TM
NITTAOMEGA XC30	NM
NITTAOMEGA XC60	EM
NITTAOMEGA XC120	5M

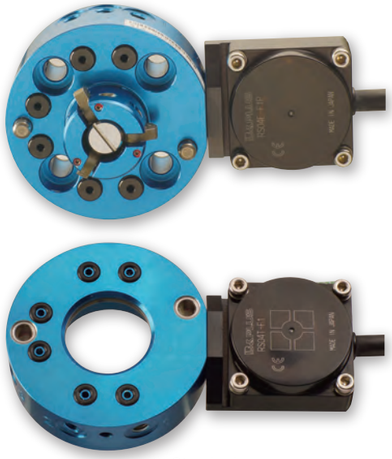
Robot side/Tool side	
Robot side	R
Tool side	T

Module type	Symbol	Specification
Spot welding module	W	No. of electrode contacts
Servo motor module	X	
Signal module	S	
Hydraulic (pneumatic) module	H	No. of fluid ports
Pneumatic module	P	
Dummy module	D	——

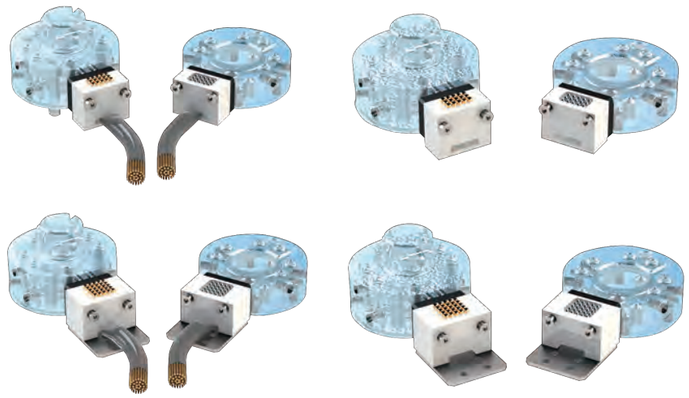
Specification
Configuration symbol

☞ For, more information on OM modules, CT modules, and other modules, please refer to P. 19, P. 21, and P. 22, respectively.

NITTAOMEGA type S-C



Standard



Option

Features

- Payload: 5-10 kg
- Small and lightweight
- Dust- and water-proofing (IP67)
- Maintenance-free
- Air port self-seal function

Applications

- Polishing and deburring
- Drilling (electrical drill)
- Handling of electric/small components during assembly
- Tightening (electrical driver)
- Sealing
- Other general industrial application

Specification

Payload		5-10 kg
Allowable moment		40.6 Nm
Allowable torque		34.3 Nm
O.D.		ø57 mm
Thickness when coupled		40.6 mm
Main body material		Aluminum alloy
Position repeatability		±0.010 mm
Operational driving pressure		0.39-0.85 MPa
Main body weight	Robot side	0.15 kg
	Tool side	0.09 kg
Electrical signals*	Robot side	No. of output signals: 4 + 1 points (in-zone)
	Tool side	Sensors: 3-line DC sensors (up to 4 points)
Air ports	No. of ports	M5: 6 ports (with check valve)
	Effective sectional area	2.26 mm²/port
	CV value	0.13/port
	Withstand pressure	0.855 MPa
Environment	Ambient temperature	0-60 °C (no freezing)
	Ambient humidity	95 % (no condensation)

* Standard remote sensor spec

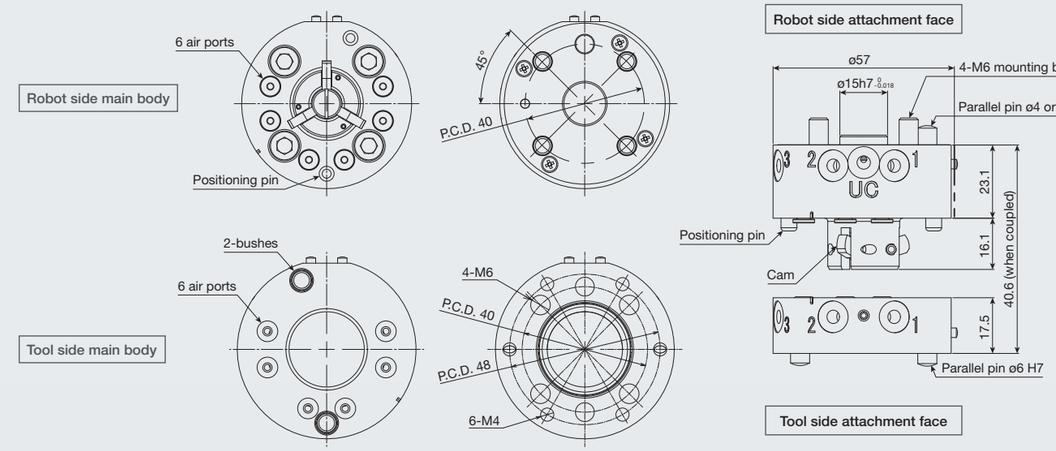
Part number

Name				Electrical signals	Part number
Standard	Remote sensor spec (contactless communication)	Robot side	NPN spec	No. of output signals: 4 + 1 points (in-zone)	SCR04-6JN00
			PNP spec		SCR04-6JN01
		Tool side	—	Sensors: 3-line DC sensors (up to 4 points)	SCT04-6JC00
Option	Signal pin spec 15 signals; solder terminal	Robot side	—	2.5 A: 15 signals	SCR15-6JN00
		Tool side	—		SCT15-6JC00
	Signal pin spec 15 signals; with cable (1 m)	Robot side	—	2.5 A: 15 signals	SCR15-6JN01
		Tool side	—		SCT15-6JC01
	Signal pin spec 25 signals; solder terminal	Robot side	—	2.5 A: 25 signals	SCR25-6JN00
		Tool side	—		SCT25-6JC00
	Signal pin spec 25 signals; with cable (1 m)	Robot side	—	2.5 A: 25 signals	SCR25-6JN01
		Tool side	—		SCT25-6JC01

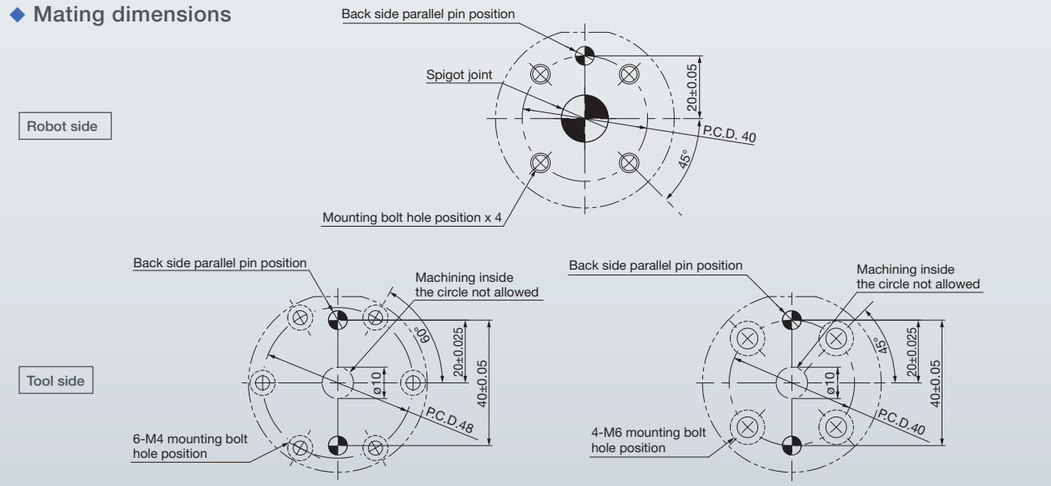
Robot flange conversion plate

Part number		Compatible robots
Robot side	SCPR10-A01	Kawasaki Heavy Industries, Ltd.: RC005L Denso Corporation: VS-068 Fanuc Corporation: CR-7iA, LRMate200iD Mitsubishi Electric Corporation: RV-7FR
Tool side	SCPT10-A01	
Robot side	SCPR10-A02	Kawasaki Heavy Industries, Ltd.: RS010L
Tool side	SCPT10-A02	
Robot side	FAX-00D-00	Nachi-Fujikoshi Corporation: MZ07
Tool side	SCPT16-A00	
Robot side	SCPR10-A04	Yaskawa Electric Corporation: MOTOMAN-GP7, MOTOMAN-GP8
Tool side	SCPT10-A04	

◆ External dimensions



◆ Mating dimensions



NITTAOMEGA XC10

Features

- Payload: 10 kg
- Lightweight/low price
- Fail-safe
- Large-bore cylinder and cam lock mechanism
- Forced separation mechanism

Applications

- Handling of electric/small components
- Removal of molded items
- Sealer gun replacement
- Replacement of inspection robot attachment

Specification

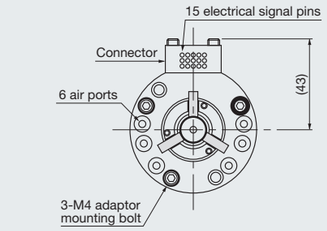
Payload		10 kg
Allowable moment		29.4 Nm
Allowable torque		34.3 Nm
O.D.		ø60 mm
Thickness when coupled		46.5 mm
Main body material		Aluminum alloy
Position repeatability		±0.010 mm
Operational driving pressure		0.39-0.59 MPa
Main body weight	Robot side	0.24 kg
	Tool side	0.12 kg
Electrical signals	Current	2.5 A
	No. of signals	None or 15 signals
Air ports	No. of ports	M5: 6 ports
	Effective sectional area	4 mm²
	CV value	0.23/port
	Withstand pressure	0.855 MPa
Environment	Ambient temperature	0-60 °C (no freezing)
	Ambient humidity	0-95 %RH (no condensation)

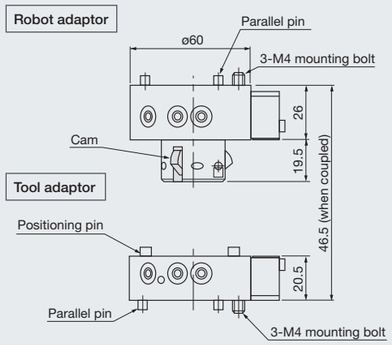
☞ For, more information on modules, please refer to P. 22.

