Operation manual update history

Aug.25,2017 page 30 / Add controller firmware, UI graphic and option card version, screwdriver serial no display on the Log-in window

page 40 / Add MAC address display on the network monitoring

Sep.25,2017 page 48,49,50 / Add Barcode setting and data saving with barcode number in SD Memory option card.

Revision : 1.1

July 05, 2017

Operation Manual MDC-26 / MDC-32

HANTAS

Human And Tightening Assembly Specialist

INDEX

1. GENERAL SAFETY RULES ENGLISH

WARNING! Read and understand all instructions. Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury

SAVE THIS INSTRUCTIONS

1.1 Work Area

- **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
- **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
- **Keep bystanders, children, and visitors away while operating a power tool.** Distractions can cause you to lose control.

1.2 Electrical Safety

- **Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded.** If the tools should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.
- **Avoid body contact with grounded surface ad pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is grounded.
- **Don't expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock
- **Do not abuse the cord. Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately.** Damaged cords increase the risk of electric shock.
- **When operating a power tool outside, use an outdoor extension cord marked W-A or W.** These cords are rated for outdoor use and reduce the risk of electric shock.

1.3 Personal Safety

- **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inflation while operating power tools may result in serious personal injury.
- **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.
- **Avoid accidental starting. Be sure switch is off before plugging in.** Carrying tools with

your finger on the switch or plugging in tools may result in personal injury.

- **Remove adjusting keys or switches before turning the tool on.** A wrench or a key that is left attached to a rotating part of the tool may result in personal injury.
- **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the tool in unexpected situations.
- **Use safety equipment. Always wear eye protection.** Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

1.4 Tool use and Care

- **Use clamps or other practical way to secure and support the workplace to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control.
- **Do not force tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
- **Do not use tool if switch does not turn it on or off.** Any tool that cannot be controlled with the switch is dangerous and must be repaired.
- **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety
- **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
- **Maintain tools with care**. **Keep cutting tools sharp and clean.** Properly maintained tools, with sharp cutting edges are less likely to bind and are easier to control.
- **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tools operation. If damaged, have the tool serviced before using.** Many accidents are caused by poorly maintained tools.
- **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool, may become hazardous when used on another tool.

1.5 SERVICE

- **Tool service must be performed only by qualified personnel.** Service or maintenance performed by unqualified personnel could result in a risk of injury
- **When servicing a tool, use only identical replacement parts. Follow instructions in the Maintenance section of this manual.** Use of unauthorized parts or failure to follow Maintenance instructions may create a risk of electric shock or injury.

2. SPECIFIC SAFETY RULES

2.1 Hold tool by insulated gripping surfaces when performing an operation where the cutting tool may contact hidden wiring or its own cord. Contact with a "live" wire will make exposed metal parts of the tool "live" and shock the operator.

2.2 Never lubricate aerosol oil on to the electrical part.

FRENCH

1. RÈGLES DE SÉCURITÉ GÉNERALÉS

AVERTISSEMENT ! Vous devez lire et comprendre les instructions. Le non-respect, même partiel, des instructions ci-près entraîne un rispue de choc électrique, d`incendie et/ou de blessures graves

CONSERVEZ CES INSTRUCTIONS

1.1 Aire de travail

- **Veillez à ce que l'aire de travail soit propre et bien éclairée.** Le désordre et le manque de lumière favorisent les accidents.
- **N`utilisez pas d`outils electriques dans une atmosphère explosive, par exemple en présence de liquides, de gaz ou de poussières inflammables.** Les outils électriques créent des étincelles qui pourraient enflammer les poussières ou les vapeurs.
- **Tenez à distance les curieux, les enfants et les visiteurs pendant que vous travaillez avec un outil électrique.** Ils pourraient vous distraire et vous faire une fausse manouevre.

1.2 Sécurité électrique

- **Les outils mis à la terre doivent être branches dans une prise de courant correctement installée et mise à la terre conformément à tous les codes et règlements pertinents. Ne modifiez jamais la fiche de quelque facon que ce soit, par exemple en enlevant la broche de mise à la terre. N`utilisez pas d`adaptateur de fiche. Si vous n`êtes pas certain que la prise de courant est correctement mise à la terre, adressez-vous à un électricien qualitié.** En cas de défaillance ou de défectuosité électrique de l`outil, une mise à la terre ofire un trajet de faible résistance à l`électricité qui autrement risquerait de traverser l`utilisateur.
- **Évitea tout contact corporel avec des surfaces mises à la terre (tuyauterie, radiateurs, cuisinières, réfrigérateurs, etc.).** Le riaque de choc électrique est plus grand si votre corps est en contact avec la terre.
- **N`exposez pas les outils électriques à la pluie ou à l`eau.** La présence d`eau dans un outil électrique augmente le risque de choc élecrique.
- **Ne maltraitez pas le cordon. Ne transportez pas l`outil par son cordon et ne débranchez pas la fiche en tirant sur le cordon. N`exposez pas le cordon à la chaleur, à des huiles, à des arêtes vives ou à des pièces en mouvement.**
  Remplacez immédiatement un cordon endommagé. Un dordon endommage augmente le risque de choc électrique.
- **Lorsque vous utilisez un outil electrique à l`extérieur, employez un**

**prolongateur pour l`extérieur marqué "W-A" ou "W".** Ces cordons sont faits pour étre utilisés à l`extérieur et réduisent le risque de choc électrique.

1.3 Sécurité des personnes

- **Restez alerte, concentrez-vous sur votre travail et faites preuve de jugement. N`utilisez pas un outil électrique si vous êtes fatigué ou souis l`influence de drogues, d`alcool ou de médicaments.** Un instant d`inattention suffit pour entrainer des biessures graves.
- **Habillez-vous convenablement. Ne portez ni vêtements flottants ni bijoux. Confinez les cheveux longs. N`approchez jamais les cheveux, les vê tements ou les gants des pièces en mouvements.** Des vêtements flottants, des bijoux ou des cheveux longs risquent d`être happés par des pièces en mouvement.
- **Méfiez-vous d`un démarrage accidentel. Avant de brancher l`outil, assurez-vous que son interrupteur est sur ARRÈT.** Le fait de transporter un outil avec le doigt sur la détente ou de brancher un outil dont l`interrupteur est en position MARCHE peut mener tout droit à un accident.
- **Enievez les cles de régiage ou de serrage avant de démarrer l`outil.** Une clé laissée dans une pièce tournante de l`outil peut provoquer des blessures.
- **Ne vous penchez pas trop en avant. Maintenz un bon appui et restez en équilibre en tout temps.** Un bonne stabilité vous permet de mieux réagir à une situation inattendue.
- **Utilisez des accessoires de sécurité. portez toujours des lunettes ou une visière.** Seleon les conditions, portez aussi un masque antipoussière, des bottes de sécurité antidéranpantes, un casque protecteur et.ou un appareil antibruit.

1.4 Utilisation et entretien des outils

- **Immobilisez le matériau sur une surface stabie au moyen de brides ou de toute autre facon adéquate.** Le fait de tenir la piece avec la main ou contre votre corps ofite une stabilité insuffisante et peut amener un dérapage de l`outil.
- **Ne forcez pas l`outil. Utilisez l`outil approprié à la tâche.** L`outil correct fonctionne mieux et de facon plus sécuritaire. Respectez aussi la vitesse de travail qui lui est propre.
- **N`utilisez pas un outil si son interrupteur est bloqué.** Un outil que vous ne pouvez pas commander par son interrupteur est dangereux et doit être réparé.
- **Débranchez la fiche de l`outil avant d`effectuer un réglage, de changer d`accessoire ou de ranger l`outil.** De telies mesures préventives de sécurité réduisent le risque de démarragte accidentel de l`outil.
- **Rangez les outils hors de la portée des enfants et d`qutres personnes inexperimentée.** Les outils sont dangereux dans ies mains d`utilisateurs

novices.

- **Prenez soin de bien entretenir les outils. Les outils de coupe doivent être toujours bien aff 苣tés et proptres.** Des outils bien entretenus, dont les arêtes sont bien tranchantes, sont moins susceptibles de coincer et plus faciles à diriger.
- **Soyez attentif à tout désalignement ou coincement des pièces en mouvnment, à tout bris ou à toute autre condition préjudiciable au bon fonctionnement de l`outil. Si vous constatez qu`un ouitl est endommagé, faites-le répqrer avant de vous en servir.** De nombreux accidents sont causés par des outils en mauvais état.
- **N`utilisez que des accessoires que le fabricant recommande pour votre modéle d`outil.** Cetains accessoires peuvent convenir à un outil, mais être dangereux avec un autre.

1.5 RÉPARATION

- **La réparation des outils électriques doit être confiée à un réparateur qualifié.** L`entretien ou la réparation d1un outil électrique par un amateur peut avoir des conséquences graves.
- **Pour la réparation d`un ouitl, n`employez que des pièces de rechange d`origine. Suivez les directives données à la section Réparation de ce manuel.** Lemploi de pièces non autorisées ou le non-respect des instructions d`entretien peut créer un risque de choc électrique ou de blessures.

2. **RÉGLE DE SÉCURITÉ PARTICULIÉRE**

2.1 T**enez l`outil par ses surfaces de prise isolées pendant toute opération où l`outil de coupe pourrait venir en contact avec un càblage dissimulé ou avec son propre cordon.** En cas de contact avec un conducteur sous tension, les pièces métalliques à découvert de l`outil transmettraient un choc électrique à l`utilisateur

2.2 **Never lubricate aerosol oil on to the electrical part.**

3. Product

It consist of DC Servo screwdriver and controller as a complete system.

1) Standard packing item

Screwdriver

Cable_14P (3m)

MDC-26, MDC-32 controller

2) Option accessories

44P I/O wiring box

ParaMon Touch

AC adapter
(DC24V,1A)

RS-232C cable

Vacuum
pick-up assy

Bit holder
for long bit

4. Main features

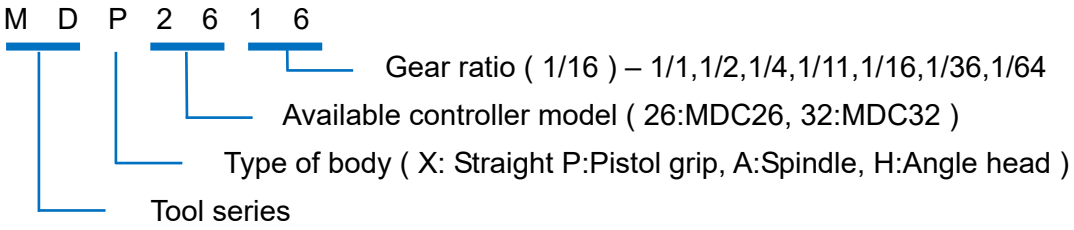
1) Digital torque and angle program in 15 preset numbers and 2 multi step sequence programs
2) 15 Models managing variable presets with counting no. and I/O in sequential 10 steps
3) Color LCD touch screen with easy control
4) Auto speed setting by torque
5) Monitoring fastening quality and count of screw numbers
6) Error information by code display
7) Easy parameter setting and monitoring by ParaMON (PC software)
8) Real time torque data and curve display
9) Real time fastening data output
10) Modbus protocol
11) RS232C, Ethernet communication port

5. Screwdriver

5.1 General specification

no	Item	Specification
1	Electric power	DC38V, 5A max
2	Motor	Swiss DC servo motor
6	Torque accuracy	10% in full scale
7	Torque repeatability	+/- 3%
8	Speed	Auto speed by torque setting,

5.2 Model specification



- Straight hand-held (Lever start)

Model	Torque(kgf.cm)	Speed range	Bit socket	Controller
MD2601	0.3 ~ 4	150-2000	Hex1/4” or dia.4	MDC-26
MD2602	0.5 ~ 7	150-2000	Hex1/4” or dia.4	
MD2604	2 ~ 14	150-1500	Hex1/4”	
MD2611	4~ 34	100-900	Hex1/4”	
MD2616	5 ~ 50	100-620	Hex1/4”	
MD3201	1 ~ 12	150-2000	Hex1/4”	MDC-32
MD3202	2 ~ 22	150-2000	Hex1/4”	
MD3204	4 ~ 40	150-1500	Hex1/4”	
MD3211	10 ~ 90	50-690	Hex1/4”	
MD3216	20 ~ 140	50-470	Hex1/4”	
MD3236	40 ~ 280	50-210	SQ3/8	
MD3264	80 ~ 500	50-115	SQ1/2	

● Pistol grip hand held (Trigger start)

Model	Torque(kgf.cm)	Speed range	Bit socket	Controller
MDP3201	1 ~ 12	150-2000	Hex1/4”	MDC-32
MDP3202	2 ~ 22	150-2000	Hex1/4”	
MDP3204	4 ~ 40	150-1500	Hex1/4”	
MDP3211	10 ~ 90	50-690	Hex1/4”	
MDP3216	20 ~ 140	50-470	Hex1/4”	
MDP3236	40 ~ 280	50-210	Hex1/4”	
MDP3264	80 ~ 500	50-115	SQ3/8	

● Angle head hand-held (Lever start)

Model	Torque(kgf.cm)	Speed range	Bit socket	Controller
MDH2604	2 ~ 14	150-1500	Hex1/4”	MDC-26
MDH2611	4~ 34	100-900	Hex1/4”	
MDH2616	5 ~ 50	100-620	Hex1/4”	
MDH3201	1 ~ 12	150-2000	Hex1/4”	MDC-32
MDH3202	2 ~ 22	150-2000	Hex1/4”	
MDH3204	4 ~ 40	150-1500	Hex1/4”	
MDH3211	10 ~ 90	50-690	Hex1/4”	
MDH3216	20 ~ 140	50-470	Hex1/4”	
MDH3236	40 ~ 280	50-210	SQ3/8	
MDH3264	80 ~ 500	50-115	SQ1/2	

MD26xx

MD32xx

MDP32xx

MDH32xx

● Spindle for automation (Remote start by I/O)

Model	Torque(kgf.cm)	Speed range	Bit socket	Wight	Controller
MDA2201	0.10 ~ 0.7	1000	dia.4 half moon		MDC-26
MDA2204	0.2 ~ 2.8	1000	dia.4 half moon		
MDA2601	0.3 ~ 4	150-2000	dia.4 half moon		
MDA2602	0.5 ~ 7	150-2000	Hex1/4” or dia.4		
MDA2604	2 ~ 14	150-1500	Hex1/4” or dia.4		
MDA2611	4 ~ 34	100-900	Hex1/4”		
MDA2616	5 ~ 50	100-620	Hex1/4”		
MDA3201	1 ~ 12	150-2000	Hex1/4”		MDC-32
MDA3202	2 ~ 22	150-2000	Hex1/4”		
MDA3204	4 ~ 40	150-1500	Hex1/4”		
MDA3211	10 ~ 90	50-690	Hex1/4”		
MDA3216	20 ~ 140	50-470	Hex1/4”		
MDA3236	40 ~ 280	50-210	SQ3/8		
MDA3264	80 ~ 500	50-115	SQ1/2		

★ Options

C : Bit cushion – rotating shaft has 4.5mm stroke sliding up cushion

V : Vacuum pick-up assy – screw pick-up by vacuum. It require custom design for mouthpiece

MDA2201-E+C

MDA2201-E+VC

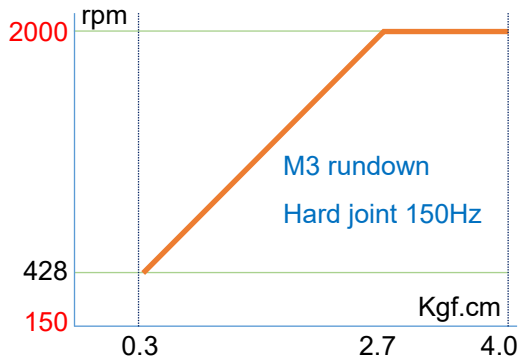
MDA32xx-A

MDA32xx-A

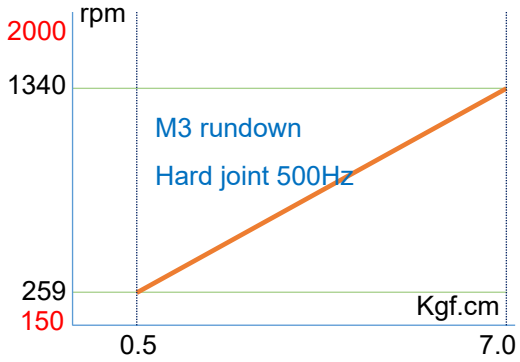
With vacuum pick-up

5.3 Auto Speed by torque setting under the each test condition

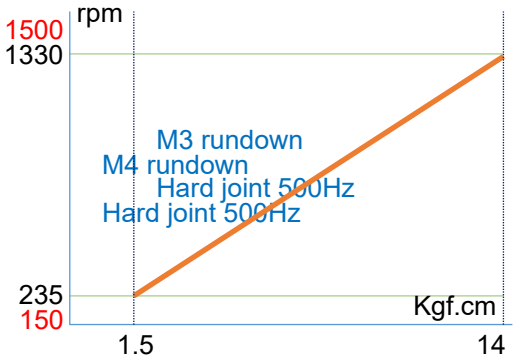
- Speed range : Available setting range by manual
- **Auto speed by torque setting** : Safe speed not exceeding over torque by rotation inertia under the testing conditions described on the chart



