SANYO MACHINE WORKS, LTD. *~Advanced Solutions and Service in Assembly System~*

Sanyo machine works
Handheld
Digital control
Nutrunner system

High quality and performance handheld Nutrunner created by reliable technology.

Sanyo Machine Works has high technology as the first maker sold Nutrunner in Japan. These handheld Nutrunner "SHDN" which are based upon the accumulated experience realize fastening quality and work efficiency at the same time by high fastening accuracy and low reaction technology.
These are sure to contribute to the fastening quality and productivity improvement.

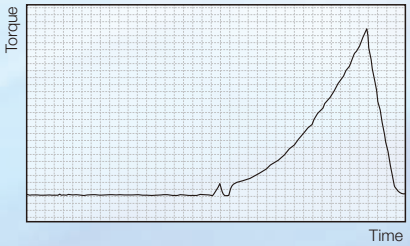
Impact Mode

●IMPACT MODE

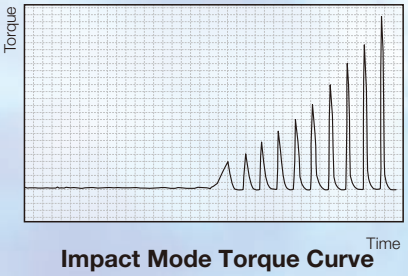
<Nutrunner mode> In this Nutrunner mode the tool tightens by continuously increasing torque until target torque is achieved.
<Impact mode> Fastening in “Impact” mode controls motor speeds and impact frequency. The tool motor starts and stops to create an impact effect which reduces torque reaction.
It also helps reduce operator strain and repetitive motion injuries.
(Patented in Japan)

●ADJUSTABLE IMPACT

Use Impact mode fastening for all types of joint conditions simply by adjusting speeds and impact frequency.
(*For use with models with Impact mode only.)