Standard part number: NITTAOMEGA XC10 robot-tool adaptor

◆ Robot adaptor **TR15-6JN10** ◆ Tool adaptor **TT15-6JN00**

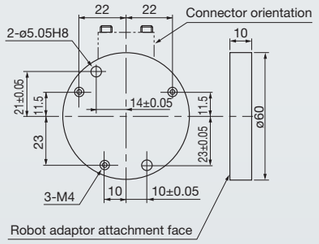
◆ External dimensions



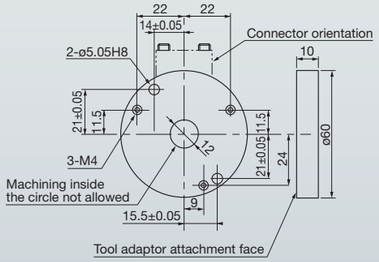


◆ Mating dimensions
(reference mounting plate drawing)

Robot adaptor plate



Tool adaptor plate



NITTAOMEGA XC30

Features

- Payload: 30 kg
- Large-bore cylinder and cam lock mechanism
- Built-in Chuck/Unchuck/Face sensors
- Abundance of variations

Applications

- Tool exchange upon removal of press/molded items
- Material handling exchange upon arc/spot welding
- Tool exchange in deburring/polishing/assembly
- Material handling exchange

Specification

Payload		30 kg	
Allowable moment		147 Nm	
Allowable torque		147 Nm	
O.D.		ø100 mm	
Thickness when coupled		60 mm	
Main body material		Aluminum alloy	
Position repeatability		±0.0125 mm	
Operational driving pressure		0.39-0.59 MPa	
Main body weight	Robot side	1.0 kg	
	Tool side	0.5 kg	
Electrical signals	Current	3 A	
	No. of signals	None or 15 signals	
Air ports	No. of ports	Rc1/8: 4 ports	M5: 4 ports
	Effective sectional area	11 mm²	4 mm²
	CV value	0.63/port	0.23/port
	Withstand pressure	0.855 MPa	
Output signals		Chuck signal	
		Unchuck signal	
		Face signal	
Environment	Ambient temperature	0-60 °C (no freezing)	
	Ambient humidity	0-95 %RH (no condensation)	
Connector part number	Robot side	2DE19P	
	Tool side	2DE19S	

☞ For, more information on modules, please refer to P. 22.

⚠ Note: To prevent malfunction of the lead switch, avoid using an adaptor plate made of any magnetic material (e.g. iron).

Standard part number: NITTAOMEGA XC30 robot-tool adaptor

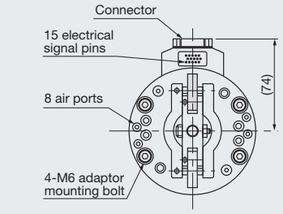
NPN spec (0 V common) ◆ Robot adaptor **NR15-8JP01** ◆ Tool adaptor **NT15-8JC01**

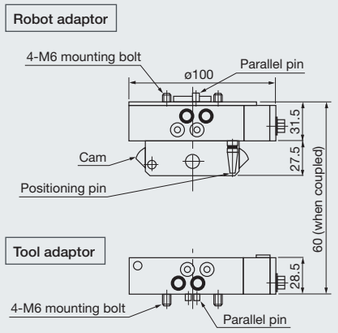
PNP spec (24 V common) ◆ Robot adaptor **NR15-8JP08** ◆ Tool adaptor **NT15-8JC01**

Cable ◆ Robot side cable **W20-60S000** ◆ Tool side cable **W15-06P000**

* We recommend Nitta genuine cables compatible with the special connectors.

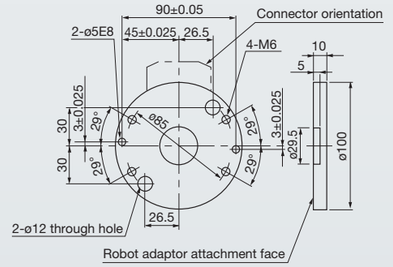
◆ External dimensions



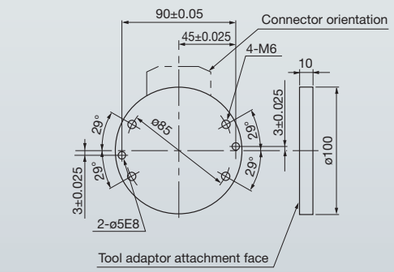


◆ Mating dimensions
(reference mounting plate drawing)

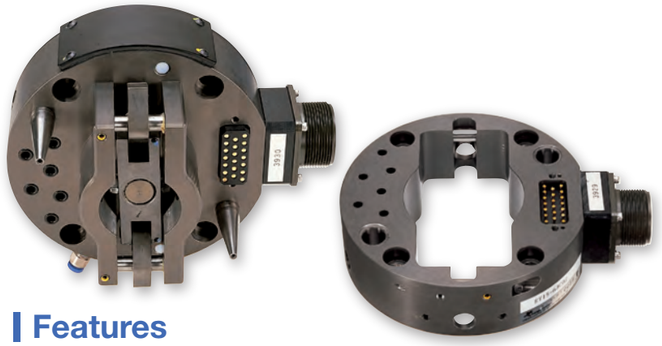
Robot adaptor plate



Tool adaptor plate



NITTAOMEGA XC60



Features

- Payload: 60 kg
- Large-bore cylinder and cam lock mechanism
- Built-in Chuck/Unchuck/Face sensors
- Abundance of variations

Applications

- Tool exchange in removal of press/molded items and deburring/ polishing/assembly
- Material handling exchange upon arc/spot welding
- Arc torch/paint/sealing gun exchange
- Material handling exchange (outdoor spec)

Specification

Payload		60 kg
Allowable moment		441 Nm
Allowable torque		441 Nm
O.D.		ø135 mm
Thickness when coupled		80 mm
Main body material		Aluminum alloy
Position repeatability		±0.0125 mm
Operational driving pressure		0.39-0.59 MPa
Main body weight	Robot side	1.9 kg
	Tool side	1.0 kg
Electrical signals	Current	3 A
	No. of signals	None or 15 signals
Air ports	No. of ports	Rc1/8: 6 ports
	Effective sectional area	11 mm²
	CV value	0.63/port
	Withstand pressure	0.855 MPa
Output signals		Chuck signal
		Unchuck signal
		Face signal
Environment	Ambient temperature	0-60 °C (no freezing)
	Ambient humidity	0-95 %RH (no condensation)
Connector part number	Robot side	MS3102A22-14P
	Tool side	MS3102A20-29S

☞ For, more information on modules, please refer to P. 22.

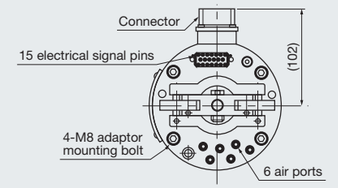
⚠ Note: To prevent malfunction of the lead switch, avoid using an adaptor plate made of any magnetic material (e.g. iron).

Standard part number: NITTAOMEGA XC60 robot-tool adaptor

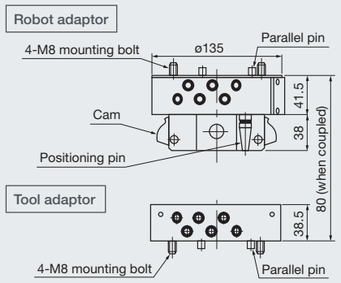
NPN spec (0 V common) ◆ Robot adaptor ER15-6JP02 ◆ Tool adaptor ET15-6JC02

PNP spec (24 V common) ◆ Robot adaptor ER15-6JP18 ◆ Tool adaptor ET15-6JC02

◆ External dimensions

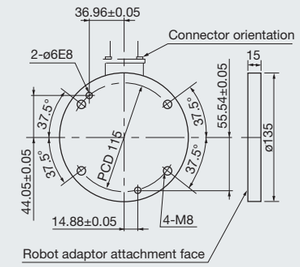


Robot adaptor

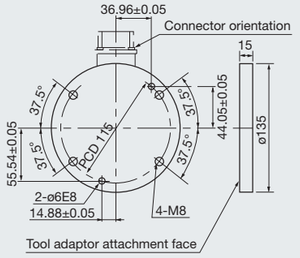


◆ Mating dimensions
(reference mounting plate drawing)

Robot adaptor plate



Tool adaptor plate



NITTAOMEGA XC120

Features

- Payload: 120 kg
- Large-bore cylinder and cam lock mechanism
- Built-in Chuck/Unchuck/Face sensors

Applications

- Tool exchange in removal of press/molded items and deburring/ polishing/assembly
- Arc torch/paint/sealing gun exchange
- Exchange of tools for various other applications

Specification

Payload		120 kg	
Allowable moment		1079 Nm	
Allowable torque		1079 Nm	
O.D.		ø180 mm	
Thickness when coupled		107 mm	
Main body material		Aluminum alloy	
Position repeatability		±0.025 mm	
Operational driving pressure		0.39-0.85 MPa	
Main body weight	Robot side	4.6 kg	
	Tool side	2.7 kg	
Electrical signals	Current	3 A	
	No. of signals	None or 20 signals	
Air ports	No. of ports	Rc1/2: 4 ports	Rc1/4: 4 ports
	Effective sectional area	64 mm²	13 mm²
	CV value	3.6/port	0.72/port
	Withstand pressure	0.855 MPa	
Output signals		Chuck signal	
		Unchuck signal	
		Face signal	
Environment	Ambient temperature	0-60 °C (no freezing)	
	Ambient humidity	0-95 %RH (no condensation)	
Connector part number	Robot side	MS3102A24-28P	
	Tool side	MS3102A24-28S	

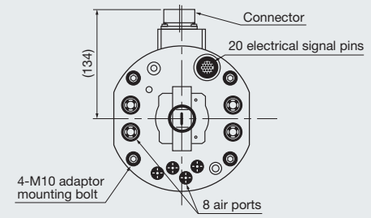
☞ For, more information on modules, please refer to P. 22.