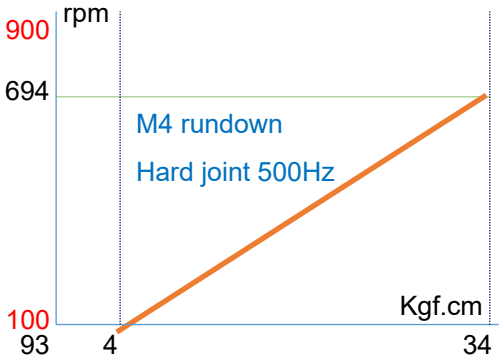
MD2601



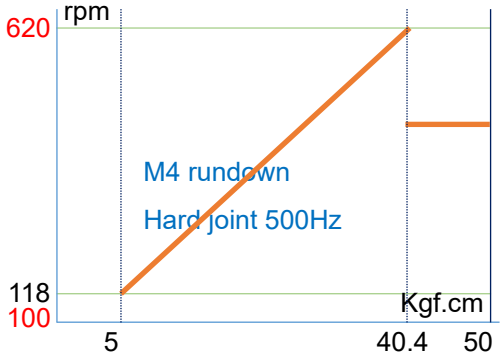
MD2602



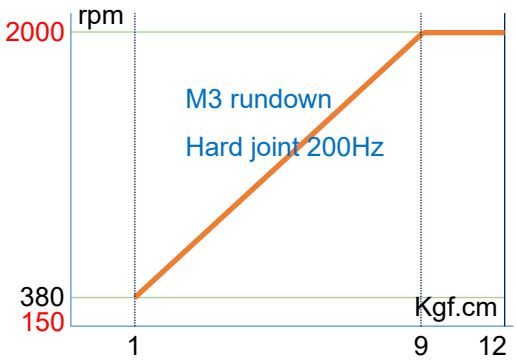
MD2604



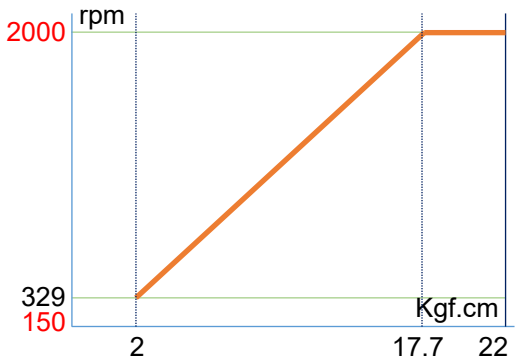
MD2611



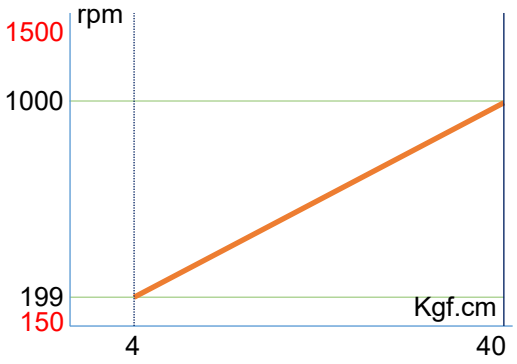
MD2616



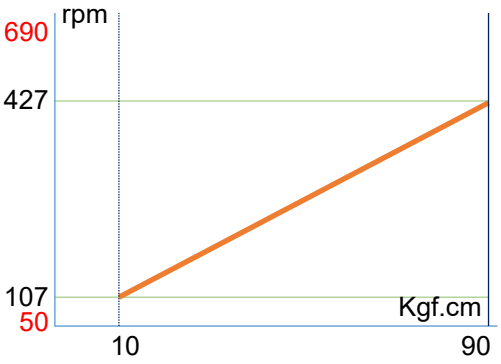
MD3201



MD3202



MD3204



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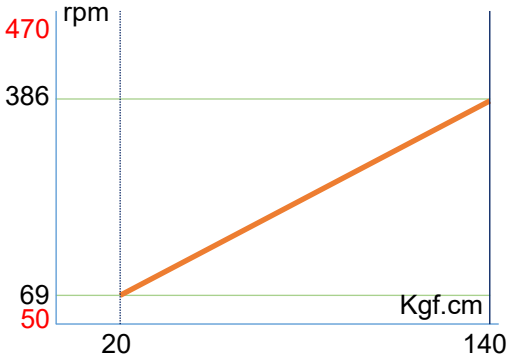
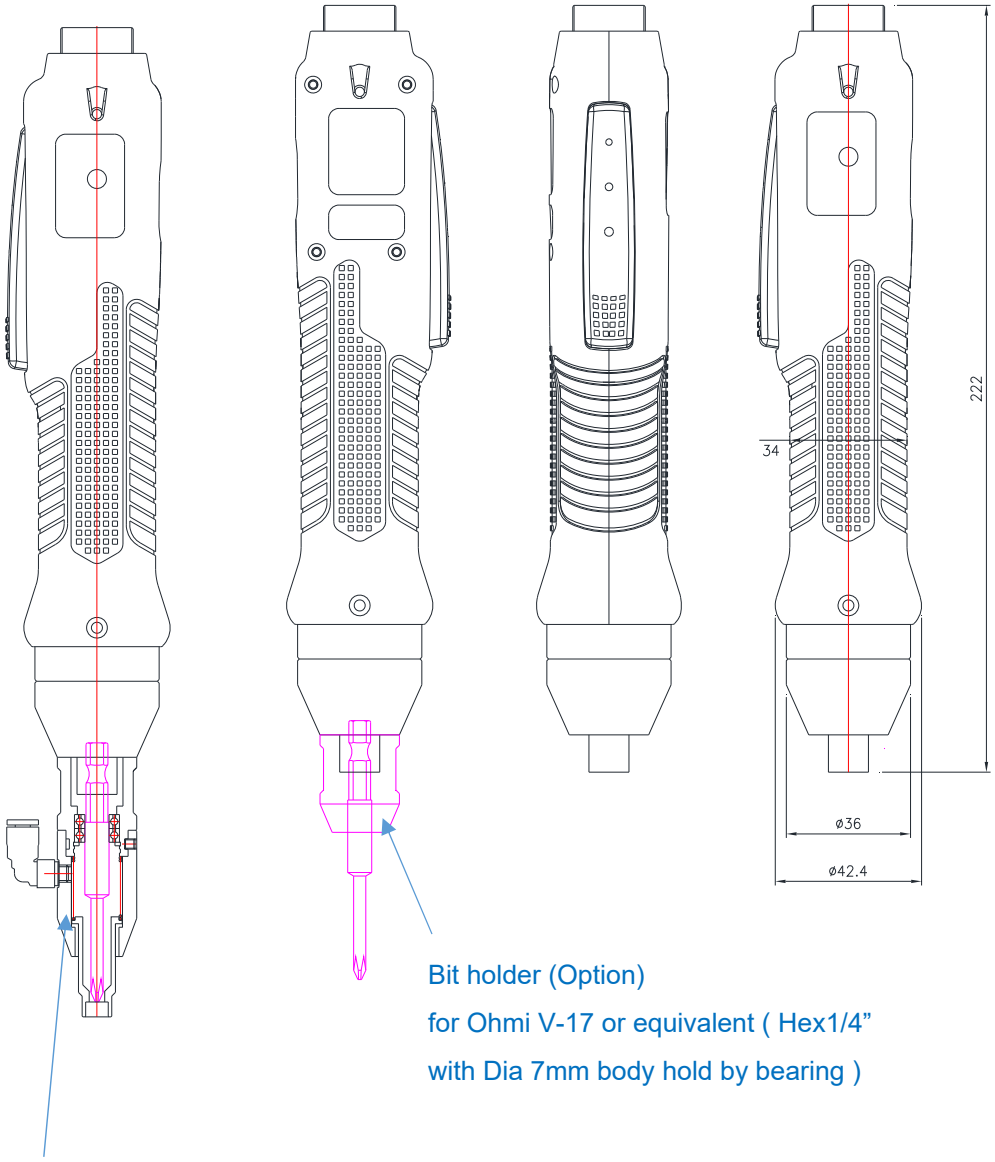


MD3216

5.4 Screwdriver dimension

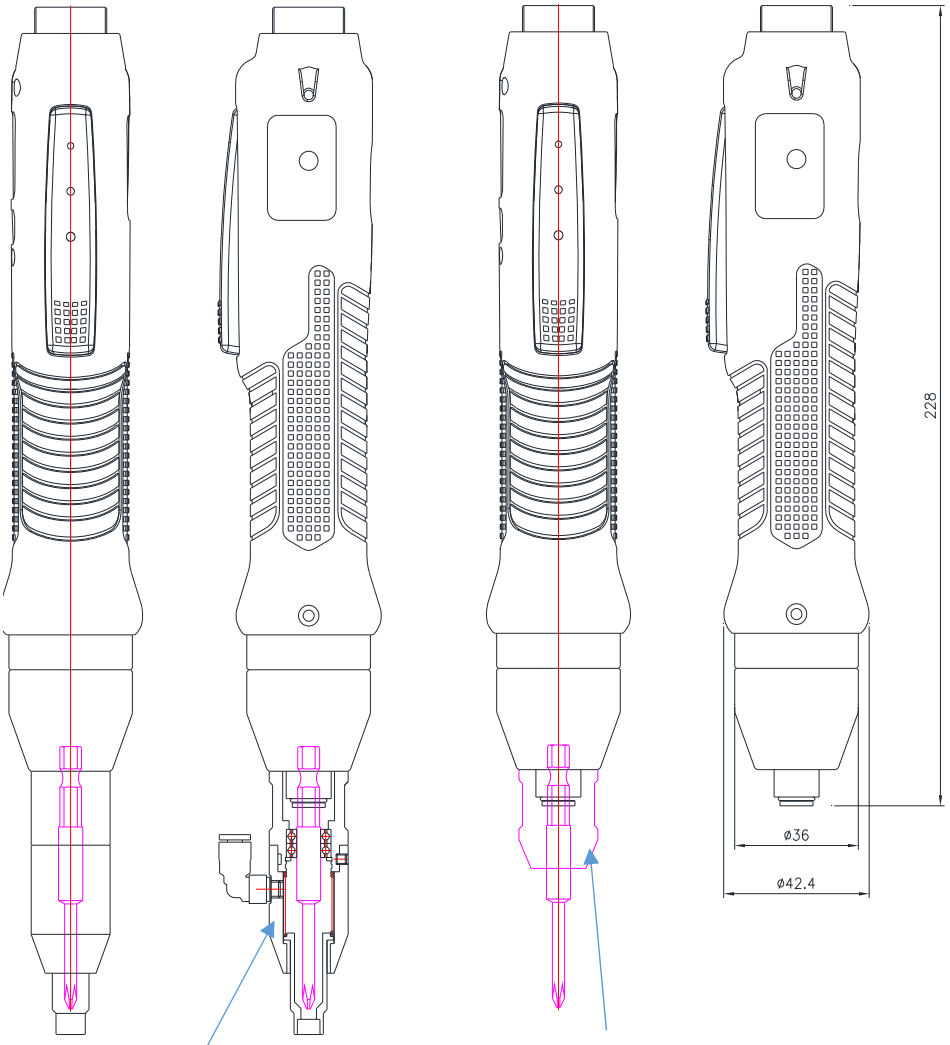
■ MD2601, MD2602



Bit holder (Option)
for Ohmi V-17 or equivalent (Hex1/4”
with Dia 7mm body hold by bearing)

Vacuum pick-up assy (Option)
for Ohmi V-17 or equivalent (Hex1/4” with Dia 7mm body hold by bearing)
Mouth piece is not included in the assy. It is custom designed for each screw size and applications. The above described vacuum pick-up assy is for one of the application. It doesn’t work for all application.

■ MD2604, MD2611, MD2616



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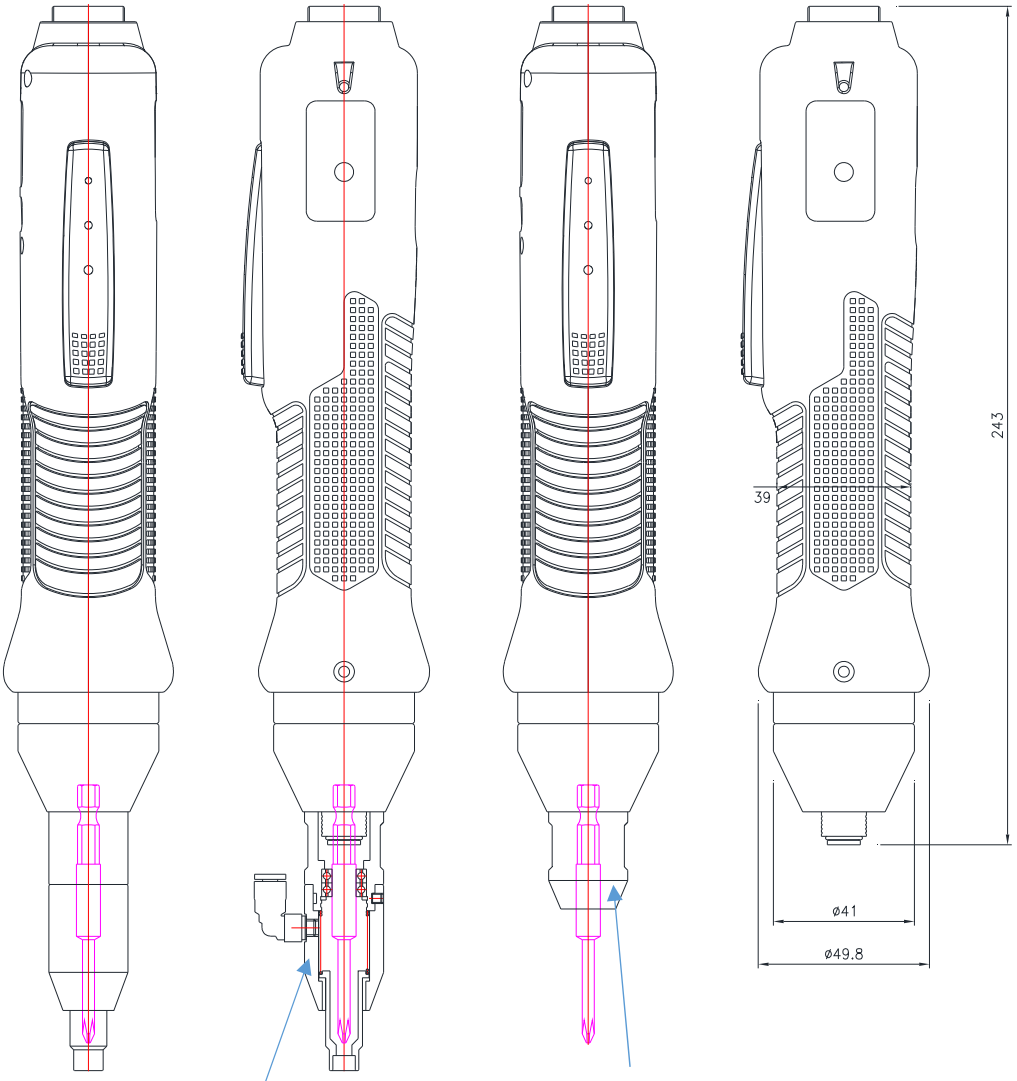
■ MD3201, MD3202



