

Mechanical feed type tapping unit

synchro tapper™



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The Synchro Tapper is a mechanically operated tapping unit capable of high-speed automated work. Synchronized rotation with feed allows precise tapping on thin and soft materials (Class 2 thread accuracy guaranteed).

STB-H/L model

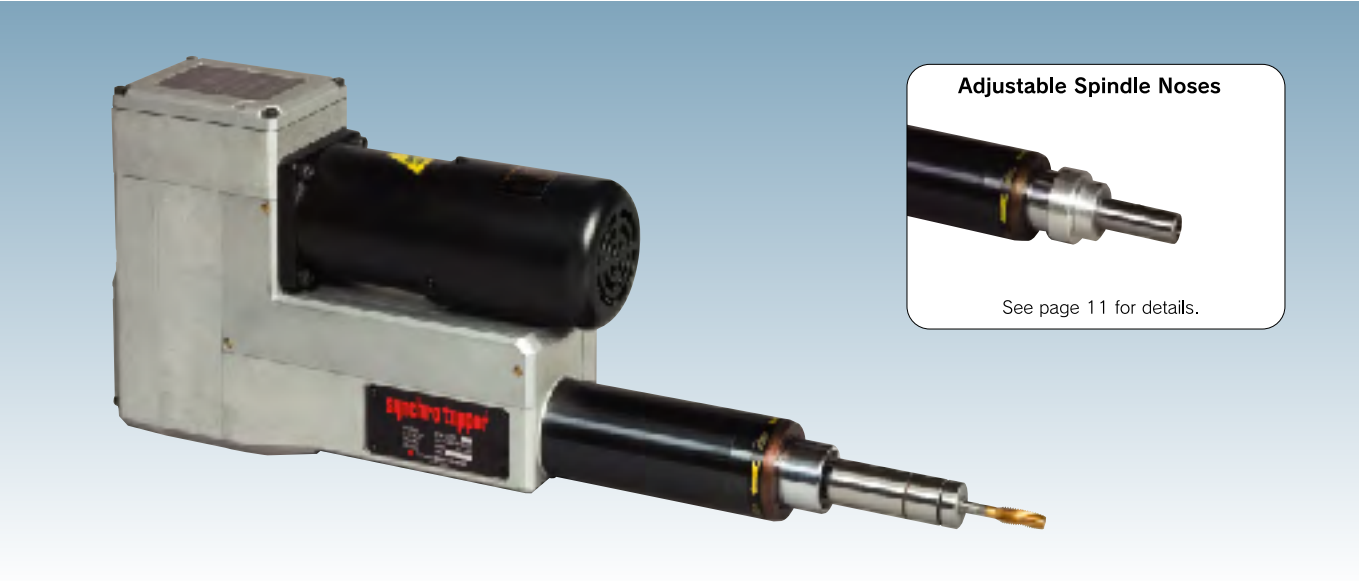
H model...High speed type

L model...High torque type

Spindle motor 0.35kW

Tapping capacity			
Aluminium M12		Steel M10	

Idling time is reduced significantly.
Tapping unit flexible to workpiece specifications.



Features1

Fast approach and fast return mechanisms cut down cycle time.

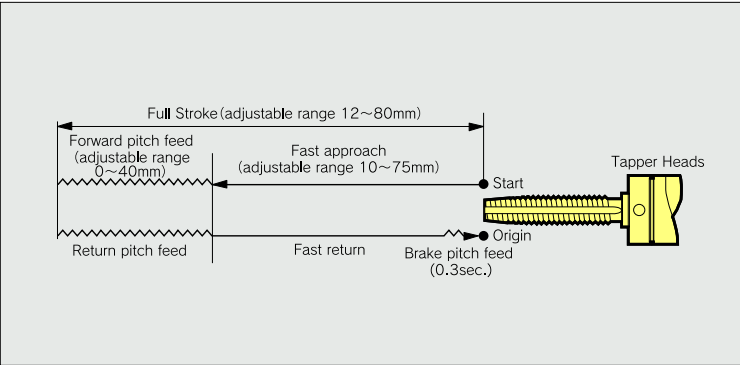
The built-in fast approach and pitch feed automatic switch mechanisms significantly cut down idling time during the tapping process.

Features2

Capable of setting at any angle.

Owing to its small and light weight, the unit can be set at any angle. The special purpose machine using Synchro Tapper to save space can be easily fabricated.