Standard part number: NITTAOMEGA XC120 robot-tool adaptor

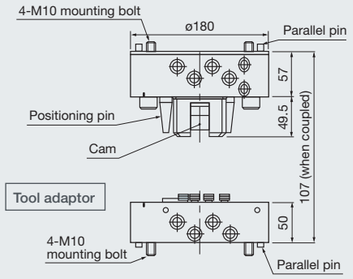
NPN spec (0 V common) ◆ Robot adaptor 5R20-8PP00 ◆ Tool adaptor 5T20-8PC00

PNP spec (24 V common) ◆ Robot adaptor 5R20-8PP03 ◆ Tool adaptor 5T20-8PC00

◆ External dimensions

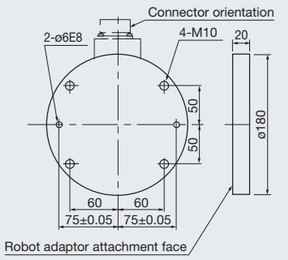


Robot adaptor

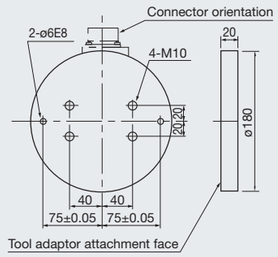


◆ Mating dimensions
(reference mounting plate drawing)

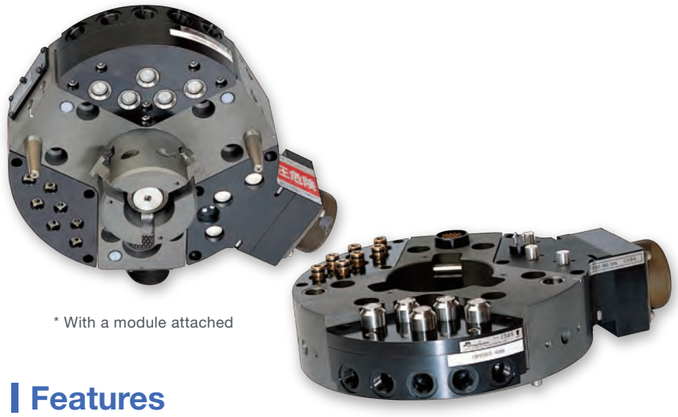
Robot adaptor plate



Tool adaptor plate



NITTAOMEGA IV



* With a module attached

Features

- Employment of 3-module configuration
- Employment of rigid body
- Secure coupling and separation by the cam lock mechanism
- Direct attachment of solenoid valve for chucking/unchucking
- LED and Chuck/Unchuck/Face sensors as standard equipment

Applications

- Spot welding gun exchange
- Exchange to spot gun material handling
- Assembly material handling exchange
- Extraction hand exchange for press/molded items
- Attachment exchange

Specification

Payload		200 kg
Allowable moment		1471 Nm
Allowable torque		1471 Nm
O.D.		ø228 mm
Thickness when coupled		120 mm
Main body material		Aluminum alloy
Position repeatability		±0.025 mm
Operational driving pressure		0.39-0.85 MPa
Main body weight	Robot side	4.2 kg
	Tool side	2.8 kg
Electrical signals	Current	3 A
	No. of signals	None or 20 signals
Output signals		Chuck signal
		Unchuck signal
		Face signal
Environment	Ambient temperature	0-60 °C (no freezing)
	Ambient humidity	0-95 %RH (no condensation)
Connector part number	Robot side	MS3102A24-28P
	Tool side	MS3102A24-28S

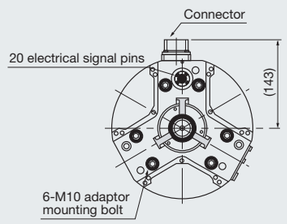
☞ For, more information on modules, please refer to P. 19-20.

Standard part number: NITTAOMEGA IV robot-tool adaptor

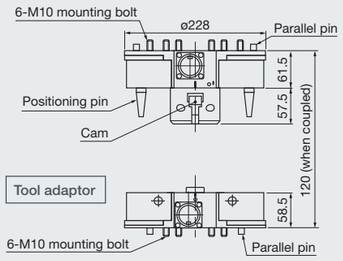
NPN spec (0 V common) ◆ Robot adaptor BR20-0PS10 ◆ Tool adaptor BT20-0PC00

PNP spec (24 V common) ◆ Robot adaptor BR20-0PS1G ◆ Tool adaptor BT20-0PC00

◆ External dimensions

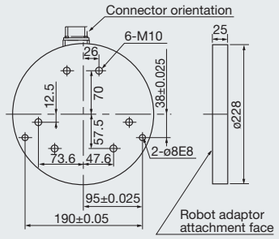


Robot adaptor

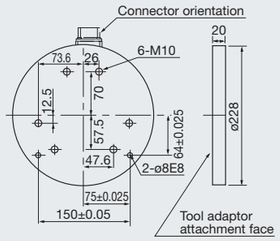


◆ Mating dimensions
(reference mounting plate drawing)

Robot adaptor plate



Tool adaptor plate



NITTAOMEGA XC300

Features

- 3-module configuration with the NITTAOMEGA IV module for common applications
- Employment of rigid body
- Secure chucking/unchucking by the cam lock mechanism
- LED and Chuck/Unchuck/Face sensors as standard equipment
- Direct attachment of solenoid valve for chucking/unchucking

Applications

- Spot welding gun exchange
- Material handling exchange
- Tool exchange upon removal of assembly/press/molded items

Specification

Payload		300 kg
Allowable moment		2205 Nm
Allowable torque		2205 Nm
O.D.		ø248 mm
Thickness when coupled		120 mm
Main body material		Aluminum alloy
Position repeatability		±0.025 mm
Operational driving pressure		0.39-0.85 MPa
Main body weight	Robot side	7 kg
	Tool side	3.5 kg
Electrical signals	Current	3 A
	No. of signals	None or 20 signals
Output signals		Chuck signal
		Unchuck signal
		Face signal
Environment	Ambient temperature	0-60 °C (no freezing)
	Ambient humidity	0-95 %RH (no condensation)
Connector part number	Robot side	MS3102A24-28P
	Tool side	MS3102A24-28S

☞ For, more information on modules, please refer to P. 19-20.

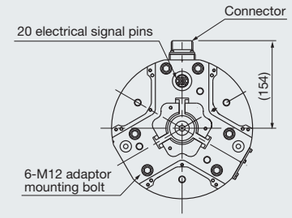
⚠ Note: Do not make a hole in the center of robot adaptor plate for weight reduction.

Standard part number: NITTAOMEGA XC300 robot-tool adaptor

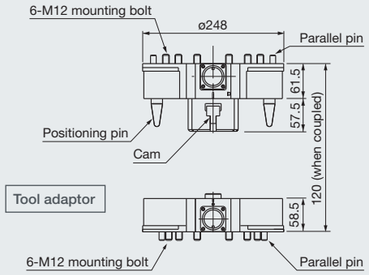
NPN spec (0 V common) ◆ Robot adaptor 4R20-0PS00 ◆ Tool adaptor 4T20-0PC00

PNP spec (24 V common) ◆ Robot adaptor 4R20-0PS01 ◆ Tool adaptor 4T20-0PC00

◆ External dimensions

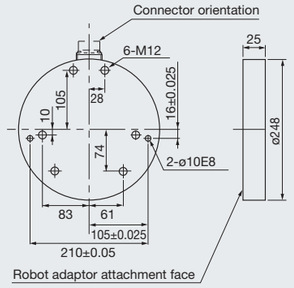


Robot adaptor

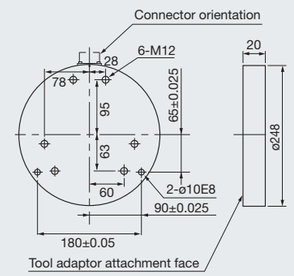


◆ Mating dimensions
(reference mounting plate drawing)

Robot adaptor plate



Tool adaptor plate



NITTAOMEGA XC400

Features

- Employment of large bore cylinder and rigid body
- Secure chucking/unchucking by the cam lock mechanism
- Chuck/Unchuck/Face sensors and fail-safe mechanism to ensure safety
- Highly reliable and affordable components
- Modules can be shared with NITTAOMEGA IV

Applications

- Large material handling exchange
- Large welding gun exchange
- Exchange of other high-load tools

Specification

Payload		400 kg
Allowable moment		2942 Nm
Allowable torque		2942 Nm
O.D.		ø270 mm
Thickness when coupled		150 mm
Main body material		Aluminum alloy
Position repeatability		±0.025 mm
Operational driving pressure		0.39-0.85 MPa
Main body weight	Robot side	12.0 kg
	Tool side	8.0 kg
Electrical signals	Current	3 A
	No. of signals	None or 20 signals
Output signals		Chuck signal
		Unchuck signal
		Face signal
Environment	Ambient temperature	0-60 °C (no freezing)
	Ambient humidity	0-95 %RH (no condensation)
Connector part number	Robot side	MS3102A24-28P
	Tool side	MS3102A24-28S

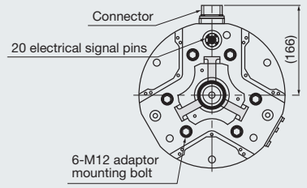
☞ For, more information on modules, please refer to P. 19-20.