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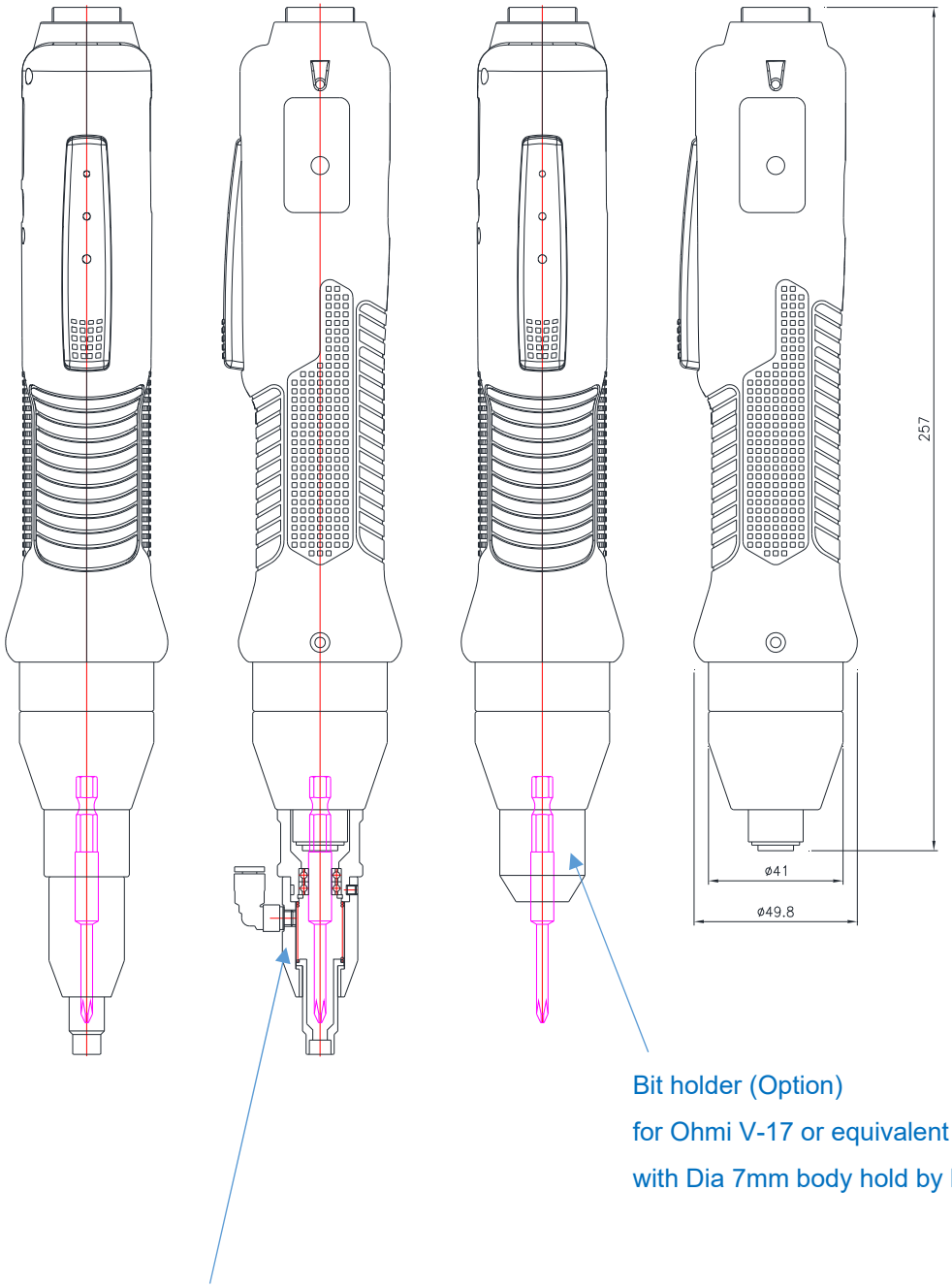
■ MD3204, MD3211, MD3216



Bit holder (Option)
for Ohmi V-17 or equivalent (Hex1/4”
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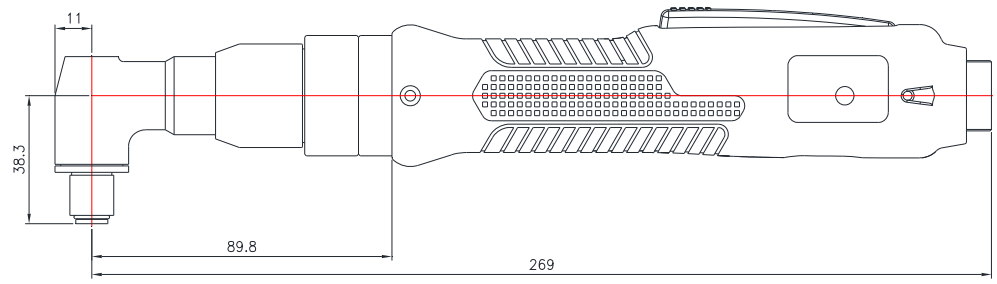
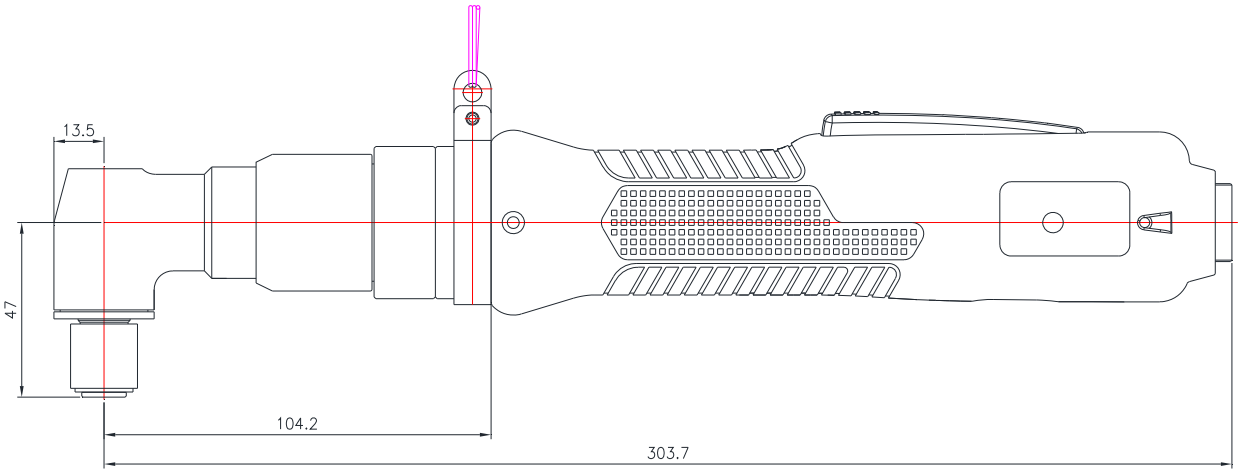
■ MDH2604, MDH2611, MDH2616

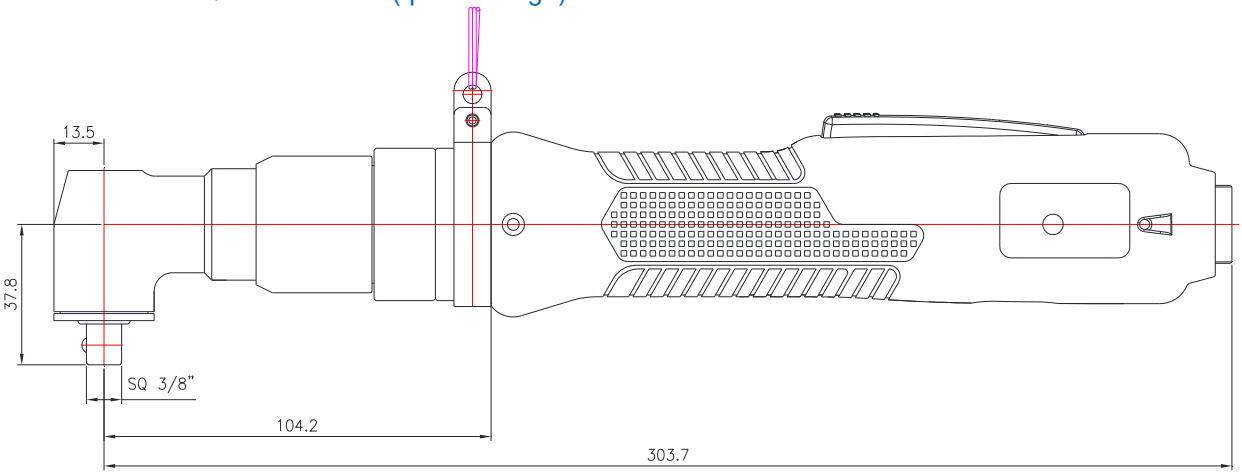


Bit socket : 1/4” hex female (quick change)

■ MDH3201, MDH3204, MDH3211, MDH3216

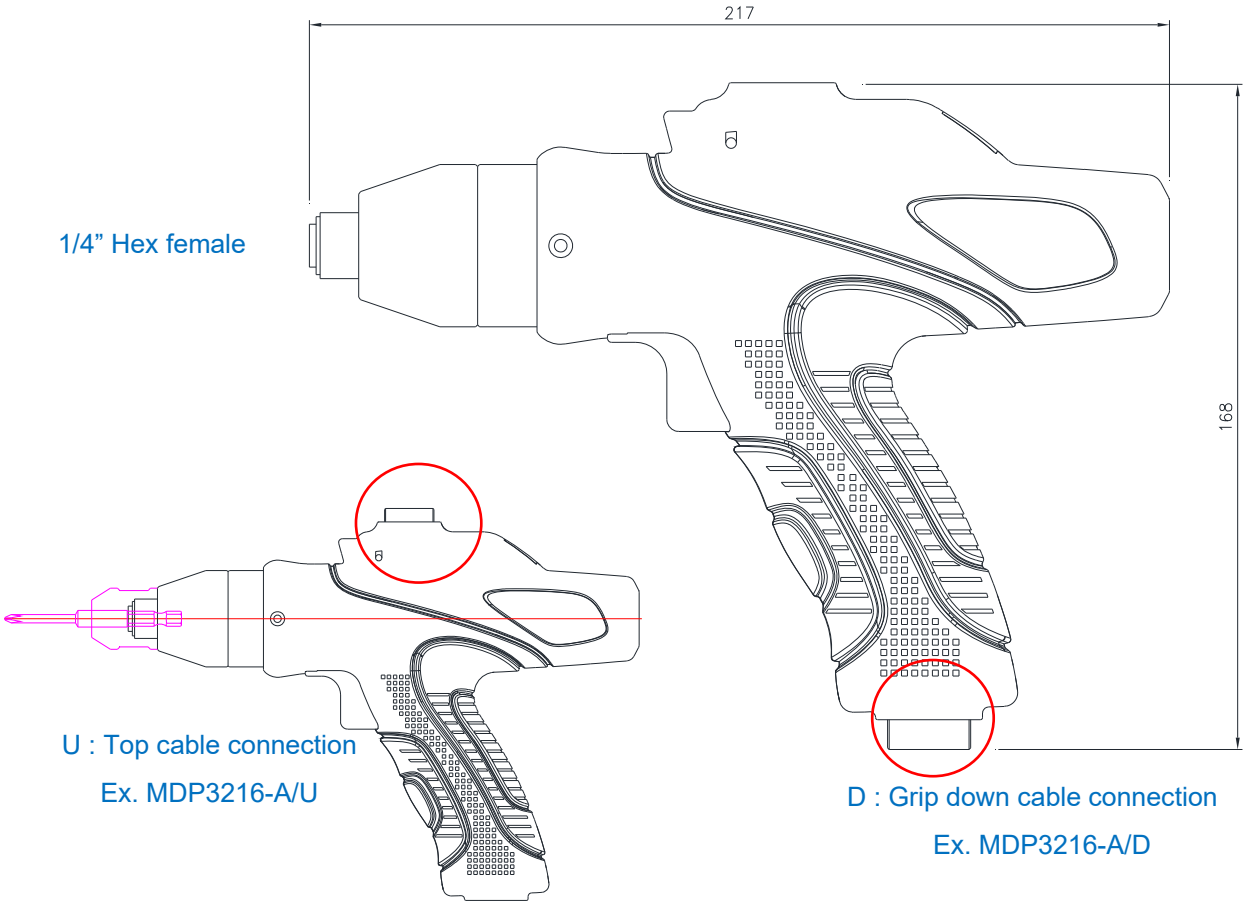


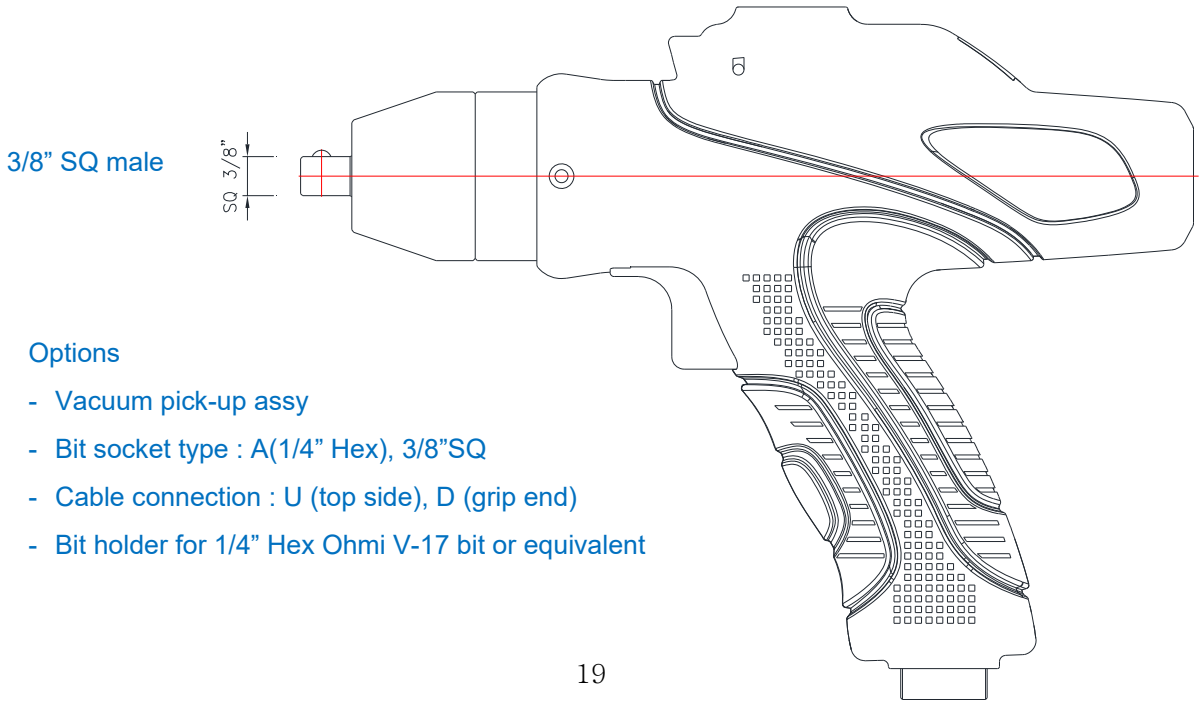
Bit socket : 1/4” hex female (quick change)



Bit socket : 3/8”SQ drive

■ MDP3201, MDP3202, MDP3204, MDP3211, MDP3216





Options

- Vacuum pick-up assy
- Bit socket type : A(1/4” Hex), 3/8”SQ
- Cable connection : U (top side), D (grip end)
- Bit holder for 1/4” Hex Ohmi V-17 bit or equivalent