Traveling chart of a cycle



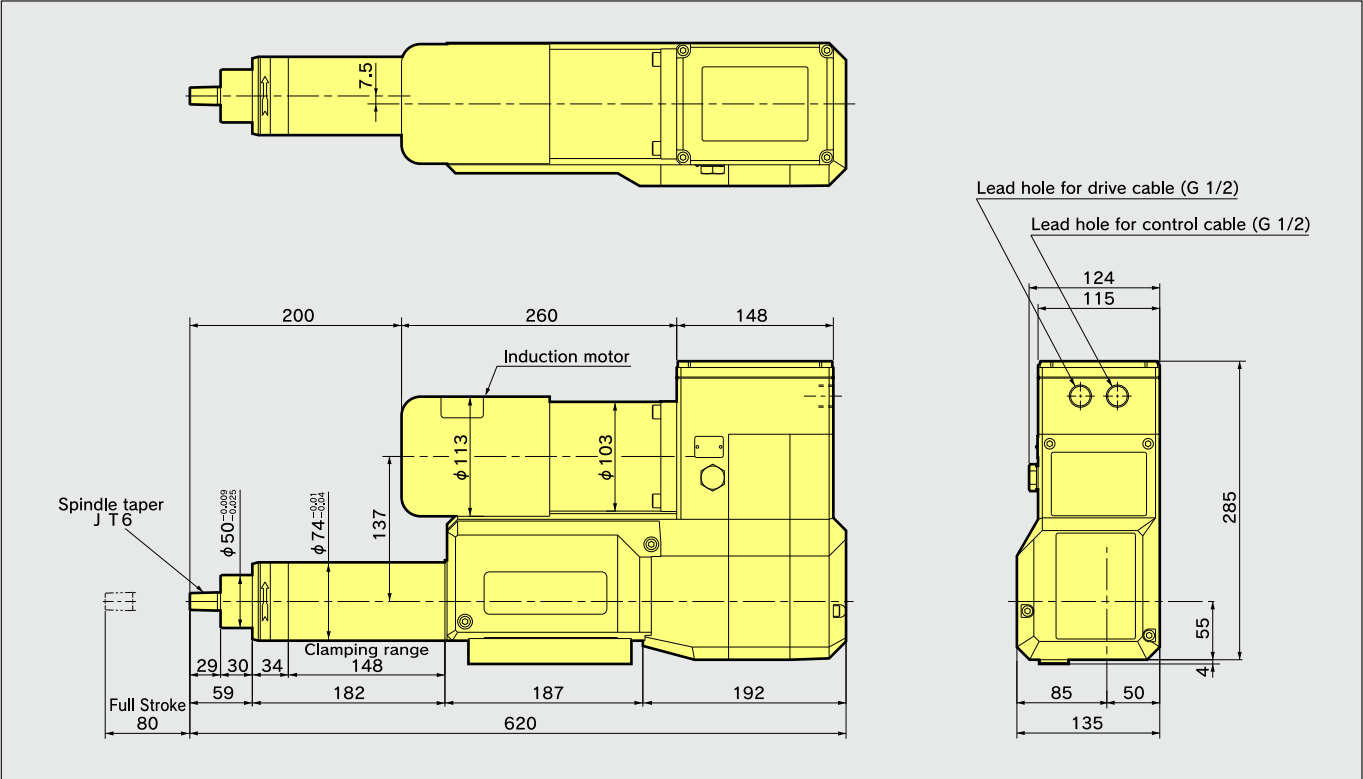
3phase Volts (V)	Motor model							
	220		380		400		415	
	50Hz	60Hz	50Hz	50Hz	60Hz	50Hz	50Hz	60Hz
Amps (A)	2.0	1.75	1.0	1.0	0.95	1.0	1.0	0.90
Power (kW)	0.35							
Poles (P)	4							

Capacity

Model	Spindle speed		Tapping capacity								Stroke			Fast approach speed		Maximum tapping cycle time per minute	Motor spec.		Thread pitch		Weight
			1 spindle		2 spindles		3 spindles		4 spindles		Full Stroke	Fast approach stroke	Pitch feed stroke	50Hz	60Hz		Power	Poles			
	50Hz	60Hz	AL *	ST* (S45C)	AL *	ST* (S45C)	AL *	ST* (S45C)	AL *	ST* (S45C)						mm			mm/s	time/min	kW
		min ⁻¹	mm		mm		mm		mm		mm			mm/s		time/min	kW	P	mm	Threads/inch	kg
STB-H108	1,750	2,100	M5	M4	M4	M2	M3	M2	—	—	12 80	10 75	0 40	88	105	30	0.35	4	0.25	100	27
			M4	M3	M3	M2	M3	M2											0.3	80	
	1,200	1,440	M6	M4	M5	M4	M4	M3	M4	M2									0.35	64	
			M5	M4	M4	M3	M3	M2	M3	M2									0.4	56	
	750	900	M8	M5	M6	M4	M5	M3	M4	M3									0.45	48	
			M6	M5	M5	M4	M4	M3	M3	M2									0.5	44	
	520	620	M8	M6	M6	M5	M6	M4	M5	M4									0.6	40	
			M8	M6	M6	M5	M5	M4	M4	M3									0.6	36	
STB-L108	920	1,100	M8	M5	M5	M4	M4	M3	M4	M2	12 80	10 75	0 40	88	105	30	0.35	4	0.7	28	27
			M6	M4	M5	M3	M4	M2	M3	M2									0.75	27	
	580	690	M8	M6	M6	M5	M5	M4	M5	M3									0.8	24	
			M8	M5	M6	M4	M5	M3	M4	M3									1	20	
	350	420	M10	M8	M8	M6	M6	M5	M5	M4									1.25	18	
			M8	M6	M6	M5	M5	M4	M4	M3									1.5	16	
	220	260	M12	M10	M10	M8	M8	M6	M6	M5									1.5	14	
			M10	M8	M8	M6	M6	M5	M5	M4									1.75	13	

