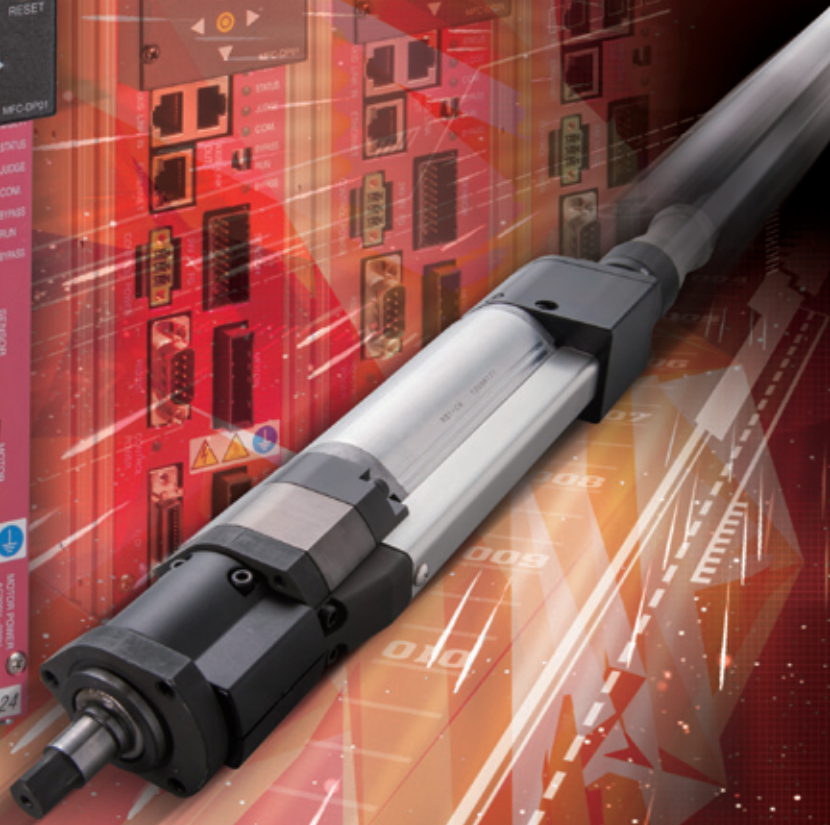


AFC3000 Next Generation

DDK Nutrunner Series

# AFC3000

*Next Generation*



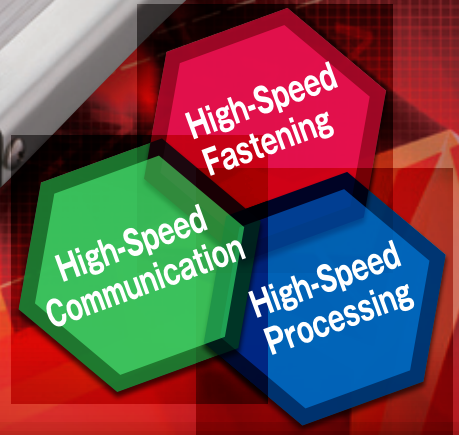
**DAI-ICHI DENTSU LTD.**



# World's First! High-Speed Seating Mechanism

## AFC3000 Series

### High-Speed Seating Mechanism



### Inter-Axis High Speed Communication

Ethernet applies for as a standard specification, for communication between User Console (PC Software) and Server.

- Inter-Axis Communication at high speed by original communication method
- State-of-the-art CPU is embedded to increase the internal processing speed (Control/Communication)
- Communication of quality data and curve data at high speed
- Sequence control is available
- Responding to 100Mbps communication speed
- Contributed to reduce in time of data communication
- Easy connection with Upper PC (Server)

### Controller communalization

Communalized all series (Nutrunner, Hand Tool, Servo Press)  
Multi Unit function is integrated into Axis Unit

### New Function

Multi Unit function and PLC function is integrated (PLC Function is integrated into Axis Unit while keeping Multi Unit function)  
Various combinations are available as customer's needs.(Details on page 4)

### Easy Control of Multiple Spindles (Embedded with Multi function)

Various combinations are available as customer's needs.(Details on page 4)

### Data Storage Function (Standard)

10,000 Fastening Results + 100 Torque Curve  
Increase in internal memory capacity  
Quality data = 12,000 results/Curve data = 100 results/Abnormal record = 500 results

### Safety Function (Standard)

Power Separation.....Control power and Drive power are separated.  
External STOP Signal.....Independent emergency stop signal can be input even when connecting to Fieldbus.