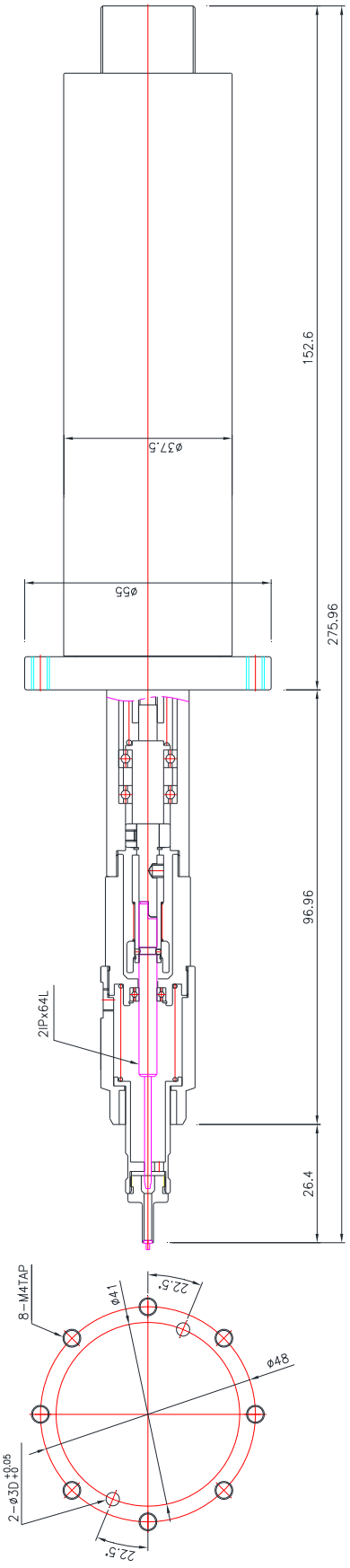
■ MDA2201-E +VC

M D A 2 2 0 1 - E + V C

Model

Bit type
A:1/4”Hex
E:Dia.4mm

Option accessory
V : Vacuum pick-up assy
C : Bit Cushion



Vacuum pick-up + Bit cushion (Option)

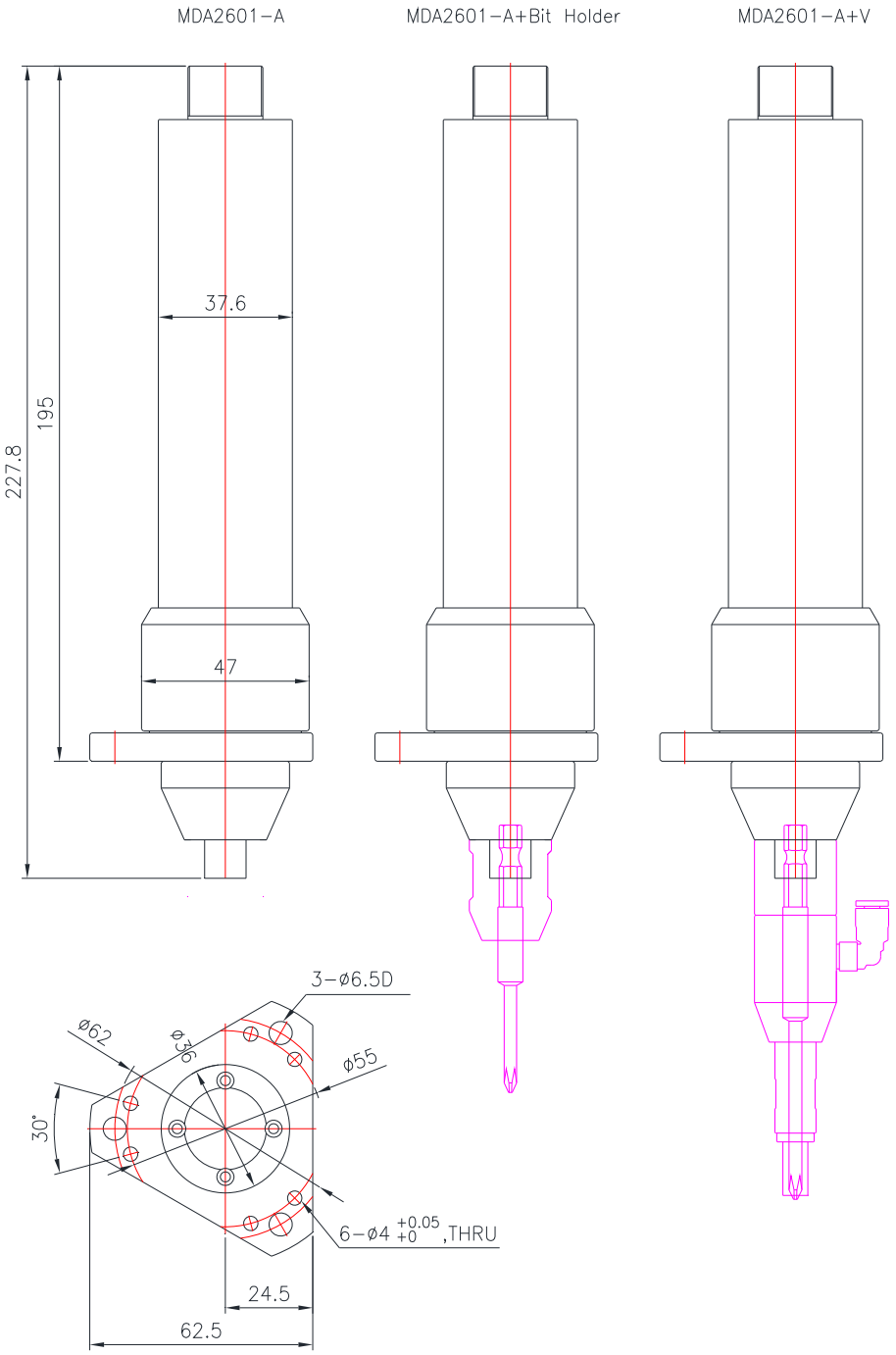
Available model : MD2207-E

Bit socket : 4mm round half moon D-cut

Bit cushion : 5mm stroke

Mouthpiece : Custom design (not included)

■ MDA2601

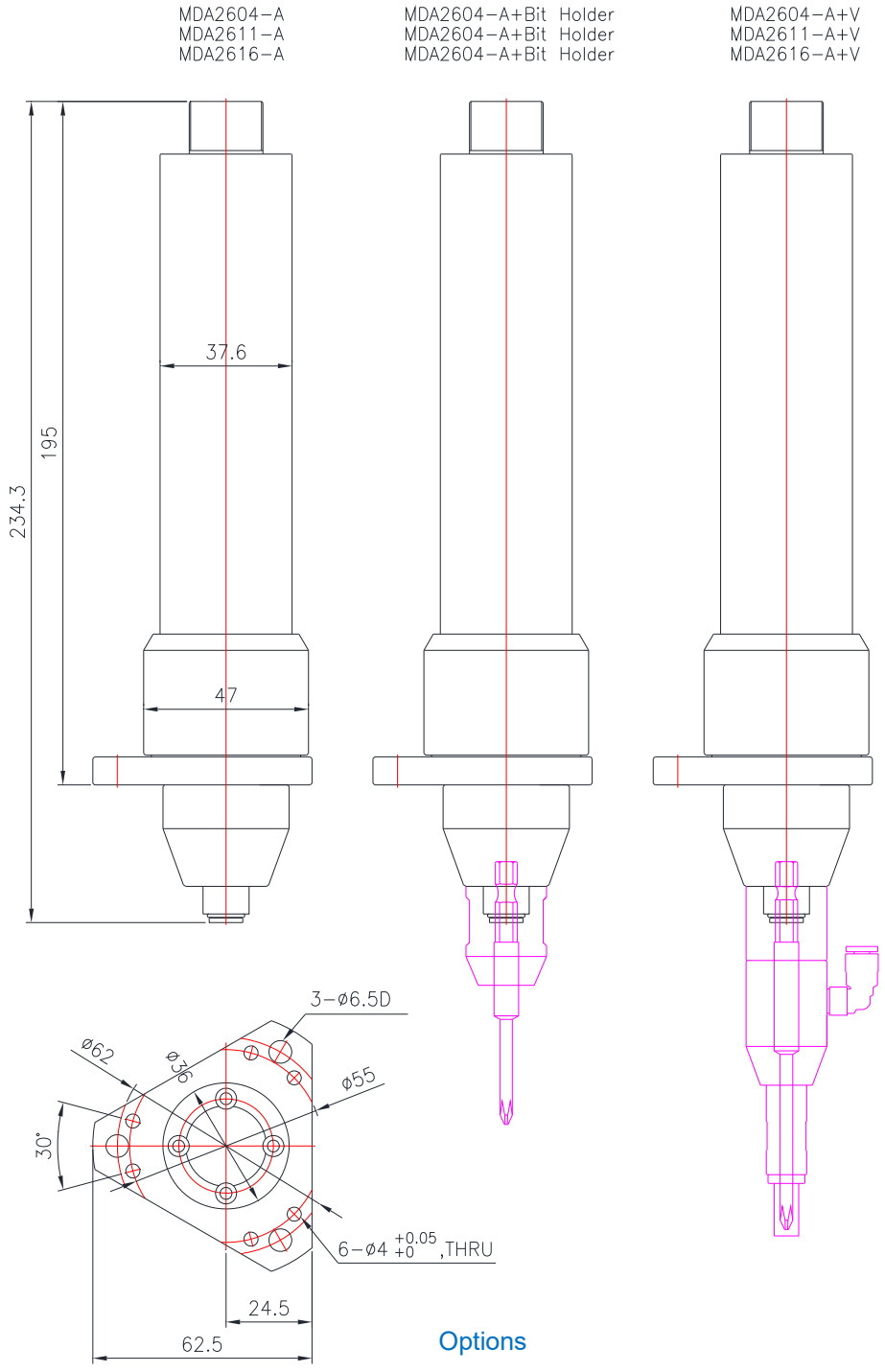


1/4” Hex female

Options

- Bit holder with bearing
- Vacuum pick-up assy
- Bit : 1/4” Hex Ohmi V-17 bit or equivalent

■ MDA2604, MDA2611, MDA2616

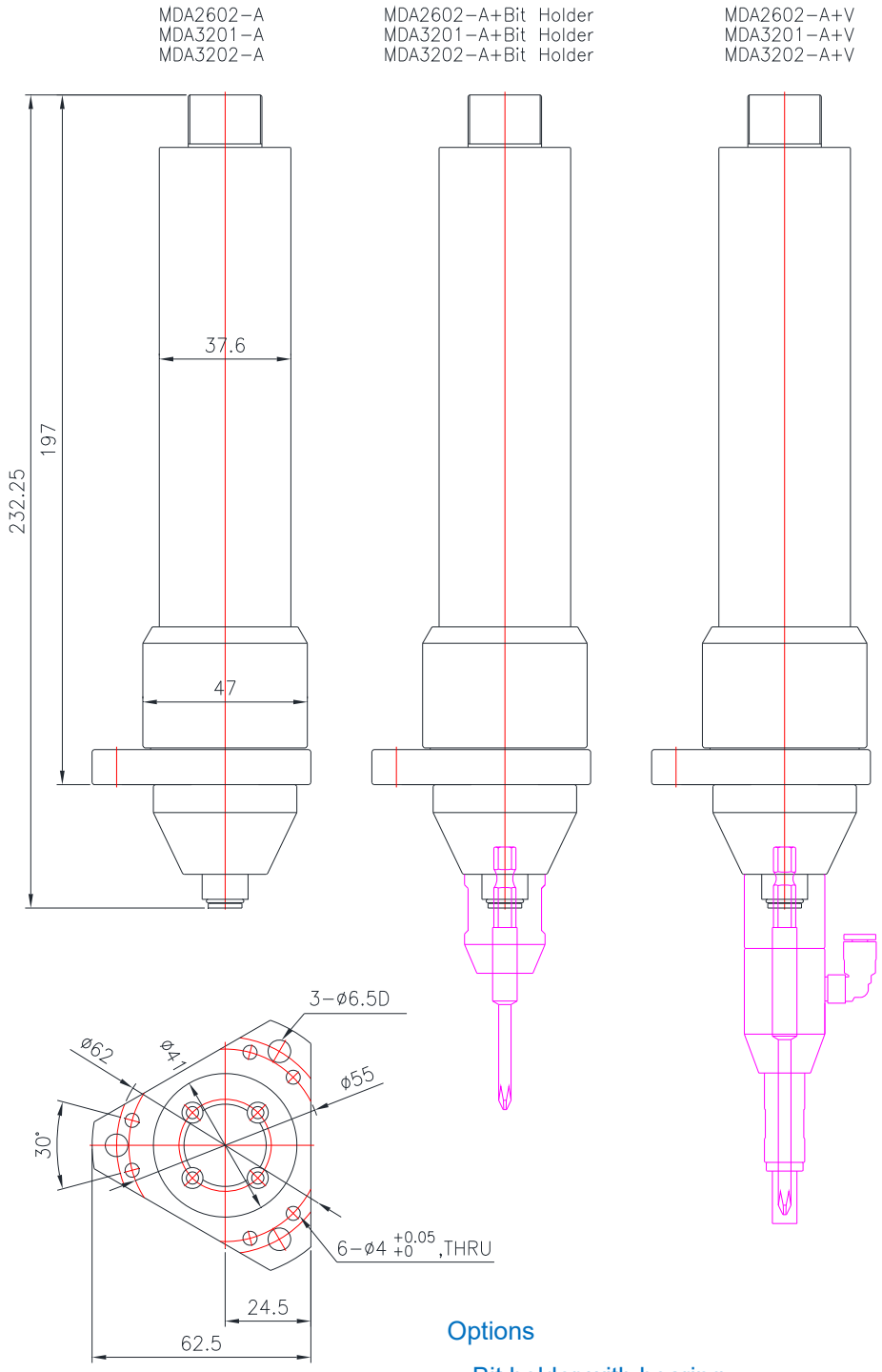


1/4” Hex female

Options

- Bit holder with bearing
- Vacuum pick-up assy
- Bit : 1/4” Hex Ohmi V-17 bit or equivalent

■ MDA2602, MDA3201, MDA3202

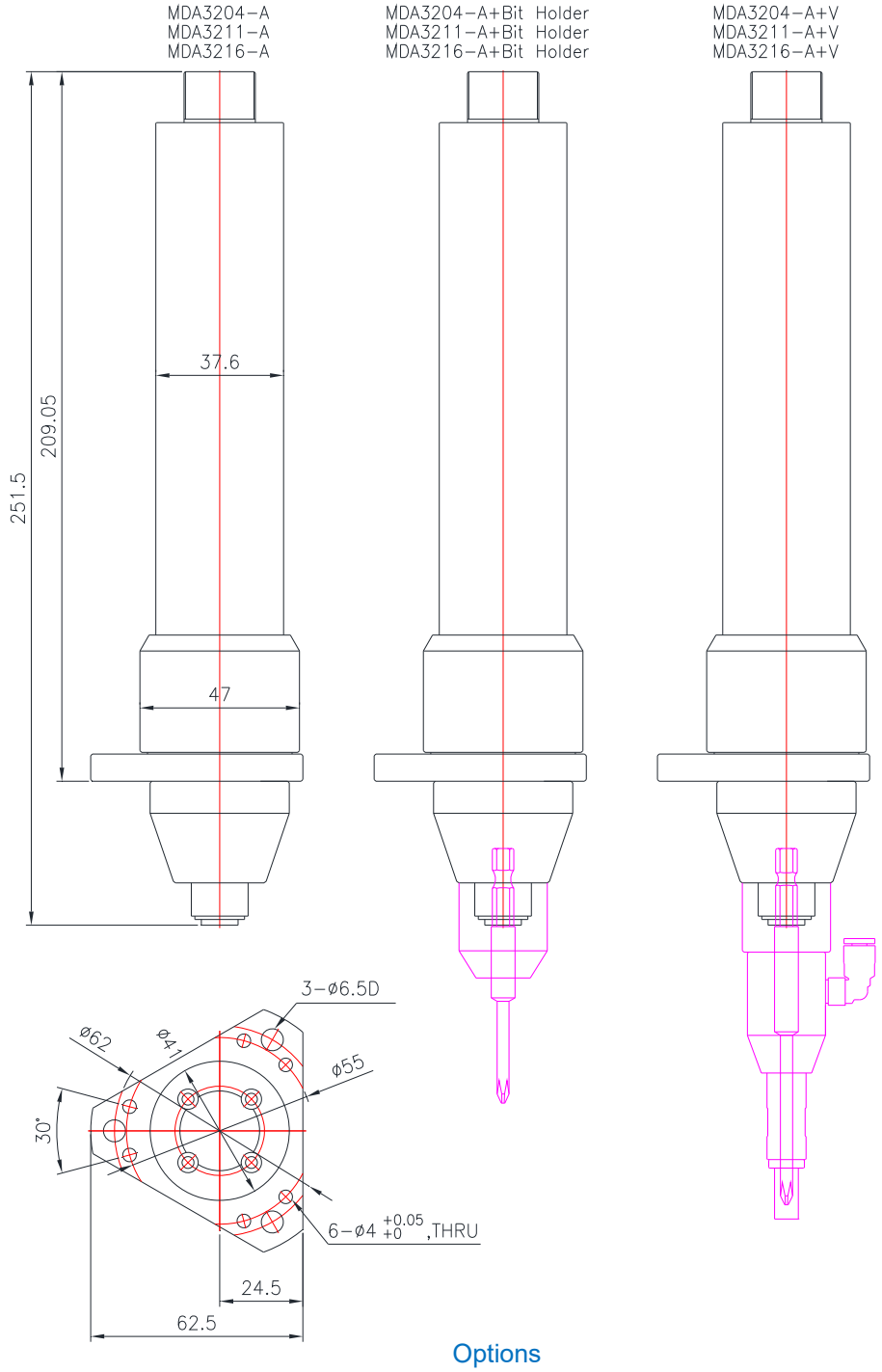


1/4” Hex female

Options

- Bit holder with bearing
- Vacuum pick-up assy
- Bit : 1/4” Hex Ohmi V-17 bit or equivalent