Note 1. A spiral tap or a point tap is used for the upper column of the tapping capacity chart and hand tap No. 2 is used for the lower column. Tapping capacities are conditional on the depth of tapping being limited to 1.5 times of the tap diameter.
2. Allowable weight of multi spindle head to be attached to Synchro Tapper is as follows.
Measures must be taken to avoid from inserting water and dust into Synchro Tapper in case of vertical work direction upward.
(The working direction in horizontal : 15kg
The working direction in vertical upward : 10kg
The working direction in vertical downward : 8kg)
3. AL* ...Aluminium ST* ...Steel

Dimensions (mm)

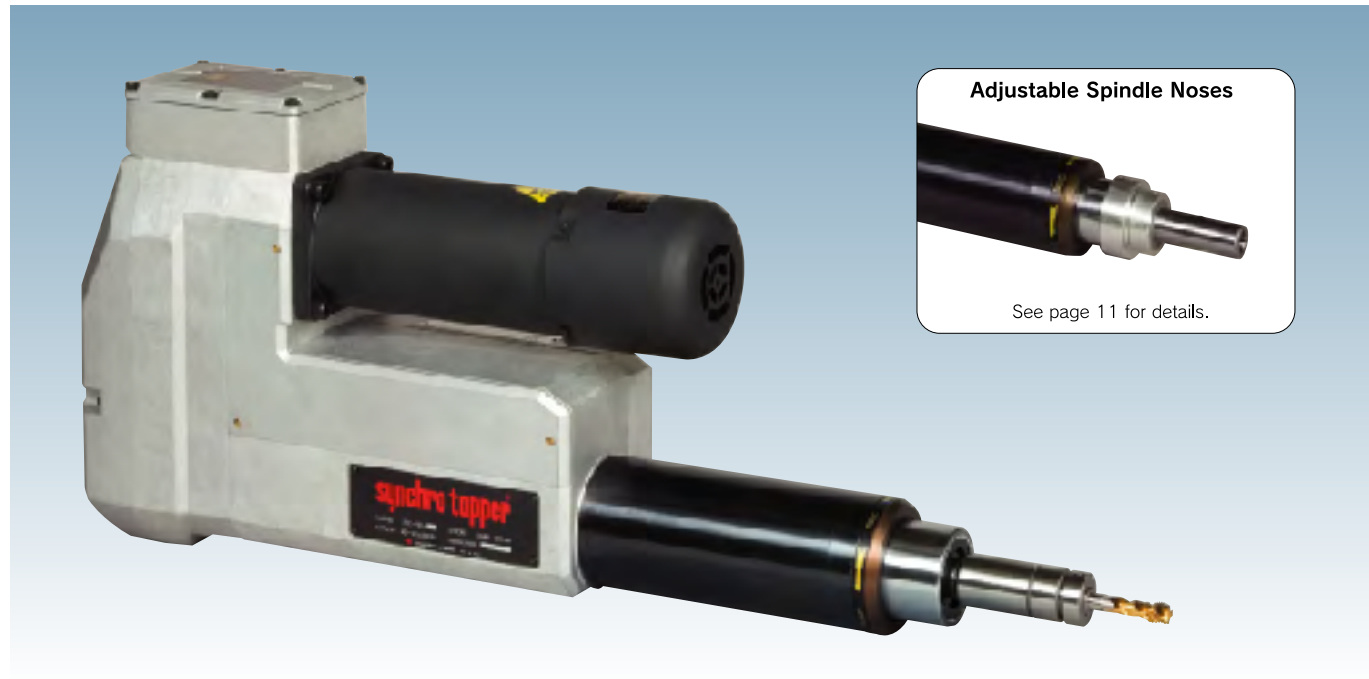


Note : Refer to page 8 and 14 for dimensions of Controller UC-25U model and Tap holder.

STC-P model

Spindle motor 0.75kW

Long stroke and capable of setting at any angle.
Suitable for assembling a special purpose machine.



Tapping capacity

Aluminium M22
Steel M16

Capacity

Model	Spindle speed		Tapping capacity								Stroke			Fast approach speed		Maximum tapping cycle time per minute	Motor spec.		Thread pitch		Weight
			1 spindle		2 spindles		3 spindles		4 spindles		Full Stroke	Fast approach stroke	Pitch feed stroke	Fast approach speed			Power	Poles			
	50Hz	60Hz	AL*	ST* (S45C)	AL*	ST* (S45C)	AL*	ST* (S45C)	AL*	ST* (S45C)				50Hz	60Hz						
	min ⁻¹		mm		mm		mm		mm		mm			mm/s		time/min	kW	P	mm	Threads/inch	
STC-P316	600	720	M14	M8	M12	M8	M10	M6	M8	M5	20 S 120	30 S 110	0 S 40	83	100	10	0.75	4	0.5	40	57
			M12	M8	M10	M6	M8	M5	M6	M5									0.7	32	
	400	490	M18	M14	M14	M10	M12	M8	M10	M6									1	26	
			M16	M12	M12	M8	M10	M6	M8	M6									1.25	24	
	210	250	M22	M16	M16	M12	M14	M10	M12	M8									1.5	19	
			M22	M16	M14	M10	M12	M8	M10	M6									1.75	18	
			M22	M16	M16	M12	M14	M10	M12	M8									2	16	
			M22	M16	M16	M12	M14	M10	M12	M8									2.5	14	
			M22	M16	M14	M10	M12	M8	M10	M6									3	13	
			M22	M16	M14	M10	M12	M8	M10	M6									3	12	

