



ELECTRICAL ASSEMBLY TOOLS  
**DAI-ICHI DENTSU LTD.**

NUTRUNNER / HAND-HELD TOOL / SERVO PRESS



**DDK NUTRUNNER SERIES**  
**AFC3000**  
HIGH SPEED NUTRUNNER



*Advanced Precision Technology*

## FEATURES

### Production Process Flexibility

Maximum 32 spindles  
multi spindle control

128 Parameters  
64 Sequences

### Quality and Traceability

ISO5393  
compliant

12,000 Stored Data  
100 Curve Data

### Patented high speed seating mechanism

Cycle time  
reduction

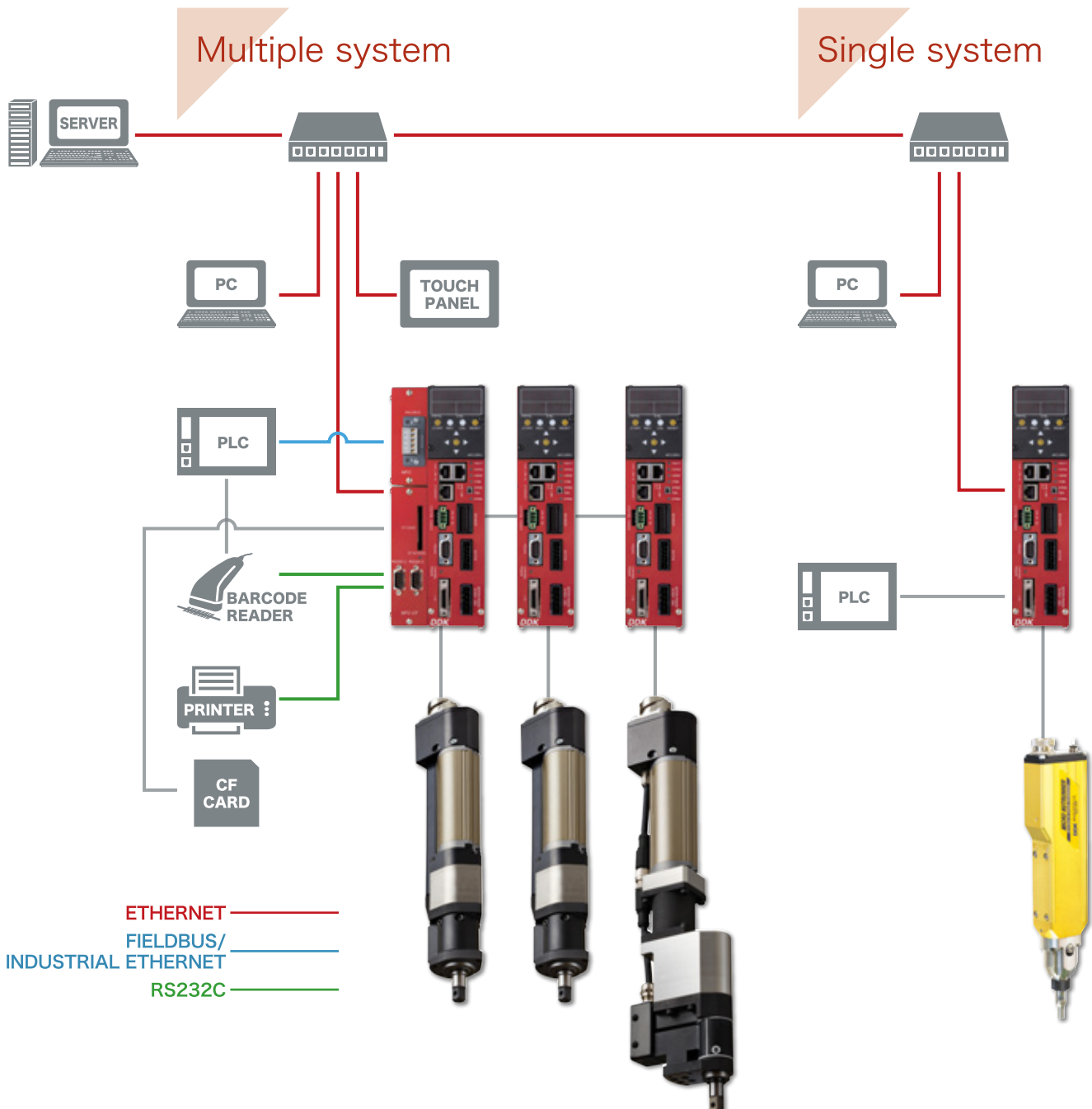
Torque overshoot  
reduction

### Wide Range of Tools

Minimum  
0.2Nm

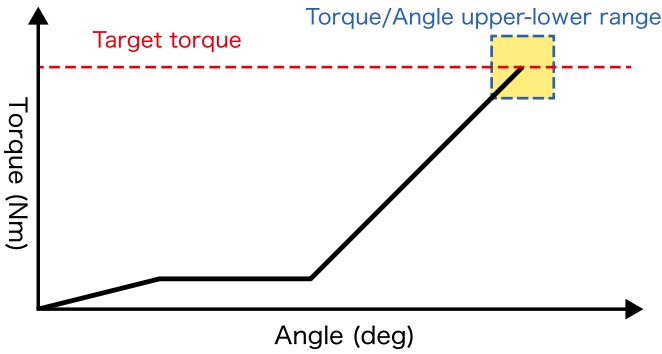
Maximum  
5,000Nm

## System configuration (Image)

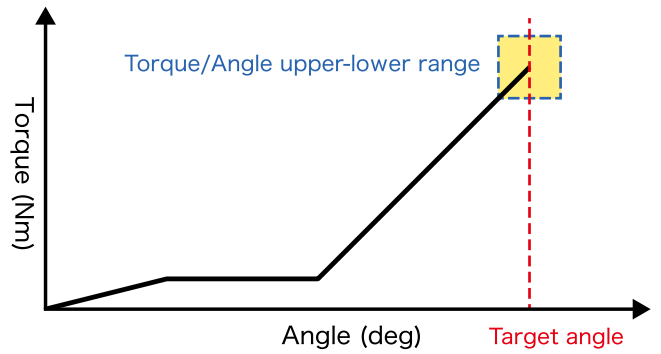


CONTROL AND FEATURES

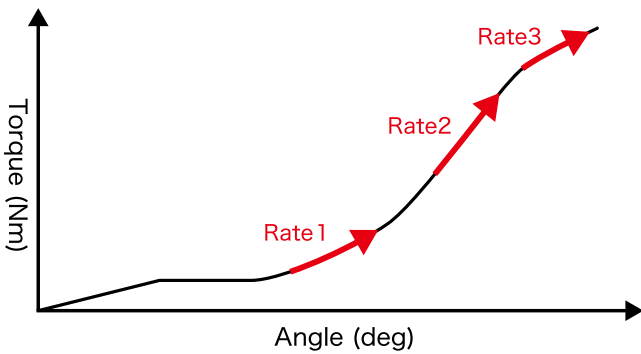
**Torque method** Tighten to the set target torque value.



