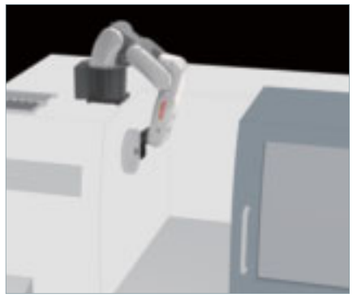
Application Examples

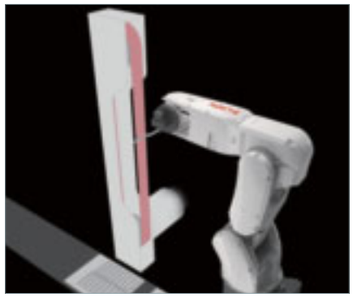

Machine Loading


Picking

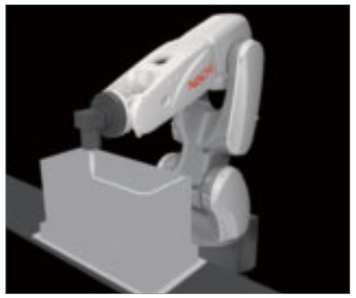

Packing/Casing


Assembling


Deburring


Finishing


Inspection


Sealing

NACHI

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●The specifications are subject to changes without notice.
●In case that an end user uses this product for military purpose or production of weapon, this product may be liable for the subject of export restriction stipulated in the Foreign Exchange and Foreign Trade Control Law. Please go through careful investigation and necessary formalities for export.

CATALOG NO.	R7702E-2

2013.09.U-ABE-ABE

NACHI

Ultra High Speed and compact

MZ07

CATALOG

Characteristics

Robot body

Top Perform High Speed

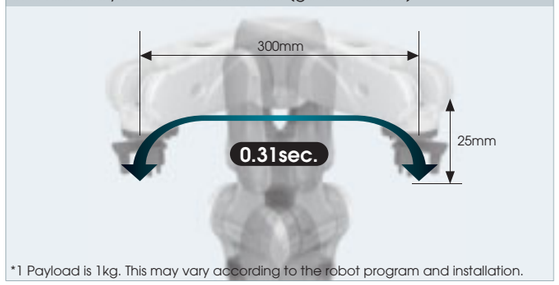
Maximum speed of each axis is the top in this class

■ Contributing to improvement of productivity by high speed

Max speed

Axis	MZ07-01	Conventional model
J1	450°/s	263°/s
J2	380°/s	240°/s
J3	520°/s	300°/s
J4	550°/s	300°/s
J5	550°/s	300°/s
J6	1000°/s	480°/s

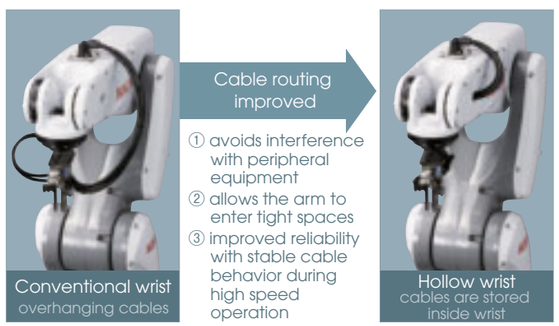
Standard Cycle Time Evaluation (go and back)*1



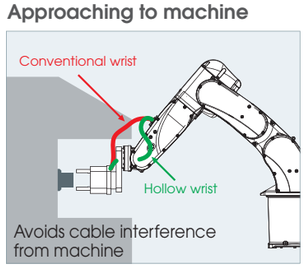
*1 Payload is 1kg. This may vary according to the robot program and installation.