Note 1. A spiral tap or a point tap is used for the upper column of the tapping capacity chart and hand tap No. 2 is used for the lower column.
Tapping capacities are conditional on the depth of tapping being limited to 1.5 times of the tap diameter.
2. Allowable weight of multi spindle head to be attached to Synchro Tapper is as follows.
Measures must be taken to avoid from inserting water and dust into Synchro Tapper in case of vertical work direction upward.
(The working direction in horizontal : 35kg
The working direction in vertical upward : 25kg
The working direction in vertical downward : 25kg)
3. AL* ...Aluminium ST* ...Steel

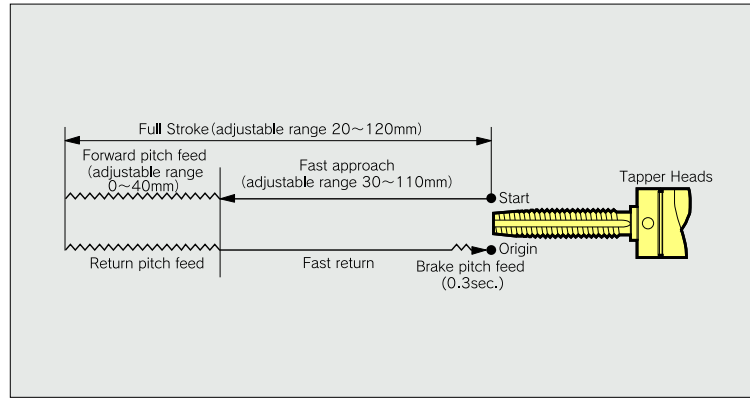
Features 1 Long stroke

Long stroke tapping unit with a 120mm full stroke. Capable of avoiding interference with fixtures or peripheral devices and making it easier for tool change.

Features 2 Fast approach and fast return mechanisms cut down cycle time.

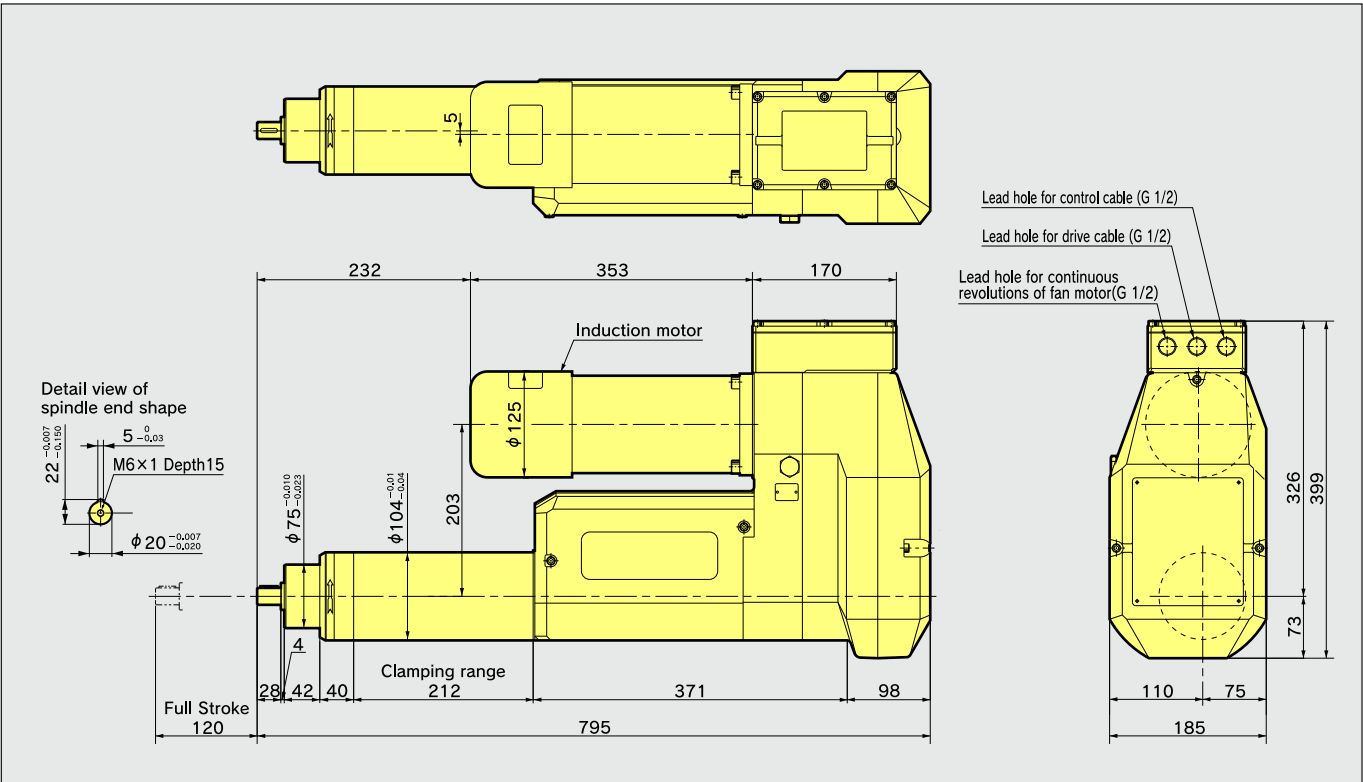
The built-in fast approach and pitch feed automatic switch mechanisms significantly cut down idling time during the tapping process.