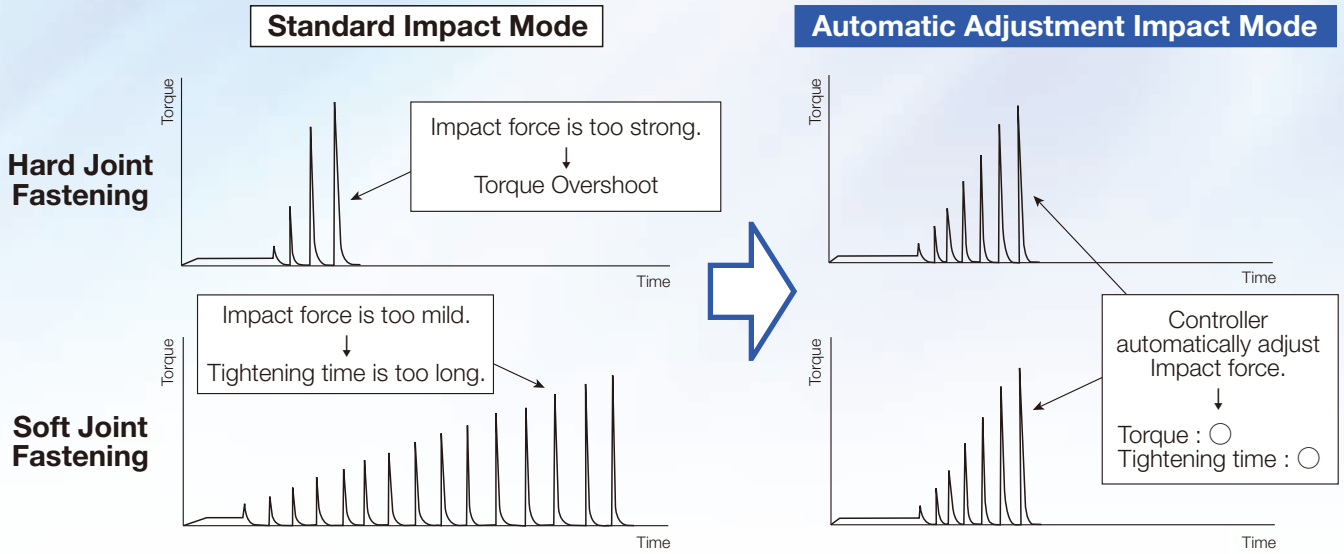
Nutrunner Mode Torque Curve



Impact Mode Torque Curve

Auto Adjusted Impact Mode Fastening

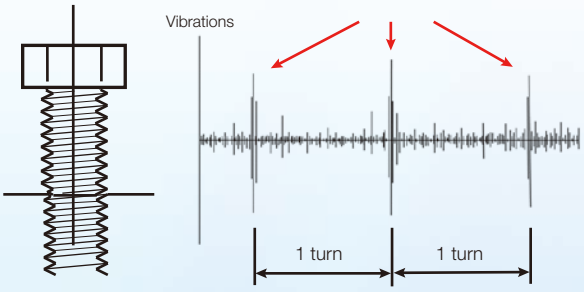
The SHDN series tool offers an Impact mode setting that automatically adjusts pulse speed and frequency to create repeatable torque accuracy with minimum reaction. This Auto impact mode is perfect for changing joint conditions on the same work piece (ex.soft joint / hard joint).



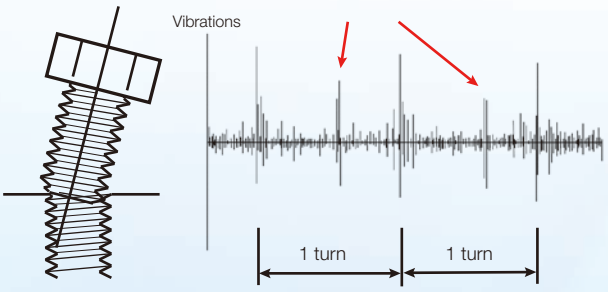
Cross Thread Prevention Function

By the counterclockwise running, some vibrations will be noticed when a screw bolt climbs over at the edge. The kind of vibrations becomes different between in the good alignment and in the no-good alignment.
By detecting them, NR can judge whether the cross thread occurs or not.
As soon as detecting a 2nd times vibration clearly at the edge of first pitch, NR will run from rundown step as usual.

There will be only the climb over vibrations.



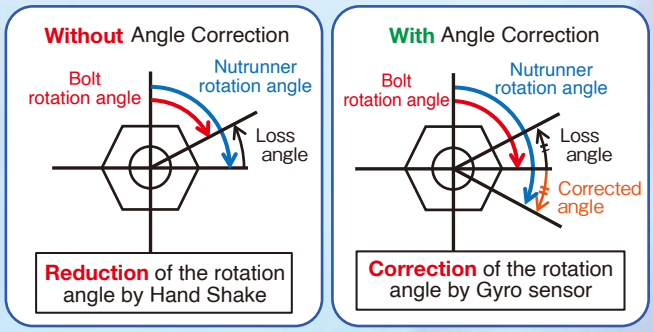
In no good alignment, other vibrations will occur.



Operator Influence Angle Auto Correction Function

By equipping an optional tool Gyro sensor, loss angle by hand shake can be corrected to accurate angle.
This function observes and calculates the angle of the tool while fastening in real time.

Ex. : Tightening angle is 90 deg.



Batch Count Function

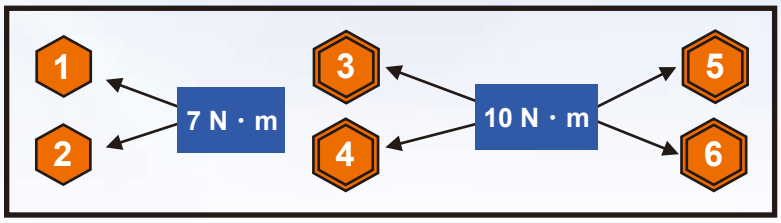
●FASTENING NUMBER COUNT
Batch count function is available for tracking multiple fastening cycles in a single workpiece. Once the set number of cycles in the batch are completed satisfactorily an OK signal is sent.