Smart Cable Routing

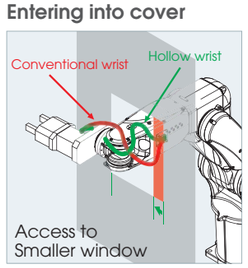
Cable and tubes can be routed through hollow wrist



Approaching to machine

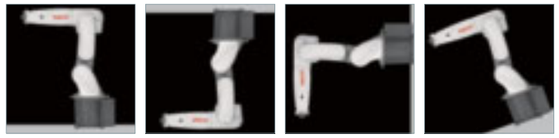


Entering into cover



Compact & Flexible Installation

Available to all-round mounting

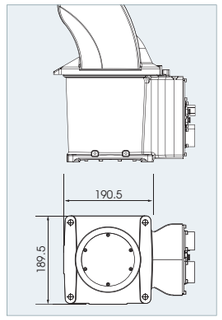


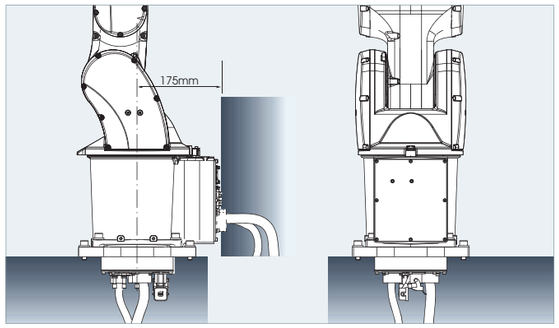
Compact installation space

■ Small bottom design enables compact installation

Cable connection from bottom side Option

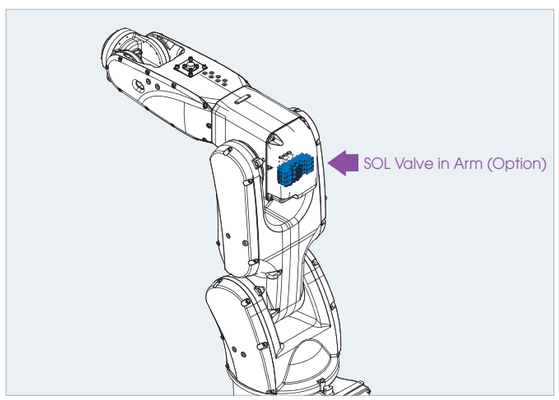
■ More compact installation
■ Robot can be installed close to behind wall
■ Cables can be stored inside robot riser





Pneumatic Valves inside Robot Arm Option

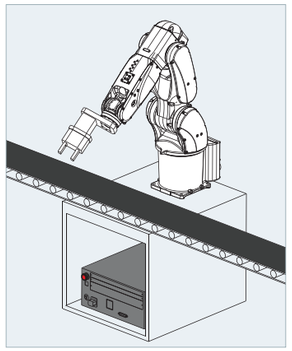
■ Up to 3 solenoid valves can be installed inside robot arm (Max 3 valve available)



Controller

Compact cabinet

■ Only 369mm in width
■ Could be installed inside robot riser



User friendly functions

Software Built-in PLC standard

■ Control peripheral equipment by robot controller
■ Simplifies system configuration to reduce cost

Offline Simulation Tool
FD on Desk Light standard

■ Best simulator of first for primary study

● Offline Programming
● Robot Layout Investigation
● Cycle Time Simulation
● PLC Ladder Editing
● Operation Training

Field bus Option

■ DeviceNet (Master, Slave)
■ EtherNet/IP (Master, Slave)
■ CC-Link (Master, Slave)
■ PROFIBUS (Master, Slave)
■ PROFINET (Slave)

DeviceNet and EtherNet/IP is a trademark of ODVA (Open DeviceNet Vender Association, Inc.).
CC-Link is a trademark of CC-Link Partner Association : CLPA.
PROFIBUS and PROFINET is a trademark of PROFIBUS & PROFINET International.