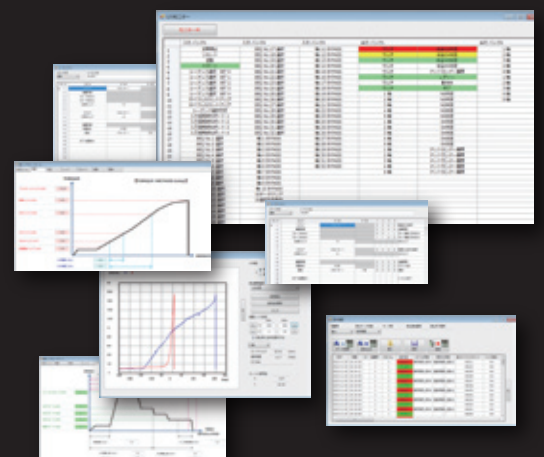
### Display Unit

Display Capability.....Improved and better operability.  
6 digits/2 stages display are adopted to enhance display contents.  
Adopted Arrow key with improved operability.

### Software (User Console)

HMI assumes the functions of 1500 series, Fastening parameter setting, Result monitor function, Curve display function, Tool information read function

## Windows Version HMI (Human Interface)



- | Fastening Setting Screen |
- | Fastening Sequence Screen |
- | Fastening Curve Screen |
- | I/O Free Format Screen |
- | Data Storage, Read, Print Screen |
- | Nutrunner information acquisition screen |
- | Confirmation screen |



# Installed Ultrahigh-Speed Nutrunner

## High-Speed Seating Function...

Improvement  
of  
Quality

Eliminate torque error  
judgment by overshoot

Reduction  
of  
Processing  
Time

Contribute to reduce machine  
cycle time drastically.

Example:  
In case of pre-fastening  
M6 × 1.0P bolt with 10 threads  
In case of 600 rpm = 1.0 sec  
In case of 1000 rpm = 0.6 sec

Reduced  
by  
**0.4**  
seconds

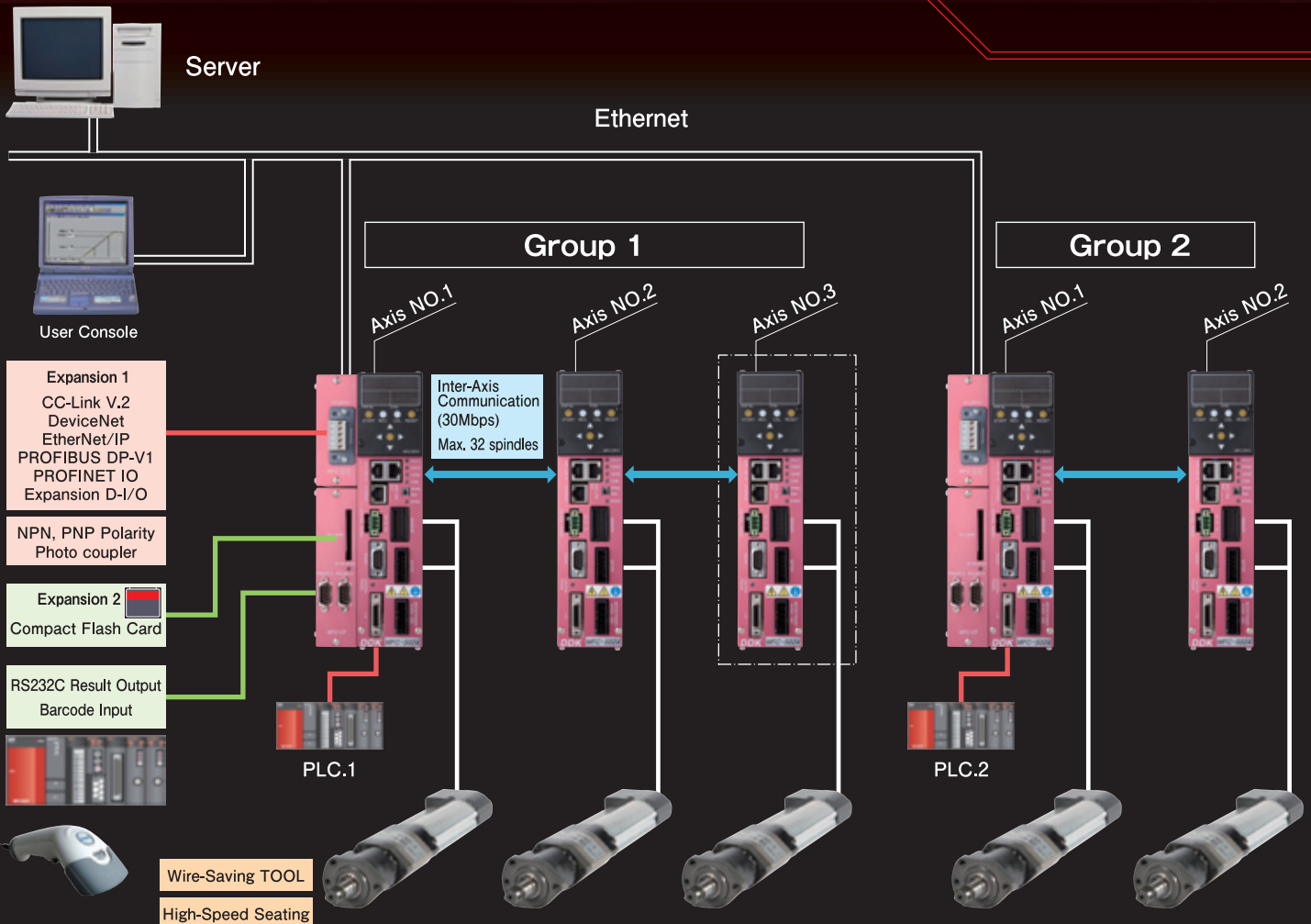
Simplification  
of  
Set Up Value

Simplify setting and  
adjustment per each work piece.  
Reduce operator's control such  
as limit in number of  
pre-fastening threads.