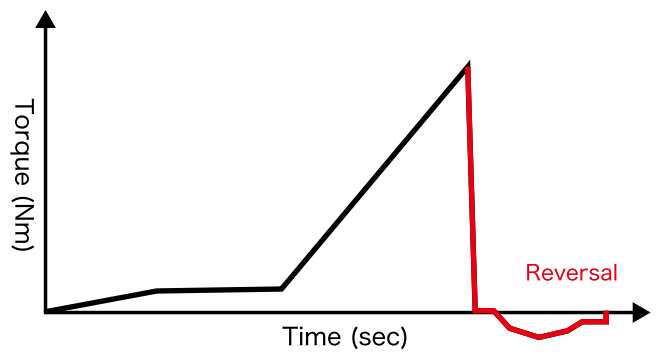
**Angle method** Tighten to the set target angle value.



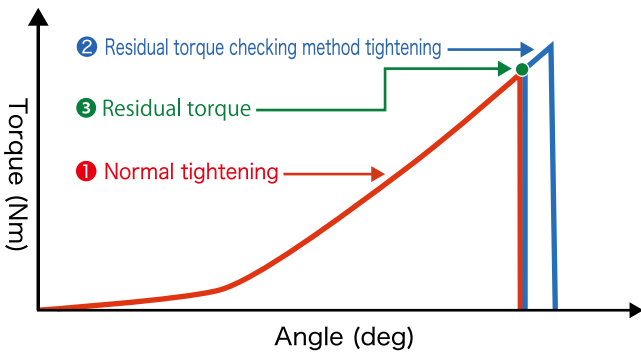
**Rate judgement** Monitor the torque / angle slope rise and judge if outside of the set limits.



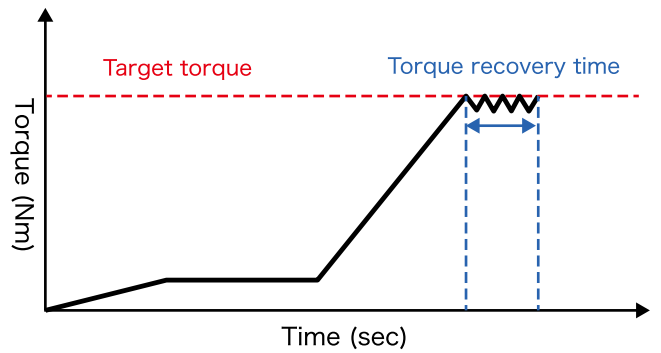
**1 Pulse reverse** Allows the disengagement of a locked fastener in the socket after tightening.



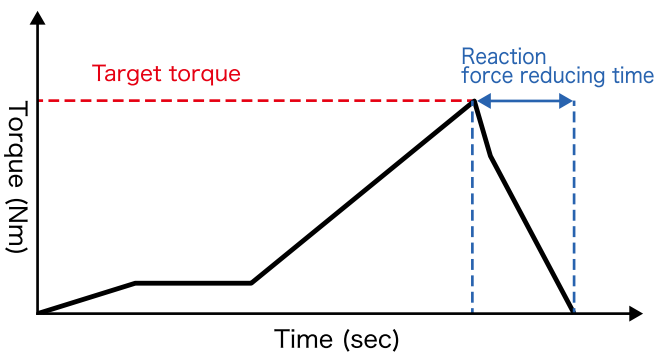
**Residual torque checking method** Detects residual torque by re-fastening a previously tightened fastener.



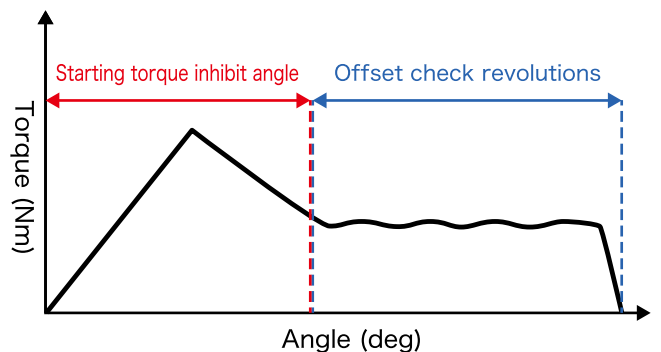
**Torque recovery** Reduces torque loss after fastening by maintaining torque for a set period of time.



**Reduce torque reaction** Function to reduce the torque reaction after reaching set torque.

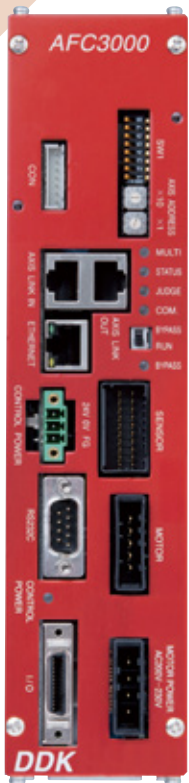


**Offset check** Function which allows the detection of adverse external torque (ie. external gearing) which could detriment actual dynamic torque applied.