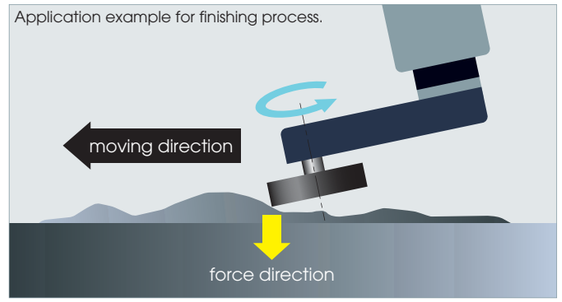
Various application

Vision Sensor NV-Pro Option

■ Operation by using teach pendant, high speed processing
■ Various application available by 2D and 3D vision sensing, dimension measurement and parts type districting

Force Sensor Option

■ Assembling (inserting, following, phasing), polishing, deburring



Robot Monitoring Unit (RMU) Option

■ Safety unit to monitor robot position and speed
■ Reducing cost and space saving

User Graphical Interface Flex-GUI Option

■ Customizing teach pendant display.
■ Operator can use teach pendant as a system operating panel.

Standard Specifications

Robot type **MZ07□-01-□□□-CFD-0000**

Arm variation

Mark	Specification	Notes
(none)	6 axes Standard arm	Max reach 723mm
L	6 axes Long arm	Max reach 912mm
P	5 axes Standard arm	Max reach 723mm (does not have J4)
LP	5 axes Long arm	Max reach 912mm (does not have J4)

Application variation

Mark	Specification	Solenoid valve	Signal wires	Notes
0	Standard	Up to 3	10 wires	-
V	Vision sensor	Up to 2	10 wires	LAN cable, Light cable
U	Vision sensor (cross laser)	Up to 1	10 wires	LAN cable, Light cable, Laser cable
F	Force sensor	Up to 1	10 wires	6 freedom Force sensor cable
S	Additional axis	Up to 1	10 wires	1 motor and 1 encoder cable

Installation variation

Mark	Specification	Notes
0	Standard	J1 working envelope ±30°at wall mounting
W	Wall mount	J1 working envelope ±170°at wall mounting

Connection variation

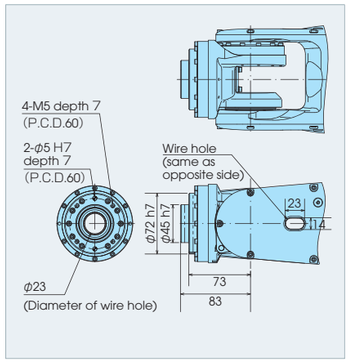
Mark	Specification	Notes
0	Rear connection	Robot to controller cable is connected at robot rear
B	Bottom connection	Robot to controller cable is connected at robot bottom

Basic specification of robot

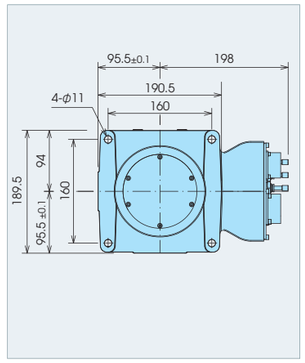
Item				Specification	
Robot Model				**MZ07-01 (MZ07P-01)**	**MZ07L-01 (MZ07LP-01)**
Construction				Articulated	
Number of Axis				6 (5)	
Drive System				AC Servodrive	
Max. Working Envelope	Arm	J1	Swivel	±2.97 rad (±170°)	
		J2	Forward/Backward	-2.36～+1.40 rad (-135°～ +80°)	
		J3	Upward/Downward	-2.37～+4.71rad (-136°～270°)	-2.43～+4.71rad (-139°～270°)
	Wrist	J4*3	Rotation 2	±3.32 rad (±190°)	
		J5	Bend	±2.09 rad (±120°)	
		J6	Rotation 1	±6.28 rad (±360°)	
Max. Speed	Arm	J1	Swivel	7.85 rad/s (450°/s)	5.24 rad/s (300°/s)
		J2	Forward/Backward	6.63 rad/s (380°/s)	4.89 rad/s (280°/s)
		J3	Upward/Downward	9.08 rad/s (520°/s)	6.28 rad/s (360°/s)
	Wrist	J4*3	Rotation 2	9.60 rad/s (550°/s)	
		J5	Bend	9.60 rad/s(550°/s)	
		J6	Rotation 1	17.5 rad/s (1000°/s)	
Max. Payload		Wrist		7kg	
Allowable Static Loading Torque		J4*3	Rotation 2	16.6 N·m	
		J5	Bend	16.6 N·m	
		J6	Rotation 1	9.4 N·m	
Max. Allowable Moment of Inertia *1		J4*3	Rotation 2	0.47 kg·m^2	
		J5	Bend	0.47 kg·m^2	
		J6	Rotation 1	0.15 kg·m^2	
Position Repeatability*2				±0.02 mm	±0.03 mm
Ambient Conditions				0～45°C	
Installation				Floor / Wall / Tilted / Inverted mount	
Robot Mass				30 kg	32 kg
Max. Reach				723 mm	912 mm
Dust Proof, Drip Proof				IP67	