■ MDA3204, MDA3211, MDA3216



1/4” Hex female

Options

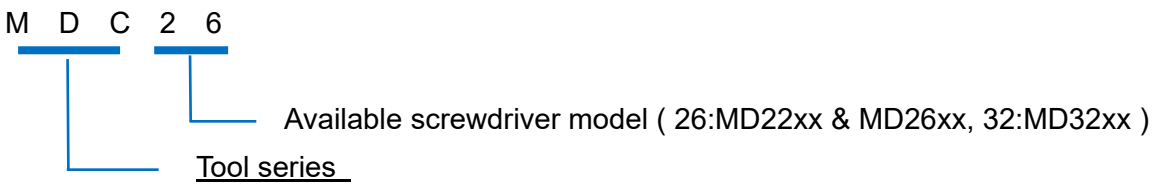
- Bit holder with bearing
- Vacuum pick-up assy
- Bit : 1/4” Hex Ohmi V-17 bit or equivalent

6. Controller

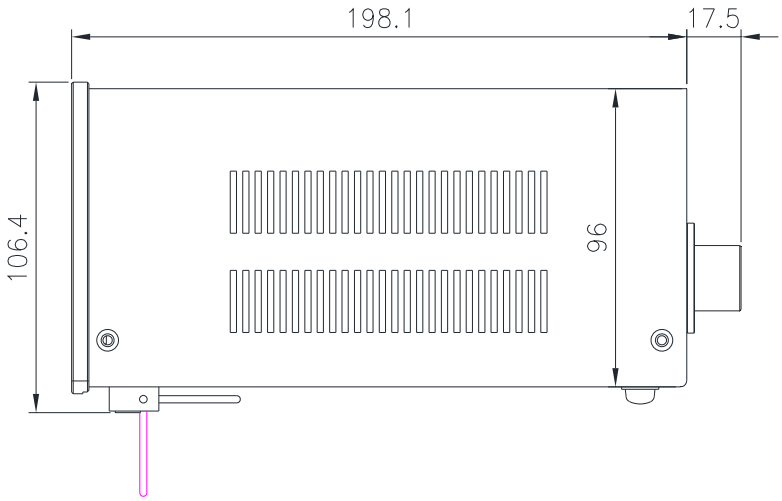
6.1 Specification

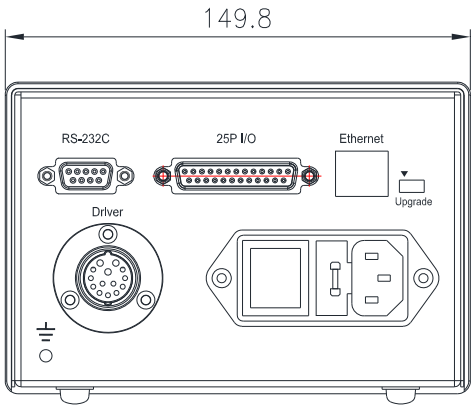
no	Item	Specification	
		MDC-26 series	MDC-32 series
1	Input	AC120VC / AC230V, 50/60Hz	
2	Output	DC38V 3.5A	
3	Fuse	230V 25A	
4	Operating environment	0 ~ 40℃ / 15 ~ 80% RH (without dew)	
5	Front panel	4.3” Color LCD with touch screen	
6	Communication	1 x RS232C, 1 x Ethernet	
7	Protocol	Modbus	
8	I/O	8 Input & 8 Output flexible I/O (25P D-Sub)	
9	No. of program(Preset)	15	
10	Torque calibration	- 10% ~ +10%	
11	Screwdriver recognition	Auto detection of connected driver when power ON of controller	
12	Error display	Error code display (3 groups)	
13	Fastening verification	Fastening data verification (NG/OK) by the preset pattern of angle.	

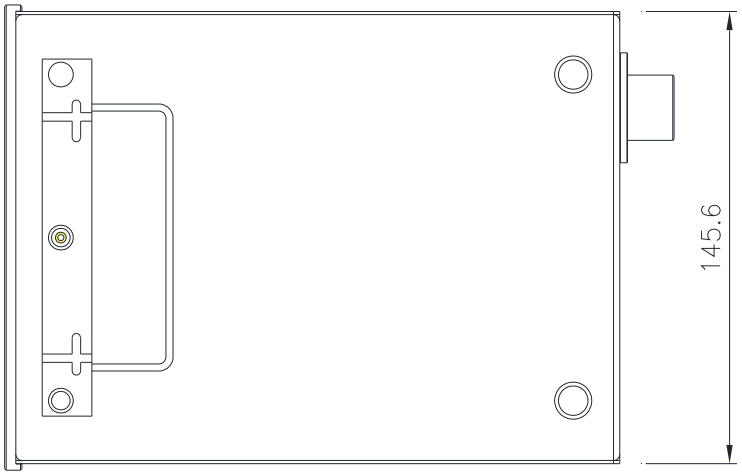
6.2 Model specification

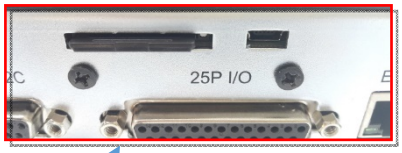


6.3 Controller dimension

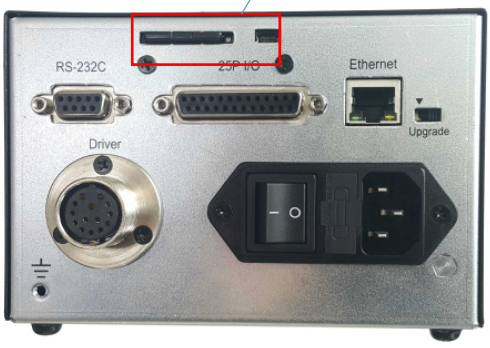






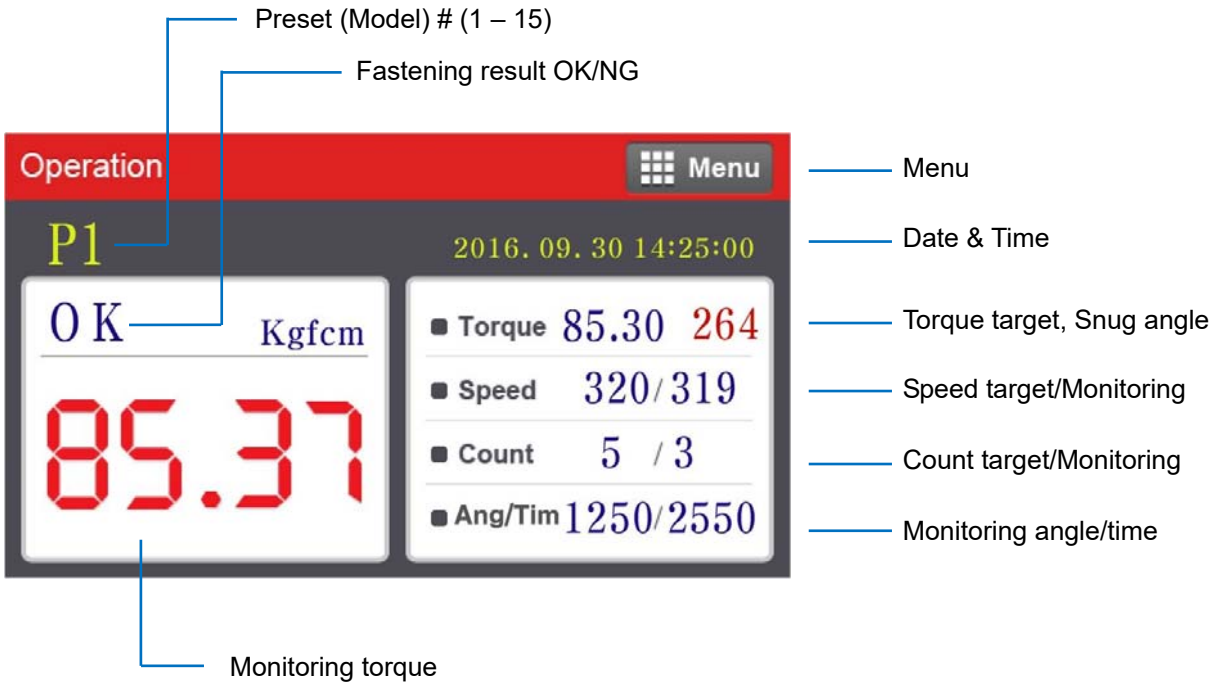


Memory card (option)



7. Operation

7.1 Operation screen

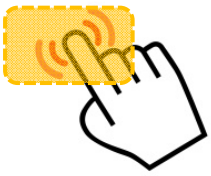


Operation screen is a default window when the controller power ON.

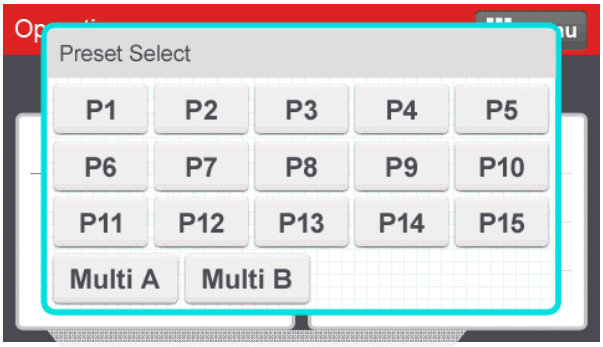
The real time monitoring data and target settings are displayed together.

To go other menu, click the Menu on the top right side.

There are 4 menu for Parameter change, Remote operation, Real time monitoring and Display settings.

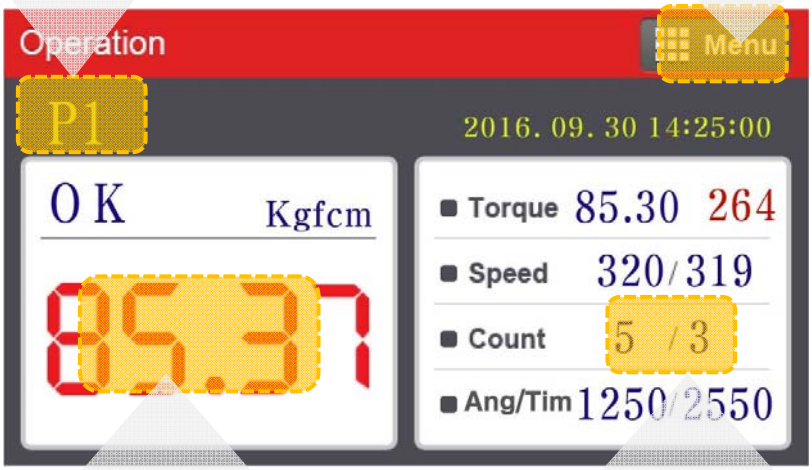


Touch Screen field to move



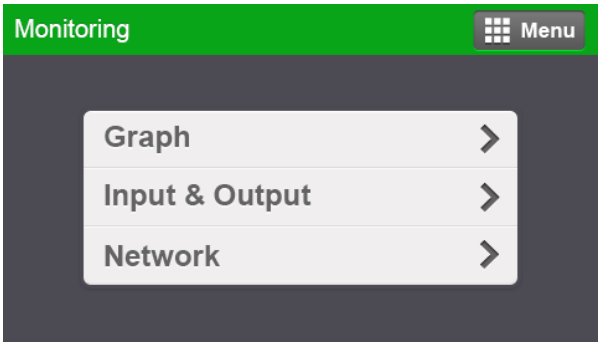
Preset # or Model select

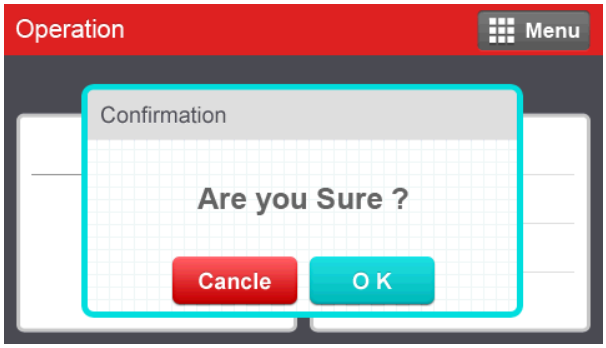
Password Log In



Real time monitoring

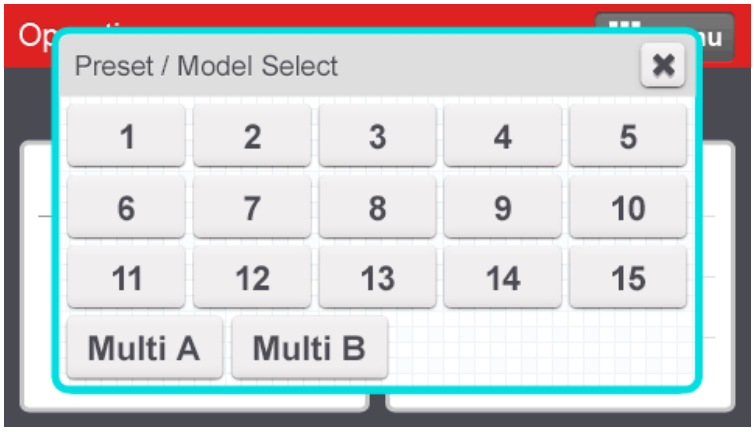
Last count cancel





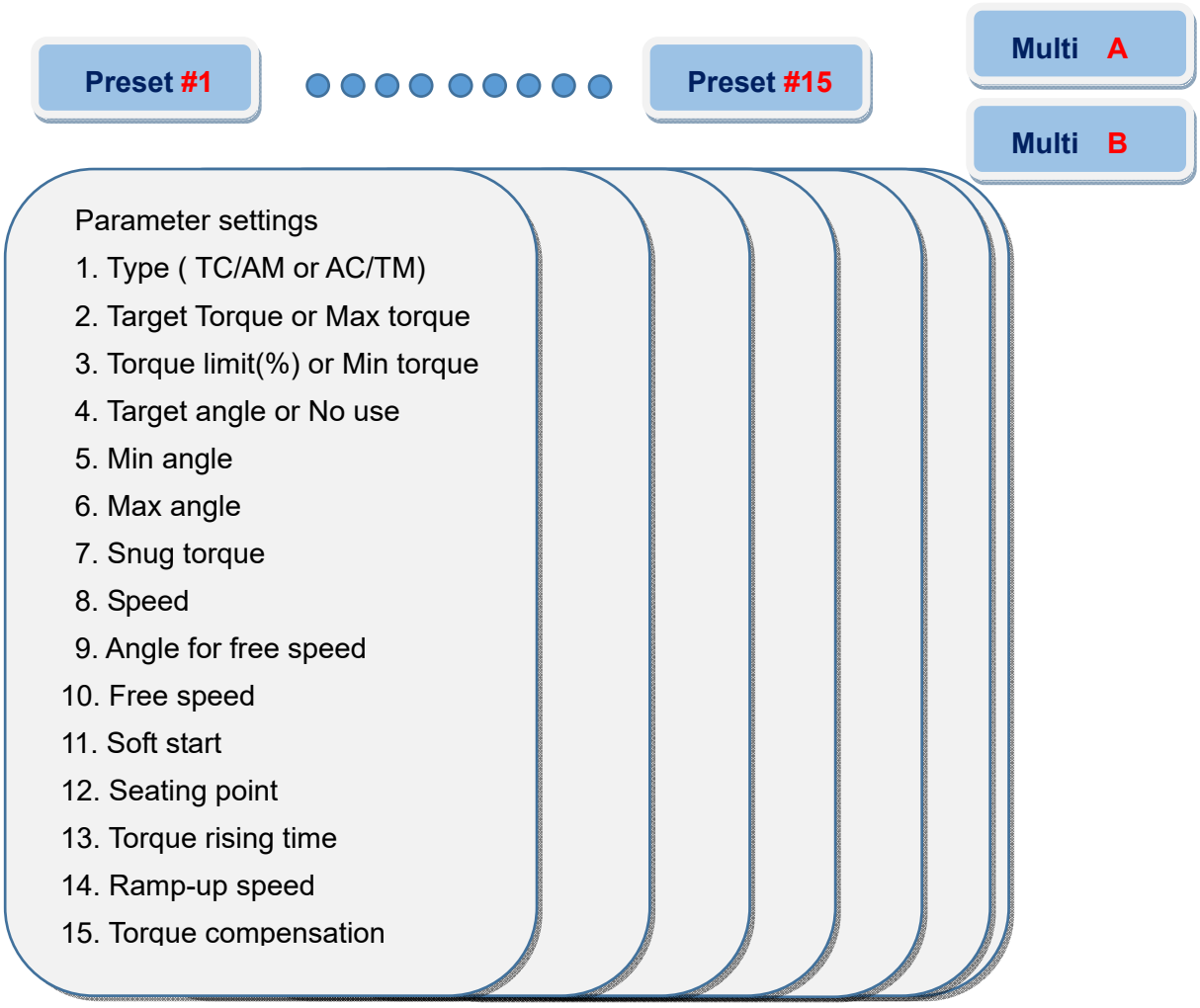
7.2 Presets or Model select

To use Model, Controller 4/9 → Model select ON setting required



There are 15 presets of program.
Each preset contains the following parameters

- Torque
- Speed
- verifying angles
- soft start duration time
- free speed tightening.