●SWITCHING FASTENING PROGRAM
Each cycle in the batch can run the same program and parameters or unique program and parameters. This is useful when tightening to different torques or using different fastening methods within a single workpiece. This function offers great flexibility in the production process and allows the tool to be set to each workpieces unique characteristics and specifications.

●VARIOUS OPTION SETTING
Additional settings are available to increase the tools production process flexibility. Optional settings such as Count UP/DOWN indication, fastening OK count/OK+NG count, count backward/forward are available to meet your various tightening processes.

– Tightening Sequence –

① 7N·m
② 7N·m
③ 10N·m
④ 10N·m
⑤ 10N·m
⑥ 10N·m



Target torque is changeable according to the fastening sequence.

Compact, Ultra-Light Weight & High Power

●SMALL & ULTRA-LIGHT TOOL
Minimum tool weights of 0.95kg (16N･m Pistol type) are achieved by using powerful, compact motors and lightweight rigid resins in the tool design.

●LOW OPERATION TEMPERATURE
The new designed motor is so efficient because the operating temperature is restrained, even during the continuous duty cycle.

●THIN & HIGH-FLEX CABLE
The thin and flexible tool cable makes operators much easier to handle the tool, because it can reduce their strain and fatigue.

●COMPACT CONTROLLER
The new space saving and light weight controller can be installed in any location. With its compact size you can install it on various places such as line-side or on top of a cart.

High performance & High Durability & High Reliability

●TOP-LEVEL HIGH-SPEED TOOL IN THE WORLD
The high speed Pistol tool (SHD-T2-Type), achieves speeds over 3 times faster than an original. With increased brake performance, the tool can reach seating torque at high speeds, and reducing fastening times.

●SUPER DURABILITY
One million consecutive running test, at rated torque, guarantees outstanding durability. High precision and high efficiency of the planetary gear contributes toward this high durability and reduces operating noise.

●NON CONTACT TRIGGER SW
Non-contact, non-wear trigger switch makes the tool trigger highly durable. Two speed trigger provides more accurate tool socket and fastener thread engagement.

●LED INDICATOR
End of cycle data (OK/NG) can be easily confirmed by 3 brightly colored LEDs. The color and status (Blinking/Steady) of the LEDs can be user defined based on error/ fault codes.

●RESOLVER FOR ANGLE DETECTION
Resolver for measuring degrees of rotation (Angle Detection) ensures high reliability and anti-shock durability.

●QUICK & EASY TOOL CHANGE
All the tools are inspected and calibrated prior to shipping and are ready for production just by hooking up to the controller.

High Precision & Multi-Function

SHD-DT2

●HIGH ACCURACY & QUICK RESPONSE

Sanyo's designed quick response motor can reach seating torque at maximum speeds with minimal over-run issues, therefore it can fasten highly accurate at decreased cycle times.

●PROGRAMMABLE & MULTI-FUNCTIONS

Fastening motions and sequences are fully programmable. You can change fastening parameters such as tightening speed and acceleration ratio. Also, you can program complicated fastening motions such as double tightening.

●WIDE COMMUNICATION CAPABILITY

Fastening data is output through a standard RS232C port.
Other common fieldbus options and Ethernet (TCP/IP) are also available.
In case more than one option board is required, there is an attachable expansion unit that allows for up to 4 fieldbus boards to be used. For example, some customers send fastening data to an upper-level server via Ethernet and control by CC-Link.

●FASTENING DATA STORAGE FUNCTION

Up to 22,500 pieces of fastening data can be saved to the controller memory. Recorded data can be read by Sanyo software <User Interface Terminal>. From there it can be saved to a PC and exported to Excel file.