1(rad)=180/π(°), 1(N·m)=1/9.8(kgf·m)
*1: Note that the allowable moment of inertia of wrist varies with the wrist load conditions.
*2: JIS B 8432 compliant.
*3: MZ07P-01 and MZ07LP-01 don't have J4 axis.

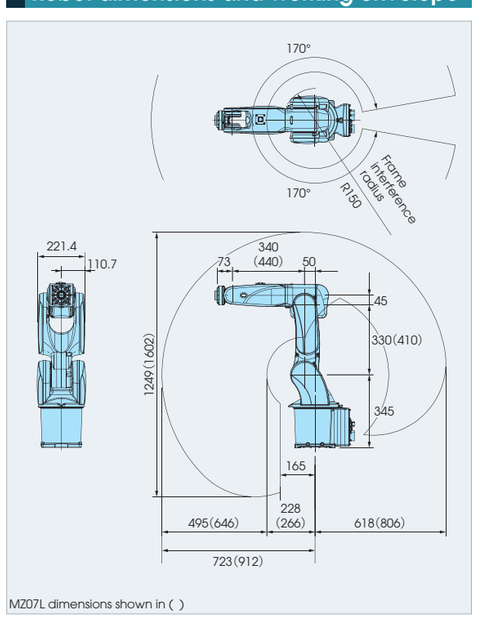
Wrist dimensions



Robot base dimensions

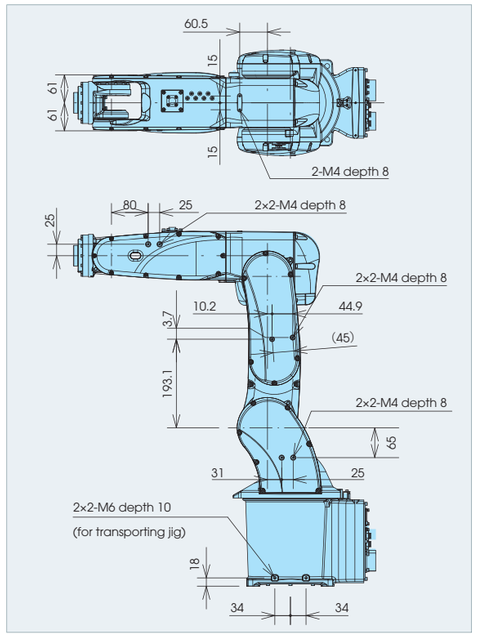


Robot dimensions and Working envelope



MZ07L dimensions shown in ( )