Standard part number: NITTAOMEGA XC400 robot-tool adaptor

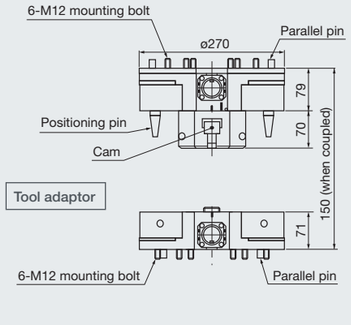
NPN spec (0 V common) ◆ Robot adaptor 2R20-0PS00 ◆ Tool adaptor 2T20-0PC00

PNP spec (24 V common) ◆ Robot adaptor 2R20-0PS04 ◆ Tool adaptor 2T20-0PC00

◆ External dimensions

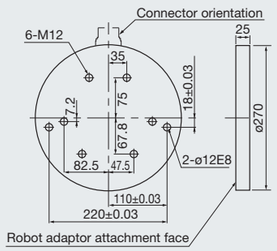


Robot adaptor

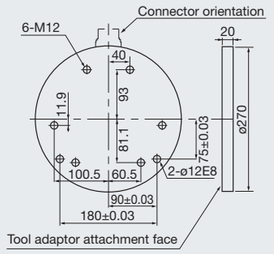


◆ Mating dimensions
(reference mounting plate drawing)

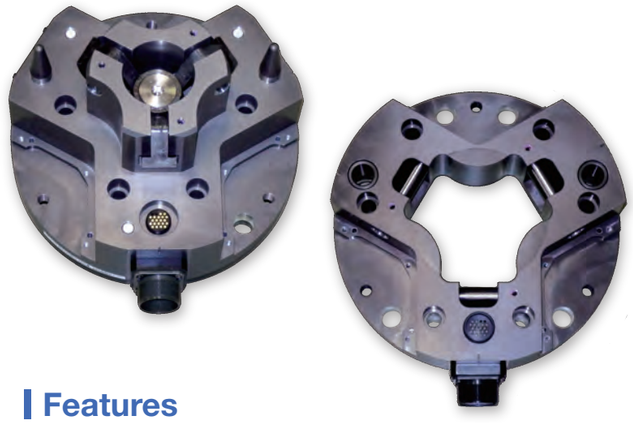
Robot adaptor plate



Tool adaptor plate



NITTAOMEGA XC500



Features

- Employment of large bore cylinder and rigid body
- Secure chucking/unchucking by the cam lock mechanism
- Chuck/Unchuck/Face sensors and fail-safe mechanism to ensure safety
- Highly reliable and affordable components
- Modules can be shared with NITTAOMEGA IV

Applications

- Large material handling exchange
- Large welding gun exchange
- Exchange of other high-load tools

Specification

Payload		500 kg
Allowable moment		3500 Nm
Allowable torque		3500 Nm
O.D.		ø270 mm
Thickness when coupled		150 mm
Main body material		Aluminum alloy
Position repeatability		±0.025 mm
Operational driving pressure		0.39-0.85 MPa
Main body weight	Robot side	12.0 kg
	Tool side	8.0 kg
Electrical signals	Current	3 A
	No. of signals	None or 20 signals
Output signals		Chuck signal
		Unchuck signal
		Face signal
Environment	Ambient temperature	0-60 °C (no freezing)
	Ambient humidity	0-95 %RH (no condensation)
Connector part number	Robot side	MS3102A24-28P
	Tool side	MS3102A24-28S

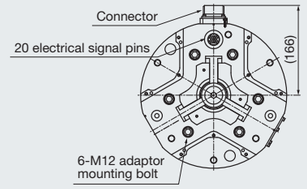
☞ For, more information on modules, please refer to P. 19-20.

Standard part number: NITTAOMEGA XC500 robot-tool adaptor

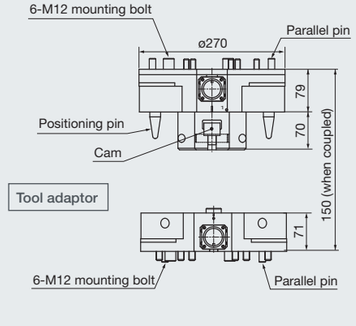
NPN spec (0 V common) ◆ Robot adaptor 2R20-0PSA0 ◆ Tool adaptor 2T20-0PCA1S

PNP spec (24 V common) ◆ Robot adaptor 2R20-0PSA1 ◆ Tool adaptor 2T20-0PCA1S

◆ External dimensions

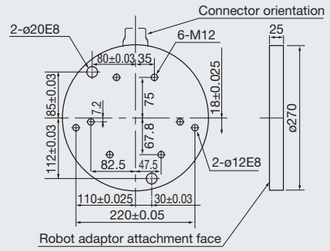


Robot adaptor

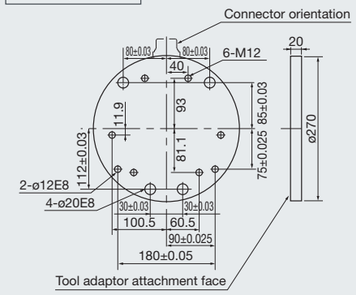


◆ Mating dimensions
(reference mounting plate drawing)

Robot adaptor plate



Tool adaptor plate



NITTAOMEGA type XL

Features

- Payload: 500-1000 kg
- Weight: 25.6 kg, Functional modules: Can be equipped with 3 modules
- Inherited safety and durability
- Inherited versatility

Applications

- Large material handling exchange
- Exchange of other high-load tools

Specification

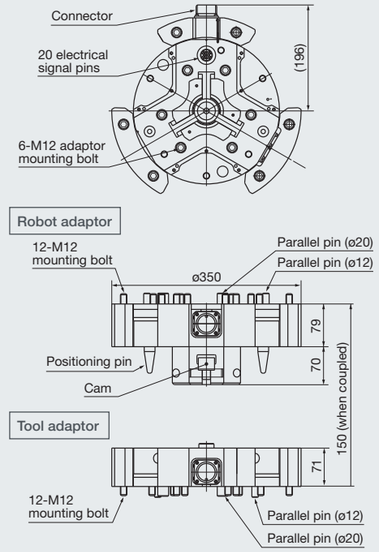
Payload		500-1000 kg*
Allowable moment		5500 Nm
Allowable torque		3500 Nm
O.D.		ø350 mm
Thickness when coupled		150 mm
Main body material		Aluminum alloy
Position repeatability		±0.025 mm
Operational driving pressure		0.39-0.85 Mpa
Main body weight	Robot side	15.4 kg
	Tool side	10.2 kg
Electrical signals	Current	3 A
	No. of signals	None or 20 signals
Output signals		Chuck signal
		Unchuck signal
		Face signal
Environment	Ambient temperature	0-60 ºC (no freezing)
	Ambient humidity	0-95 %RH (no condensation)
Connector part number	Robot side	MS3102A24-28P
	Tool side	MS3102A24-28S

☞ For, more information on modules, please refer to P. 19-20.
* Please contact us if you use it over 700 kg load.
Note: Be sure to use this product in combination with a mounting plates.

Standard part number: NITTAOMEGA type XL robot-tool adaptor

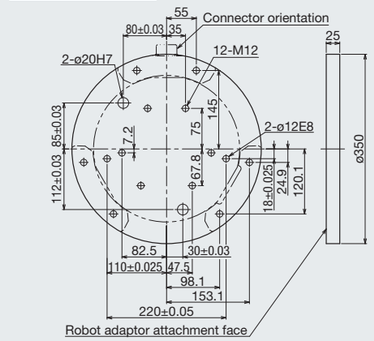
NPN spec (0 V common) ◆ Robot adaptor 2R20-0PSX0 ◆ Tool adaptor 2T20-0PCX0
PNP spec (24 V common) ◆ Robot adaptor 2R20-0PSX1 ◆ Tool adaptor 2T20-0PCX0

◆ External dimensions

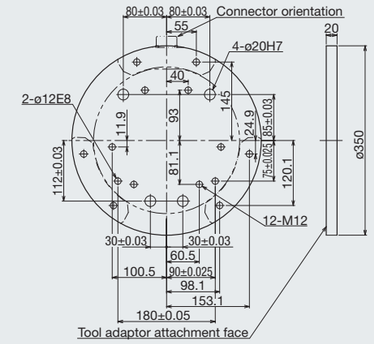


◆ Mating dimensions
(reference mounting plate drawing)

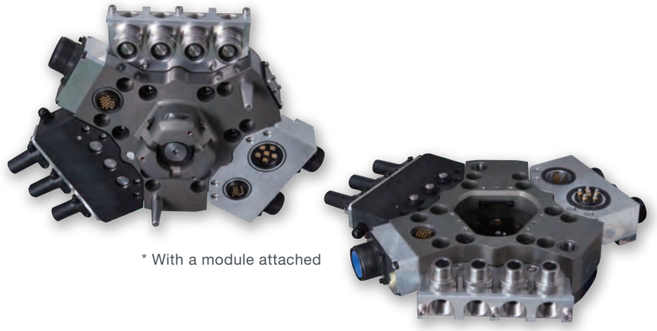
Robot adaptor plate



Tool adaptor plate



NITTAOMEGA type M



* With a module attached

Features/Applications

- **Payload: 50-250 kg**
  Can be directly coupled with 45 different types of robots (P.C.D. 125) from domestic and international manufacturers.
- **High load capacity with thin and lightweight body**
  Direct coupling with robot, thin and lightweight body, and acceleration of small and high-speed robot usage.
- **New-generation specifications**
  Capacity to handle increased welding current, improved cooling capacity, noise reduction against signal failures, and hydraulic module to reduce spillage.
- **Inherited versatility**
  Inherited versatility features for various applications, e.g. functional modules and L/R synchronization.
- **Enhanced preventive (predictive) maintenance features**
  Reduction of maintenance efforts through preventive maintenance (optional).

Specification

Payload		50-250 kg
Allowable moment		1471 Nm
Allowable torque		1471 Nm
O.D.		ø235 mm
Thickness when coupled		90 mm
Main body material		Aluminum alloy
Position repeatability		±0.025 mm
Operational driving pressure		0.39-0.85 MPa
Main body weight	Robot side	4.0 kg
	Tool side	2.2 kg
Plate weight	Robot side	Not required (can be attached directly to P.C.D. 125)
	Tool side	
Electrical signals	Current	3 A
	No. of signals	None or 20 signals
Output signals		Chuck signal
		Unchuck signal
		Face signal
Environment	Ambient temperature	0-60 ºC (no freezing)
	Ambient humidity	0-95 %RH (no condensation)
Connector part number	Robot side	MS3102A24-28P
	Tool side	MS3102A24-28S

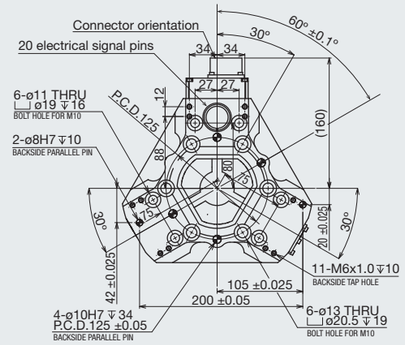
☞ For, more information on modules, please refer to P. 21.