We introduce the new Nutrunner system based on nearly 40 years of experience and performance since developed in 1975.

We are in progress to develop the new system that can be for the common platform for Nutrunner, Hand Tool and Servo Press system in the assembly process.

This system is designed to offer high reliability and productivity and meet flexibly to market needs. In addition, development that conform each product standard (CE, RoHS, UL) is in progress.



# AFC3000

## Multi Unit & Expansion Unit

Standard Unit



**MFC-S024**  
**S060**

### Optional Accessories



#### MFC-DP01

Display Capability... Improved and better operability.

- 6 digits/2 stages display are adopted to enhance display contents.
- Adopted Arrow key with improved operability.



#### MFC

Fieldbus Connector

Inserted Slot

- CC-Link V.2(V.1.10)
- DeviceNet
- EtherNet/IP
- PROFIBUS DP-V1
- PROFINET IO
- Expansion D-I/O Connector Input: 32ch/Output: 32ch



#### MFC-CF

Record Data Expansion Memory

CF Card Slot

CF ACCESS LED

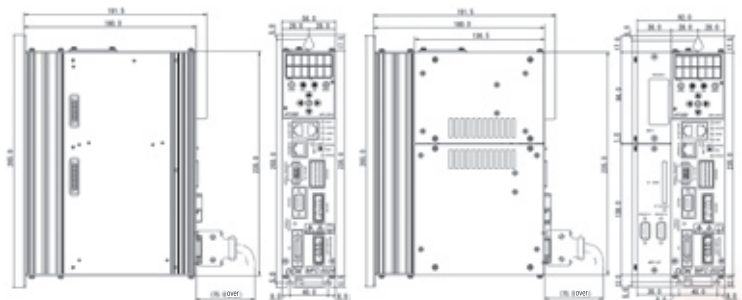
Expansion RS232C Connector



Axis Unit	Max. Current	Applicable Tool	Display	Expansion 1	Expansion 2
MFC-S024	24A	CFT-***RS1-*		MFC-DP01	MFC-CC
MFC-S060	60A	CFT-***RS3-*	MFC-DP01 Simple Display	MFC-CC Fieldbus Connection	MFC-CF Expansion Memory
MFC-S120	120A	NFT-***RM4-*			