Input / Output Board	Sink input (NPN)
	Source input (PNP)
Fieldbus Board	CC-Link
	CC-Link Ver.2
	CC-Link IE
	DeviceNet
	PROFIBUS
	PROFINET
	Ethernet/IP
Data Communications Board	Ethernet

Option Board List

User Interface Terminal Software (UIT)

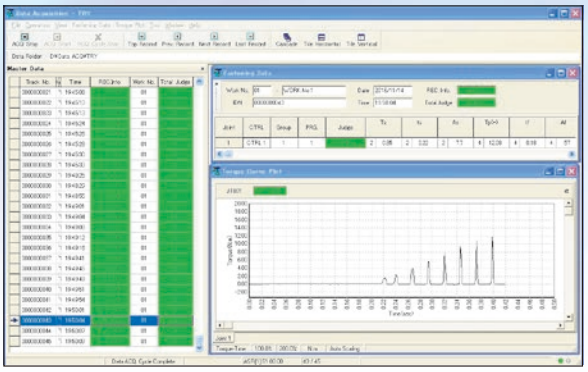
●NUTRUNNER SUPPORT SOFTWARE

By using the User Interface Terminal Software, fastening parameters & programs can be set up and storage fastening data and torque curve data can be collected. Recorded data can be saved as a file, and can be outputted to the file such as CSV.
User Interface Terminal has two versions Basic and Full. Basic version allows for fastening setting and fastening data storage. The Full version supports all UIT functions such as data acquisition, torque curve monitoring,maintenance etc.

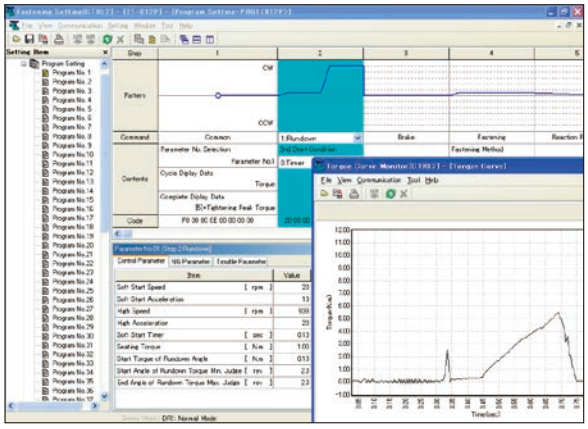
●FUNCTION

<Basic version / Full support version>
- Fastening setting
- Storage fastening data display

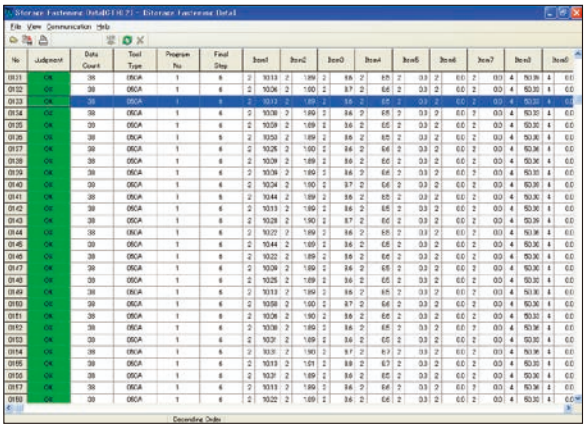
<Full support version only>
- Fastening data acquisition
- Torque curve monitor
- Tool maintenance check
- NG report