Traveling chart of a cycle



Motor model								
3phase Volts (V)	220		380		400		415	
	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Amps (A)	3.6	3.3	2.1	1.9	1.7	1.9	1.8	1.6
Power (kW)	0.75							
Poles (P)	4							

Dimensions (mm)



Note : Refer to page 9 and 14 for dimensions of Controller UC-24U model and Tap holder.

STE-H/L model

Spindle motor 2.2kW

H model...High tapping cycle type

L model...High torque type

Tapping capacity

Aluminium M48

Steel M36

Large-diameter thread is available and highly efficient tapping process is achieved by mounting multi-spindle head on Model STE.



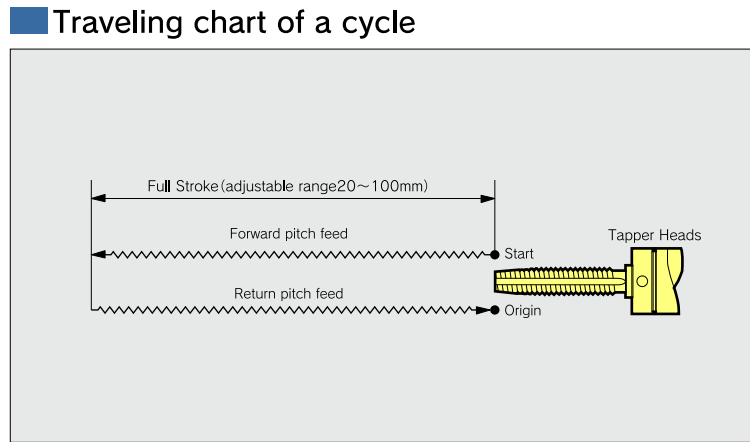
- Features

1

Capable of tapping R1(Aluminium)
- The powerful motor enables processing large-diameter thread, taper thread and multiple thread.Capable of tapping R3/4, M20 rolled threads in S45C steel.
- Features

2

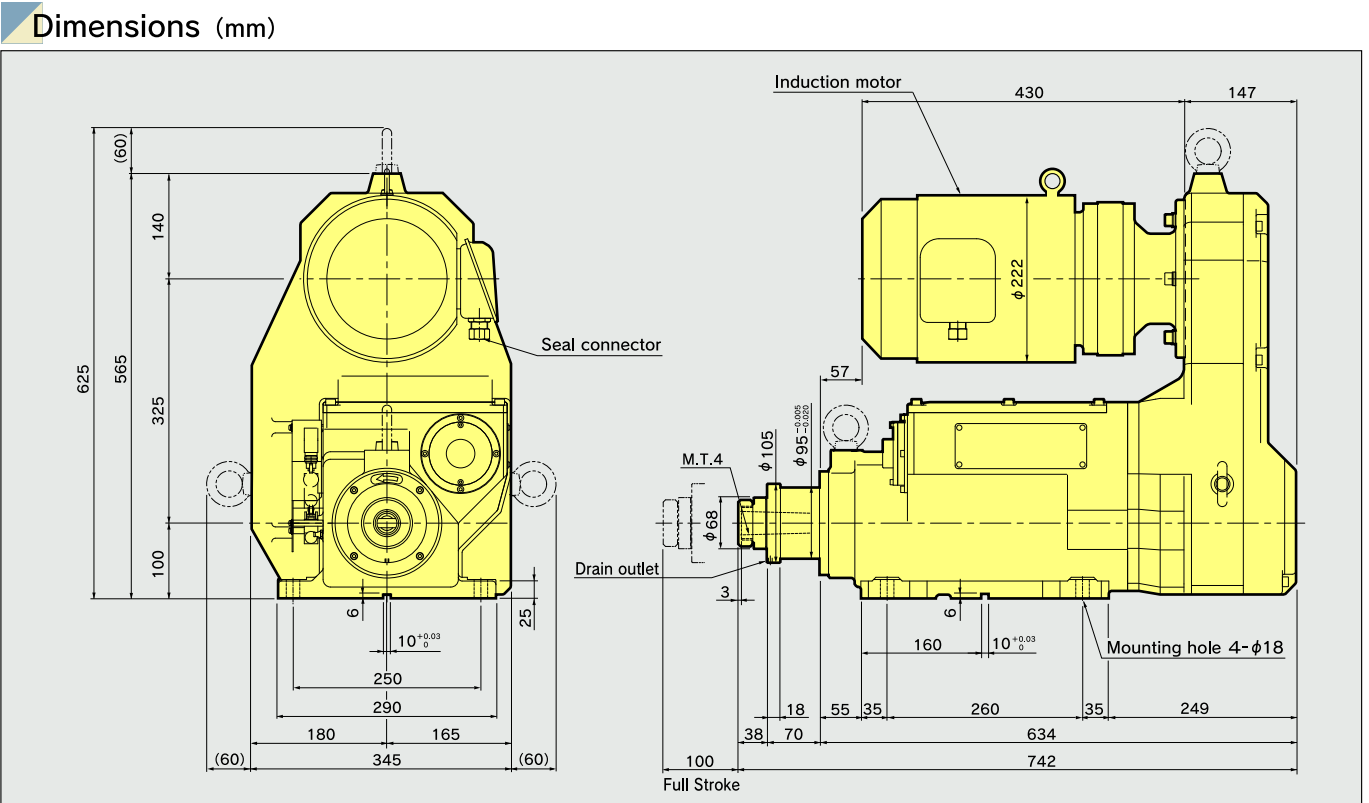
Capable of mounting multi-spindle taper head on STE.
- Tapping process cost can be reduced by mounting multi-spindle taper head.