# CONTROLLER AND EXPANSION UNIT

## BASE UNIT



## OPTIONAL UNIT



### Display

User Friendly Display

- Displays full content with 6 digit / 2 row LED
- Easily operated cursor keys

### Option1

Fieldbus I/O Interfaces

Various interfaces for direct PLC I/O & data connections

### Option2

Expansion COM Ports and memory

- Compact Flash (CF) for result data
- Expansion RS232C Input / Output ports



Momentary Max. Peak Current (Arms)

Unit Model	MFC-S008	MFC-S024	MFC-S060	MFC-S120
Momentary Max. Peak Current	5.6Arms	17.0Arms	42.4Arms	84.8Arms
Continuous AC Drive Current	1.1Arms	2.0Arms	4.0Arms	5.2Arms
Transformer Capacity	0.3KVAxspindles	0.3KVAxspindles	0.8KVAxspindles	4.0KVAxspindles
Input power	single phase-AC100V-230V±10%	3-phase AC200~230V±10% 50/60H		
Control Power	DC24V±10% 0.5A		DC24V±10% 1A	
Operating Environment	temperature 0°C~+50°C humidity -below 90%RH			
RS232C communication	38400bps (default)/19200bps/9600bps, 1port			
External analog monitor output	Torque analog voltage, angle pulse, CC/CW pulse etc.			
Axis Link Communication	Spindle Link Communication Port (connect Max. 32 spindles)			
Ethernet	PC communication port in conformity with IEEE802.3(100BASE-T)			
Standard I/O Connector	Input : 12 Output : 12			
Fastening Result Data memory	120,000 Cycles max		500 last REJECT cycles	
TQ. Curve Memory	Last 100 Curves		Last 100 Reject Curves	

Controller	Tool Model Supported	display	option1	option2
MFC-S008	MFT-***M10-*			
MFC-S024	CFT-***RS1-*	MFC-DP01	Fieldbus Industrial Ethernet	CF CFEN
MFC-S060	NFT-***RM1/RM2-*			
MFC-S120	CFT-***RS3-*			
MFC-S120	NFT-***RM3-*			
MFC-S120	CFT-***RM4J-*			
MFC-S120	NFT-***RM4H-*			
MFC-S120	NFT-***RM5-*			

Optional model	Description	Unit Type
MFC-DT	Expansion Discrete I/O	Option1
MFC-CC	Input : 32 Output : 32	
MFC-DN	CC-Link V2	
MFC-DN	DeviceNet	
MFC-PB	PROFIBUS DP-V1	
MFC-EN	EtherNet/IP	
MFC-PN	PROFINET IO	
MFC-CI	CC-Link IE Field	
MFC-EC	EtherCAT	
MFC-CF	CompactFlash card supported	
MFC-CFEN	Expansion RS232C(2port)	
MFC-CFEN	Ethernet for Server PC	Option2
MFC-CFEN	CompactFlash card supported	
MFC-CFEN	Expansion RS232C(1port)	

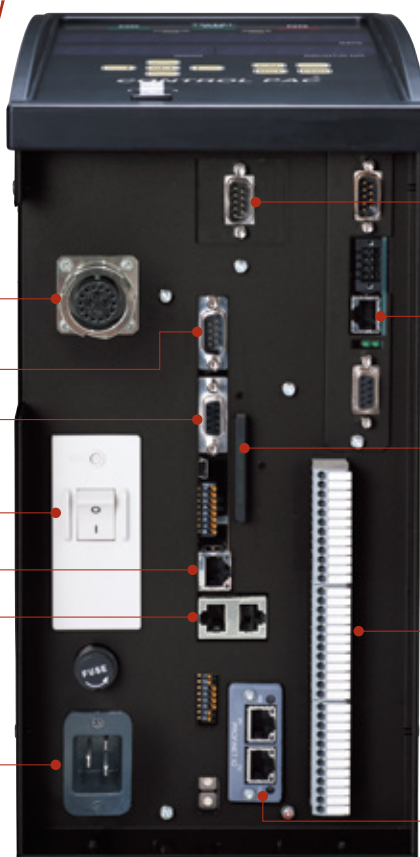


CONTROL PAC

FRONT PANEL



BOTTOM VIEW



Tool cable connector

Connector for RS232C communication(data output)

T/A monitor connector

Power source breaker

Connector for Ethernet communication (PC communication)

Axis Link Communication Connector

Primary power source connector

Option: RS232C-2 communication connector (ID Data Input)

Option: Connector for special ethernet data output protocols

CF card slot

I/O Terminal

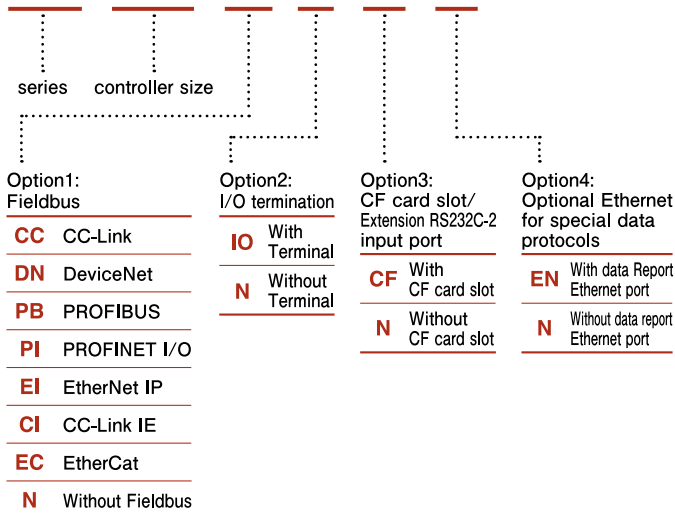
Various Fieldbus I/O interfaces

Unit Model	MFC-B060
Settings	Sequence: 64 Parameter: 128
Momentary Max. Peak Current	42.4Arms
Continuous AC Drive Current	5.2Arms
Input power	Single AC200~230V ±10%
Operating Environment	0°C~+45°C humidity below 90%RH
RS232C communication	38400bps (default)/19200bps/9600bps, 1 port
External analog monitor output	Torque analog voltage, angle pulse, CC/CW pulse etc.
Axis Link Communication	Spindle Link Communication Port (connect Max. 32 spindles)
Ethernet	PC communication port in conformity with IEEE802.3(100BASE-T)
Standard I/O Connector	Input : 12 Output : 12
Option	Please refer to the Option1-4 on the left side
Fastening Result Data memory	120,000 Cycles max 500 last Reject cycles
TQ. Curve Memory	Last 100 Curves Last 100 Reject Curves

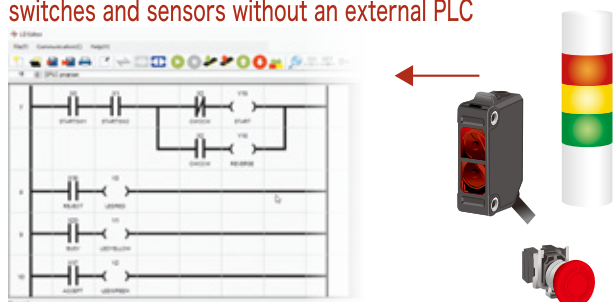
	Adapted tool model	Standard cable
CFT tool	CFT-***RS1- CFT-***RS3-*	C30-FT3-M** (M=length in meter Std:5, 10, 15 Max 25m)
NFT tool(RM)	NFT-***RM1- NFT-***RM2- NFT-***RM3-*	C30-FM2-M** (M=length in meter Std:5, 10, 15 Max 25m)