Fastening Data Acquisition Display Screen



Fastening Setting / Torque Curve Monitor Display Screen



Storage Fastening Data Display Screen

Various Judgement Functions

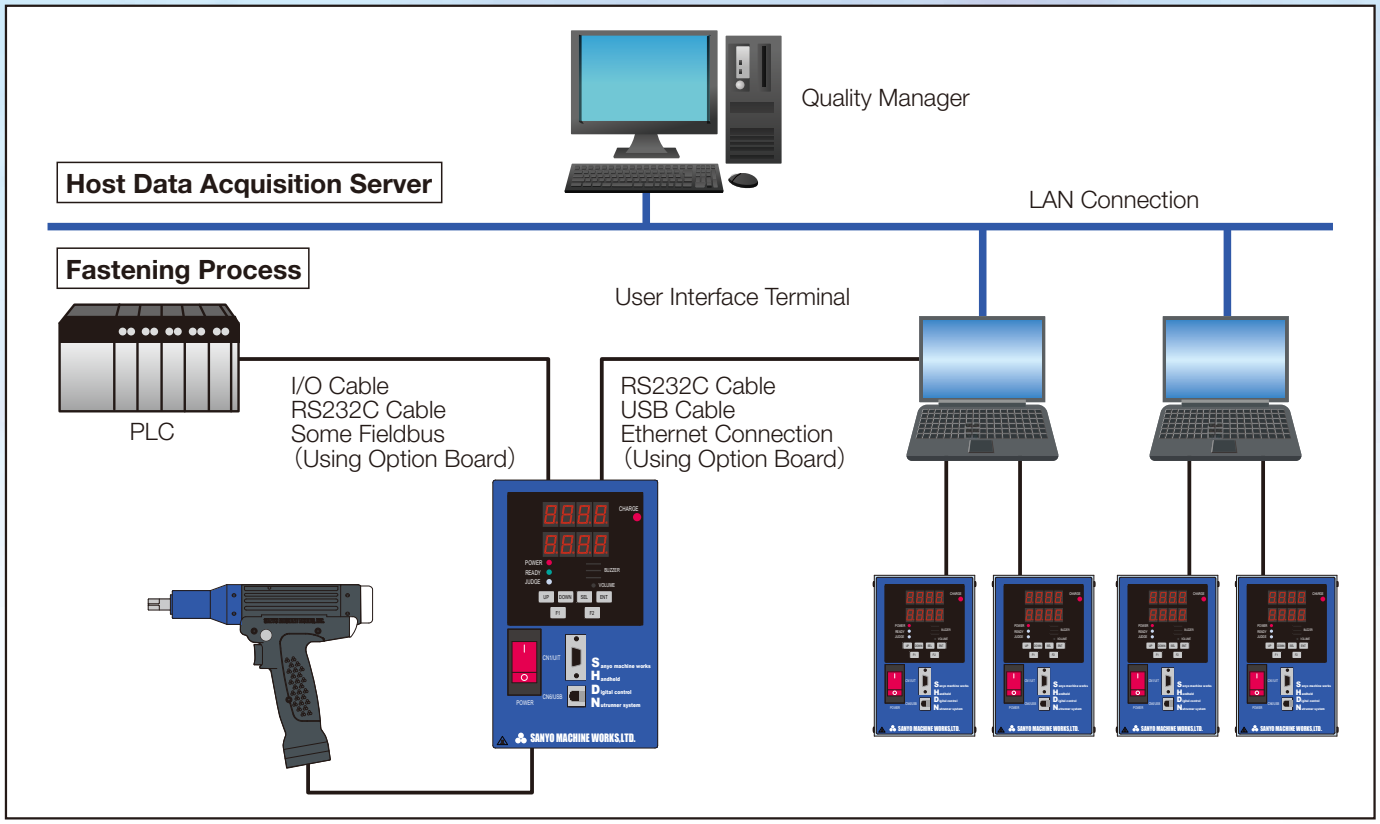
The SHDN tool system has over 66 judgement parameters which can be used to ensure high quality fastening. By judging fastening criteria during and after each fastening cycle, our fastening systems can detect almost all abnormalities such as cross, stripped or contaminated threads. Each production cycle results must be within the limits programmed to meet specified tightening criteria. Using torque, time, degrees (angle), and current in any combination we can ensure that each cycle was completed within suitable parameters for a quality fastened part.
66 total judgement criteria, 32 No Good (NG) end-of-cycle items and 34 Trouble (TR) in-process judgement criteria available.

Quality Manager (QM)

Quality Manager (QM) is a total management software solution for collecting fastening and torque curve data through the User Interface Terminal. QM has functions such as data acquisition, simultaneous torque curve monitoring, trend graphs and histograms. (For more information, please ask Sanyo.)

System Diagram

SHDN handheld Nutrunner controller can connect with many interfaces and common fieldbus options. It comes standard with a discrete I/O interface for tool motion control and program/parameter selection.
End-of-cycle fastening data such as torque, time and angle and overall judgement result can be sent by RS232C, multiple fieldbus devices as well as Ethernet.
Connecting to a PC running the User Interface Terminal software allows communication with an upper level server running Quality Manager (QM). With QM, the fastening and torque curve data from multiple controllers can be collected automatically.