Capacity

Model	Spindle speed	Tapping capacity								Full Stroke	Maximum tapping cycle time per minute	Motor spec.		Thread pitch			Weight
		1 spindle		2 spindles		3 spindles		4 spindles				Power	Poles				
	AL*	ST* (\$45C)	AL*	ST* (\$45C)	AL*	ST* (\$45C)	AL*	ST* (\$45C)	mm					time/min	kW	P	
STE-H527	420	M27	M16	M20	M12	M16	M10	M16	M10	20 100	15	2.2	4	0.8			175
		M22	M12	M16	M10	M12	M8	M12	M8					1			
	310	M33	M20	M22	M16	M20	M12	M16	M10					1.25	28	14	
		M24	M16	M16	M10	M16	M10	M12	M8					1.5	24	12	
	210	M36	M22	M27	M16	M22	M14	M22	M12					1.75	20	11	
		M27	M16	M22	M12	M16	M10	M16	M10					2	19	10	
STE-L527	100	M45	M30	M36	M22	M30	M20	M27	M16		6	2.2	4	2.5	18	9	
		M39	M24	M27	M18	M24	M16	M22	M12					3	16	8	
	70	M48	M36	M42	M27	M33	M22	M33	M20	3.5							
		M45	M27	M33	M22	M27	M16	M24	M16	4							

Note 1. A spiral tap or a point tap is used for the upper column of the tapping capacity chart and hand tap No. 2 is used for the lower column.
Tapping capacities are conditional on the depth of tapping being limited to 1.5 times of the tap diameter.
2. Tapping speed is the same for both 50Hz and 60Hz regions. (The motor is supplied 60Hz from the inverter inside the controller).
3. The speed can be changed by replacing pulleys. But speed changeover between STE-H and STE-L requires a motor and a belt replacement in addition to the pulleys.
4. Allowable weight of multi spindle head to be attached to Synchro Tapper is as follows.
Measures must be taken to avoid from inserting water and dust into Synchro Tapper in case of vertical work direction upward.
(The working direction in horizontal : 100kg
The working direction in vertical upward : 90kg
The working direction in vertical downward : 90kg)
5. AL* ...Aluminium ST* ...Steel
6. Motors for 200,220,400,440 voltage are available.

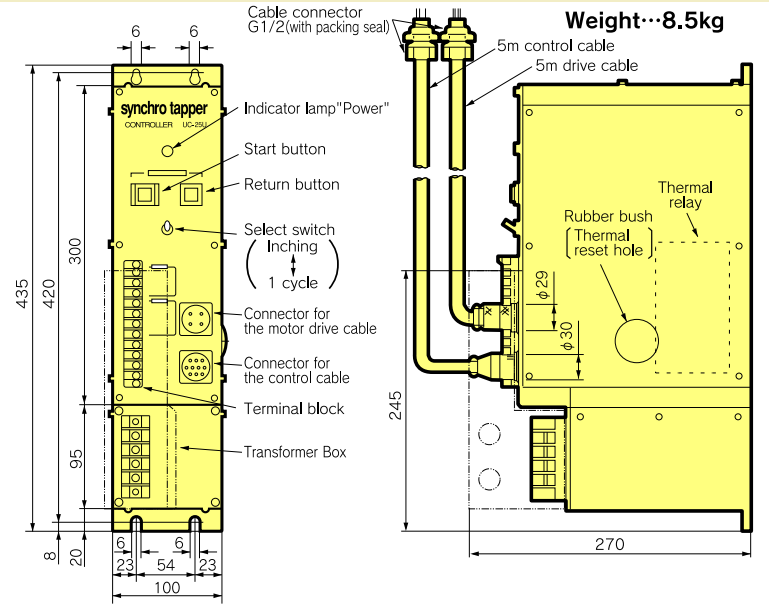


Note 1.Refer to page 10 for dimensions of Controller UC-26U model.
2.We recommend tap holder, WFLP340-0/MT4, by NT Tool. Tap holder is to be provided by the customer.
3.Adjust the direction so that the drain outlet facing downward, when installing synchro taper in a horizontal position.