Service Taps



Basic specification of controller

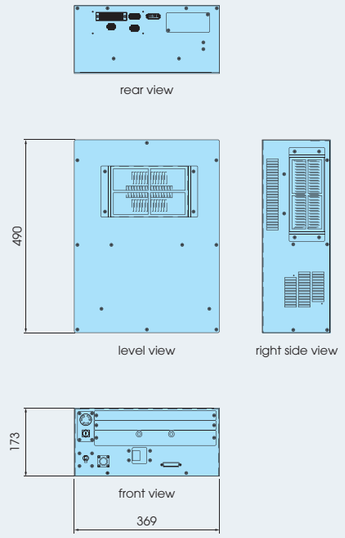
Item		Specification
Controlled Axis		6-Axes
Maximum Control Axis		7-Axes
Safety Function		PLd Category-3
Teaching Method		Teach / Playback Robot Language
Program Number		9,999 programs
Memory Capacity		256MB (2,560,000 program steps equivalent)
Teach Pendant	Smart TP	5.7" Color LCD Touch Panel, Cable Length: 4m 3 Position Enable SW, Emergency Stop Button
	Compact TP	Monochrome, 20 characters x 4 lines Display, Cable Length: 4m 3 Position Enable SW, Emergency Stop Button
Operating Panel		Emergency Stop, Mode select switch (teach/playback)
Exclusive Safety Input		External Emergency Stop, Safety Plug, External Enable Switch, Protective Stop
Network		Ethernet
Memory Device		USB Port
External Dimension		369mm(W)×490mm(D)×173mm(H)
Weight		Approx. 17kg
Primary Power Supply		3-Phase AC200-230V ±10% Single Phase AC200-230V ±10%
Consuming Power		0.4KVA
Dust Proof, Drip Proof		IP20
Ambient Temperature		0～40°C
Ambient Humidity		20～85%(Non-condensing)

Controller options

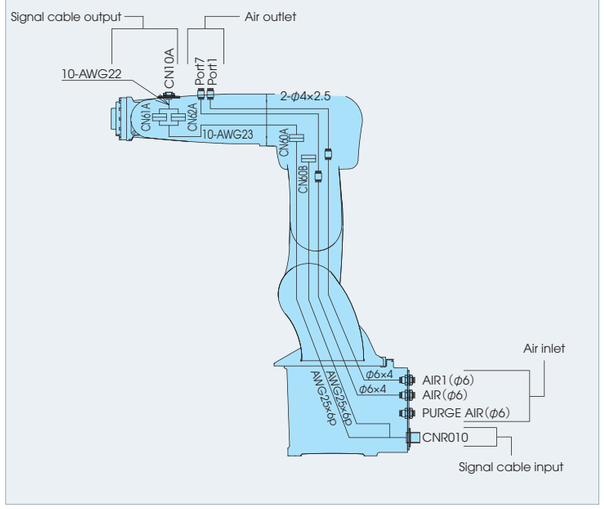
Item	Specification
Additional Axis	One additional axis is possible (Motor Capacity: up to 400W)
Fieldbus	DeviceNet, EtherNet/IP, PROFIBUS, PROFINET, CC-Link
Digital I/O	Up to 2pcs of 32point/32point I/O Board
	8 photo coupler input and 8 transistor output or 8 photo coupler input and 8 relay contact output
External Memory	USB Memory
Vision Sensor (*)	NV－Pro
Robot Monitoring Unit (*)	Category 4, SIL 3
Controller Protection Box	IP54 equivalent Dust-proof and drip-proof box

(*) Another box is necessary.