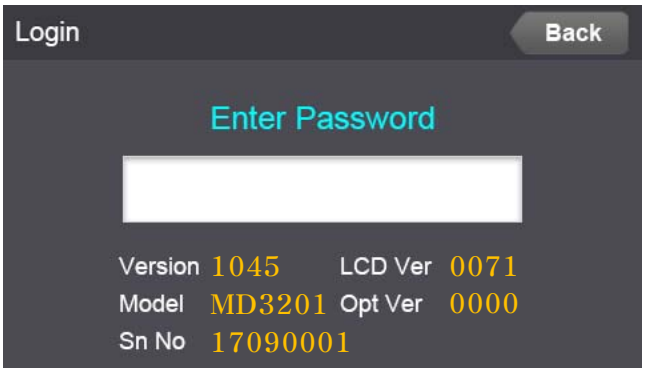


7.3 Parameters

To program each Presets, Click 

and go to 

Parameter menu require password to log in the initial factory setting is " 0 " for password The password can be changed once log in. There are approx.. 500 address for each parameters. Parameters are grouped for each settings as below

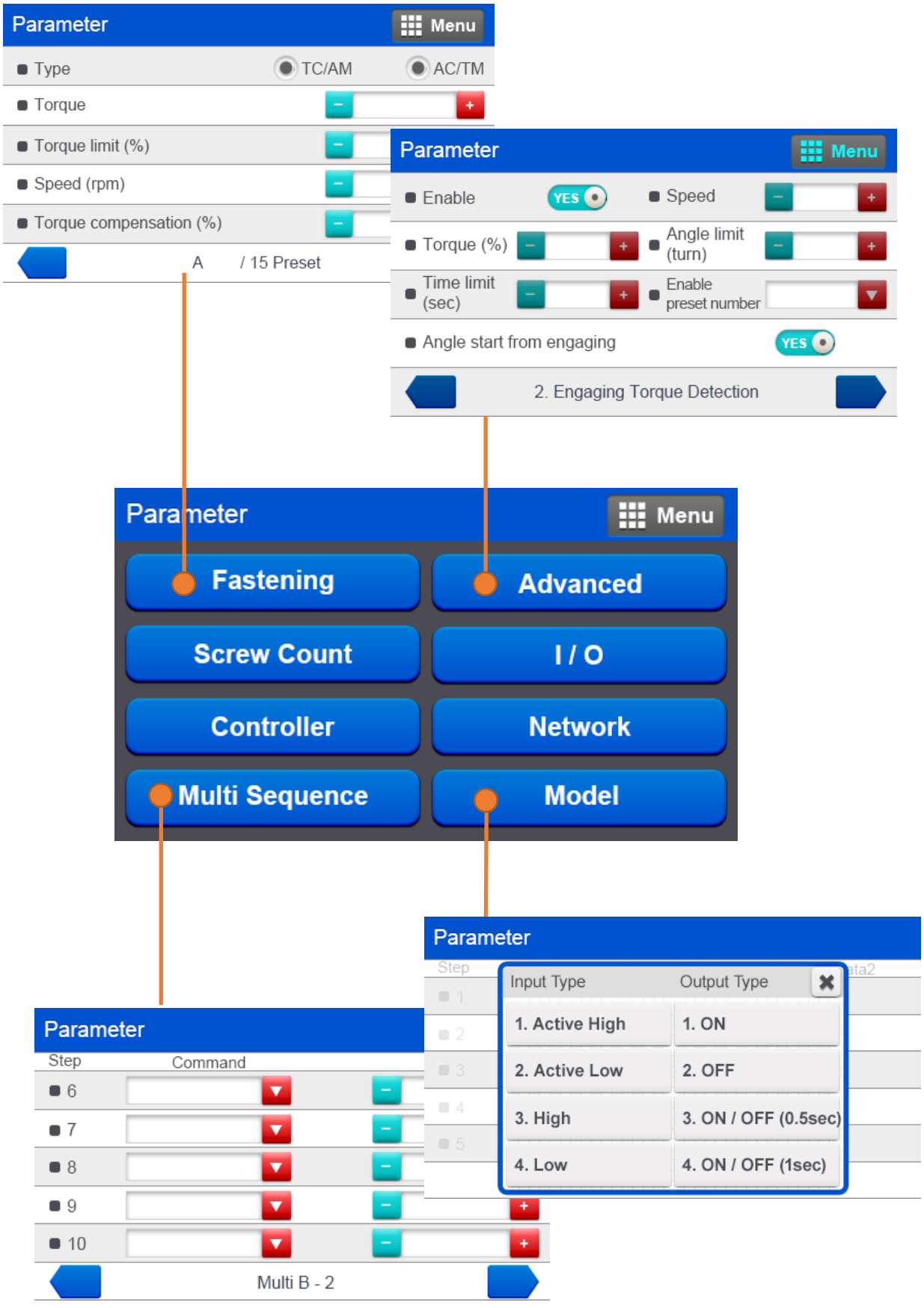


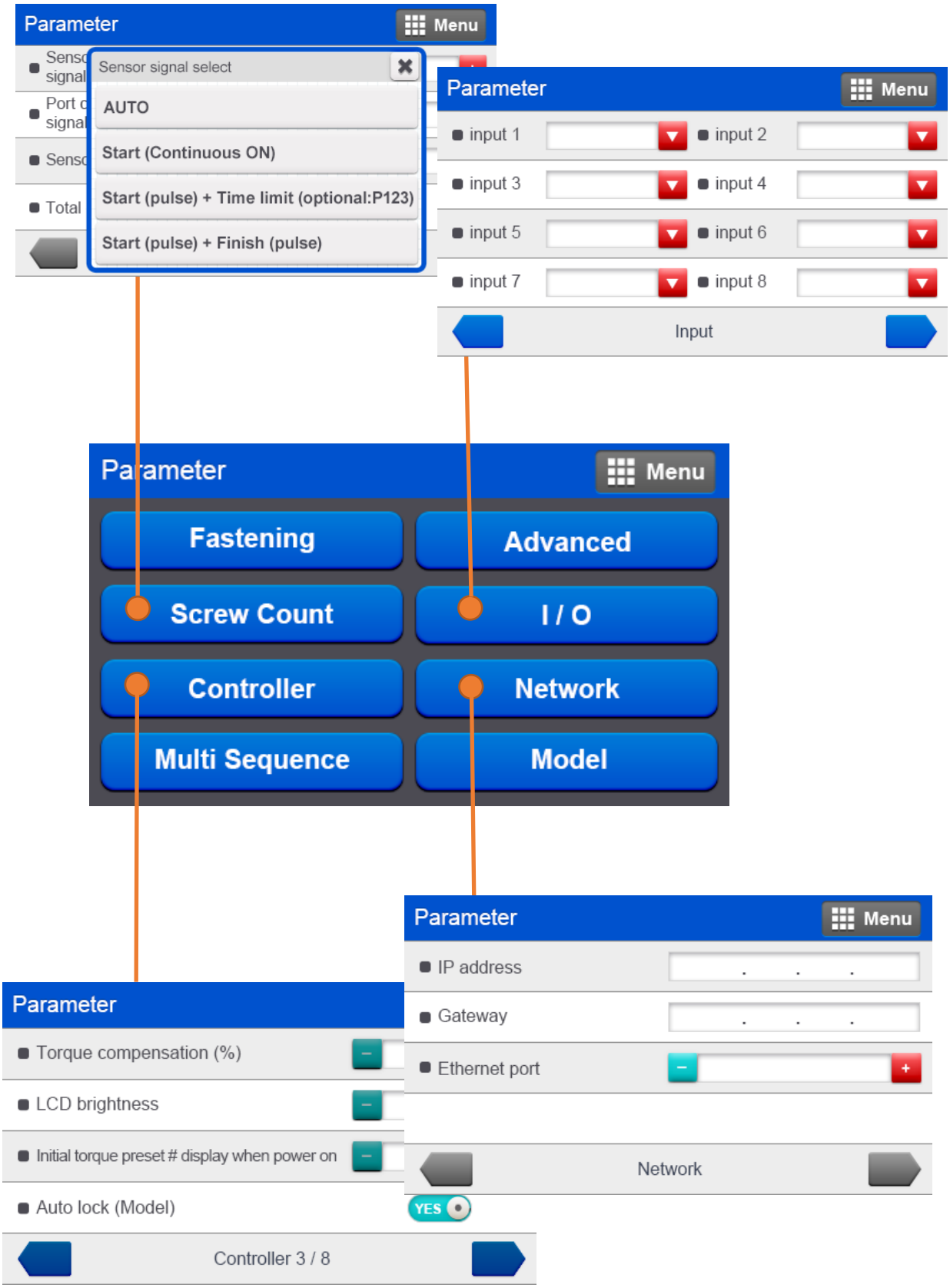
On the log in window, there are tool information about controller firmware version, LCD UI graphic version and option card firmware version, screwdriver model, serial no

Parameter group

Please refer to the operation manual of ParaMon PC software for details of parameter settings.

Group	Parameter	Address
1. Fastening	Preset #1 to #15	A001 – A225
2. I/O	Input	A226 – A233
	Output	A234 – A241
3. Screw count	Number & cycle start	A242 – A247
4. Advanced Function	Free reverse	A250 – 253
	Engaging detection	A254 – 260
	Angle after torque	A261 – 265
5. Controller	Setting 1	A270 – 284
	Setting 2	A290 – 305
6. Network	IP address	A310 – 318
7. Multi sequence	Multi-A, Multi-B	A321 – 348
8. Model	Model #1 to 15	A350 – 499


Parameter
Menu
Type
TC/AM
AC/TM
Torque
Torque limit (%)
Speed (rpm)
Torque compensation (%)
A
/ 15 Preset
Parameter
Menu
Enable
YES
Speed
Torque (%)
Angle limit (turn)
Time limit (sec)
Enable preset number
Angle start from engaging
YES
2. Engaging Torque Detection
Parameter
Menu
Fastening
Advanced
Screw Count
I / O
Controller
Network
Multi Sequence
Model
Parameter
Step
Command
6
7
8
9
10
Multi B - 2
Parameter
Step
Input Type
Output Type
1. Active High
1. ON
2. Active Low
2. OFF
3. High
3. ON / OFF (0.5sec)
4. Low
4. ON / OFF (1sec)


Parameter
Menu
Sensor signal select
AUTO
Start (Continuous ON)
Start (pulse) + Time limit (optional:P123)
Start (pulse) + Finish (pulse)
Parameter
Menu
input 1
input 2
input 3
input 4
input 5
input 6
input 7
input 8
Input
Parameter
Menu
Fastening
Advanced
Screw Count
I / O
Controller
Network
Multi Sequence
Model
Parameter
Menu
IP address
Gateway
Ethernet port
Network
Parameter
Torque compensation (%)
LCD brightness
Initial torque preset # display when power on
Auto lock (Model)
YES
Controller 3 / 8

Parameter details and factory setting

(Firmware version 1.03.8)

	Preset #	Parameter		Adderss	Factory setting
Fastening	1	TC/AM	AC/TM	1	0
		Target torque	Max torque	2	Auto
		Torque limit (%)	Min torque	3	0
		No use	Target angle(degree)	4	0
		Min angle(degree)		5	0
		Max angle(degree)		6	0
		Snug torque(%)		7	0
		Speed (rpm)		8	Auto
		Free fastenig angle(degree)		9	0
		Free fastenig speed(rpm)		10	0
		Soft start(1-300ms)		11	0
		Seating point (%) 10-90		12	Auto
		Torque rising rate(ms) 50-200		13	50
		Ramp-up speed (rpm) 20 – 80% of max .		14	Auto
		Torque compensation (%) 90-110		15	100
	2	TC/AM	AC/TM	16	0
		Target torque	Max torque	17	Auto
		Torque limit (%)	Min torque	18	0
		No use	Target angle(degree)	19	0
		Min angle(degree)		20	0
		Max angle(degree)		21	0
		Snug torque(%)		22	0
		Speed (rpm)		23	Auto
		Free fastenig angle(degree)		24	0
		Free fastenig speed(rpm)		25	0
		Soft start(1-300ms)		26	0
		Seating point (%) 10-90		27	Auto
		Torque rising rate(ms) 50-200		28	50
		Ramp-up speed (rpm) 20 – 80% of max .		29	Auto
		Torque compensation (%) 90-110		30	100
	3	TC/AM	AC/TM	31	0

		Target torque	Max torque	32	Auto
		Torque limit (%)	Min torque	33	0
		No use	Target angle(degree)	34	0
		Min angle(degree)		35	0
		Max angle(degree)		36	0
		Snug torque(%)		37	0
		Speed (rpm)		38	Auto
		Free fastenig angle(degree)		39	0
		Free fastenig speed(rpm)		40	0
		Soft start(1-300ms)		41	0
		Seating point (%) 10-90		42	Auto
		Torque rising rate(ms) 50-200		43	50
		Ramp-up speed (rpm) 20 – 80% of max .		44	Auto
		Torque compensation (%) 90-110		45	100
	4	TC/AM	AC/TM	46	0
		Target torque	Max torque	47	Auto
		Torque limit (%)	Min torque	48	0
		No use	Target angle(degree)	49	0
		Min angle(degree)		50	0
		Max angle(degree)		51	0
		Snug torque(%)		52	0
		Speed (rpm)		53	Auto
		Free fastenig angle(degree)		54	0
		Free fastenig speed(rpm)		55	0
		Soft start(1-300ms)		56	0
		Seating point (%) 10-90		57	Auto
		Torque rising rate(ms) 50-200		58	50
		Ramp-up speed (rpm) 20 – 80% of max .		59	Auto
		Torque compensation (%) 90-110		60	100
	5	TC/AM	AC/TM	61	0
		Target torque	Max torque	62	Auto
		Torque limit (%)	Min torque	63	0
		No use	Target angle(degree)	64	0
		Min angle(degree)		65	0
		Max angle(degree)		66	0