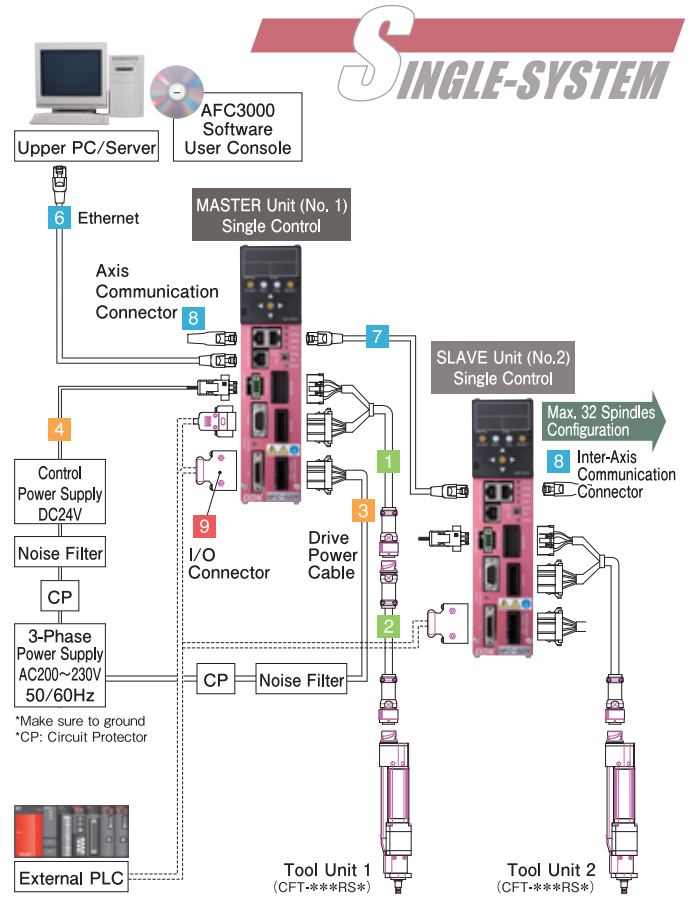
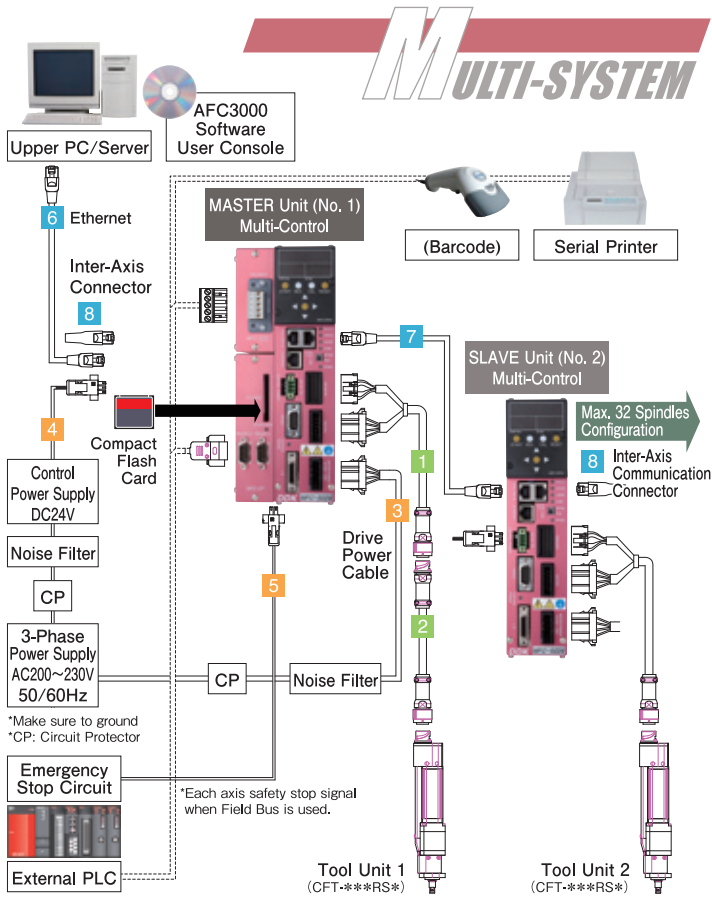
Unit Model	① Mounting Connector	Unit Classification	Unit Model	① Mounting Connector	Unit Classification
MFC-DT	Expansion D-I/O (Input:32ch/Output:32ch)	Expansion Unit 1	MFC-PB	PROFIBUS DP-V1	Expansion Unit 1
MFC-FB	Fieldbus	Expansion Unit 1	MFC-EN	EtherNet/IP	Expansion Unit 1
MFC-CC	CC-Link V.2	Expansion Unit 1	MFC-PN	PROFINET IO	Expansion Unit 1
MFC-DN	DeviceNet	Expansion Unit 1	MFC-CF	Compatible to Compact Flash card Expansion RS232C (2ports)	Expansion Unit 2

- Unit Model.....MFC-S024, MFC-S060
- Input Power.....3-Phase AC200~230V±10% 50/60Hz
- Control Power.....DC24V±10% 0.5A
- Peak Maximum Current...17.0A / 42.4A
- Transformer Capacity...0.3KVA × Spindles / 0.6KVA × Spindles
- Display.....6 letters × 2 lines 7 segments LED display, Function switch: 9 pcs
- Switch.....Bypass Slide Switch: RUN/BYPASS switch  
Setting Switch: For setting by user (front of unit)  
Axis Setting Switch: Maximum 32 spindles settable.  
Internal Setting Switch: 8bit for adjustment by manufacturer (Unit bottom)
- LED.....MULTI LED, STATUS LED, JUDGE LED, COM.LED, BYPASS LED, CONTROL POWER LED, Ethernet LED
- CPU.....SH-2A
- RS232C communication...38400bps (Default)/19200bps/9600bps, 1 port
- External Analog Monitor Output...Torque analog voltage, Angle pulse, CW/CCW pulse etc.
- Axis Communication.....Axis communication port (Maximum number of connections: 32 spindles)
- Ethernet.....PC communication port in conformity with IEEE802.3 (100 BASE-T)
- Standard I/O.....Input: Bidirectional photo coupler input  
DC12V 5mA/DC24V 10mA Number of input points:12ch  
\*Both of NPN (sink/-common) type and PNP (source/+common) type connectable  
Output:Photo MOS relay contact point DC24V 30mA  
Number of output points:12ch  
\*Both NPN (sink/-common) type and PNP (source/+common) type connectable





## System Configuration (Wiring Diagram)



No.	Cable/Connector	Standard Length[m]	Model	Remark
1	Standard Tool Cable (For 24A/60A)	5	C30-FT1-M5	
		10	C30-FT1-M10	
		15	C30-FT1-M15	
2	Extension Tool Cable (For 24A/60A)	5	C30-FT1-M5-E	
		10	C30-FT1-M10-E	
		15	C30-FT1-M15-E	
3	Drive Power Cable (For 24A/60A)	2	C15-D1-M2	Including Standard unit
4	Control Power Connector	—	MC1.5/3-STF-3.81	Including Standard unit
	Control Power Cable	2	C30-DC1-M2	