Standard part number: NITTAOMEGA type M robot-tool adaptor

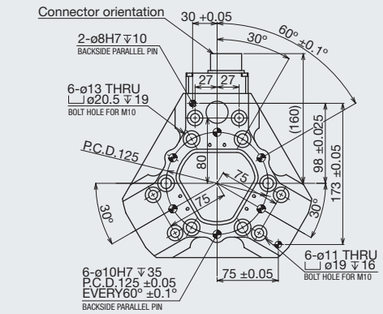
NPN spec (0 V common) ◆ Robot adaptor MOR20-0PS00 ◆ Tool adaptor MOT20-0PC01
PNP spec (24 V common) ◆ Robot adaptor MOR20-0PS01 ◆ Tool adaptor MOT20-0PC01

◆ External mating dimensions

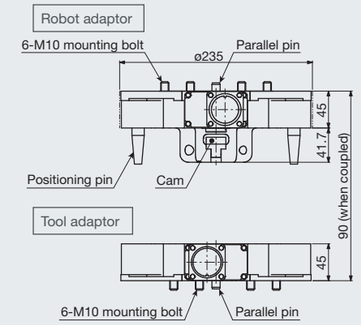
Robot adaptor



Tool adaptor



Robot adaptor

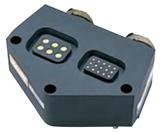


OM modules

(For NITTAOMEGA IV, NITTAOMEGA XC300, NITTAOMEGA XC400, NITTAOMEGA XC500, NITTAOMEGA type XL)

Example module installation

Spot welding module



Servo motor module

Hydraulic module

Pneumatic module

Features

- Modules corresponding to different ATC applications
- Common attachment pattern for different modules, which can be freely combined
- Modules with non-standard signals and number of ports available upon request

Applications

- Air, fluid such as water, power supply to welding gun and motor, etc., and communication of digital and analog signals

Spot welding module

Standard part number	Robot side	Tool side	Robot side	Tool side	Robot side	Tool side	Robot side	Tool side
	OMRW06-670	OMTW06-680	OMRW06-69G	OMTW06-6AH	OMRW01-003	OMTW01-000	OMRW03-6H3	OMTH03-6H3
Specification	Connector type: 3 100 A electrodes		Seal connector type: 3 200 A electrodes		Bus bar type (direct electrode coupling)		200 A module	
Connector part number	MS3102A36-3P	MS3102A36-3S	Seal connector type: ABS36-28		—		C2MBG36-15×3P-42	
Weight	Approx. 1.0 kg	Approx. 1.0 kg	Approx. 1.0 kg	Approx. 1.0 kg	Approx. 1.0 kg	Approx. 1.0 kg	Approx. 1.0 kg	Approx. 1.0 kg
Material	Voltage-proof resin		Voltage-proof resin		Voltage-proof resin		Voltage-proof resin	

Servo motor module

Standard part number	Robot side	Tool side	Robot side	Tool side
	OMRX21-026	OMTX21-026	OMRX42-020	OMTX42-010
Specification	3 A: 15 signal pins, 20 A: 6 electrodes		3 A: 30 signal pins, 20 A: 12 electrodes	
Connector part numberl	Signal: MS3102A20-29P Motor power supply: MS3102A20-17P	Signal: MS3102A20-29S Motor power supply: MS3102A20-17S	Signal: MS3102A20-29P Motor power supply: MS3102A20-17P	Signal: MS3102A20-29S Motor power supply: MS3102A20-17S
Weight	Approx. 0.8 kg	Approx. 0.8 kg	Approx. 1.3 kg	Approx. 1.3 kg
Material	Voltage-proof resin		Voltage-proof resin	

Signal module

Standard part number	Robot side	Tool side
	OMRS35-012	OMTS35-022
Specification	5 A: 35 signal pins	
Connector part number	MS3102A28-21P	MS3102A28-21S
Weight	Approx. 0.5 kg	Approx. 0.5 kg
Material	Voltage-proof resin	

Hydraulic module

Standard part number	Robot side	Tool side	Robot side	Tool side	Robot side	Tool side	Robot side	Tool side
	OMRH04-000	OMTH04-002	OMRH04-004	OMTH04-006	OMRH06-001	OMTH06-001	OMRH04-000	OMTH04-004
Specification	Rc3/8: 4 ports		Rc1/2: 4 ports		Rc3/8: 6 ports		Rc3/8: 4 ports (hydraulic)	
Weight	1.0 kg	0.8 kg	1.2kg	1.2kg	1.5kg	1.1kg	1.0kg	0.8kg
Material	Main body: aluminum alloy Fitting: stainless steel		Main body: aluminum alloy Fitting: stainless steel		Main body: aluminum alloy Fitting: stainless steel		Main body: aluminum alloy Fitting: stainless steel	

Standard part number	Non-spill hydraulic module		Brass hydraulic module	
	Robot side	Tool side	Robot side	Tool side
	OMRH04-N00	OMTH04-N00	OMRH04-009	OMTH04-00B
Specification	Rc1/2: 4 ports		Rc1/2: 4 ports	
Weight	1.1 kg	1.0 kg	2.3 kg	1.9 kg
Material	Main body: stainless steel, Fitting: stainless steel		Main body: brass, Fitting: stainless steel	

Pneumatic module

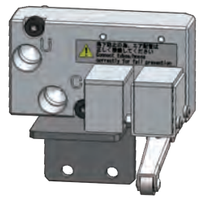
Standard part number	Robot side	Tool side	Robot side	Tool side	Robot side	Tool side	Robot side	Tool side
	OMRP04-000	OMTP04-000	OMRP07-000	OMTP07-000	OMRP04-001	OMTP04-003	OMRP02-001	OMTP02-001
Specification	Rc1/4: 4 ports *With tool-side check valve; OMTP04-001		Rc1/4: 7 ports		Rc1/2: 4 ports		Rc1/4 external pneumatic: 2 ports *A dedicated plate for mounting is required. This module is for NITTAOMEGA IV and NITTAOMEGA XC300.	
Weight	1.0 kg	0.8 kg	0.8 kg	0.9 kg	1.0 kg	0.8 kg	Approx. 0.6 kg	Approx. 0.6 kg
Material	Main body: aluminum alloy Fitting: stainless steel		Main body: aluminum alloy Fitting: stainless steel		Main body: aluminum alloy Fitting: stainless steel		Main body: aluminum alloy Fitting: stainless steel	

Other modules

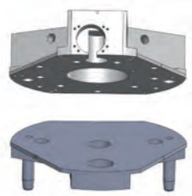
Standard part number	Dummy module			Camera module		Large bore pneumatic module	
	Tool side	Tool side	Tool side	Robot side	Tool side	Robot side	Tool side
	OMTD00-002	OMTD00-006	OMTD00-003	OMRX20-000	OMTX20-000	OMRP04-013	OMTP07-004
Specification	For spot welding module	For servo module	For hydraulic Module	—		Rc1-1/2: 2, Rc1/2: 1, Rc1/4: 2	
Weight	0.5 kg	0.5 kg	0.5 kg	Approx. 0.8 kg	Approx. 0.8 kg	—	—
Material	Voltage-proof resin			Voltage-proof resin		Main body: aluminum alloy, Fitting: stainless steel	

*Please contact us for specifications of modules other than OM modules introduced in this catalog.

Fall prevention system

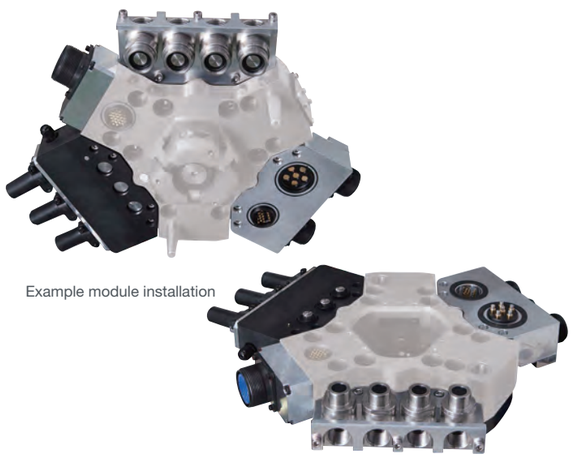
Appearance	Features/Applications
	● Prevents accidental fall-off or detachment caused by simple errors in valve mechanism operations, wrong manual switching of solenoid valve, or residual air pressure due to bending or clogging of piping ● Easy attachment to existing systems
	Part number
	CAR-006-M1

Teaching jig

Appearance	Features/Applications		
	● Accurate teaching aid jig for ATC coupling ● Save efforts for teaching upon line startup ● Easy and accurate teaching		
	Applicable to	NITTAOMEGA IV	
	Part number	Robot side	Tool side
		AT4-3S2579S	AT4-3S2580S
	Applicable to	NITTAOMEGA XC300	
	Part number	Robot side	Tool side
		AT9-3S0107S	AT9-3S0108S
	Applicable to	NITTAOMEGA XC400, XC500	
	Part number	Robot side	Tool side
		AT6-3S0341S	AT6-3S0342S
	Applicable to	NITTAOMEGA type M	
	Part number	Robot side	Tool side
		AMO-R0024	AMO-T0033

CT modules

(For NITTAOMEGA type M)



Example module installation

Spot welding module

Servo motor module

Hydraulic Module

Pneumatic module

Spot welding module

Standard part number	Robot side	Tool side	Robot side	Tool side
	CTRW04-003	CTTW04-003	CTRW04-001	CTTW04-001
Specification	Direct coupling type: 3-200 A electrodes		Direct coupling type: 3-130 A electrodes	
Connector part number	—		MS3101A36-3P	MS3101A36-3S
Weight	Approx. 1.0 kg	Approx. 1.0 kg	Approx. 1.0 kg	Approx. 1.0 kg
Material	Voltage-proof resin		Voltage-proof resin	