		Snug torque(%)		67	0
		Speed (rpm)		68	Auto
		Free fastenig angle(degree)		69	0
		Free fastenig speed(rpm)		70	0
		Soft start(1-300ms)		71	0
		Seating point (%) 10-90		72	Auto
		Torque rising rate(ms) 50-200		73	50
		Ramp-up speed (rpm) 20 – 80% of max .		74	Auto
		Torque compensation (%) 90-110		75	100
	6	TC/AM	AC/TM	76	0
		Target torque	Max torque	77	Auto
		Torque limit (%)	Min torque	78	0
		No use	Target angle(degree)	79	0
		Min angle(degree)		80	0
		Max angle(degree)		81	0
		Snug torque(%)		82	0
		Speed (rpm)		83	Auto
		Free fastenig angle(degree)		84	0
		Free fastenig speed(rpm)		85	0
		Soft start(1-300ms)		86	0
		Seating point (%) 10-90		87	Auto
		Torque rising rate(ms) 50-200		88	50
		Ramp-up speed (rpm) 20 – 80% of max .		89	Auto
		Torque compensation (%) 90-110		90	100
	7	TC/AM	AC/TM	91	0
		Target torque	Max torque	92	Auto
		Torque limit (%)	Min torque	93	0
		No use	Target angle(degree)	94	0
		Min angle(degree)		95	0
		Max angle(degree)		96	0
		Snug torque(%)		97	0
		Speed (rpm)		98	Auto
		Free fastenig angle(degree)		99	0
		Free fastenig speed(rpm)		100	0
		Soft start(1-300ms)		101	0

		Seating point (%) 10-90		102	Auto
		Torque rising rate(ms) 50-200		103	50
		Ramp-up speed (rpm) 20 – 80% of max .		104	Auto
		Torque compensation (%) 90-110		105	100
	8	TC/AM	AC/TM	106	0
		Target torque	Max torque	107	Auto
		Torque limit (%)	Min torque	108	0
		No use	Target angle(degree)	109	0
		Min angle(degree)		110	0
		Max angle(degree)		111	0
		Snug torque(%)		112	0
		Speed (rpm)		113	Auto
		Free fastenig angle(degree)		114	0
		Free fastenig speed(rpm)		115	0
		Soft start(1-300ms)		116	0
		Seating point (%) 10-90		117	Auto
		Torque rising rate(ms) 50-200		118	50
		Ramp-up speed (rpm) 20 – 80% of max .		119	Auto
		Torque compensation (%) 90-110		120	100
	9	TC/AM	AC/TM	121	0
		Target torque	Max torque	122	Auto
		Torque limit (%)	Min torque	123	0
		No use	Target angle(degree)	124	0
		Min angle(degree)		125	0
		Max angle(degree)		126	0
		Snug torque(%)		127	0
		Speed (rpm)		128	Auto
		Free fastenig angle(degree)		129	0
		Free fastenig speed(rpm)		130	0
		Soft start(1-300ms)		131	0
		Seating point (%) 10-90		132	Auto
		Torque rising rate(ms) 50-200		133	50
		Ramp-up speed (rpm) 20 – 80% of max .		134	Auto
		Torque compensation (%) 90-110		135	100
	10	TC/AM	AC/TM	136	0

		Target torque	Max torque	137	Auto
		Torque limit (%)	Min torque	138	0
		No use	Target angle(degree)	139	0
		Min angle(degree)		140	0
		Max angle(degree)		141	0
		Snug torque(%)		142	0
		Speed (rpm)		143	Auto
		Free fastenig angle(degree)		144	0
		Free fastenig speed(rpm)		145	0
		Soft start(1-300ms)		146	0
		Seating point (%) 10-90		147	Auto
		Torque rising rate(ms) 50-200		148	50
		Ramp-up speed (rpm) 20 – 80% of max .		149	Auto
		Torque compensation (%) 90-110		150	100
	11	TC/AM	AC/TM	151	0
		Target torque	Max torque	152	Auto
		Torque limit (%)	Min torque	153	0
		No use	Target angle(degree)	154	0
		Min angle(degree)		155	0
		Max angle(degree)		156	0
		Snug torque(%)		157	0
		Speed (rpm)		158	Auto
		Free fastenig angle(degree)		159	0
		Free fastenig speed(rpm)		160	0
		Soft start(1-300ms)		161	0
		Seating point (%) 10-90		162	Auto
		Torque rising rate(ms) 50-200		163	50
		Ramp-up speed (rpm) 20 – 80% of max .		164	Auto
		Torque compensation (%) 90-110		165	100
	12	TC/AM	AC/TM	166	0
		Target torque	Max torque	167	Auto
		Torque limit (%)	Min torque	168	0
		No use	Target angle(degree)	169	0
		Min angle(degree)		170	0
		Max angle(degree)		171	0

		Snug torque(%)		172	0
		Speed (rpm)		173	Auto
		Free fastenig angle(degree)		174	0
		Free fastenig speed(rpm)		175	0
		Soft start(1-300ms)		176	0
		Seating point (%) 10-90		177	Auto
		Torque rising rate(ms) 50-200		178	50
		Ramp-up speed (rpm) 20 – 80% of max .		179	Auto
		Torque compensation (%) 90-110		180	100
	13	TC/AM	AC/TM	181	0
		Target torque	Max torque	182	Auto
		Torque limit (%)	Min torque	183	0
		No use	Target angle(degree)	184	0
		Min angle(degree)		185	0
		Max angle(degree)		186	0
		Snug torque(%)		187	0
		Speed (rpm)		188	Auto
		Free fastenig angle(degree)		189	0
		Free fastenig speed(rpm)		190	0
		Soft start(1-300ms)		191	0
		Seating point (%) 10-90		192	Auto
		Torque rising rate(ms) 50-200		193	50
		Ramp-up speed (rpm) 20 – 80% of max .		194	Auto
		Torque compensation (%) 90-110		195	100
	14	TC/AM	AC/TM	196	0
		Target torque	Max torque	197	Auto
		Torque limit (%)	Min torque	198	0
		No use	Target angle(degree)	199	0
		Min angle(degree)		200	0
		Max angle(degree)		201	0
		Snug torque(%)		202	0
		Speed (rpm)		203	Auto
		Free fastenig angle(degree)		204	0
		Free fastenig speed(rpm)		205	0
		Soft start(1-300ms)		206	0

		Seating point (%) 10-90		207	Auto
		Torque rising rate(ms) 50-200		208	50
		Ramp-up speed (rpm) 20 – 80% of max .		209	Auto
		Torque compensation (%) 90-110		210	100
	15	TC/AM	AC/TM	211	0
		Target torque	Max torque	212	Auto
		Torque limit (%)	Min torque	213	0
		No use	Target angle(degree)	214	0
		Min angle(degree)		215	0
		Max angle(degree)		216	0
		Snug torque(%)		217	0
		Speed (rpm)		218	Auto
		Free fastenig angle(degree)		219	0
		Free fastenig speed(rpm)		220	0
		Soft start(1-300ms)		221	0
		Seating point (%) 10-90		222	Auto
		Torque rising rate(ms) 50-200		223	50
		Ramp-up speed (rpm) 20 – 80% of max .		224	Auto
		Torque compensation (%) 90-110		225	100
I/O	I/O (IN)	Input #1	0) None 1) Torque select 1 2) Torque select 2 3) Torque select 3 4) Torque select 4 5) Start 6) Fastening / Loosening 7) Driver Lock 8) Multi sequence 9) Alarm reset 10) Count start 11) Count reset 12) Count(workpiece) out 13) Model cancel 14) Model select 1 15) Model select 2 16) Model select 3 17) Model select 4	226	1
		Input #2		227	2
		Input #3		228	3
		Input #4		229	5
		Input #5		230	6
		Input #6		231	7
		Input #7		232	8
		Input #8		233	9
	I/O (OUT)	Output #1		234	1
		Output #2	0) None 1) Torque Up 2) Fastening OK 3) Ready 4) Motor RUN 5) Alarm 6) Status of F/L 7) Count complete 8) Alarm code 1 9) Alarm code 2 10) Alarm code 3 11) Model complete	235	2
		Output #3		236	3
		Output #4		237	4
		Output #5		238	5
		Output #6		239	6
		Output #7		240	7
		Output #8		241	8

Screw count	Screw count	Sensor signal type 0 - 3	242	0
		Time limit (if P122-->2)	243	0
		Count complete OUT manage	244	0
		Middle count no. 0 - 99	245	0
		Sensor signal delay time (x10ms)	246	0
		Total count (screw no.)	247	5
Advanced Function	Free Reverse	Enable(1) / Disable(0)	250	0
		Speed (rpm)	251	0
		Angle (turn) 0 - 20	252	0
		Applicable Preset # 1-15	253	0
	Engaging torque detection	Enable(1) / Disable(0)	254	0
		Speed (rpm)	255	0
		Torque(%)	256	0
		Angle limit (turn) 0 - 20	257	0
		Time limit (sec)	258	0
		Applicable Preset # 1-15	259	0
		Angle start from engaging	260	0
	Extra angle after torque up	Enable(1) / Disable(0)	261	0
		Speed (rpm)	262	0
		Angle (degree) 0-3600	263	0
		Direction	264	0
		Applicable Preset # 1-15	265	0
Controller	Setting 1	Run time limit / Forward (sec)	270	10
		Run time limit / Reverse (sec)	271	10
		Motor stall time limit (sec)	272	0.2
		Loosening speed (rpm)	273	Auto
		Motor acceleration (ms)	274	100
		Fastening complete signal OUT time	275	0
		Driver ID no.	276	1
		Error display reset time	277	1
		Torque compensation master (%) 90-110	278	100
		LCD brightness 10-64	279	45
		Initial preset # when power ON	280	1
		Driver model no. 1-99	281	Auto
		Password 0-9999	282	0

		Parameter initialize to factory setting	283	0
		Driver auto lock (for Model)	284	0
		Selection on panel 0:Preset 1:Model	285	0
		Torque holding time(ms) 2 - 20	286	2
	Setting 2	Auto speed on torque setting	290	1
		Judge fastening min turns	291	0
		Model selection 0: off 1: on	292	0
		Fastening stop error	293	0
		Reverse Lock	294	0
		Trigger start (Handheld only)	295	0
		Reverse start (Handheld only)	296	0
		Auto data output	297	0
		Beep sound	298	1
		Preset change by Touch pannel	299	1
		COM port Baud rate	300	4
		Torque unit	301	0
		Screw type	302	0
		Auto data output port (0 serial, 1 Ethernet)	303	0
		Lamp on time	304	0
		Option card	305	0
IP Address		IP Address1	310	192
		IP Address2	311	168
		IP Address3	312	1
		IP Address4	313	100
		Gateway 1	314	192
		Gateway 2	315	168
		Gateway 3	316	1
		Gateway 4	317	1
		Port	318	5000
Multi SQ	PG1	MS PG 1	321	0
		MS PG 2	322	0
		MS PG 3	323	0
		MS PG 4	324	0
		MS PG 5	325	0
		MS PG 6	326	0

	PG2	MS PG 7	327	0
		MS PG 8	328	0
		MS PG 9	329	0
		MS PG 10	330	0
		MS PG 11	331	0
		MS PG 12	332	0
		MS PG 13	333	0
		MS PG 14	334	0
		MS PG 15	335	0
		MS PG 16	336	0
		MS PG 17	337	0
		MS PG 18	338	0
		MS PG 19	339	0
		MS PG 20	340	0
ERROR		ERROR 1	341	0
		ERROR 2	342	0
		ERROR 3	343	0
		ERROR 4	344	0
		ERROR 5	345	0
		ERROR 6	346	0
		ERROR 7	347	0
		ERROR 8	348	0
		Controller model	349	Auto
Model		Model data(150)	350 ~ 499	0
Firmware Version			500	Auto

★ Please refer to the operation manual of ParaMon PC software for details of parameter settings.

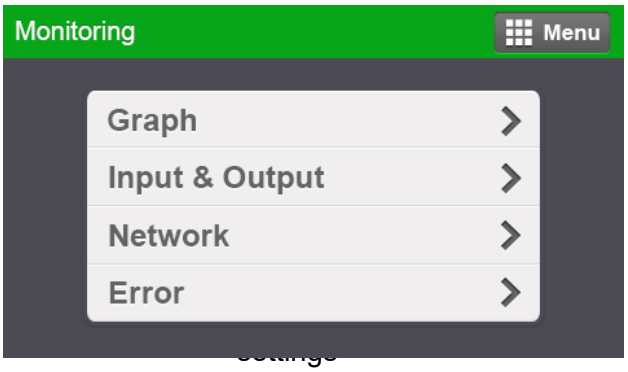
7.4 Monitoring

To monitor fastening data and I/O status, Click 

and go to 

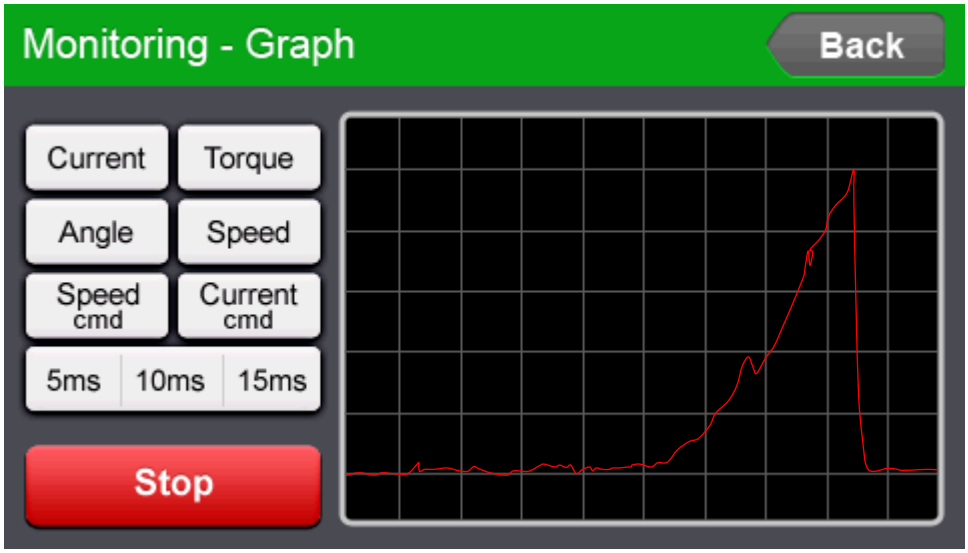
There are three(3) real-time monitoring menu.

And one error history.



- Error : latest 8 error history

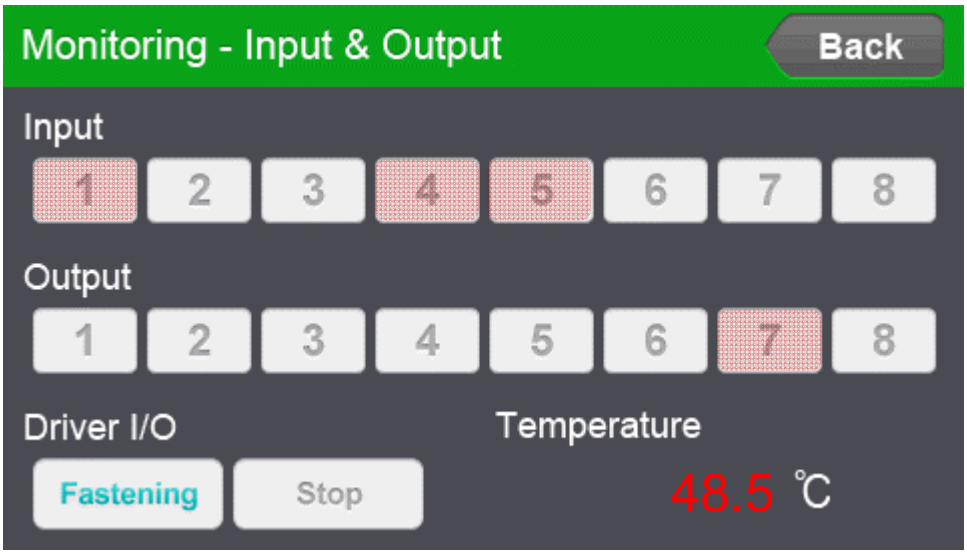
◆ Graph (Torque curve) monitoring



Select the required data and press Start. The sampling rate is 5ms for 1second, 10ms for 2 second and 15ms for 3 second display with total 200 data

- Current
- Torque
- Angle
- Speed

◆ I/O Status monitoring

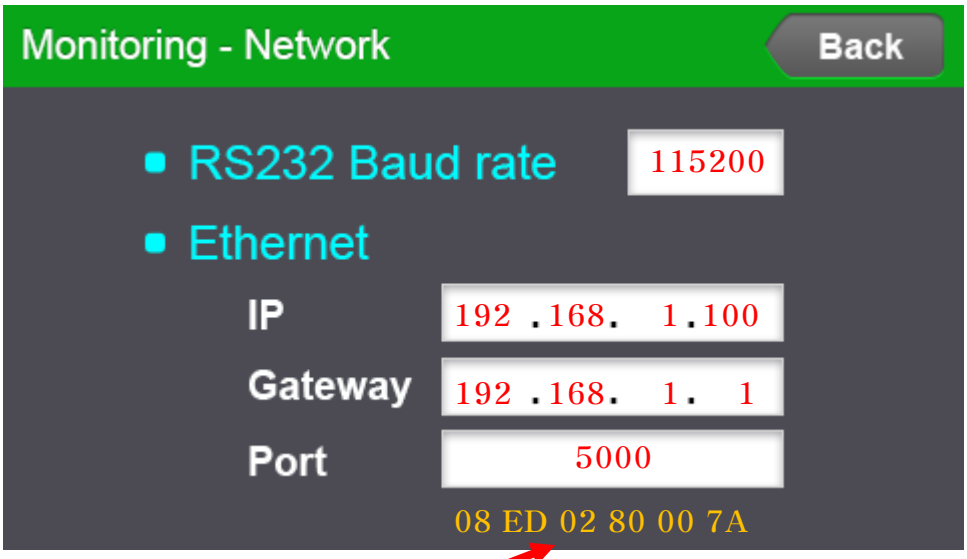


The active I/O & tool operation signals are displayed with orange color by real time.

