

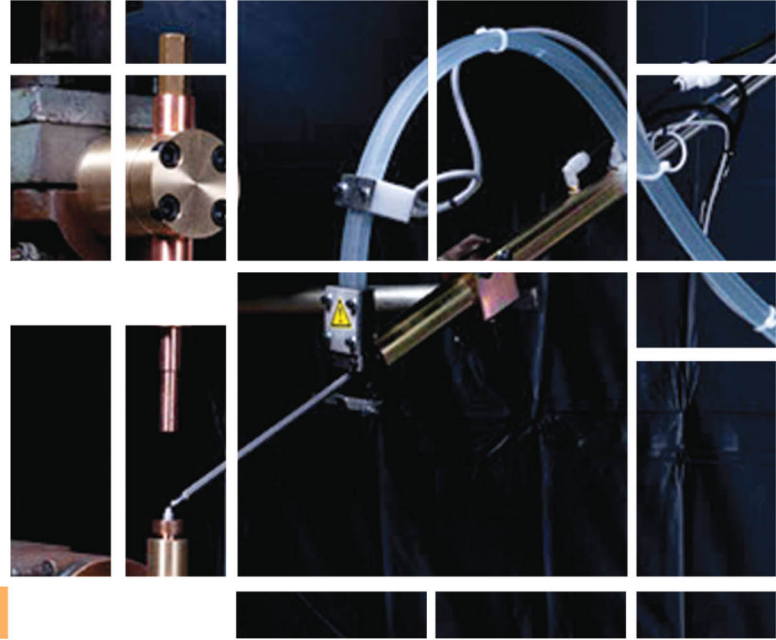
Nut Feeding System

TSM



wanna know more





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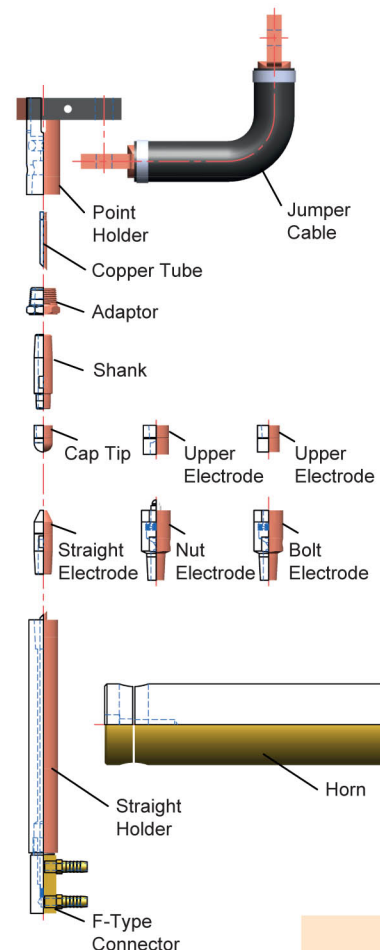
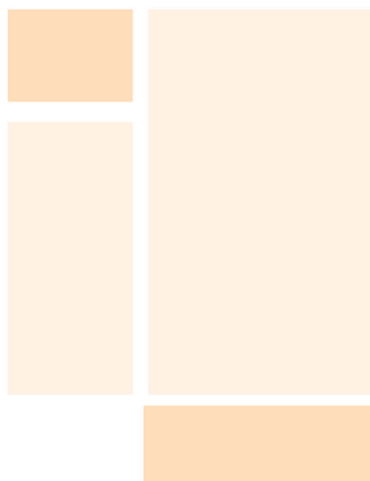
Features of TSM Electrode

Electrode life is very important in the resistance welding. Electrode life is affected by many factors; material characteristic, Manufacturing Process, shape, welding condition and panel material.

TSM has been manufacturing the electrodes since establishment and been devoting ourselves to make "durable electrode" by giving the excellent engineering technique to superior materials.

We make electrodes according to your needs, and we choose the best material for your maximum satisfaction.

Stationery Welding



Nut



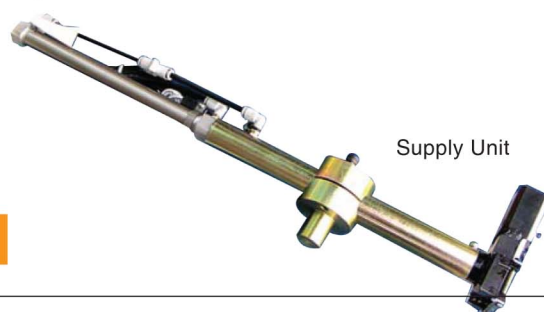
our product

Air Rod Feeder

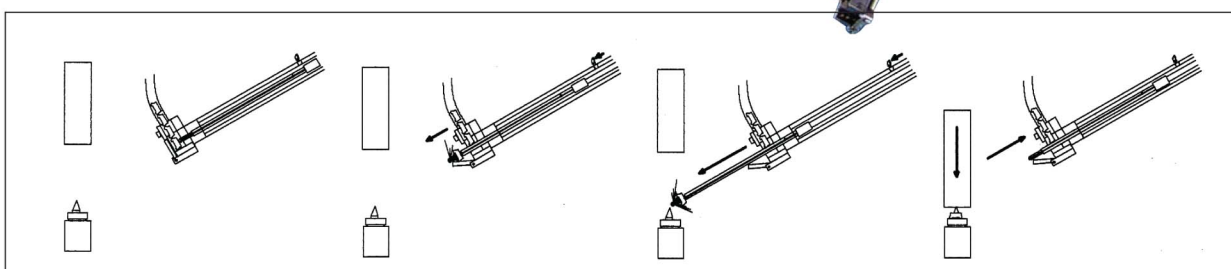
If you want to reduce costs by using a considerably low-priced nut feeder at the time of introduction

The characteristics of this nut feeder

- The Air Rod Feeder is extremely low in price because of its simple design.
- Unlike a nut-piercing feeding system and permanent magnet and electric magnet feeding system, the Air Rod Feeder retains and feeds the nuts by air blow from the tip of the rod. Air turns off 10mm short of guide pin and nut moves onto guide pin.
- Supply unit is possible to installed with the angle from 15° to 60° because the nuts are retained by air.
- Since the nuts are retained by air, the supply stroke can be extended to 400mm.
- A sequencer is used for controlling feeder.