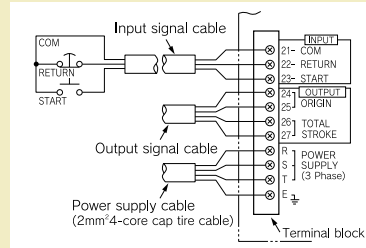
Electric system diagram ▶ STB-H/L model

Controller UC-25U model

●Dimensions (mm)



●Wiring of power supply, I/O signals.



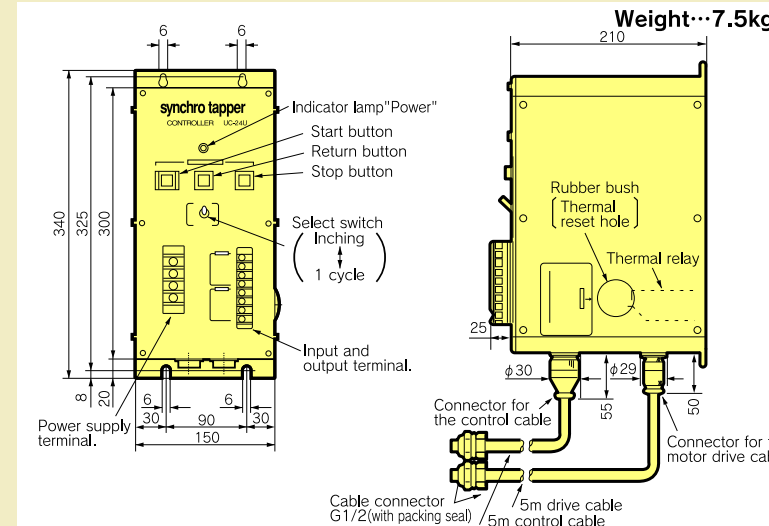
●Specifications of I/O signals

Input signal	Form	No-voltage contact
	Input time	Min. 0.1 second
	Circuit voltage	DC24V (Internal supply)
Output signal	Description	Start--Normally open contact Return--Normally closed contact
	Form	No voltage 1a contact output (Relay contact) Max. applicable load AC200V 1A (Inductive load)
	Description	ORIGIN-- Continuous signal at full return position TOTAL STROKE-- Continuous signal from full forward position until 0.5 sec. After unit retracts to full return position.

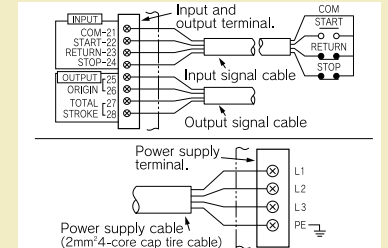
Electric system diagram ▶ STC-P model

Controller UC-24U model

●Dimensions (mm)



●Wiring of power supply, I/O signals.

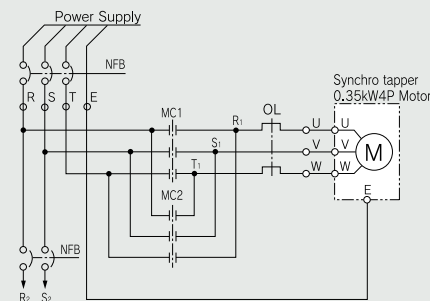


●Specifications of I/O signals

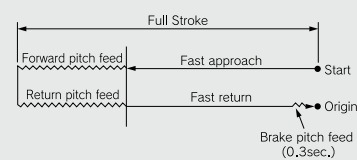
Input signal	Form	No-voltage contact
	Input time	Min. 0.1 second
	Circuit voltage	DC24V (Internal supply)
Output signal	Description	Start--Normally open contact Return--Normally closed contact Stop--Normal close contact point
	Form	No voltage 1a contact output (Relay contact) Max. applicable load AC200V 1A (Inductive load)
	Description	ORIGIN-- Continuous signal at full return position TOTAL STROKE-- Continuous signal from full forward position until 0.5 sec. After unit retracts to full return position.

Controller Electric Circuit with Programmable Controller (Example)