No.	Cable/connector	Standard Length[m]	Model	Remark
5	STOP Signal Connector	—	MC1.5/2-STF-3.81	Including one standard unit (Excluding MFC-DT)
	STOP Signal Cable	2	C30-XA1-M2	
6	PC Communication Cable (Cross)	3	C30-UL1-M3	For Direct Connection
	PC Communication Cable (Straight)	3	C30-UL2-M3	For Via Hub
7	Axis Communication Cable	0.3	C15-A3-M03	
8	Axis Communication Connector	—	C30-AL2	
9	Standard I/O Connector	—	10126-3000PE	Including Standard unit
	Standard I/O Cable	2	C30-SU1-M2	

### Tool Model CFT-201 RS1-S \*-\*

① Max. Torque		② Motor Capacity		③ Tool Type		④ Connector Direction		⑤ Option	
Symbol	Max. torque	Symbol	Capacity	Symbol	Shape	Symbol	Direction	Symbol	Specification
101	10N·m	RS1	70W	S	Straight	None	Upper		Standard
201	20N·m	RS3	200W	O	Offset	L	Lower	H	High-speed seating specification
281	28N·m								
401	40N·m								
801	80N·m								
132	130N·m								
202	200N·m								
302	300N·m								

Tool Model	Max. Torque [N·m]	Max. Speed [rpm]	Min. Speed [rpm]	Max. Rate [N·m/deg]	Applicable Unit
CFT-101RS1-S	10	3,000	1	99.999	MFC-S024
CFT-201RS1-S	20	1,293	1	99.999	MFC-S024
CFT-281RS1-S	28	992	1	99.999	MFC-S024
CFT-401RS1-S	40	712	1	99.999	MFC-S024
CFT-801RS3-S	80	1,015	1	99.999	MFC-S060
CFT-132RS3-S	130	662	1	99.999	MFC-S060
CFT-202RS3-S	200	387	1	99.999	MFC-S060
CFT-302RS3-S	300	260	1	99.999	MFC-S060
CFT-201RS1-O	20	1,221	1	99.999	MFC-S024
CFT-401RS1-O	40	712	1	99.999	MFC-S024
CFT-801RS3-O	80	1,015	1	99.999	MFC-S024
CFT-132RS3-O	130	662	1	99.999	MFC-S060
CFT-202RS3-O	200	387	1	99.999	MFC-S060

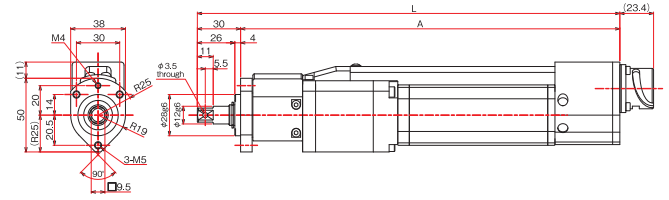
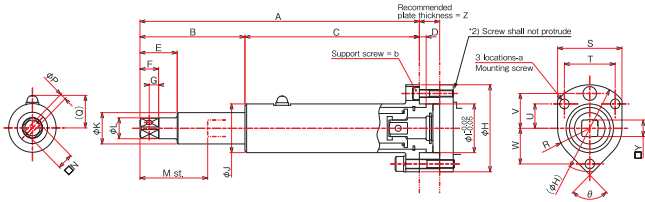
### Spindle Unit Model CFT-SP401 40 V

Spindle Unit Model	① Max. Torque [N·m]	② Standard Stroke [mm]	③ Installation Direction V: Vertical / H: Horizontal	Applicable Unit
CFT-SP401-40V	40	40	Vertical	CFT-101RS1-S
				CFT-201RS1-S
				CFT-281RS1-S
				CFT-401RS1-S
CFT-SP801-50V	80	50	Vertical	CFT-801RS3-S
CFT-SP132-50V	130	50	Vertical	CFT-132RS3-S
CFT-SP202-50V	200	60	Vertical	CFT-202RS3-S
CFT-SP302-50V	300	70	Vertical	CFT-302RS3-S

\*Contact us tool specification except those listed.