Cables

Tool Cable

This is a small diameter and flexible cable. It has four kinds of cable lineup.

Straight tool cable

Elbow type tool cable

Coil type tool cable

Tool Cable Model List

Type	Model	Length (m)
Straight	SHD-CT-H05	5
	SHD-CT-H10	10
	SHD-CT-H15	15
	SHD-CT-H20	20
	SHD-CT-H25	25
	SHD-CT-H30	30
Hook up	SHD-CTJ-S__	(*1)
Elbow	SHD-CT-L__-_____ (*2)	(*1)
Coil	Please contact us separately.	

*1 Part of "__" in model must be mentioned cable length.
Line up of cable length is same as standard cable.
(About specifications or maximum length, please contact us.)

*2 The end of model name is different according to the Elbow metal direction what you hope.

Power Cable

Power cable has two kinds of 100V and 200V. Primary power source side is a round terminal basically.
(*Accept an offer for connector which is different type for each country.)

100V power cable

200V power cable

Power Cable Model List

Type	Model	Length (m)
100V	SHD-CPP-03	3
200V	SHD-CPT-02	2
	SHD-CPT-03	3
	SHD-CPT-05	5

I/O Cable

I/O cable has two kinds of cable lineup.

Standard I/O cable

Terminal base

I/O Cable Model List

Type	Model	Length (m)
Standard	SHD-CI-03	3
	SHD-CI-05	5
	SHD-CI-10	10
Terminal Base	SHD-CIT	-

Options

Tool Hanger

Pistol type has three kinds of hanger lineup, and Angle type has three kinds of hanger lineup.

Pistol tool Horizontal | Pistol tool Vertical | Pistol tool Inverse

Angle tool Horizontal | Angle tool Horizontal rotatable | Angle tool Vertical

Hanger Model List

Type	Direction	Model	Tool Model
Pistol	Horizontal	SHD-HP-H1	Except below
		SHD-HP-H2	SHD-T2-050P SHD-T3-080P
	Vertical	SHD-HP-V1	Except below
		SHD-HP-V2	SHD-T3-080P
	Inverse	SHD-HP-U	All pistol models
Angle	Horizontal	SHD-HA-H1	SHD-T1-___A
		SHD-HA-H2	SHD-T2-_*_A
		SHD-HA-H3	SHD-T2-220A
	Horizontal rotatable	SHD-HA-F1	SHD-T1-___A
		SHD-HA-F2	SHD-T2-_*_A
		SHD-HA-F3	SHD-T2-220A
	Vertical	SHD-HP-U	All angle models

*) Except SHD-T2-220A

Tool Cover

This is protection resin cover according to the each tool.

Pistol tool cover | Angle tool cover

Tool Cover Model List

Type	Model	Tool Model
High-Speed Pistol	SHD-P2-010P	SHD-T2-010P
		SHD-T2-012P
	SHD-P2-020P	SHD-T2-020P
High-Speed Impact Pistol	SHD-P2-016P	SHD-T2-016P
	SHD-P2-032P	SHD-T2-032P
	SHD-P2-050P	SHD-T2-050P
	SHD-P3-080P	SHD-T3-080P
Angle	SHD-P1-020A	SHD-T1-020A
	SHD-P2-050A	SHD-T2-050A
	SHD-P2-100A	SHD-T2-100A
	SHD-P2-150A	SHD-T2-150A
	SHD-P2-220A	SHD-T2-220A

Option Board

Option board has fieldbus board and data communication board. In case of two option boards using at the same time, an expansion unit is necessary to be attached to the controller. (Option board is available up to 4 pcs.)