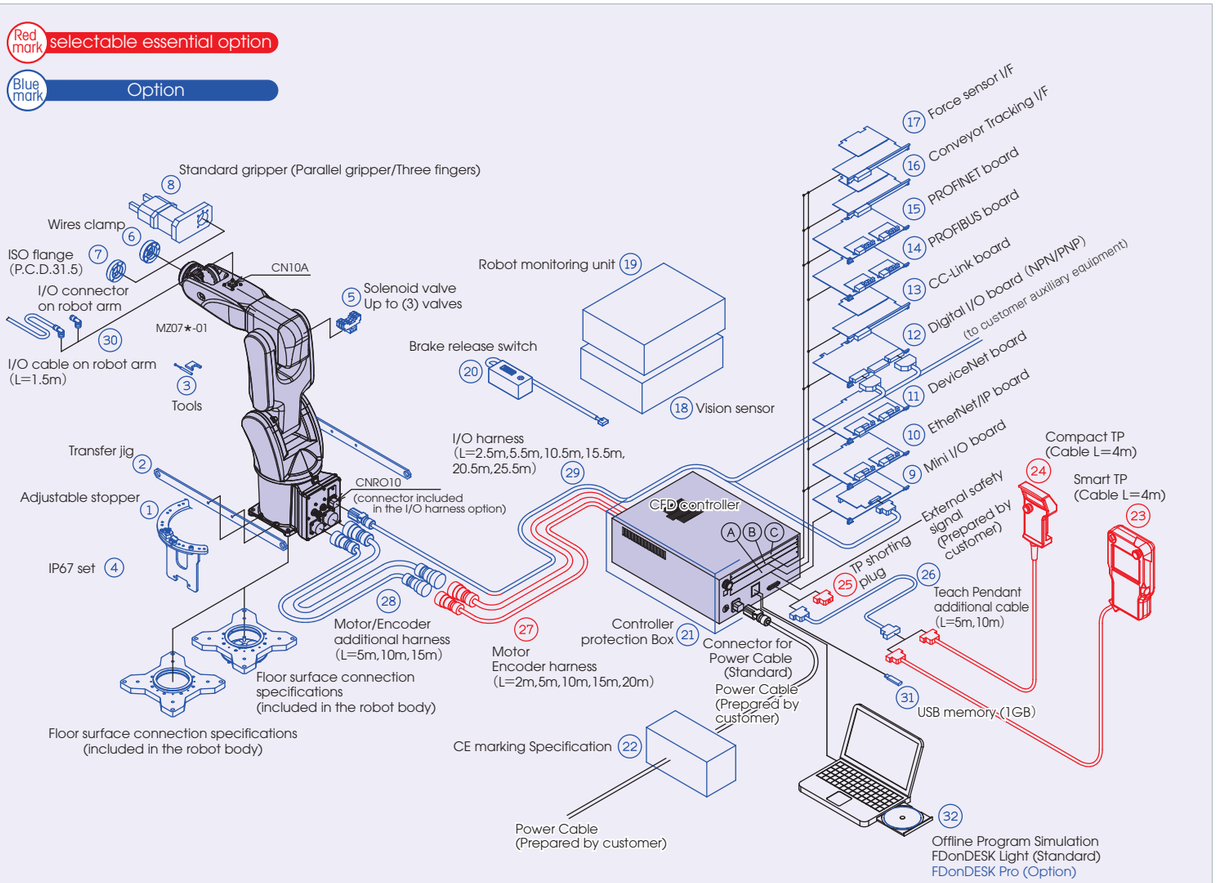
Controller dimensions



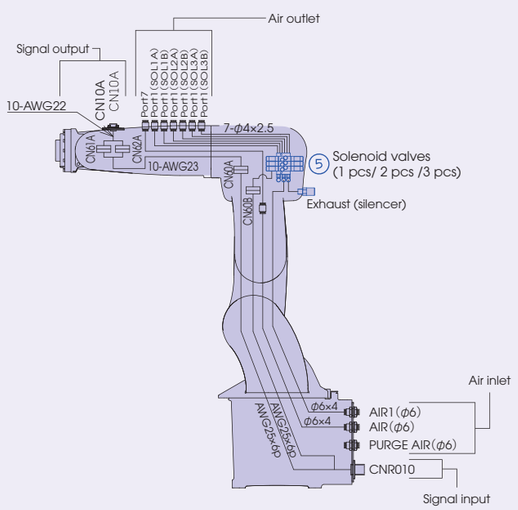
Wiring and tubing inside arm



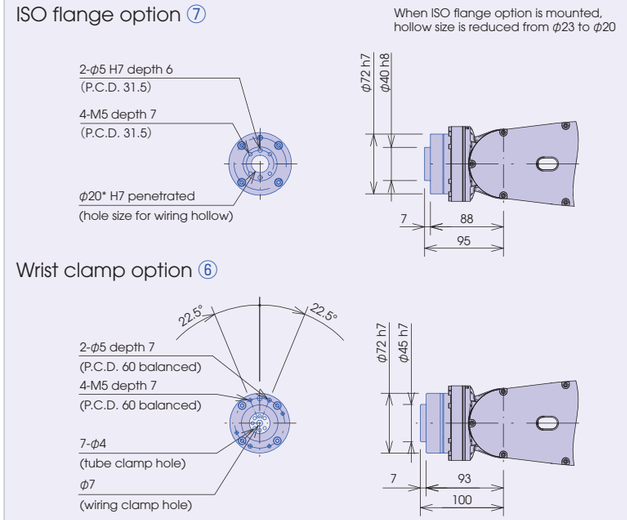
Options



Wiring and tubing in Robot arm (when SOL installed in arm)