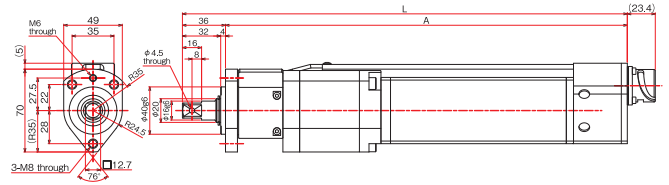
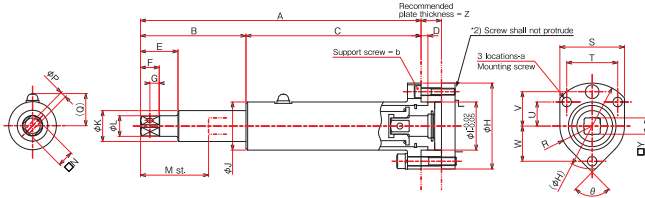


## Tool Unit & Spindle Adaptor Dimensions (Straight)



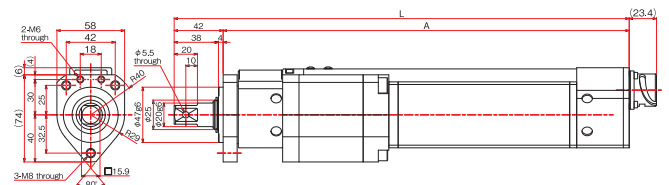
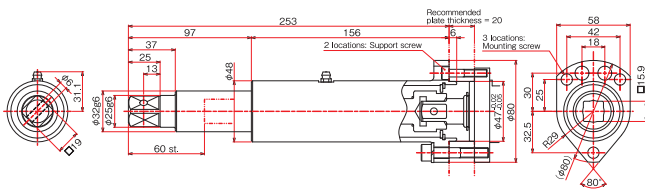
Spindle Adaptor Model	Max. Torque [N·m]	Dimensions [mm]							Weight [kg]	Bolt Size
		A	B	C	D	E	F	G		
CFT-SP401-40V	40	165	62	103	4	22	11	5.5	0.4	3-a
		H	I	J	Kg6	Lg6	M	□N		M 5
		50	28	28	18	12	40	9.5		b #2
		P	Q	R	S	T	U	V		M4×18
		3.5	18.7	19	38	30	14	20		
		W	□Y	Z	θ					
20.5	9.5	12	90							

Tool Model	Max. Torque [N·m]	Max. Speed [rpm]	Min. Speed [rpm]	Weight [kg]	Square Drive [mm]	Total Length L [mm]	A [mm]
CFT-101RS1-S	10	3,000	1	1.3	9.5	275	245
CFT-201RS1-S	20	1,293	1	1.4	9.5	290	260
CFT-281RS1-S	28	992	1	1.4	9.5	293	263
CFT-401RS1-S	40	712	1	1.4	9.5	293	263



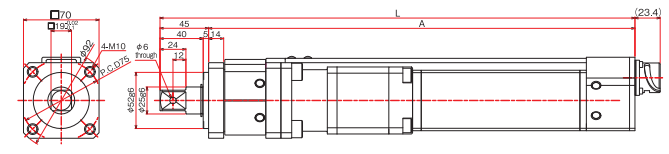
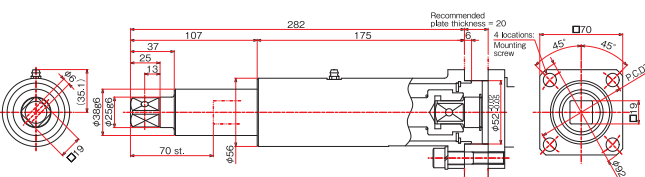
Spindle Adaptor Model	Max. Torque [N·m]	Dimensions [mm]							Weight [kg]	Bolt Size
		A	B	C	D	E	F	G		
CFT-SP801-50V	80	217	77	140	4	27	16	8	1	3-a
		H	I	J	Kg6	Lg6	M	□N		M 8
		70	40	39	25	16	50	12.7		b #2
		P	Q	R	S	T	U	V		M6×25
		4.5	26.6	24.5	49	35	22	27.5		
		W	□Y	Z	θ					
28	12.7	16	76							
CFT-SP132-50V	130	230	82	148	4	32	20	10	1.4	3-a
		H	I	J	Kg6	Lg6	M	□N		M 8
		70	40	43	28	20	50	15.9		b #2
		P	Q	R	S	T	U	V		M6×25
		5.5	28.6	24.5	49	35	22	27.5		
		W	□Y	Z	θ					
28	12.7	16	76							

Tool Model	Max. Torque [N·m]	Max. Speed [rpm]	Min. Speed [rpm]	Weight [kg]	Square Drive [mm]	Total Length L [mm]	A [mm]
CFT-801RS3-S	80	1,015	1	3.4	12.7	372	336
CFT-132RS3-S	130	662	1	3.4	12.7	372	336



Spindle Adaptor Model	Max. Torque [N·m]	Dimensions [mm]			Weight [kg]
		Mounting screw	Support screw	Recommended plate thickness	
CFT-SP202-60V	200	M8	M6×30	20	1.9

Tool Model	Max. Torque [N·m]	Max. Speed [rpm]	Min. Speed [rpm]	Weight [kg]	Square Drive [mm]	Total Length L [mm]	A [mm]
CFT-202RS3-S	200	387	1	4.3	15.9	390	348