The temperature of the motor surface is also displayed.

Refer to the operation manual of ParaMon for details of wiring, schematic and digital I/O mapping.

◆ Network setting

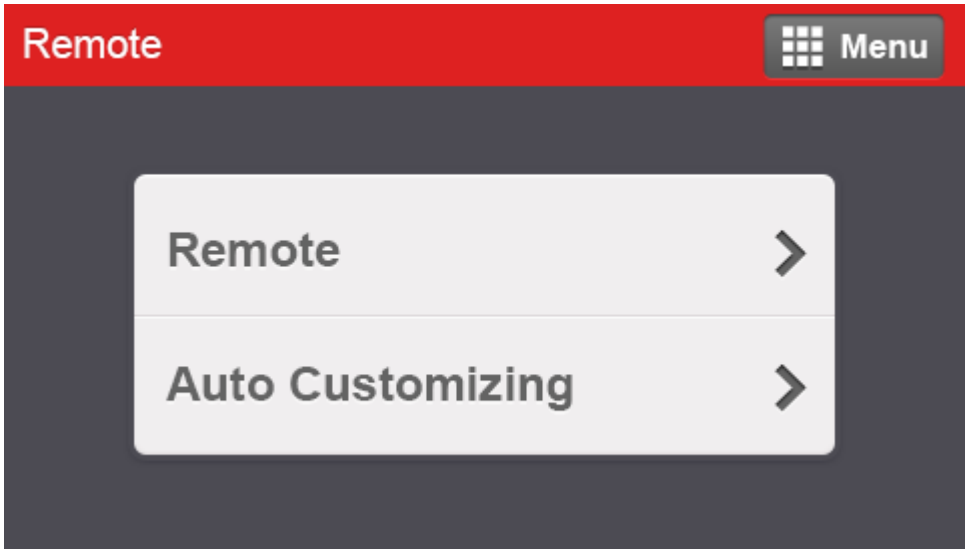


Controller MAC address

7.4 Remote & Auto customizing

For remote operation and Auto customizing parameters, Click 

, and 

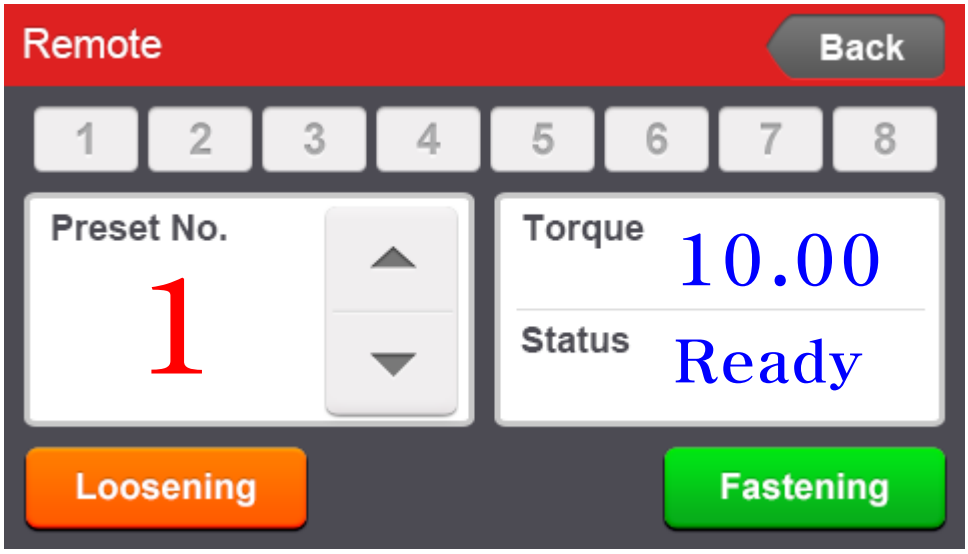


◆ Remote

The tool and output signal can be operated remotely by click the screen.

It is useful feature to simulate the tools in automation integration. Easy to find the output wiring and tool test without PLC

- Preset selection
- Remote start tool in Fastening or Loosening direction
- Providing Output signals

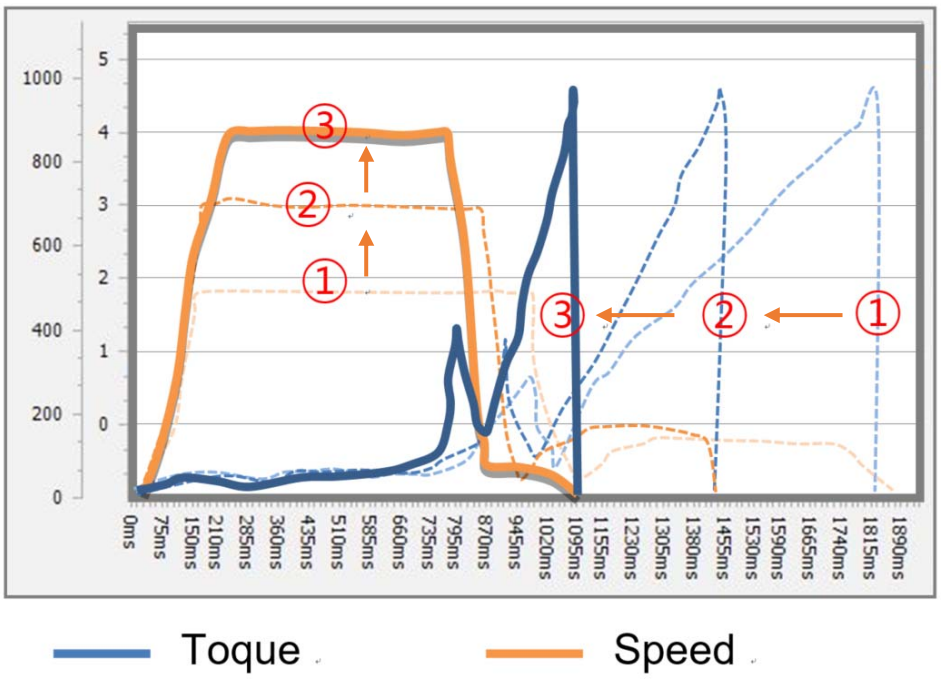


◆ Auto customizing parameters

Simulation & modification window

MD tool has the auto speed setting feature against torque setting not to provide any over torque by speed shock. This auto speed is safe speed on the hard joint condition. On the real application, this setting can be changed manually. Auto customizing feature provides most optimized parameter settings for saving cycle time on the real application.

Speed Torque



① Select Preset # to modify parameter settings

② Select one of Soft & Hard joint condition when it is obviously clear or both together when it is not clear to be clarified, then click START

③ Apply screw tightening several times until there is no more parameter changing on the simulation & modification window. Be sure that the fastening condition should be same during the process. The system changes parameter values by the previous fastening data.

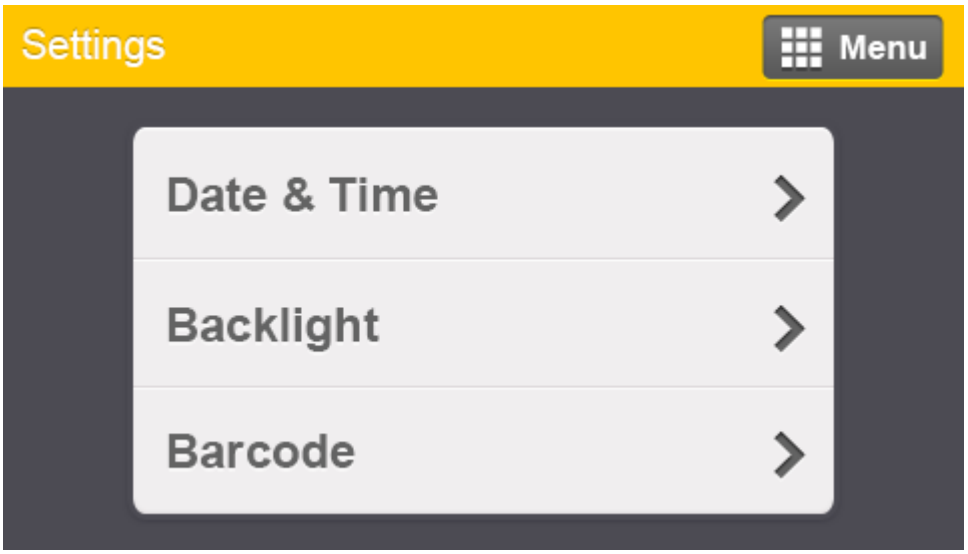
④ Once there is no more changes on the simulation & modification window, click STOP to finish testing.

⑤ Click APPLY to apply the settings on the simulation & modification window. The setting can be modified by manually before applying them.

7.5 Setting

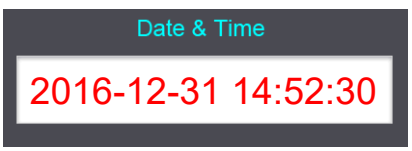
To modify Date, Time and backlight brightness , Click 

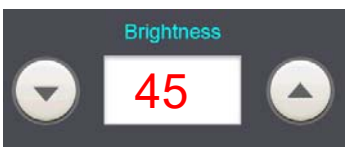
, and 



System date and time can be modified. yyyy-mm-dd hh:mm:ss

Backlight brightness is adjustable between 2 to 64. Factory setting is 45.





◆ Barcode setting

The barcode information can select the Preset or Model by the setting.

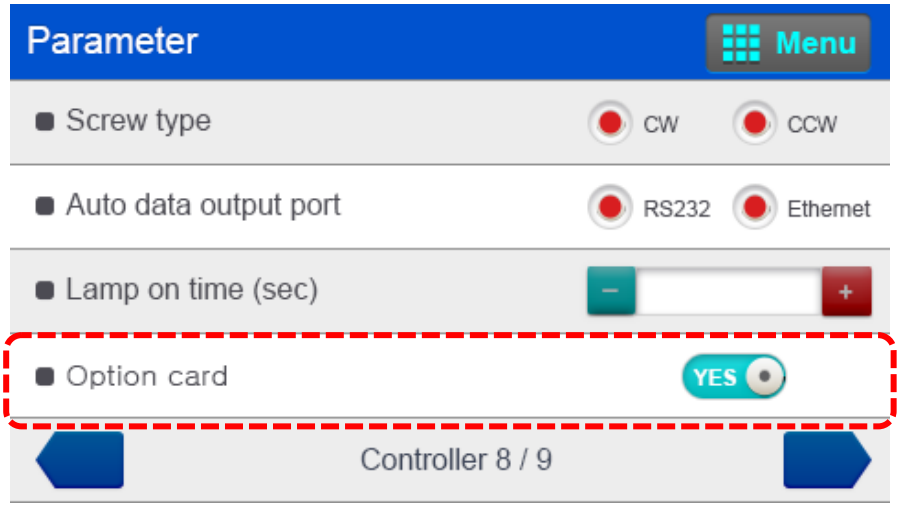
In order to use barcode scanner, there are some parameters to be selected prior to the barcode setting.

A306 [Controller] R2232C

- Scanner : RS232C
- Total number of barcode registration : 15
- Max number of barcode data length : 24 characters (including CR)
-

7.6 SD memory card (Option)

To use this option, check on the parameter (A305) on the Parameter setting.



System creates the folders of YEAR, MONTH automatically. And it creates one file in CSV format with the file name of DATE.

SD CARD > 2017 (folder) > 07 (folder) > 21 (file) ….. File name : 21.csv

The real time fastening data in Monitoring menu are stored together with the system clock time of the controller.

Clock time, Fastening time, Preset#, Target torque, Converted torque, Speed, A1, A2, A3 angles, Count no.

Error code, Forward/Reverse, Status(OK), Snug angle

SD Memory card

- drvstate.txt

HISTORY → folder

YEAR → folder / one folder per year

MONTH → folder / one folder per month

- Date.csv → monitoring data file / one file per one day

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Time	Serial	Barcode	F_time	Preset	T_torque	C_torque	Speed	A1	A2	A3	Count	Error	F/L	Status	Snug angle
2	%16:11:27	16.11.0005	:B170728025201/3	0	1	10	0	214	0	0	0	5	0	0	0	0
3	16:11:30	16.11.0005	:B170601011304/10	0	2	10	0	214	0	0	0	5	0	0	0	0
4	16:11:33	16.11.0005	:B170728025201/3	0	1	10	0	214	0	0	0	5	0	0	0	0
5	16:12:11	16.11.0005	:B170728025201/3	699	1	5	5.14	113	381	8	389	4	0	0	1	0
6	16:12:13	16.11.0005	:B170728025201/3	650	1	5	5.08	113	336	16	352	3	0	0	1	0
7	16:12:15	16.11.0005	:B170728025201/3	1278	1	5	5.09	113	766	11	777	2	0	0	1	0
8	16:12:17	16.11.0005	:B170728025201/3	1000	1	5	4.94	113	581	9	590	1	0	0	1	0
9	16:12:19	16.11.0005	:B170728025201/3	1059	1	5	5.24	113	625	7	632	5	0	0	1	0
10	16:12:21	16.11.0005	:B170728025201/3	813	1	5	5.1	113	464	4	468	4	0	0	1	0
11	16:12:23	16.11.0005	:B170728025201/3	647	1	5	5.11	113	344	8	352	3	0	0	1	0
12	16:12:25	16.11.0005	:B170728025201/3	1029	1	5	4.95	113	597	13	610	2	0	0	1	0
13	16:12:26	16.11.0005	:B170728025201/3	1001	1	5	5.09	113	558	16	574	1	0	0	1	0
14	16:12:28	16.11.0005	:B170728025201/3	0	1	5	0	113	0	0	0	1	0	0	0	0
15	16:12:30	16.11.0005	:B170728025201/3	919	1	5	5.02	113	530	6	536	5	0	0	1	0
16	16:12:32	16.11.0005	:B170728025201/3	0	1	5	0	113	0	0	0	5	0	0	0	0
17	16:12:35	16.11.0005	:B170601011304/10	0	2	7.5	0	163	0	0	0	5	0	0	0	0
18	16:12:38	16.11.0005	:B170601011304/10	890	2	7.5	7.7	163	729	12	741	4	0	0	1	0
19	16:12:40	16.11.0005	:B170601011304/10	942	2	7.5	7.73	163	776	15	791	3	0	0	1	0
20	16:12:42	16.11.0005	:B170601011304/10	936	2	7.5	7.28	163	766	16	782	2	0	0	1	0
21	16:12:43	16.11.0005	:B170601011304/10	942	2	7.5	7.51	163	768	19	787	1	0	0	1	0

** The last scanning data is recorded together with every fastening data