Standard Drawing



Specifications for Air Rod Feeder

Nut Selector	Outer Dimensions	D-245mm W-470mm H-1030mm	
	Power Supply	100VAC 50/60Hz	
	Motor	25w geared motor	If the selector is turned ON and OFF five or six times a minutes, it can be used for 5000hours
	Gear Head	1/18	
	Magnet	ND-FE-B magnets $\phi 13$	
	Stainless Steel Plate	SUS304 Hard chrome-plated on one side	
	Hopper	SUS304	
	Hopper Capacity	6000 M6 square nuts (W=10.8mm H=5.8mm)	
	Control	Sequencer	Keyence, Mitubishi, and Omron
	Air Pressure	4kg/cm ²	
	Air Consumption	Average in the case of air feeding: 2.6NL/piece	In the case of M8 square nuts
		In the case of natural fall : 0.0NL	No relation to nut sizes
	Valve	Return type, lead wire type effective cross-sectional area: 10mm ²	
	Air Control Unit	1/4 one-touch manual discharge, lubricating oil K2213-2	
	Snap Switch	Toggle (WD 1011 WD1211)	
	Relay	2a2b (MY2N)	
	Push Botton	Single Pole (AB542177)	
Air Rod Feeder (Supply unit)	Cylinder	$\phi 20$ stroke 200mm	
	Cylinder Switch	MAX 120VAC 50VDC	X1
	Joint	1/8 one-touch	
	Air Tube	Outer diameter $\phi 6$, Inner diameter $\phi 4$	
	Air Consumption	1.1NL/1stroke	In the case of M6 square nuts

our product

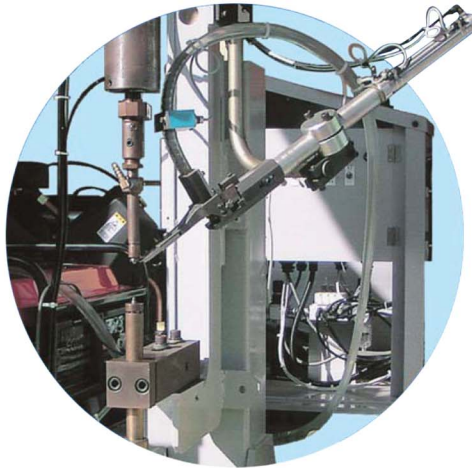
New Feeder Mate

If you want to reduce costs by shortening the tact time after the introduction

Nuts can be fed to C channel type product and also such product, which has deep to bottom with narrow inlet due to the nuts are fed to upper electrode. Time for nut welding reduces to half compared with before which leads to pare payroll costs drastically.

The characteristics of this nut feeder

- Upper holder comes down when weld complete signal is received then next nut is fed to upper holder and wait start signal. That makes the feeling of spot welding. The time to wait nut becomes "0" which improves take time. Next nut will be fed to upper electrode when receiving weld complete signal.
- Nut is held by upper electrode to be parallel against work that reduces the possibility of miss welding.
- Due to the nut is held by upper guide pin to be parrallel against work, lower guide pin has lower possibility of damage and wear-out.

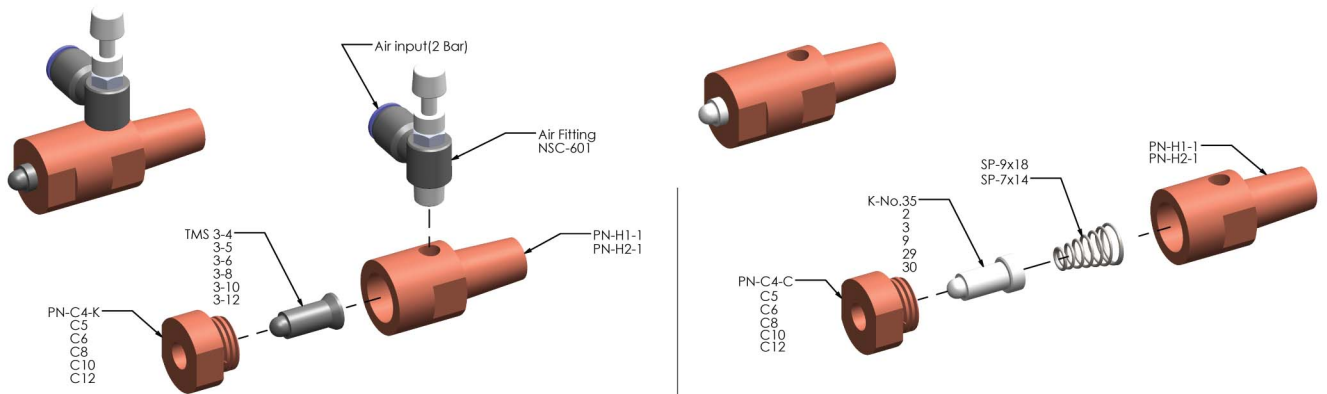


Specifications for Feeder Mate

Nut Selector	Outer Dimensions	D-245mm W-470mm H-1030mm	
	Power Supply	100VAC 50/60Hz	
	Motor	25w geared motor	If the selector is turned ON and OFF five or six times a minutes, it can be used for 5000hours
	Gear Head	1/18	
	Magnet	ND-FE-B magnets $\phi 13$	
	Stainless Steel Plate	SUS304 Hard chrome-plated on one side	
	Hopper	SUS304	
	Hopper Capacity	6000 M6 square nuts (W=10.8mm H=5.8mm)	
	Control	Sequencer	Keyence, Mitsubishi, and Omron
	Air Pressure	4kg/cm ²	
	Air Consumption	Average in the case of air feeding: 2.6NL/piece	In the case of M8 square nuts
		In the case of natural fall : 0.0NL	No relation to nut sizes
	Valve	Return type, lead wire type effective cross-sectional area: 10mm ²	
	Air Control Unit	1/4 one-touch manual discharge, lubricating oil K2213-2	
	Snap Switch	Toggle (WD 1011 WD1211)	
	Relay	2a2b (MY2N)	
	Push Botton	Single Pole (AB542177)	
Feeder Mate (Supply unit)	Outer Dimensions	Overall length 730mm	
	Cylinder	$\phi 25$ stroke 150mm non-rotating	M6/M8 nuts
	Cylinder Switch	MAX 120VAC 50VDC	X2
	Joint	1/8 one-touch	
	Air Tube	Outer diameter $\phi 6$ Inner diameter $\phi 4$	
Upper Holder	Air Consumption	1.88NL/1 stroke	Magnet type upper electrode, M8 square nut
	Holder	Copper	$\phi 25$ OR $\phi 32$
	Cylinder	$\phi 12$ stroke 25mm	
	Magnet	Samarium Cobalt Magnet	
	Guide Pin	SUS304	
Lower Holder	Cylinder Rod	SUS304	
	Inner	Beryllium copper	
	Outer	Brass	$\phi 25$ OR $\phi 32$
	Cylinder	$\phi 20$ stroke 25mm	
	Guide Pin	Ceramics	
	Cylinder Rod	Resin	