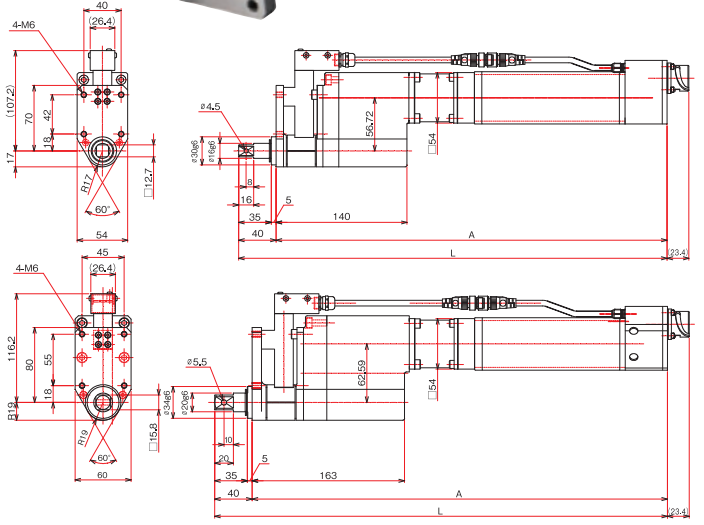
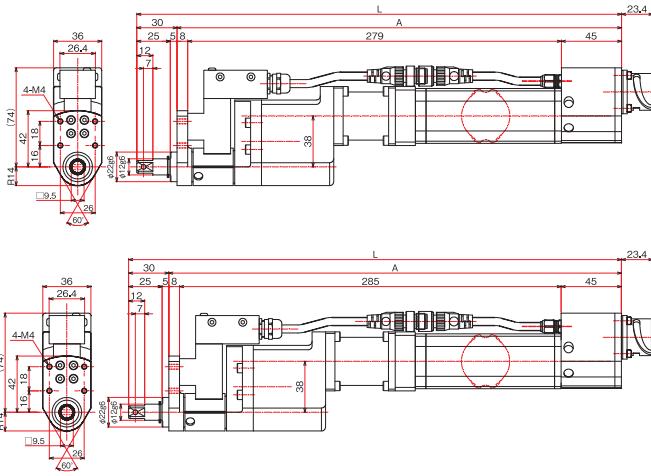


Spindle Adaptor Model	Max. Torque [N·m]	Dimensions [mm]			Weight [kg]
		Mounting screw	Support screw	Recommended plate thickness	
CFT-SP302-70V	300	M10	None	20	2.7

Tool Model	Max. Torque [N·m]	Max. Speed [rpm]	Min. Speed [rpm]	Weight [kg]	Square Drive [mm]	Total Length L [mm]	A [mm]
CFT-302RS3-S	300	260	1	5.8	19	440	395

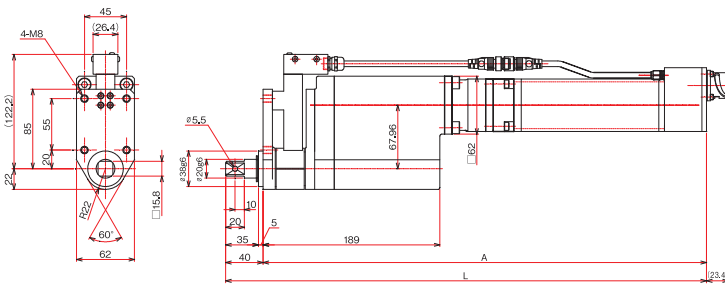


## Tool Unit Dimensions (Offset)



Tool Model	Max. Torque [N·m]	Max. Speed [rpm]	Min. Speed [rpm]	Weight [kg]	Square Drive [mm]	Total Length L [mm]	A [mm]
CFT-201RS1-O	20	1,221	1	2.0	9.5	362	332
CFT-401RS1-O	40	712	1	2.4	9.5	368	338

Tool Model	Max. Torque [N·m]	Max. Speed [rpm]	Min. Speed [rpm]	Weight [kg]	Square Drive [mm]	Total Length L [mm]	A [mm]
CFT-801RS3-O	80	1,015	1	6.0	12.7	458	418
CFT-132RS3-O	130	662	1	7.5	15.9	484	444



Tool Model	Max. Torque [N·m]	Max. Speed [rpm]	Min. Speed [rpm]	Weight [kg]	Square Drive [mm]	Total Length L [mm]	A [mm]
CFT-202RS3-O	200	387	1	8.2	15.9	474	514

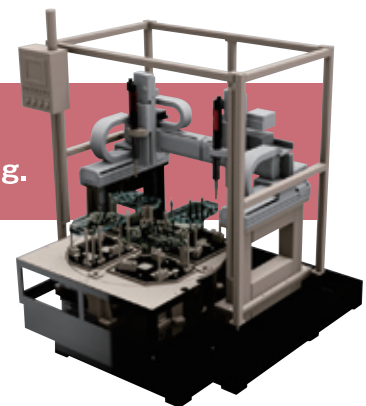
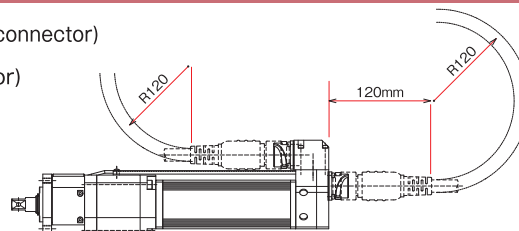
## Tool Unit (Lower Direction Cable)

Minimum bending radius of tool cable is 120mm on operating.  
Lower connector specification is also available for space saving.