Servo motor module

Standard part number	Robot side	Tool side	Robot side	Tool side
	CTRX21-001	CTTX21-001	CTRX42-000	CTTX42-000
Specification	3A: 15 signal pins, 20A: 6 electrodes		3 A: 30 signal pins, 20 A: 12 electrodes	
Connector part number	Signal: MS3102A20-29P Motor power supply: MS3102A20-17P	Signal: MS3102A20-29S Motor power supply: MS3102A20-17S	Signal: MS3102A20-29P Motor power supply: MS3102A20-17P	Signal: MS3102A20-29S Motor power supply: MS3102A20-17S
Weight	Approx. 0.8 kg	Approx. 0.8 kg	Approx. 1.5 kg	Approx. 1.5 kg
Material	Aluminum alloy		Voltage-proof resin	

Hydraulic module

Standard part number	Robot side	Tool side	Robot side	Tool side
	CTRH04-N00	CTTH04-N00	CTRH06-N00	CTTH06-N00
Specification	Rc1/2: 4 ports		Rc1/2: 6 ports	
Weight	Approx. 1.1 kg	Approx. 1.0 kg	Approx. 1.3 kg	Approx. 1.1 kg
Material	Main body: stainless steel, Fitting: stainless steel		Main body: stainless steel, Fitting: stainless steel	

Pneumatic module

Standard part number	Robot side	Tool side	Robot side	Tool side
	CTRP04-000	CTTP04-000	CTRP08-000	CTTP08-000
Specification	Rc1/4: 4 ports		Rc1/4: 8 ports	
Weight	Approx. 0.6 kg	Approx. 0.6 kg	Approx. 1.1 kg	Approx. 1.1 kg
Material	Main body: aluminum alloy, Fitting: stainless steel		Main body: aluminum alloy, Fitting: stainless steel	

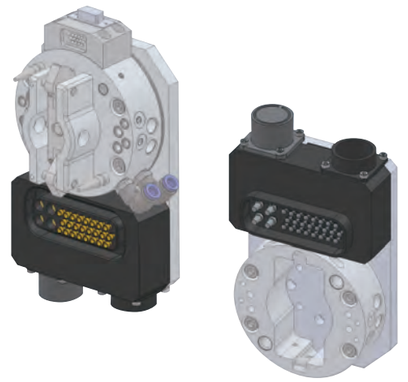
* Please contact us for specifications of modules other than CT modules introduced in this catalog.

Modules for other models

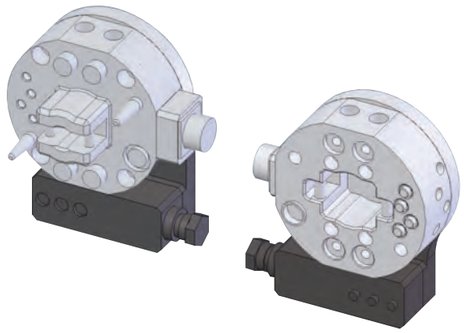
Main external modules for NITTAOMEGA XC10, NITTAOMEGA XC30, NITTAOMEGA XC60, and NITTAOMEGA XC120

Applicable to	Type	Robot side	Tool side	Specification
NITTAOMEGA XC10	Motor power	TMRW02-000	TMTW02-000	20 A: 2 electrodes
NITTAOMEGA XC30	Pneumatic	NMRP01-000	NMTP01-000	Rc3/8: 1 port
		NMRP02-000	NMTP02-000	M5: 2 ports
	Motor power	NMRW04-000	NMTW04-000	20A: 4 electrodes
	Servo motor	NMRX24-000	NMTX24-000	3A: 18 signal pins 20A: 6 electrodes
		NMRX28-000	NMTX28-000	3A: 24 signal pins 20A: 4 electrodes
NITTAOMEGA XC60	Pneumatic	EMRP01-000	EMTP01-000	Rc3/8: 1 port
		EMRP02-000	EMTP02-000	Rc1/8: 2 ports
		EMRP03-000	EMTP03-000	Rc1/8: 3 ports
		EMRP05-000	EMTP05-000	Rc1/8: 5 ports
		EMRP10-000	EMTP10-000	M5: 10 ports
	Signal	EMRS06-000	EMTS06-000	3A: 6 signal pins
		EMRS33-000	EMTS33-000	3A: 33 signal pins
	Servo motor	EMRX32-000	EMTX32-000	3A: 28 signal pins 20A: 4 electrodes
NITTAOMEGA XC120	Signal	5MRS24-000	5MTS24-000	3A: 24 signal pins

* Connectivity with various other interfaces can be provided upon request. Also compatible with other models. For details, please contact us.
⚠ Note: Each must be attached to the robot/tool plate.



NITTAOMEGA XC30 equipped with a servo motor module



NITTAOMEGA XC120 equipped with a spot welding module

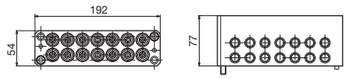
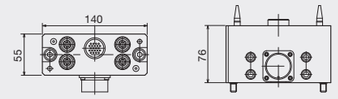
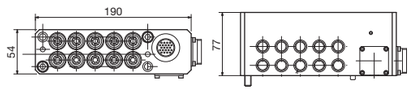
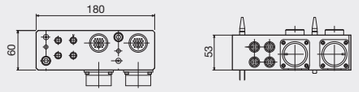
Interface unit

Features

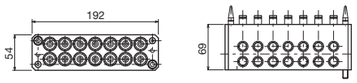
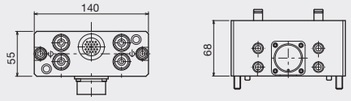
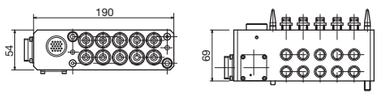
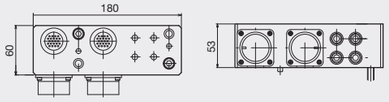
This interface unit is primarily designed for automotive manufacturing processes, including automation of air and signal supply to jigs and trucks, etc. upon process change such as vehicle model change.
With use of experiences we obtained as a leading manufacturer of automatic tool changers, we produce high-reliability products using gun changer components.
These elemental components are based on unique design philosophy: the signal pins have the self-cleaning capability to use under poor atmospheric conditions and the fluid ports achieved a high level of reliability thanks to a structure with less pressure losses and a high sealing property.
Various specifications with different numbers of signal pins/air ports, combinations of tapered pin and bush, floating features, with/without connectors/check valves are offered for different customer applications.
Our ready-made products have optimal design and compact and lightweight profiles, but we do offer custom-made designs upon customer requests.

Example Products

● Supply side

Part number	Signals		Air ports			Dimensions (L×W×H)	Connector	Remarks	External profile
	No.	Capacity	No.	Dia (inch)	Self seal function				
XMRG14-000	0	0	14	Rc1/4	Yes	192 × 54 × 77	No	Bush	
XMRG18-003	14	3	4	Rc1/4	Yes	140 × 55 × 76	MS3102 A22-19P	With tapered pin With floating function Fixed signal pin	
XMRG32-L00	22	3	10	Rc1/4	Yes	190 × 54 × 77	JMR2524M	Changeable connector outlet With bush Movable signal pin	
XMRG48-000	44	3	4	Rc1/4	No	180 × 60 × 53	MS3102 A24-28P × 2	With tapered pin Fixed signal pin	

● Receive side

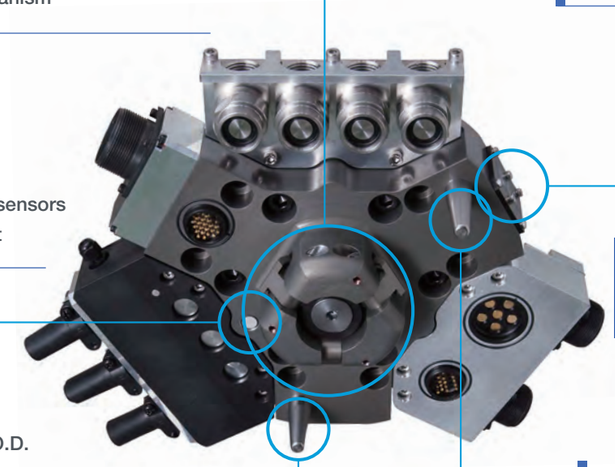
Part number	Signals		Air ports			Dimensions (L×W×H)	Connector	Remarks	External profile
	No.	Capacity	No.	Dia (inch)	Self seal function				
XMTG14-000	0	0	14	Rc1/4	No	192 × 54 × 69	No	With tapered pin	
XMTG18-002	14	3	4	Rc1/4	No	140 × 55 × 68	MS3102A 22-19S	With bush Movable signal pin	
XMTG32-L00	22	3	10	Rc1/4	Yes (5)	190 × 54 × 69	JMR2524F	Changeable connector outlet With tapered pin Flat-type movable signal pin	
XMTG48-000	22 × 2	3	4	Rc1/4	No	180 × 60 × 53	MS3102A 24-28S × 2 qty	With bush Movable signal pin	

Features of NITTAOMEGA series

- Large-bore cylinder and cam lock mechanism for secure and safe coupling mechanism
- Wear regulation and robust coupling maintained by proprietary wear compensation mechanism