Wrist dimensions



Option List

No.	Item	Specifications	Parts No.	Notes
①	Adjustable stopper	Restriction of axis 1 to 3 working envelope	OP-S5-022	
②	Transfer jig	Common for crane transporting, inverted and wall mount	OP-S2-042	
③	Tools	Zeroing pin & Zeroing block	OP-T2-078	
④	IP67 set	Air purge unit in robot body	OP-H9-004	
⑤	Solenoid valve	1 valve	OP-H4-004	2 position double Pressure range : 0.1 to 0.5MPa Coil voltage : 24V
		2 valves	OP-H5-008	
		3 valves	OP-H6-004	
⑥	Wires clamp	Clamp for wires and air tubes inside wrist hollow	OP-W3-012	Air (φ4:7 lines), signals
⑦	ISO flange	ISO flange adapter (P.C.D.31.5)	OP-W2-012	
⑧	Standard gripper *1	Parallel gripper single S	OP-F10-002	Grip force 320N (air source 0.5MPa) Stroke 24mm
		Parallel gripper double S	OP-F10-003	
		Parallel gripper single M	OP-F10-004	Grip force 600N (air source 0.5MPa) Stroke 30mm
		Three fingers single S	OP-F10-005	Grip force 300N (air source 0.5MPa) Stroke 8mm
		Three fingers double S	OP-F10-006	
		Three fingers single M	OP-F10-007	Grip force 410N (air source 0.5MPa) Stroke 10mm
		Three fingers double M	OP-F10-008	
⑨	Mini I/O board	I/O Photo coupler 8 inputs / NPN Transistor 8 outputs	CFD-OP150-A	Mounted on sequence board UM352 of slot A
		I/O Photo coupler 8 inputs / Relay contact 8 outputs	CFD-OP150-B	
⑩	EtherNet/IP board	Master 1CH	CFD-OP130-A	Occupies (1) slot
		Slave 1CH	CFD-OP130-B	
		Master 1CH + Slave 1CH	CFD-OP130-C	
		Slave 2CH	CFD-OP130-D	
		Master 2CH	CFD-OP130-E	
⑪	DeviceNet board	Master 1CH	CFD-OP131-A	Occupies (1) slot
		Slave 1CH	CFD-OP131-B	
		Master 1CH +Slave 1CH	CFD-OP131-C	
		Slave 2CH	CFD-OP131-D	
		Master 2CH	CFD-OP131-E	
⑫	Digital I/O board	I/O Photo coupler 32 inputs / NPN Transistor 32 outputs	CFD-OP125-A	Occupies (1) slot
		I/O Photo coupler 64 inputs / NPN Transistor 64 outputs	CFD-OP125-B	Occupies (2) slots
		I/O Photo coupler 32 inputs / PNP Transistor 32 outputs	CFD-OP151-A	Occupies (1) slot
		I/O Photo coupler 64 inputs / PNP Transistor 64 outputs	CFD-OP151-B	Occupies (2) slots
⑬	CC-Link board	Both master and slave 1CH	CFD-OP98-B	Occupies (1) slot
⑭	PROFIBUS board	Master 1CH	CFD-OP132-A	Occupies (1) slot
		Slave 1CH	CFD-OP132-B	
		Master 1CH + Slave 1CH	CFD-OP132-C	
		Slave 2CH	CFD-OP132-D	
		Master 2CH	CFD-OP132-E	
⑮	PROFINET board	Slave 1CH	CFD-OP136-B	Occupies (1) slot
		Slave 2CH	CFD-OP136-D	
⑯	Conveyor Tracking I/F	RS422 Differential input encoder counter	CFD-OP47-A	Occupies (1) slot