Control PAC model information

MFC - B060 - CC - IO - CF - EN



Internal PLC Logic control option: Ability to control external lights, switches and sensors without an external PLC



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the drawings  
from here



## MFT & CFT TOOLS

Tool type	Model	Max.Torque [Nm]	Max.Speed [rpm]	Weight [kg]	Length [mm] ※1	Square drive [mm]	Min.Pitch [mm]	Applicable controller
Micro	MFT-080M10-S1	0.8	2220	0.68	206	Hex. 6.35	31	MFC-S008
	MFT-160M10-S	1.6	1250	0.68	206	Hex. 6.35	31	MFC-S008
	MFT-240M10-S	2.4	800	0.68	206	Hex. 6.35	31	MFC-S008
Straight	CFT-051RS1-S/SL	5	1330	1.16	270	9.5	41	MFC-S024
	CFT-101RS1-S/SL (-H)	10	3000	1.26	275	9.5	39	MFC-S024
	CFT-201RS1-S/SL (-H)	20	1293	1.42	290	9.5	39	MFC-S024
	CFT-281RS1-S/SL (-H)	28	992	1.42	293	9.5	39	MFC-S024
	CFT-401RS1-S/SL (-H)	40	712	1.42	293	9.5	39	MFC-S024
	CFT-801RS3-S/SL (-H)	80	1015	3.4	372	12.7	50	MFC-S060
	CFT-132RS3-S1/S1L (-H)	130	574	3.4	372	12.7	50	MFC-S060
	CFT-202RS3-S/SL	200	387	4.3	390	15.9	59	MFC-S060
	CFT-302RS3-S/SL	300	260	5.8	440	19	71	MFC-S060
	CFT-502RM4J-S	500	238	13.5	500	25.4	89	MFC-S120
	CFT-802RM4J-S	800	150	15	566	25.4	96	MFC-S120
	CFT-113RM4J-S	1100	120	22	618	38.1	99	MFC-S120
	CFT-153RM4J-S	1500	88	28.5	633	38.1	115	MFC-S120
	Offset	CFT-201RS1-O/OL	20	1221	2	362	9.5	25
CFT-401RS1-O/OL		40	712	2.4	368	9.5	29	MFC-S024
CFT-801RS3-O/OL		80	1015	6	456	12.7	35	MFC-S060
CFT-132RS3-O1/O1L		130	574	7.5	484	15.9	39	MFC-S060
CFT-202RS3-O/OL		200	387	8.2	514	15.9	45	MFC-S060
CFT-302RS3-O/OL		300	260	13	583	19	55	MFC-S060
CFT-502RM4J-O		500	238	23.5	692	25.4	62	MFC-S120
CFT-802RM4J-O		800	150	31	788	25.4	71	MFC-S120
Angle head (Straight tool sold separately)	RA025-CFT	25	1941(101)	1.0	104	9.5	29	CFT-101/201RS1-S
	RA040-CFT	40	836(201)	1.3	135	9.5	37	CFT-201/281RS1-S
	RA060-CFT	60	460(401)	1.3	135	12.7	37	CFT-401RS1-S
	RA080-120-CFT	80	656(801)	2.0	157	12.7	42	CFT-801RS3-S
	RA130-120-CFT	130	656(801)	2.3	169	12.7	46	CFT-801RS3-S
	RA200-120-CFT	200	371(132)	2.7	196.5	15.9	56	CFT-132RS3-S1
	RA300-120-CFT	300	250(202)	5.0	248	19	67	CFT-202RS3-S

※Length means the length of standard tool including the square drive, Connector parts are not included, Please refer to the drawings from the above QR code.

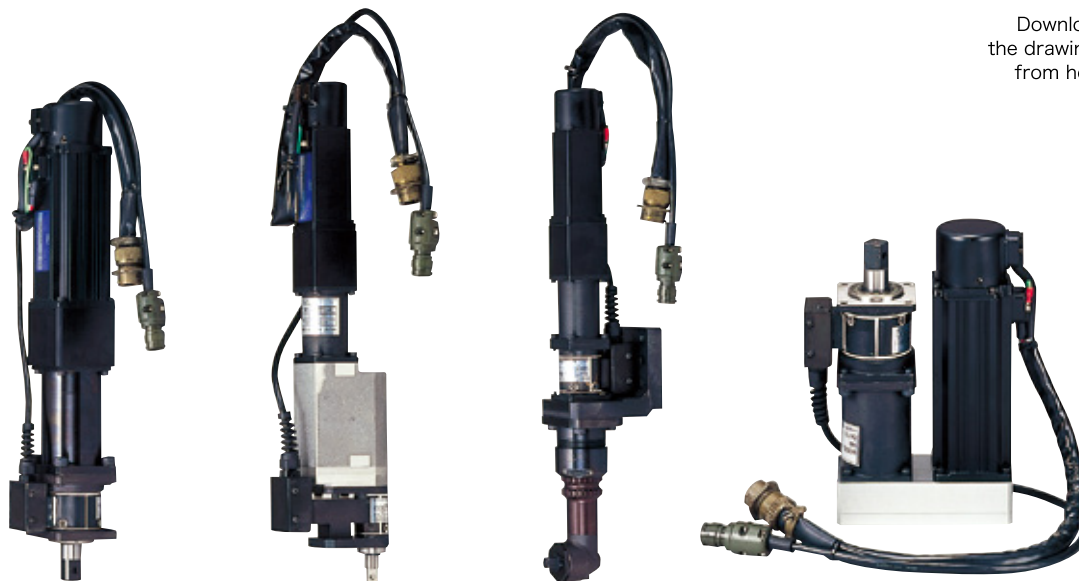
## CFT Spindle Adaptor

Model	Max.Torque [Nm]	Length [mm]	Stroke [mm]	Square drive [mm]	Applicable tool
CFT-SP401-40V	40	165	40	9.5	CFT-101RS1-S/SL (-H)
CFT-SP401-40HW	40	181	40	9.5	CFT-201RS1-S/SL (-H)
					CFT-281RS1-S/SL (-H)
					CFT-401RS1-S/SL (-H)
CFT-SP801-50V/H	80	217	50	12.7	CFT-801RS3-S/SL (-H)
CFT-SP132-50V/H	130	230	50	15.9	CFT-132RS3-S1/S1L (-H)
CFT-SP202-60V/H	200	253	60	19	CFT-202RS3-S/SL
CFT-SP302-70V/H	300	282	70	19	CFT-302RS3-S/SL
SP502Vertical/Horizontal	500	276	50	25.4	CFT-502RM4J-S