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Nut Electrode



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Alpock / Ceramic Guide Pin

Standard Drawing

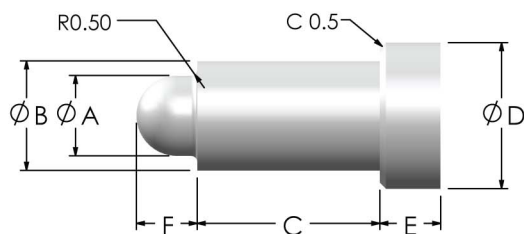


Table for Ceramic Guide Pin

Nut size	Model	Ø A	Ø B	C	Ø D	E	F
M4	K-No. 35	3.2	4.8	15	10	5	3.8
M5	K-No. 2	4.1	5.8	15	10	5	4.0
M6	K-No. 3	4.8	6.8	15	10	4.8	4.8
M8	K-No. 9	6.7	8.8	15.5	12	5	5.8
M10	K-No. 29	8.6	10.8	14	14	6	8.0
M12	K-No. 30	10.4	12.8	17	16	5	8.0

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KCF Guide Pin

Standard Drawing

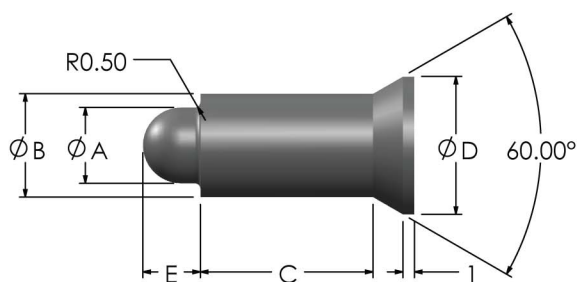


Table for KCF Guide Pin

Nut size	Model	Ø A	Ø B	C	Ø D	E
M4	TMS 3-4	3.2	5.9	15	12	3.8
M5	TMS 3-5	4.1	6.1	15	12	4.0
M6	TMS 3-6	4.8	6.9	15	12	4.5
M8	TMS 3-8	6.6	9.0	15	12	5.0
M10	TMS 3-10	8.6	11.2	15	16	8.0
M12	TMS 3-12	10	13.0	15	16	6.0

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KCF / Ceramic Guide Pin

Standard Drawing

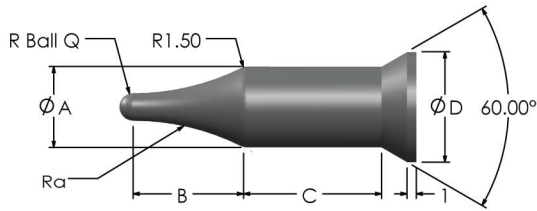


Table for KCF / Ceramic Guide Pin

Nut Size	Model (KCF)	Model (Ceramics)	ØA	B	C	ØD
M4	SW-PN-4P	SW-GPN-4P	4.8	6.5	15	12
M5	SW-PN-5P	SW-GPN-5P	5.8	8.5	15	12
M6	SW-PN-6P	SW-GPN-6P	6.8	11	15	12
M8	SW-PN-8P	SW-GPN-8P	8.8	12	15	12
M10	SW-PN-10P	SW-GPN-10P	10.8	14	15	16
M12	SW-PN-12P	SW-GPN-12P	12.8	17	15	16

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Ceramic Guide Pin



Standard Drawing

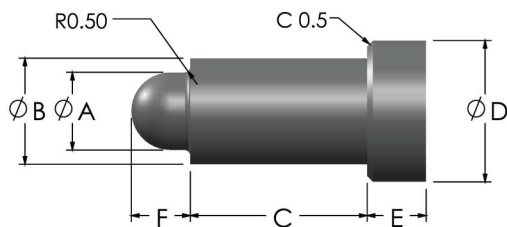


Table for Ceramic Guide Pin

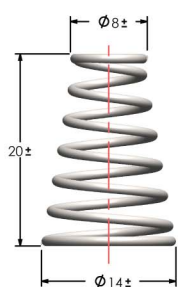
Nut size	Model	Ø A	Ø B	C	Ø D	E	F
M4	K-No. 35	3.2	5.9	15	8	5	3.8
M5	K-No. 2	4.1	6.1	15	10	5	4.0
M6	K-No. 3	4.8	6.9	15	10	5	4.5
M8	K-No. 9	6.6	9.0	15	12	5	5.0
M10	K-No. 29	8.6	11.2	15	14	5	8.0
M12	K-No. 30	10	13.0	15	16	6	6.0

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Spring

Part : SP-7x14

specification : M4,5,6,8



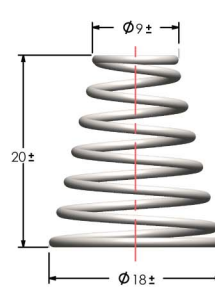
Front view



Isometric view

Part : SP-9x18

specification : M10,12

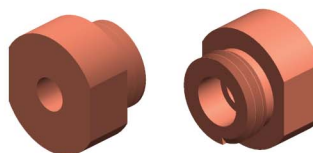


Front view



Isometric view

Ceramic Pin Cover



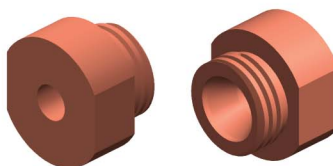
The drawing shows a circular plate with a central hole. The top view (left) indicates an outer diameter ϕC and an inner diameter ϕA . The total thickness is D . The cross-section view (right) shows a total thickness of 17. The top flange has a thickness of 11 and a diameter of ϕB . The central hole has a diameter of ϕA . The cross-section shows a central core of 10 and a surrounding layer of 7. The core is labeled with dimensions M18 x 1.5 (M4,5,6,8) and M22 x 1.5 (M10,12).