⑰	Force sensor I/F	Force sensor unit for CFD (another box)	CFD-OP152-A	Occupies (1) slot
⑱	Vision sensor	Vision sensor unit for CFD (another box)	CFD-OP139-A	
⑲	Robot monitoring unit	Robot monitoring unit for CFD (another box)	CFD-OP145-A	
⑳	Brake release switch	Brake release switch (portable type)	FD11-OP90-E	
㉑	Controller protection BOX	Upgraded to IP54 equivalent by preparing dust-proof and drip-proof box	CFD-OP133-A	
㉒	UL specification	Some parts are replaced to conform to UL standard	CFD-UL-A	
	CE marking specification	Some parts are replaced to conform to European CE marking	CFD-CE-A	
	KCs specification	Some parts are replaced to conform to Korean KCs standard	CFD-KCS-A	
㉓	Smart TP *2	Cable length 4m	CFDTP-10-04M	
㉔	Compact TP *2	Cable length 4m	MINITP-10-04M	These are selectable options. One of them must be selected.
㉕	TP shorting plug *2	To disconnect teach pendant	CFD-OP153-A	
㉖	Teach Pendant extention cable	5m	CFDTP-RC05M	Only one cable can be added.
		10m	CFDTP-RC10M	Both side have connector
㉗	Motor/Encoder harness	2m	Z101C-J1-02-A	
		5m	Z101C-J1-05-A	
		10m	Z101C-J1-10-A	Harness between robot and controller
		15m	Z101C-J1-15-A	These are selectable option. One of them must be selected.
		20m	Z101C-J1-20-A	
㉘	Motor/Encoder extention harness	5m	Z102C-00-05-A	Only one cable can be added. Total length is 25m
		10m	Z102C-00-10-A	at maximum. Both side is connector
		15m	Z102C-00-15-A	
㉙	I/O harness	2.5m	IOCABLE-10-02M	I/O cable between robot and controller. Controller side is separate cable. Manufacturing needs to be done by customer.
		5.5m	IOCABLE-10-05M	
		10.5m	IOCABLE-10-10M	
		15.5m	IOCABLE-10-15M	
		20.5m	IOCABLE-10-20M	
		25.5m	IOCABLE-10-25M	
㉚	I/O cable on robot arm	1.5m	IOCABLE-20-01M	Tool side is separate cable. Manufacturing needs to be done by customer.
	I/O connector on robot arm	Connector only Soldering type	IOCABLE-20-00	This is connector only. Manufacturing needs to be done by customer.
㉛	USB memory	1GByte	FD11-OP93-A	
㉜	FDonDESK Pro	Robot Program Simulator	FDonDESK Pro	Following utilities are added on "FDonDESK Light" ● Program creation utility from CAD data ● Mukti robot control

*1 Grip force may vary according to the supplied air pressure (0.3 to 0.5 MPa) and finger length. *2 "TP" means teach pendant.

● All option is shipped with robot by kit (sub assembly). Please install it by customer after reading option install procedure.