## Nutrunner tools

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the drawings  
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## NFT TOOLS

Tool type	Model	Max.Torque [Nm]	Max.Speed [rpm]	Weight [kg]	Length [mm] ※1	Square drive [mm]	Min.Pitch [mm]	Applicable controller
Straight	NFT-101RM1-S1	10	500	2.1	311	9.5	41	MFC-S024
	NFT-201RM1-S	20	500	2.1	311	9.5	41	MFC-S024
	NFT-301RM2A-S	30	600	2.1	367	9.5	41	MFC-S024
	NFT-401RM1-S	40	250	2.1	311	9.5	41	MFC-S024
	NFT-801RM3-S	80	500	4.5	408	12.7	61	MFC-S060
	NFT-132RM3-S	130	395	5.5	417	15.9	61	MFC-S060
	NFT-202RM3-S	200	220	6	438	15.9	63	MFC-S060
	NFT-302RM3-S	300	150	9	456	19	77	MFC-S060
	NFT-303RM5-S	3000	39	70	946	44.5	172	MFC-S120
NFT-503RM5-S	5000	22	90	930	50.8	207	MFC-S120	
Offset	NFT-201RM1-O	20	500	2.7	388	9.5	25	MFC-S024
	NFT-301RM2A-O	30	600	3	466	9.5	29	MFC-S024
	NFT-401RM1-O	40	250	3	410	9.5	29	MFC-S024
	NFT-801RM3-O	80	500	6.8	497	12.7	35	MFC-S060
	NFT-132RM3-O	130	395	8	537	15.9	39	MFC-S060
	NFT-202RM3-O	200	220	9.5	573	15.9	45	MFC-S060
	NFT-302RM3-O	300	150	13.5	606	19	55	MFC-S060
Angle	NFT-201RM1-A55	31	321	4.2	433.5	12.7	37	MFC-S024
	NFT-401RM1-A55	56	160	4.2	433.5	12.7	37	MFC-S024
	NFT-801RM3-A130	124	321	8.5	551.5	15.9	46	MFC-S060
	NFT-132RM3-A250U	202	250	11.3	580	15.9	57	MFC-S060
	NFT-202RM3-A250U	255	140	11.8	601	15.9	57	MFC-S060
	NFT-202RM3-A380	310	142	16.9	640	19	75	MFC-S060
	NFT-302RM3-A550	466	96	22.2	658	25.4	75	MFC-S060
U type	NFT-101RM1-S1U	10	500	2.5	141(150)	9.5	41	MFC-S024
	NFT-201RM1-SU	20	500	2.5	141(150)	9.5	41	MFC-S024
	NFT-401RM1-SU	40	250	2.5	141(150)	9.5	41	MFC-S024
	NFT-132RM3-SU	130	395	6.5	209(221)	15.9	61	MFC-S060
	NFT-202RM3-SU	200	220	7	230(221)	15.9	63	MFC-S060
	NFT-302RM3-SU	300	150	10	257(221)	19	77	MFC-S060

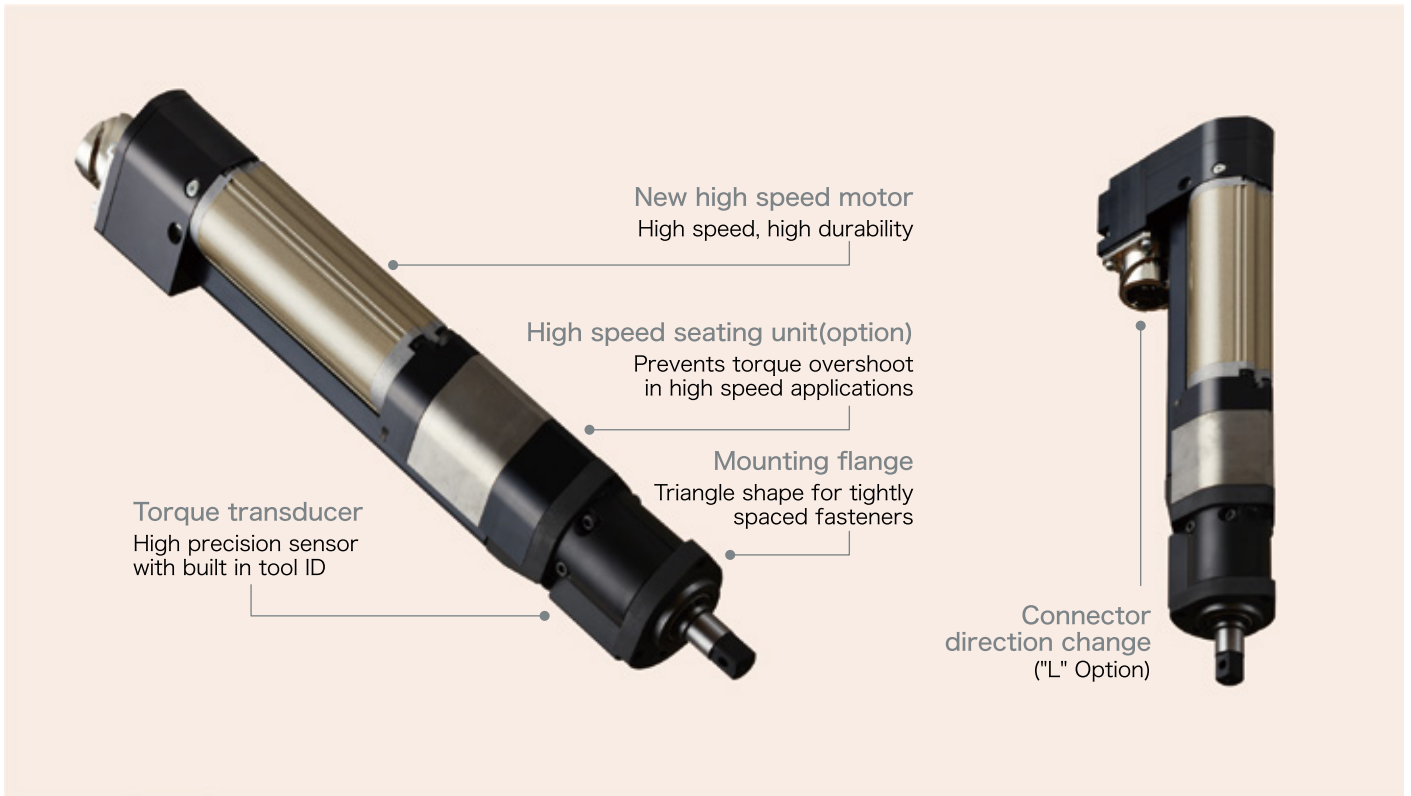
※Length means the length of standard tool including the square drive. Connector parts are not included. Please refer to the drawings from the above QR code.