LED to show simple ATC status indications

Chuck/Unchuck/Face sensors as standard equipment



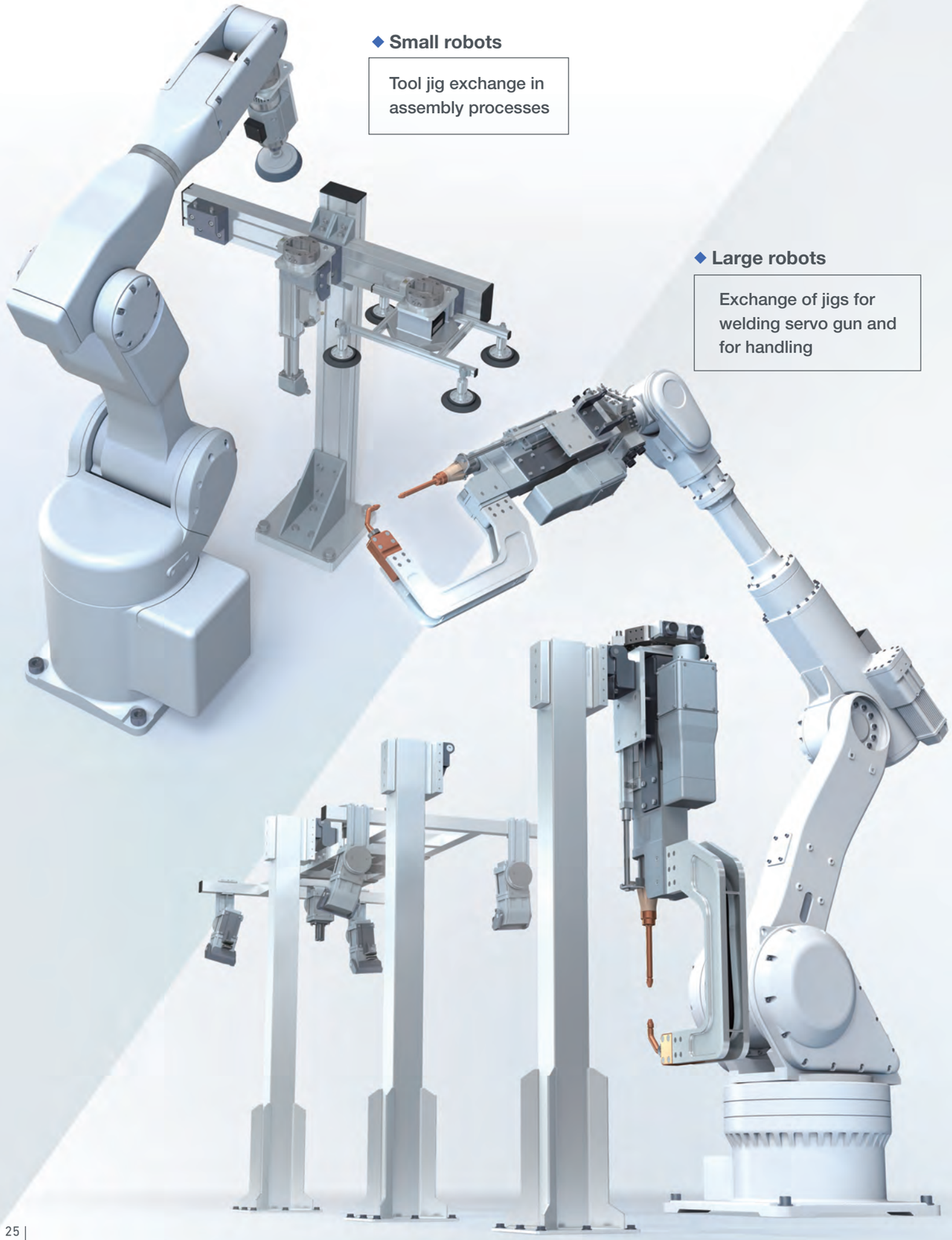
Consumables can be replaced by customer

- Built-in modules to minimize the entire O.D.
- Minimum risk of interference

High durability and high precision tapered pins

Over 200,000 units have been deployed in more than 30 countries across the world

Use examples



◆ **Small robots**

Tool jig exchange in assembly processes

◆ **Large robots**

Exchange of jigs for welding servo gun and for handling

Precautions for selection

Products must be selected so that the actual moment/torque force will not exceed the allowable numbers during normal acceleration/deceleration of robot.

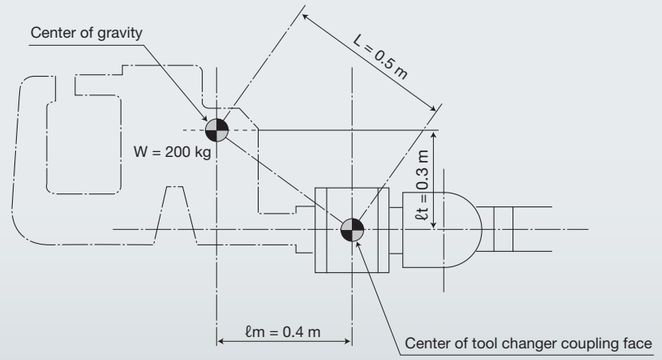
◆ **In case of NITTAOMEGA IV:**

Payload (W)
= 200 kg

Eccentric distance (L)
$= \sqrt{\ell m^2 + \ell t^2} = \sqrt{0.4^2 + 0.3^2} = 0.5$ m

Bending moment (M)
= L × W × Gr* = 0.5 × 200 × 1.5* × 9.8
= 1471 Nm ≤ Allowable moment

Torsional torque (T)
= ℓt × W × Gr* = 0.3 × 200 × 1.5* × 9.8
= 882 Nm ≤ Allowable torque



* Gr is the acceleration factor of normal acceleration/deceleration in automatic robot operations.
For specific values of robot performance, please contact the robot manufacturer for further consideration. (Use 1.5-2.0 G as a standard.)

Operation programming

Following programming tasks are quired for proper operations.

❶Preparation

Place all tools on fixture (tool stand).

❷Unchuck check

Check that the robot adaptor's cams are retracted. (Unchuck signal ON)

❸Parallelism check

Make the robot adaptor approach the tool adaptor while visually checking that they are in parallel with each other.

❹Visual check of access

Make the robot adaptor further approach the tool adaptor and insert robot adaptor's positioning pin (tapered pin) into tool adaptor's positioning hole (bush). Make the robot adaptor approach the tool adaptor until Face signals of Connection OK are received.

❺Air pressurization of connection port

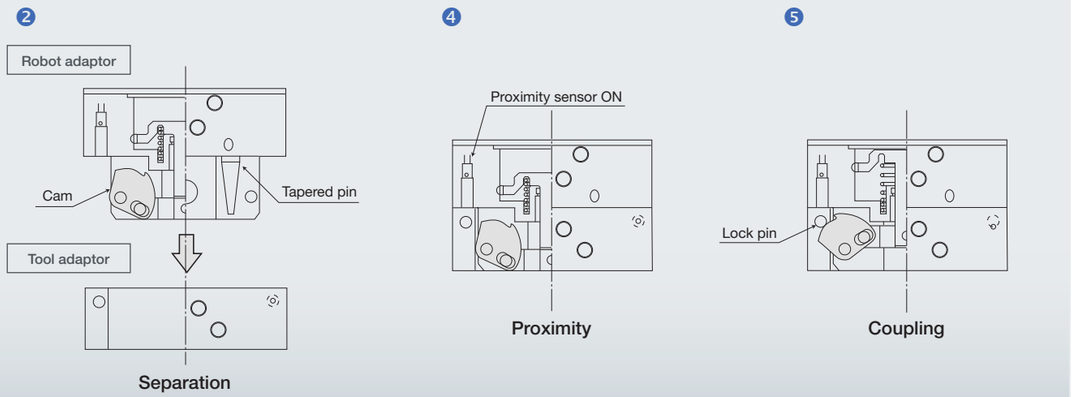
Apply air to Chuck port for chucking piping. Now the coupling operation is completed. (Chuck signal ON)

❻Precautions for unchucking operations

For smooth unchucking, air pressure should be applied to Unchuck port of the unchucking piping when the tool adaptor is placed on fixture.
Unchuck signal is activated once the unchucking operation is completed.

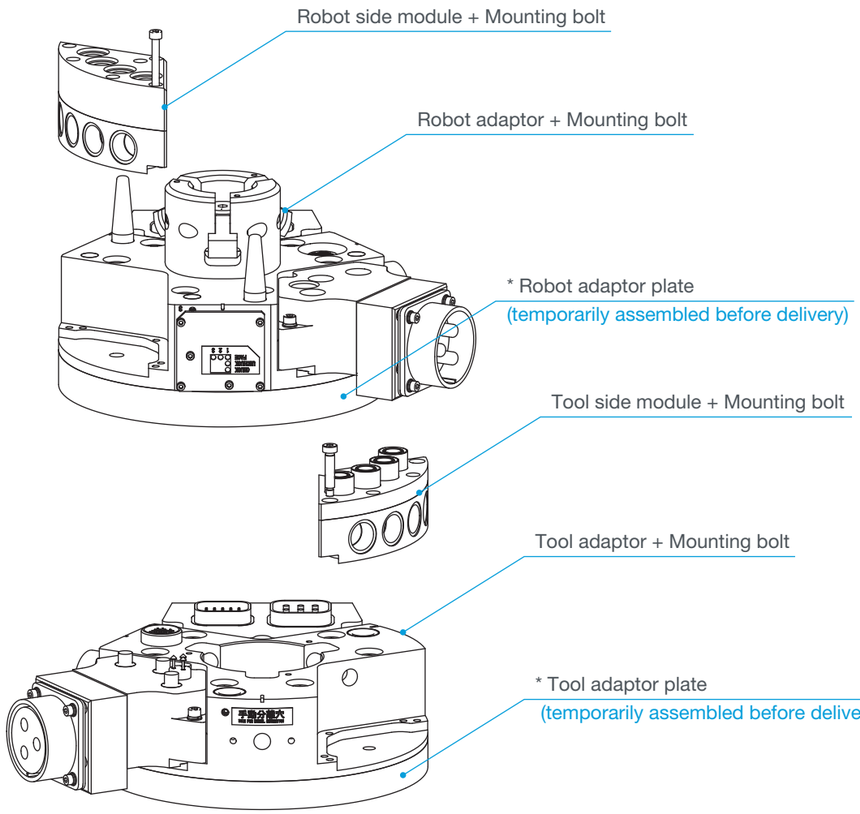
Others

For the chuck/unchuck piping, the constant pressure line (with the valve not energized) must always be connected with the "Chuck" port to maintain coupling situation in the event of power failure. For safe and accurate tool exchange, incorporate the 3 types (Chuck/Unchuck/Face) of signals and signals from fixture's presence check sensor into the robot's interlock circuit.