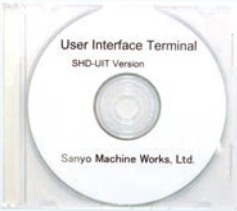
Controller with option board | Controller with expansion unit

Option Board Model List

Type	Model	Specification
I/O	SIO-NPN	NPN
	SIO-PNP	PNP
Fieldbus	SNET-CC	CC-Link
	SNET-CCV2	CC-LinkVer.2
	SNET-CCIE	CC-Link IE
	SNET-DN	DeviceNet
	SNET-PR	PROFIBUS
	SNET-PRNT	PROFINET
	SNET-EHIP	Ethernet/IP
Data Communication	SNET-EH	Ethernet
Expansion Unit	SHD-EX	–

User Interface Terminal (UIT)

UIT has the basic version that can be used only for fastening setting and storage fastening data, and the full support version that can be used for every function. It is possible to choose a USB, RS232C and Ethernet for the communication between PC and controller.



UIT CD

USB Cable

RS232C Cable

UIT and Communication Cable Model List

Type	Model	Specification
UIT	SHD-UITB	Basic Version
	SHD-UITF	Full Support Version
USB Cable	USB-AB-02	A-B Type, 2m
RS232C Cable	RS-N09F09F-02A	PC Side D-Sub9Pin, 2m

Reaction Force Reduction Arm

Reaction force reduction arm has two types. Position arm that has function which can switch fastening sequence and fastening program. And elastic telescopic arm that can reduce a reaction force. (*About the specifications of these arms, please contact us.)

Position arm (SAH - ＊＊＊)

Telescopic arm (SAT - ＊＊＊)

Other Option

Many other options are available. (*About specifications of these options, please contact us.)

Support arm

Angle tool / Straight tool
Long trigger switch

RS232C cable for PLC

Specifications

Tool

Type	Model	Rated Torque (N・m)	Maximum Torque (N・m)	Free Speed (rpm)	Weight (kg)	Fastening Accuracy (%)
High-Speed Pistol	SHD-T2-010P	10	14	3750	1.10	±5 (3σ/Rated Torque) (Nutrunner Mode)
	SHD-T2-012P	12	16	3000		
	SHD-T2-020P	20	32 (Impact Mode)	1730	1.30	
High-Speed Impact Pistol	SHD-T2-016P	16	16	3000	0.95	
	SHD-T2-032P	32	32	2645	1.15	
	SHD-T2-050P	50	50	2600	(*)	
	SHD-T3-080P	80	80	2140	1.96	
Angle	SHD-T1-020A	20	20	675	1.35	
	SHD-T2-050A	50	50	740	1.85	
	SHD-T2-100A	100	100	540	2.55	
	SHD-T2-150A	150	150	335	3.25	
	SHD-T2-220A	220	220	250	5.00	
Straight	SHD-T1-005S	5	5	1125	1.20	
	SHD-T1-010S	10	10			
	SHD-T2-030S	30	30	1230	1.72	
	SHD-T2-050S	50	50	900	2.36	
	SHD-T2-085S	85	85	555	2.60	
	SHD-T2-150S	150	150	320	3.95	

*Square 9.52mm type : 1.72 / Square 12.7mm type :1.83

Controller

Model	Imput Power (V)	Average Power Consumption (W)	Instant Peak Current (A)	Weight (kg)	Operating Temperature (℃)
SHD-DT2-1	AC 90 ～ 127	160	42.4	2.8	0 ～ 50 (Do not condense dew)
SHD-DT2-2	AC 180 ～ 253				

Tool type

SHD-T__ - ____ __ - __

Motor size
1 : Type1 motor
2 : Type2 motor
3 : Type3 motor

Rated torque
(For three figures)

Tool type
P : Pistol type
A : Angle type
S : Straight type

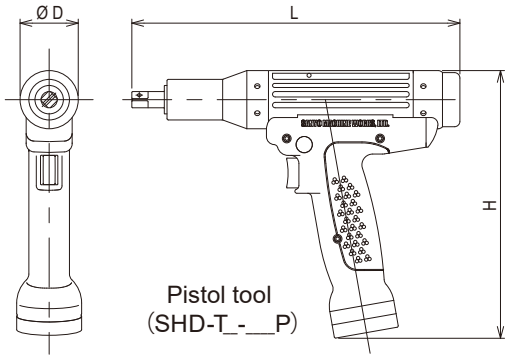
Output axis type
1 : Square drive with hole
2 : Square drive with plunger
3 : Hex female bit (*1)
5 : Different diameter (*2)