## NFT Spindle Adaptor

Model	Max.Torque [Nm]	Length [mm]	Stroke [mm]	Square drive [mm]	Applicable tool
SP201 Vertical/Horizontal	20	156	25	9.5	NFT-201RM1-S/SU
SP401 Vertical/Horizontal	40	180	40	9.5	NFT-401RM1-S/SU
SP801 Vertical/Horizontal	80	218	50	12.7	NFT-801RM3-S/SU
SP202 Vertical/Horizontal	200	237	50	15.9	NFT-132/202RM3-S/SU
SP302 Vertical/Horizontal	300	240	50	19	NFT-302RM3-S/SU



## CFT tool features

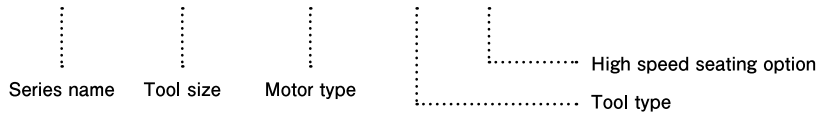


## CFT tool

## Model information

**CFT - 201**

**RS1 - S - H**



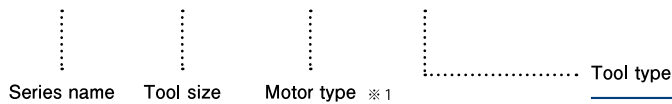
- S** Straight
- SL** Straight Tool Connector "L" Option
- O** Offset
- OL** Offset Tool Connector "L" Option

## NFT tool

## Model information

**NFT - 201**

**RM1 - S**



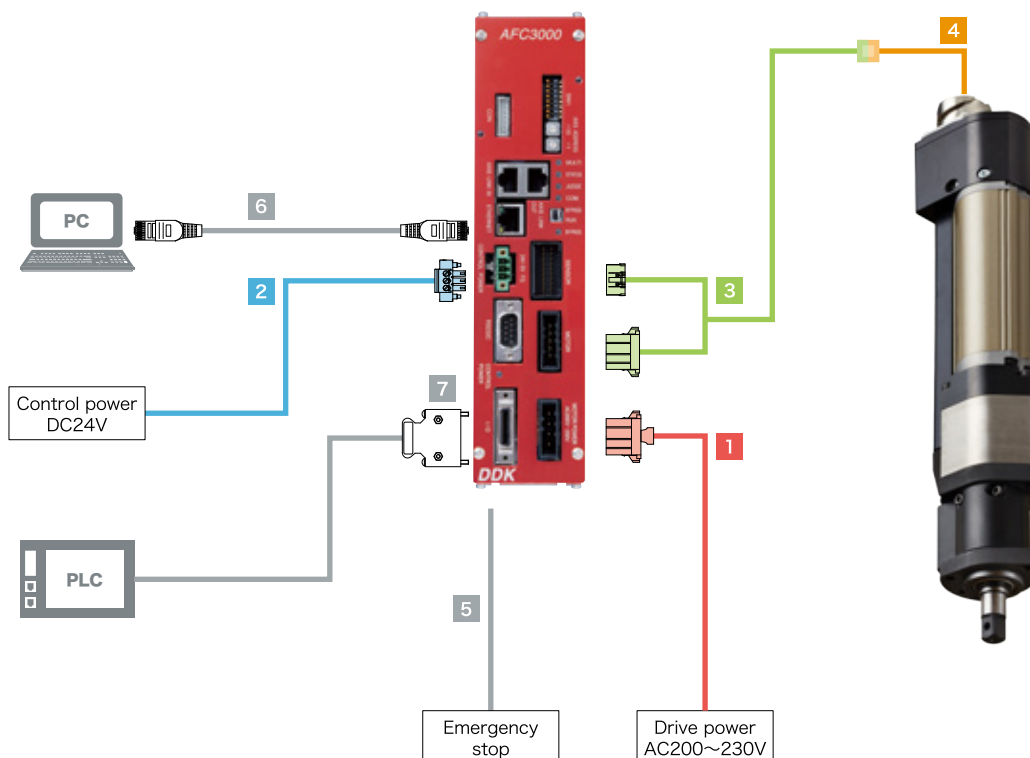
- S** Straight
- O** Offset
- A** Angle
- SU** U type