Preparation

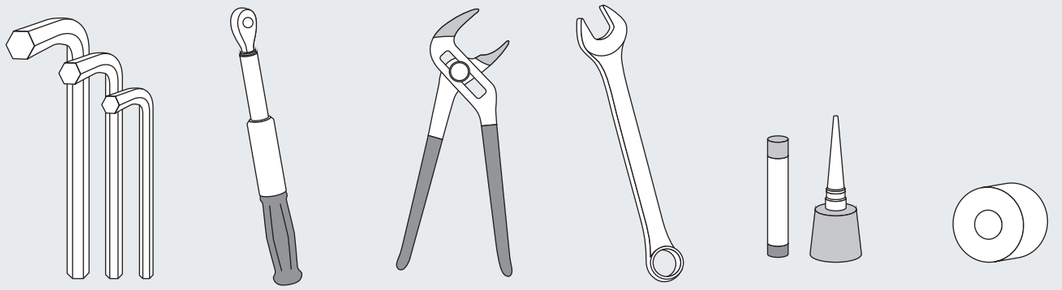
<Packed components>



* For details of this product, please refer to the instruction manual.

* The above is the standard configuration for your reference. The robot adaptor plate, tool adaptor plate, insulation materials, fittings, and cables, etc. may need to be prepared by customer depending on specifications. For details of your configuration, please refer to respective delivery specifications.

◆ Items to be prepared by customer



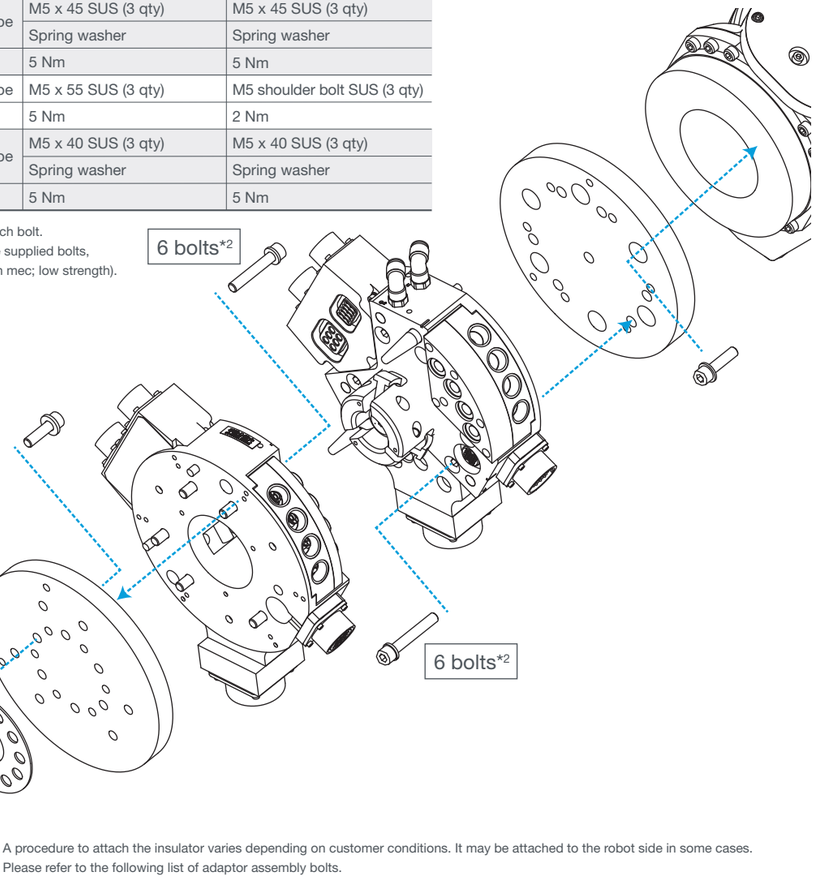
Hex wrench | Torque wrench | Plier | Spanner wrench | Locking agent | Sealing tape

Installing NITTAOMEGA to a robot (example)

◆ List of module assembly bolts

Module types	Item	Robot side	Tool side
Spot welding module Servo motor module Signal module	Screw shape	M5 x 40 SUS (3 qty)	M5 x 40 SUS (3 qty)
		Spring washer+ Flat washer	Spring washer+ Flat washer
	Torque	5 Nm	5 Nm
Power/signal module	Screw shape	M5 x 45 SUS (3 qty)	M5 x 45 SUS (3 qty)
		Spring washer	Spring washer
	Torque	5 Nm	5 Nm
Hydraulic module Hydraulic/pneumatic module	Screw shape	M5 x 55 SUS (3 qty)	M5 shoulder bolt SUS (3 qty)
	Torque	5 Nm	2 Nm
Pneumatic module	Screw shape	M5 x 40 SUS (3 qty)	M5 x 40 SUS (3 qty)
		Spring washer	Spring washer
	Torque	5 Nm	5 Nm

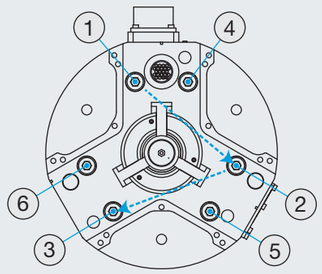
Note: Apply screw locking agent (mild strength) to each bolt.
Locking agent application is not needed for the supplied bolts, to which locking agent is already applied (green mec; low strength).

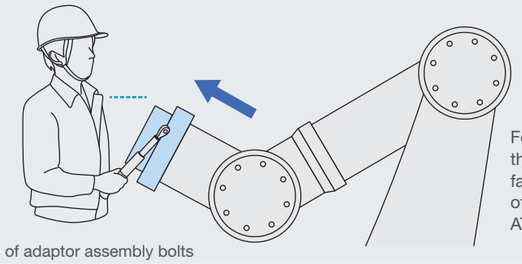


*1 A procedure to attach the insulator varies depending on customer conditions. It may be attached to the robot side in some cases.
*2 Please refer to the following list of adaptor assembly bolts.

⚠ Caution

Tighten bolts in the order of the numbers in steps so that equal force is applied to each bolt.
E.g. Tightening screws in a criss-cross pattern starting with ①, ②, ③ and so on.





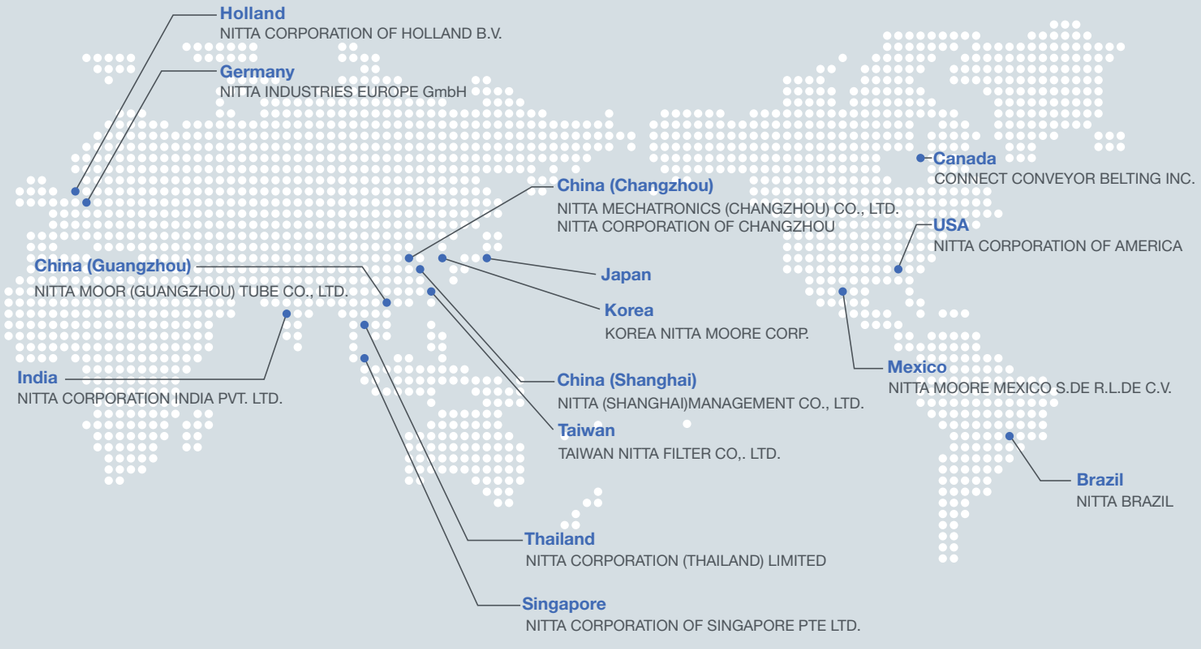
For the installation work, set the robot flange surface facing upward at the height of your breast to prevent ATC from falling.

◆ List of adaptor assembly bolts

Model			Mounting bolt size	Torque
NITTAOMEGA	IV	R side	M10 x 65 (w/SW)	60 Nm
		T side	M10 x 60 (w/SW)	
	XC300	R side	M12 x 65 (w/disc sp.)	80 Nm
		T side	M12 x 60 (w/disc sp.)	
	XC400	R side	M12 x 80 (w/disc sp.)	
	XC500	T side	M12 x x70 (w/disc sp.)	

Note: Apply screw locking agent (mild strength) to each bolt.

Global map



Domestic sites

- **Head Office**
  4-4-26 Sakuragawa, Naniwa-ku, Osaka, Osaka 556-0022
- **Tokyo Branch**
  8-2-1 Ginza, Chuo-Ku, Tokyo 104-0061
- **Nagoya Branch**
  1-17-23 Meieki-Minami, Nakamura-ku, Nagoya, Aichi 450-0003
- **Nabari Plant**
  1300-45 Yabata, Nabari, Mie 518-0494

We recommend you use NITTA tubes and joints with NITTAOMEGA series.

- All models (air supply for chuck/unchuck functions)
- Selected hydraulic module (water supply)
- Selected pneumatic module (air supply)

PushOne™ joints

- No jigs/tools are required for tube connection (one-push connection)
- Electroless nickel plating is applied
- Flame retardant resin (equivalent to UL94 V-0)
- Sealing on R thread sections

FUK tube (flame resistant)

Flame-resistant tubing.
Lineup: O.D. ø6-12

U2 tube

Its excellent balance between flexibility and pressure-resistance and good workability make this tube optimal for general air piping applications.
Also it is made of ether polyurethane resin for less corrosion and deterioration caused by water content under high temperature and humidity conditions.
Lineup: O.D. ø3-16 (mm)
O.D. ø3/16-1/2 (inch)

For inquiry about this product, please contact us through the inquiry form in the Nitta website.

https://www.nitta.co.jp