*1 SHD-T1-012P, SHD-T2-010P, SHD-T2-012P and SHD-T2-016P four models only.
*2 SHD-T2-050P model only

Dimensions

Pistol tool

Type	Model	Size (mm)			Output Axis (mm)
		D	H	L (*1)	
High-Speed Pistol	SHD-T2-010P	43	198	242.5	(*2)
	SHD-T2-012P				
	SHD-T2-020P			269	Square 9.52
High-Speed Impact Pistol	SHD-T2-016P	43	198	213	(*2)
	SHD-T2-032P			229.5	Square 9.52
	SHD-T2-050P	49	202.5	270	(*3)
	SHD-T3-080P	58	220.4	272	Square 12.7

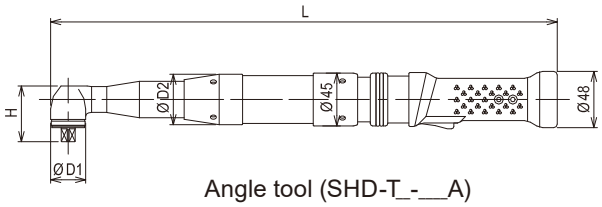


Pistol tool
(SHD-T_-__P)

*1 The length depends on output axis. (The upper table shows the size of the square type.) *2 Square 9.52 or hex female 6.35
*3 Square 9.52 or square 12.7. In case of over 45N·m, it is recommended to use square12.7 type.

Angle tool

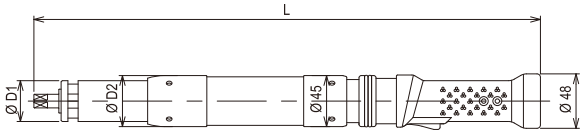
Type	Model	Size (mm)				Output Axis (mm)
		D1	D2	H	L	
Angle	SHD-T1-020A	30	43	48	434	Square 9.52
	SHD-T2-050A	36	45	52	477	
	SHD-T2-100A	46	54	65.5	498	Square 12.7
	SHD-T2-150A	54	56	75	505	Square 15.88
	SHD-T2-220A	63	56	87	792	Square 19.05



Angle tool (SHD-T_-__A)

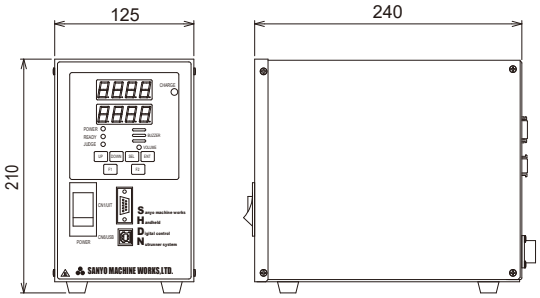
Straight tool

Type	Model	Size (mm)			Output Axis (mm)
		D1	D2	L	
Straight	SHD-T1-005S	31	43	390	Square 9.52
	SHD-T1-010S				
	SHD-T2-030S	36	45	446	
	SHD-T2-050S	44	54	456	Square 12.7
	SHD-T2-085S	47	56	469	
	SHD-T2-150S	64	73	489.5	Square 15.88

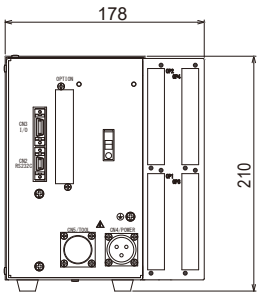


Straight tool (SHD-T_-__S)

Controller



Controller (SHD-DT2-__)



Controller with expansion unit
(Rear side)

SANYO MACHINE WORKS, LTD.

JQA-QM3832 CM009

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*The above-mentioned specification may be changed without prior notice.

SHD-P2.3-E 2024.09