※1 Option



**RM1A/RM2A/RM3A**  
 "A" type adds motor connector directly mounted





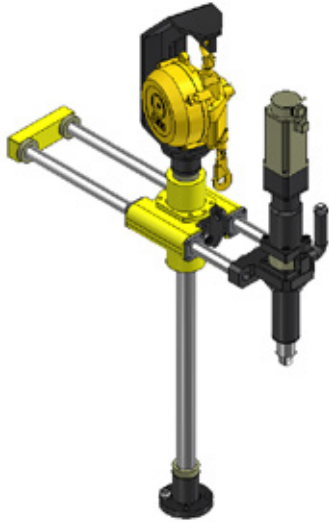
## Cable Applicable Table

No.	Cable name	MFT***M10*	CFT***RS1*	CFT***RS3*	CFT***RM4J*	NFT***RM1*	NFT***RM2*	NFT***RM3*	NFT***RM5*	Model	Standard length	CE <sub>※1</sub>	Remarks
1	Drive power cable for MFC-S008/S024/S060	■	■	■		■	■	■		C15-D1-M*	2m		Included in controller
	Drive power cable for MFC-S008/S024/S060(CE type)	■	■	■		■	■	■		C15-D1-M*-UC	2m	○	
	Drive power cable for MFC-S120				■					■ C15-D2-M*	2m		Included in controller
	Drive power cable for MFC-S120(CE type)				■					■ C15-D2-M*-UC	2m	○	
2	Control power cable for MFC	■	■	■	■	■	■	■		■ C30-DC1-M*	2m		
	Control power connector for MFC	■	■	■	■	■	■	■		■ MC1.5/3-STF-3.81			Included in controller
3	Tool cable for MFT	■								■ C30-FT2-M*	3m/5m/10m	○	
	Tool cable for CFT-RS1/RS3		■	■						■ C30-FT1-M*	5m/10m/15m	○	
	Tool cable for NFT-RM1/RM2/RM3					■	■	■		■ C30-FM1-M*	5m/10m/15m		For Robot type, please add "-R" to the end of the model
	Tool cable for CFT-RM4J,NFT-RM4H				■					■ C30-FW4-M*	5m/10m/15m		For Robot type, please add "-R" to the end of the model
	Motor cable for NFT-RM5								■	■ C15-M1-M*	5m/10m/15m		For Robot type, please add "-UR" to the end of the model
	Pre-amplifier & Resolver cable for NFT-RM5								■	■ C30-PR5-M*	5m/10m/15m		
4	Extension tool cable for CFT-RS1/RS3		■	■						■ C30-FT1-M*-E	5m/10m/15m	○	
	Extension tool cable for NFT-RM1/RM2/RM3					■	■	■		■ C15-EF1-M*	2m/5m/10m		C15-EF2-M*-LR for robot type.
	Extension tool cable for CFT-RM4J,NFT-RM4H				■					■ C15-EF2-M*	2m/5m/10m		For Robot type, please add "-UR" to the end of the model
	Extension motor cable for NFT-RM5								■	■ C15-EM1-M*	5m		For Robot type, please add "-UR" to the end of the model
	Extension resolver cable for NFT-RM5								■	■ C15-ER1-M*	2m/5m/10m		For Robot type, please add "-UR" to the end of the model
	Extension pre-amplifier cable for all NFT motors				■	■	■	■	■	■ C15-EP1-M*	2m/5m/10m		For Robot type, please add "-UR" to the end of the model
5	Stop signal connector	■	■	■	■	■	■	■		■ MC1.5/2-STF-3.81			Included in FieldBus Option 1
	Stop signal cable	■	■	■	■	■	■	■		■ C30-XA1-M2	2m		
6	Ethernet Crossover	■	■	■	■	■	■	■		■ C30-UL1-M3	3m		For direct connect
	Ethernet Straight	■	■	■	■	■	■	■		■ C30-UL2-M3	3m		For connect through HUB
7	Standard I/O connector	■	■	■	■	■	■	■		■ 10126-3000PE			Included in controller
	Standard I/O cable	■	■	■	■	■	■	■		■ C30-SU1-M3	3m		
8	Axis communication cable	■	■	■	■	■	■	■		■ C15-A3-M03	0.3m		
	Axis communication connector	■	■	■	■	■	■	■		■ C30-AL2			

※MFT,CFT tools are only compatible to CE.Please change to the control power cable to CE compatible model.  
 ※You need to change the Control power cable model to "-UC" but you don't need to change any other cables.

# Applications

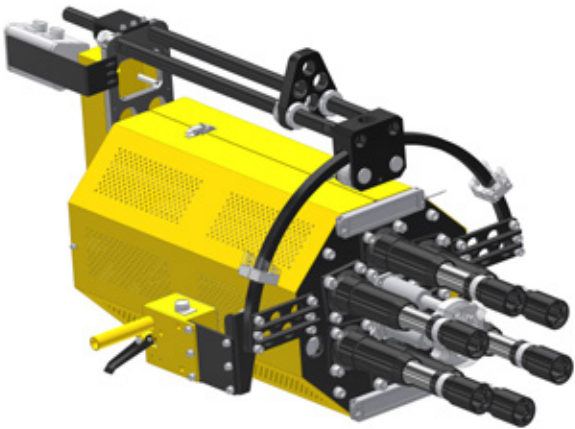
Sliding arm for manual production



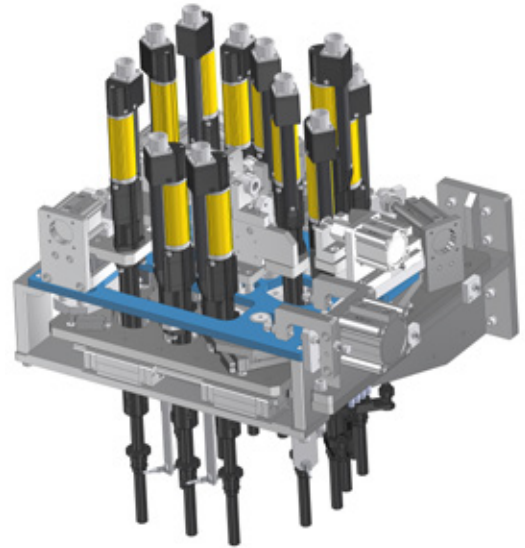
Multi-spindle manually-operated hanging head



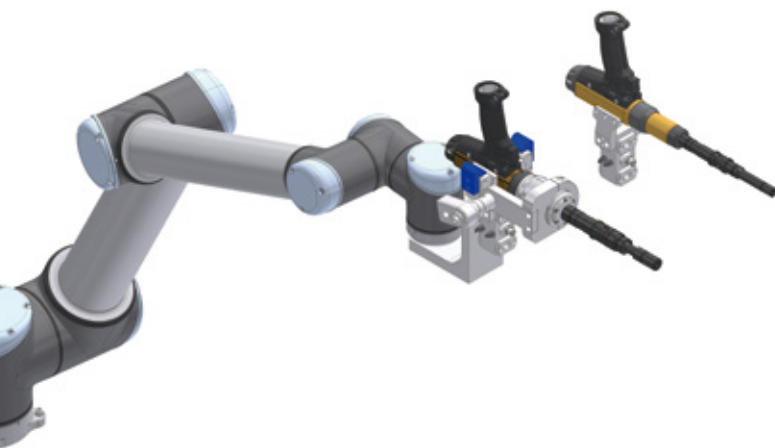
Tire fastening systems



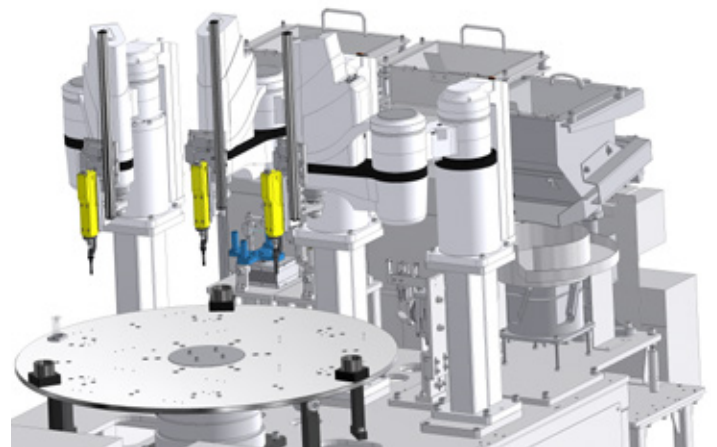
Open type, machine mount - variable pitch systems