Ceramic Pin Cover

Table for Ceramic Pin Cover

Nut size	Model	Ø A	Ø B	Ø C	D
M4	PN-C4-C	6.0	8.2	25	22
M5	PN-C5-C	6.2	10.2	25	22
M6	PN-C6-C	7.0	10.2	25	22
M8	PN-C8-C	9.1	12.2	25	22
M10	PN-C10-C	11.3	14.2	30	27
M12	PN-C12-C	13.1	16.2	30	27

Pin Cover



Pin Cover

Table for Pin Cover

Nut size	Model	Ø A	Ø B	Ø C	D
M4	PN-C4-K	6.0	12.5	25	22
M5	PN-C5-K	6.2	12.5	25	22
M6	PN-C6-K	7.0	12.5	25	22
M8	PN-C8-K	9.1	12.5	25	22
M10	PN-C10-K	11.3	16.5	30	27
M12	PN-C12-K	13.1	16.5	30	27

Pin Holder

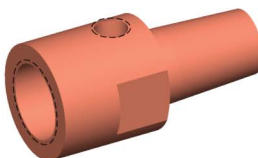
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Table for Pin Holder

Model Number	ØA	ØB	L	For Pin Cover
PN-H1-1	22	25	50	M4-M8
PN-H2-1	27	30		M10-M12

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Upper Electrode for Welding Nut

Standard Drawing

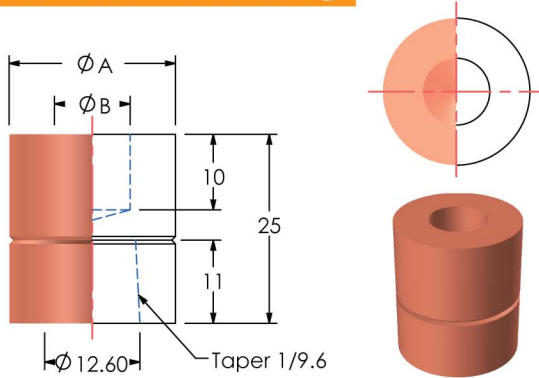


Table for Cap Tip Type

Nut	Cord No.	Ø A	Ø B
M4	PN-U-C4	16	4
M5	PN-U-C5		5
M6	PN-U-C6		6
M8	PN-U-C8	20	8
M10	PN-U-C10	22	10
M12.7/16	PN-U-C127	25	12
M14	PN-U-C14	30	14

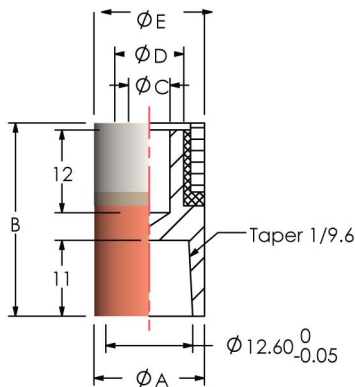
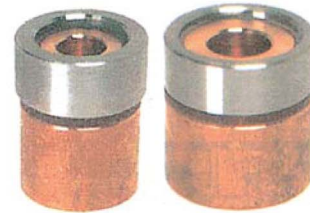
our product

Nut Checker

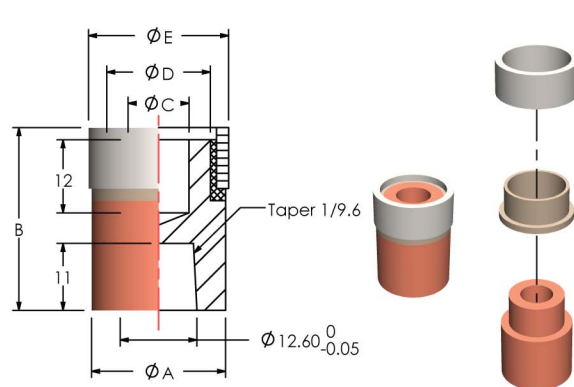
Upper Electrode with insulator for Nut Welding

About Nut detect tip

Nut detect tip prevents upside down nut and miss feed of nut to be welded by separating between electrode section and SS ring by insulator. When reversed nut is fed or no nut is fed, no current condition will be made which makes nut not to be welded on work. It is also that temporary stop or re-start of related devices and Robot can be carried out very quick if "No current function" on Spot welder's timer is used.



M5,6,12,7/16



M8,M10

Table for Square Nut

Nut	Cord No.	Ø A	B	Ø C	Ø D	Ø E
M5	PN-K-C5-8.5	16	28	5	8.5	16
	PN-K-C5-9				9.0	
	PN-K16-C6-10			6	10.0	
M6	PN-K16-C6-11				11.0	
	PN-K16-C6-12				12.0	
	PN-K-C8-13	20	8	13.0	22	
M8	PN-K-C8-14			14.0		
	PN-K-C8-15			15.0		
M10	PN-K-C10-17	22	30	10	17.0	23
M12	PN-K-C12-20	28		12	20.0	28
M7/16	PN-K-C7/16-21.5				21.5	

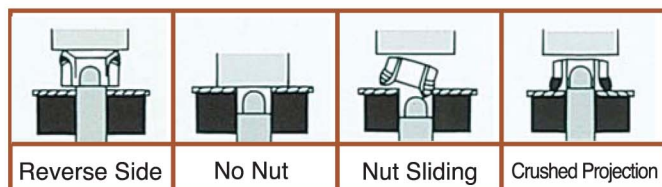
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Nut Checker with insulator case

Detection of poor feeding of weld nut-Purge of sliding nut and reversed side nut

Lost cost! Easy! Accurate!

Detect poor feeding of weld nut. Only assembling Nut Checker onto Upper Electrode. No wiring and piping are required.