**CFT-201RS1-S** (Standard upper connector)

**CFT-201RS1-SL** (Lower connector)

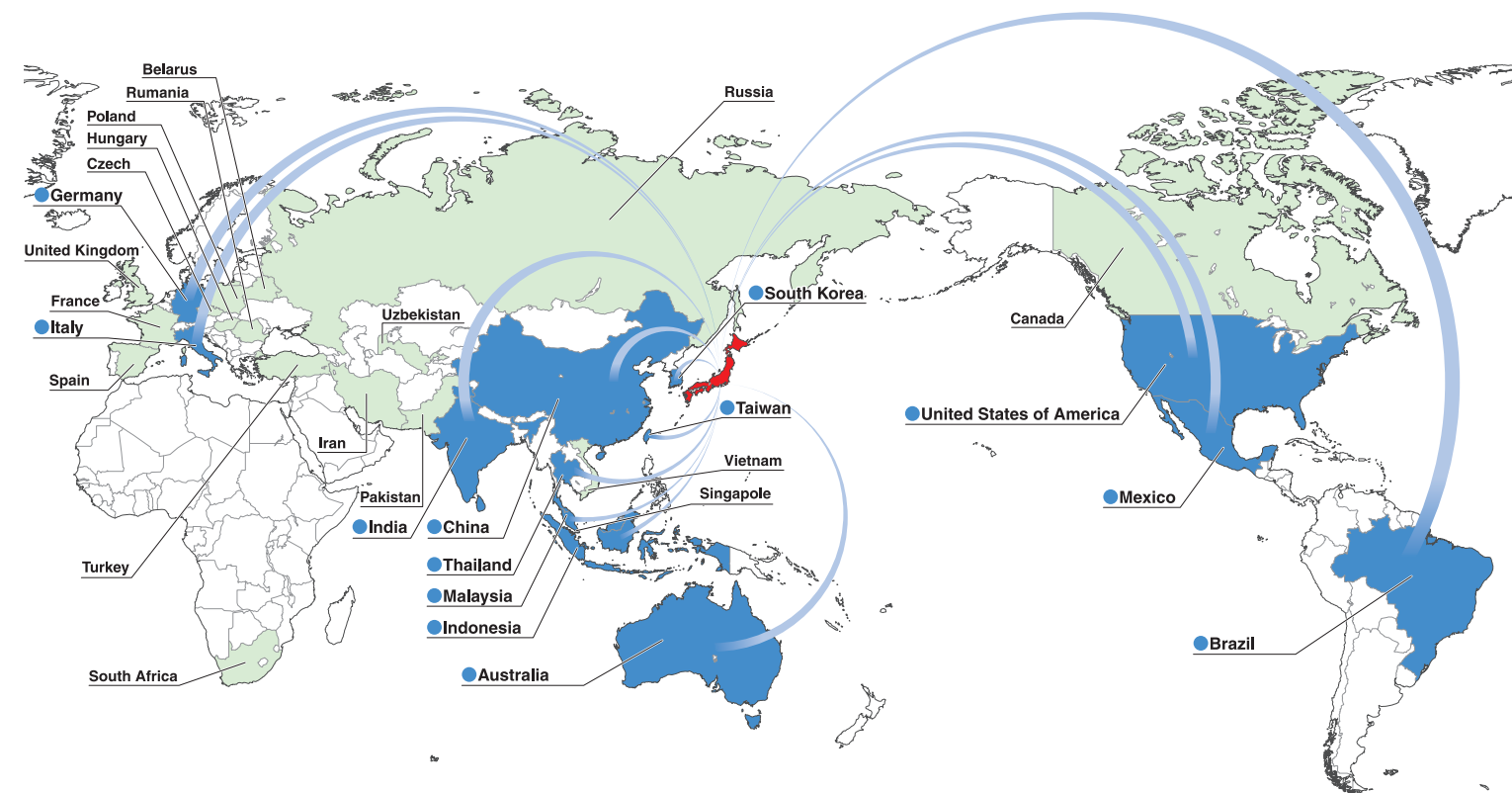
\*Details refer to the system configuration.



Suitable for mounting to robots etc!



# Global Delivery Map



※ Service Available  
 Delivery Record



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JQA-QMA13393



●Specification may be changed without notice due to system improvement. ●Actual color may be different than they appear on this brochure.