Robotic systems (with tool change function)



Dial table type Micro-nutrunner systems

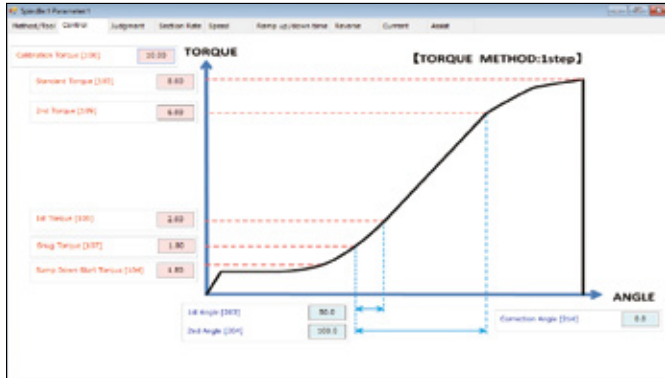


# User Console Software

## Setup / Monitor Software for Windows (MFC-UC-N)

- Simple graphic settings
  - Result data Collection & Storage
  - Fastening curve display and Excel format storage
  - Fastening Sequence function
- \*Supported language: Japanese/English/Chinese/Korean/Indonesian

### Control setting display



### Speed setting display



### Sequence setting display

Step	Comment	Date 1	Date 2	Unit	Comment
1	Start Method	Parameter 1		ON	
2	Line Report				
3	Report Jump	0			
4	1st Stop	Parameter 2		ON	
5	Data Report				
6	Report Jump	0			
7	2nd Stop	Parameter 3		ON	
8	Data Report				
9	End Cycle Data Report				

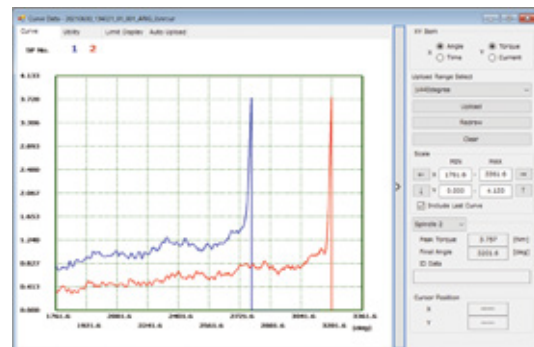
### I/O monitor

Input Device	Output Device	Output Device	Output Device
1. Emergency Stop	Total Report	Spindle 1	Spindle 2
2. Start	Total Report	Spindle 1	Spindle 2
3. Stop	Multi-Step/Manual	Spindle 1	Spindle 2
4. Start	Ready	Spindle 1	Spindle 2
5. Sequence Select Bit 1	Ready	Spindle 1	Spindle 2
6. Sequence Select Bit 2	Ready	Spindle 1	Spindle 2
7. Sequence Select Bit 3	Ready	Spindle 1	Spindle 2
8. Sequence Select Bit 4	Ready	Spindle 1	Spindle 2
9. Sequence Select Bit 5	Ready	Spindle 1	Spindle 2
10. Cycle Count UP	Ready	Spindle 1	Spindle 2
11. Cycle Count Clear	Ready	Spindle 1	Spindle 2
12. Input Mask Port 1	Ready	Spindle 1	Spindle 2
13. Input Mask Port 2	Ready	Spindle 1	Spindle 2
14. Input Mask Port 3	Ready	Spindle 1	Spindle 2
15. Input Mask Port 4	Ready	Spindle 1	Spindle 2
16. Spindle 1 BIT-FAULT	Ready	Spindle 1	Spindle 2
17. Spindle 2 BIT-FAULT	Ready	Spindle 1	Spindle 2
18. Spindle 3 BIT-FAULT	Ready	Spindle 1	Spindle 2
19. Spindle 4 BIT-FAULT	Ready	Spindle 1	Spindle 2
20. Spindle 5 BIT-FAULT	Ready	Spindle 1	Spindle 2
21. Spindle 6 BIT-FAULT	Ready	Spindle 1	Spindle 2
22. Spindle 7 BIT-FAULT	Ready	Spindle 1	Spindle 2
23. Spindle 8 BIT-FAULT	Ready	Spindle 1	Spindle 2
24. Spindle 9 BIT-FAULT	Ready	Spindle 1	Spindle 2
25. Spindle 10 BIT-FAULT	Ready	Spindle 1	Spindle 2
26. ID Data Clear	Ready	Spindle 1	Spindle 2
27. ID Select enable	Ready	Spindle 1	Spindle 2
28. Bit-Select 0	Ready	Spindle 1	Spindle 2
29. Bit-Select 1	Ready	Spindle 1	Spindle 2
30. Bit-Select 2	Ready	Spindle 1	Spindle 2

### Fastening result monitor

Spindle No.	Unit	Date	Time	Spindle Judgment	OK NG Item	Report Name	Spindle Cycle
88	2023-04-28	13:47:18	0	OK			75
89	2023-04-28	13:48:38	0	OK			75
90	2023-04-28	13:49:57	0	OK			69
91	2023-04-28	13:49:13	0	OK			...
92	2023-04-28	13:45:39	0	OK			67
93	2023-04-28	17:32:53	0	OK			66
94	2023-04-28	17:31:29	0	OK			65
95	2023-04-28	17:29:04	0	OK			...
96	2023-04-28	15:29:23	0	OK			93
97	2023-04-28	15:31:37	0	OK			82
98	2023-04-28	14:30:58	0	OK			61
99	2023-04-28	14:26:30	0	OK			60
70	2023-04-28	14:22:18	0	OK			59
71	2023-04-28	14:18:03	0	OK			58
72	2023-04-28	14:16:28	0	OK			57
73	2023-04-28	14:05:17	0	OK			57
74	2023-04-28	14:03:53	0	OK			56

### Fastening curve monitor





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