- **Nut Checker** directly detects Nut sliding, Reversed side, Stand up and No nut and does not allow start welding.
- Nut Checker has an ability to work with Robot, Automated machines and Standard machines.
- Detection is carried out mechanically. That's mean no worries are necessary for failure.
- Nut Checker can be automatically controlled when using with automatic monitoring system for Projection nut.

Feature

- Nut Checker detects mistakes so that anyone can operate machine.
- No damage is created on work when mistake founds.
- One-touch assembly is possible for any machines.
- No matter what shape of electrodes.

Capacity

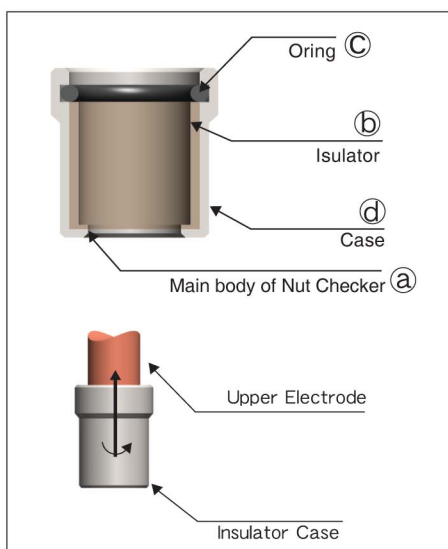
- Welding does not start when mistake is found.
- Please output error by the no current signal from welder.



our product

Nut Checker with insulator case (How to use Nut Checker)

Name and method of assembly



Point to be checked before use

- The center of Upper and Lower electrodes needs to be in line within 0.5mm and make sure not to be angled. If electrodes are misaligned more than 1mm, it may cause a misalignment of nut.
- Check the condition of electrode cooling. There are possibilities of loss of Nut Checker and poor insulation due to burn out of insulator or O ring.
- Check if outside diameter of upper electrode is within +0.1-0mm of Nut Checker size. If the diameter is bigger, it is difficult to assemble Nut Checker which may cause a loss of Nut Checker. (It is also possible to manufacture Nut Checker to meet the used electrode size. Please consult with us.)

Check Out

- | | |
|-----------------------------|--|
| A) Main body of Nut Checker | a) No energization and No mark of electrical corrosion on the edge of bottom |
| | b) No harmful damage at inlet of nut |
| | c) No harmful damage on overall of Nut Checker |
| B) Insulator | d) No harmful damage at inlet of nut |
| | e) No stain inside Nut Checker |
| C) O ring | f) No abnormal assembly is accepted |

Selection chart of Nut Checker

Nut size	M 6	M 6	M 6	M 8	M 8	M 10
Cord No.	◎CM6-16A	○CM6-16B	○CM6-18B	◎CM8-18A	○CM8-20A	◎CM10-20A

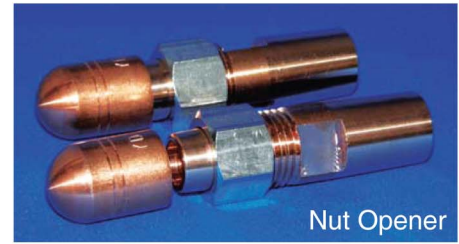
◎Standard ○Semi-Standard

* Please supply sample nut at the time of placing your purchase order. Suitable size of Nut Checker will be selected.

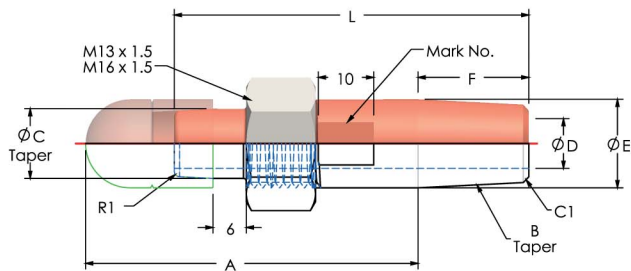


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Straight Shank

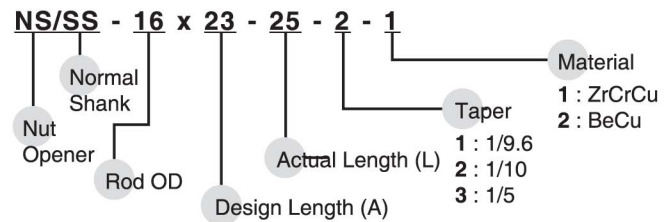


Standard Drawing Nut Opener



Shank with nut for removing cap-tip - natume

Order Example



Shank 13

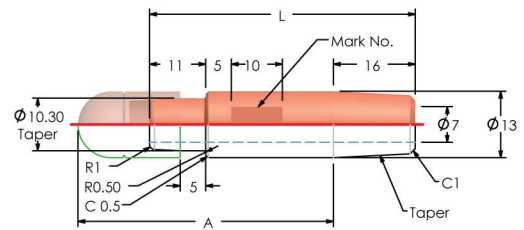
Normal Shank

Model Number	A	L
SS - 13 x 23 - 25 - 2 - 1	23	25
SS - 13 x 28 - 30 - 2 - 1	28	30
SS - 13 x 33 - 35 - 2 - 1	33	35
SS - 13 x 40 - 42 - 2 - 1	40	42
SS - 13 x 50 - 52 - 2 - 1	50	52
SS - 13 x 60 - 62 - 2 - 1	60	62
SS - 13 x 70 - 72 - 2 - 1	70	72
SS - 13 x 80 - 82 - 2 - 1	80	82
SS - 13 x 90 - 92 - 2 - 1	90	92
SS - 13 x 100 - 102 - 2 - 1	100	102

Nut Opener

Model Number	A	L
NS - 13 x 23 - 25 - 2 - 1	23	25
NS - 13 x 28 - 30 - 2 - 1	28	30
NS - 13 x 33 - 35 - 2 - 1	33	35
NS - 13 x 40 - 42 - 2 - 1	40	42
NS - 13 x 50 - 52 - 2 - 1	50	52
NS - 13 x 60 - 62 - 2 - 1	60	62
NS - 13 x 70 - 72 - 2 - 1	70	72
NS - 13 x 80 - 82 - 2 - 1	80	82
NS - 13 x 90 - 92 - 2 - 1	90	92
NS - 13 x 100 - 102 - 2 - 1	100	102

Standard Drawing Normal Shank



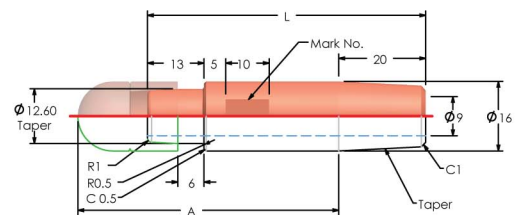
Shank 16

Normal Shank

Model Number	A	L
SS - 16 x 40 - 44 - 2 - 1	40	44
SS - 16 x 50 - 54 - 2 - 1	50	54
SS - 16 x 60 - 64 - 2 - 1	60	64
SS - 16 x 70 - 74 - 2 - 1	70	74
SS - 16 x 80 - 84 - 2 - 1	80	84
SS - 16 x 90 - 94 - 2 - 1	90	94
SS - 16 x 100 - 104 - 2 - 1	100	104
SS - 16 x 110 - 114 - 2 - 1	110	114
SS - 16 x 124 - 124 - 2 - 1	120	124
SS - 16 x 130 - 134 - 2 - 1	130	134
SS - 16 x 140 - 144 - 2 - 1	140	144
SS - 16 x 150 - 154 - 2 - 1	150	154

Nut Opener

Model Number	A	L
NS - 16 x 40 - 44 - 2 - 1	40	44
NS - 16 x 50 - 54 - 2 - 1	50	54
NS - 16 x 60 - 64 - 2 - 1	60	64
NS - 16 x 70 - 74 - 2 - 1	70	74
NS - 16 x 80 - 84 - 2 - 1	80	84
NS - 16 x 90 - 94 - 2 - 1	90	94
NS - 16 x 100 - 104 - 2 - 1	100	104
NS - 16 x 110 - 114 - 2 - 1	110	114
NS - 16 x 124 - 124 - 2 - 1	120	124
NS - 16 x 130 - 134 - 2 - 1	130	134
NS - 16 x 140 - 144 - 2 - 1	140	144
NS - 16 x 150 - 154 - 2 - 1	150	154



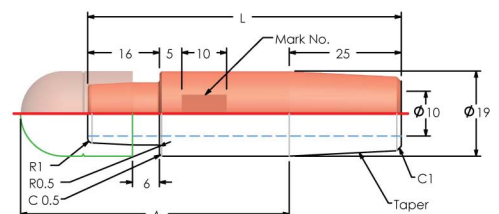
Shank 19

Normal Shank

Model Number	A	L
SS - 19 x 40 - 50 - 2 - 1	40	50
SS - 19 x 50 - 60 - 2 - 1	50	60
SS - 19 x 60 - 70 - 2 - 1	60	70
SS - 19 x 80 - 90 - 2 - 1	80	90
SS - 19 x 90 - 100 - 2 - 1	90	100
SS - 19 x 100 - 110 - 2 - 1	100	110

Nut Opener

Model Number	A	L
NS - 19 x 40 - 50 - 2 - 1	40	50
NS - 19 x 50 - 60 - 2 - 1	50	60
NS - 19 x 60 - 70 - 2 - 1	60	70
NS - 19 x 80 - 90 - 2 - 1	80	90
NS - 19 x 90 - 100 - 2 - 1	90	100
NS - 19 x 100 - 110 - 2 - 1	100	110



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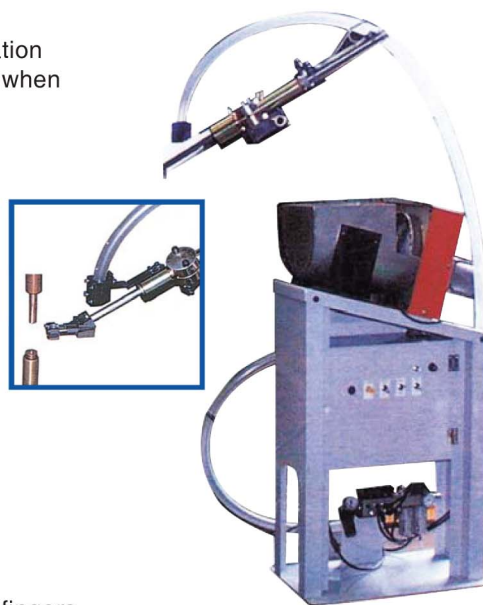
Bolt Feeder

Bolt does not fall down when inserting bolt on work. Operation becomes Safer, Reliable and Speedy. The figure is stable when inserting bolt. That makes high quality of welding result

Specifications

Unit: mm

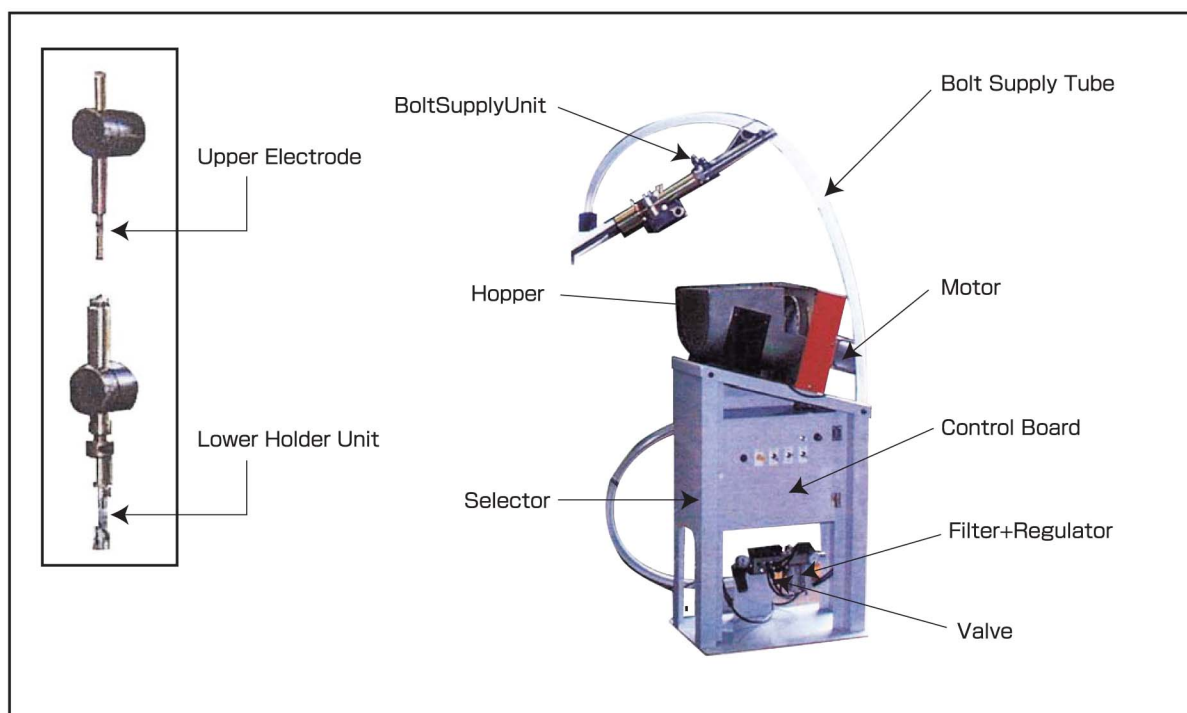
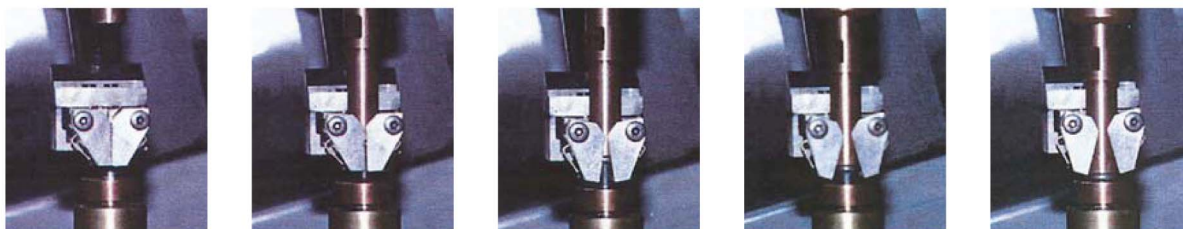
BOLT Size	M5~M10
Length	12mm~30mm
Selection capability	30~60/min
Feeding stroke	200mm
Feeding angle	30°



Character

- No vibrator is used to line bolts but lined by 25W motor.
- Upper electrode comes down to pressurize a bolt inside fingers.
 - * The end of bolt is inserted into the lower hole of work.
 - * The Finger holds bolt to be vertical against work so that bolt will not fall down.
- The screw threads are not damaged though the bolt is pinched by the end of finger.
- Welding current does not flow even if pressurizing with no bolt. The feeder informs that there is no bolt with keeping pressurizing.

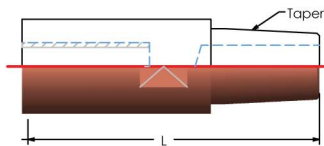
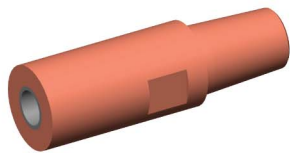
A bolt is inserted to the Lower hole completely



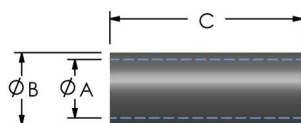
our product

KCF Sleeve / Electrode

Standard Drawing



Standard Drawing for Electrode



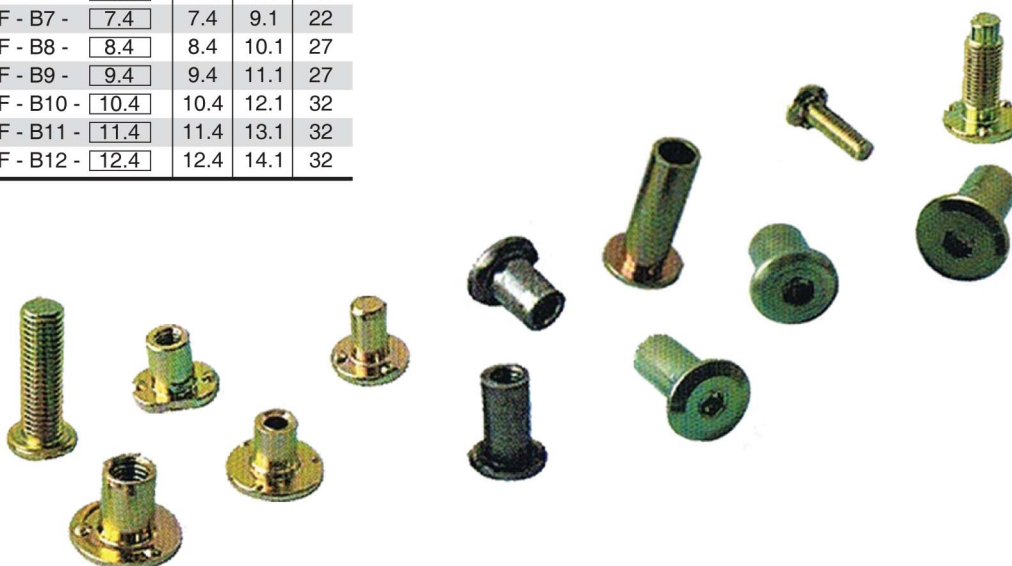
Standard Drawing for KCF Sleeve

Table for standard KCF Sleeve

Model Number	ØA	ØB	C
KCF - B4 - 4.0	4	5.1	17
KCF - B5 - 5.0	5	6.1	17
KCF - B6 - 6.0	6	7.1	22
KCF - B7 - 7.0	7	8.1	22
KCF - B8 - 8.0	8	9.1	27
KCF - B9 - 9.0	9	10.1	27
KCF - B10 - 10.0	10	11.1	32
KCF - B11 - 11.0	11	12.1	32
KCF - B12 - 12.0	12	13.1	32

Model Number	ØA	ØB	C
KCF - B4 - 4.4	4.4	6.1	17
KCF - B5 - 5.4	5.4	7.1	17
KCF - B6 - 6.4	6.4	8.1	22
KCF - B7 - 7.4	7.4	9.1	22
KCF - B8 - 8.4	8.4	10.1	27
KCF - B9 - 9.4	9.4	11.1	27
KCF - B10 - 10.4	10.4	12.1	32
KCF - B11 - 11.4	11.4	13.1	32
KCF - B12 - 12.4	12.4	14.1	32

Model Number	ØA	ØB	C
KCF - B4 - 4.2	4.2	6.1	17
KCF - B5 - 5.2	5.2	7.1	17
KCF - B6 - 6.2	6.2	8.1	22
KCF - B7 - 7.2	7.2	9.1	22
KCF - B8 - 8.2	8.2	10.1	27
KCF - B9 - 9.2	9.2	11.1	27
KCF - B10 - 10.2	10.2	12.1	32
KCF - B11 - 11.2	11.2	13.1	32
KCF - B12 - 12.2	12.2	14.1	32
KCF - B13 - 13.2	13.2	15.1	32
KCF - B14 - 14.2	14.2	16.1	32
KCF - B15 - 15.2	15.2	17.1	32



our product

Lower Electrode with Ceramics Sleeve

Standard Drawing

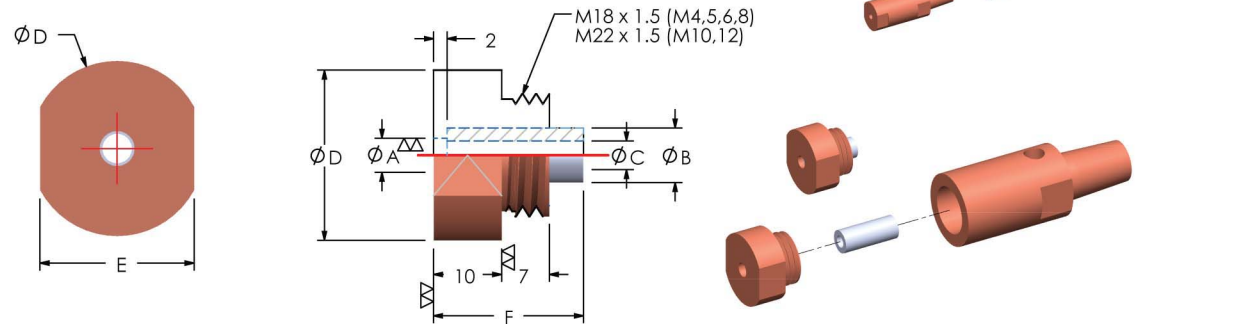


Table for Lower Electrode with Ceramics Sleeve

Nut Size	Model	$\varnothing A$	$\varnothing B$	$\varnothing C$	$\varnothing D$	E	F
M4	PB-KC4-2527	5	6	4.2	25	22	17
M5	PB-KC5-2527	6	7	5.2	25	22	17
M6	PB-KC6-2527	7	8	6.2	25	22	22
M8	PB-KC8-2532	9	10	8.2	25	22	27
M10	PB-KC10-3042	11	12	10.2	30	27	27
M12	PB-KC12-3042	13	14	12.2	30	27	27

our product

Lower Electrode Holder

Standard Drawing

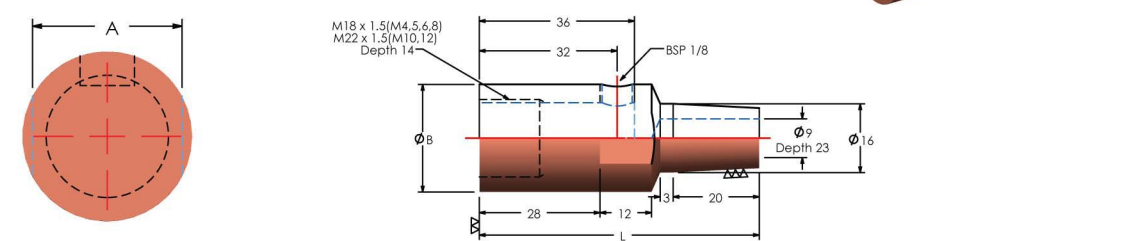


Table for Lower Electrode Holder

Model Number	A	$\varnothing B$	L	For Pin Cover
S-125MF	22	25	65	M4 ~ M8
S-130MF	27	30		M10 ~ M12

our product

Weld Nut For Resistance Welding



We supply:

- Weld Nut
- Hex, Square and Round Nuts
- Flange Nuts, Locking Nuts
- Roller
- All Metal Parts
- Rivet
- JIS Sq Nuts
- Din Weld Nuts
- Hex Weld Nuts

our product

Weld Condition For Spot Projection Nut Welding

4-Spot Projection Nut Welding

Screw (Nominal) mm	Material Thickness mm	A			B			Weld Twisting Strength kgf-cm
		Time (cycle)	Electrode Force kgf	Weld Current A	Time (cycle)	Electrode Force kgf	Weld Current A	
12	1.2	3	450	17,000	6	370	14,000	1,200
	2.3	3	480	18,500	6	400	15,000	
	4.0	3	520	20,000	6	420	16,500	
8	1.2	3	360	13,500	6	270	9,500	1,000
	2.3	3	400	15,000	6	290	10,500	
	4.0	3	430	16,500	6	320	12,000	
5	1.2	3	300	10,500	6	240	8,000	700
	2.3	3	320	11,500	6	260	9,000	
	4.0	3	350	12,500	6	280	9,500	

3-Spot Projection Nut Welding

Screw (Nominal) mm	Material Thickness mm	A			B			C			Weld Twisting Strength kgf-m	Nut Twisting Strength kgf-m
		Time (cycle)	Electrode Force kgf	Weld Current A	Time (cycle)	Electrode Force kgf	Weld Current A	Time (cycle)	Electrode Force kgf	Weld Current A		
10	1.2	3	420	16,000	6	350	13,000	12	280	10,000	15.3	5.5
10	2.3	3	450	17,000	6	370	14,000	12	300	11,000	15.3	5.5
10	4.0	3	480	18,000	6	410	15,500	12	320	12,000	15.3	5.5
6	1.2	3	310	11,000	6	270	9,500	12	220	7,000	4.5	1.5
6	2.3	3	340	12,000	6	290	10,500	12	250	8,500	4.5	1.5
6	4.0	3	370	14,000	6	320	12,000	12	270	9,500	4.5	1.5



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