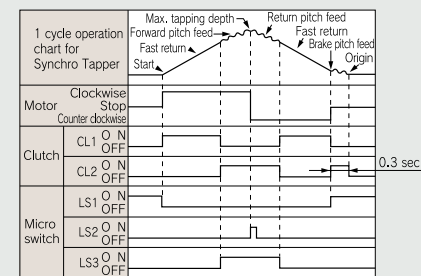
●Power and motor circuit



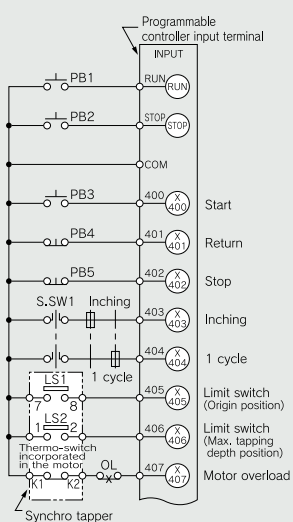
●Traveling chart of a cycle



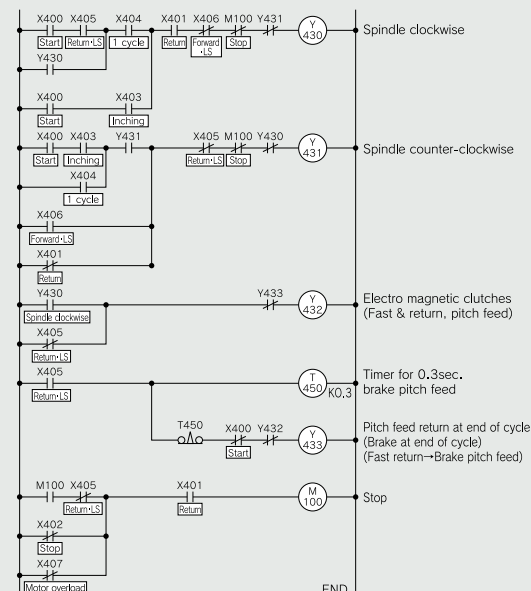
●Operation chart for one cycle



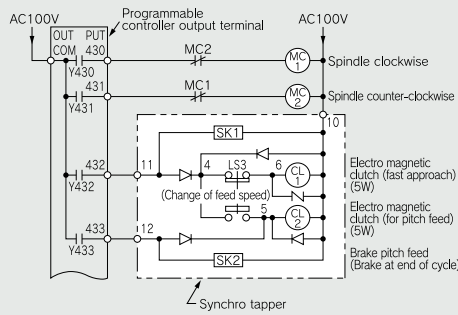
●PLC input circuit



●PLC circuit

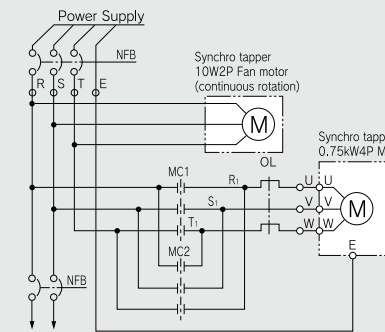


●PLC output circuit

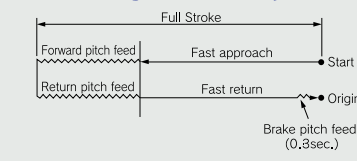


Note :
Power source which AC100V power is converted into DC45V power inside the unit body is supplied for the electro magnetic clutch. (By using special electro magnetic clutch, direct supply of power source of DC24V is possible upon request.)
(The control circuit of the Synchro Tapper exclusive controller UC-25U is not the same as this circuit example.)

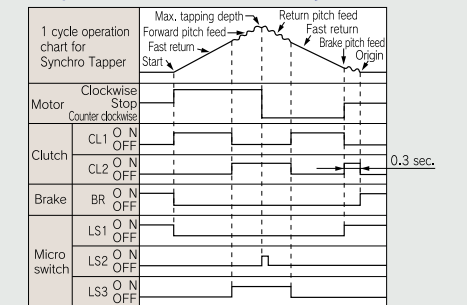
●Power and motor circuit



●Traveling chart of a cycle

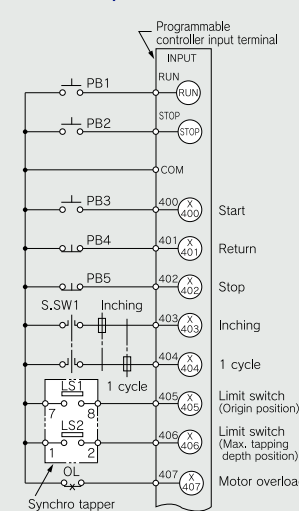


●Operation chart for one cycle

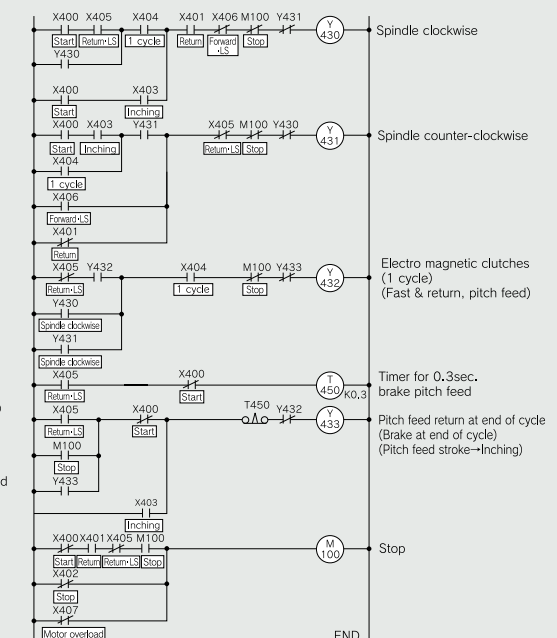


Note:
Above is a sequence chart of mechanical movement. The above diagram shows that the brake movement is off, when the electric signal is on, and on when the electric signal is off.

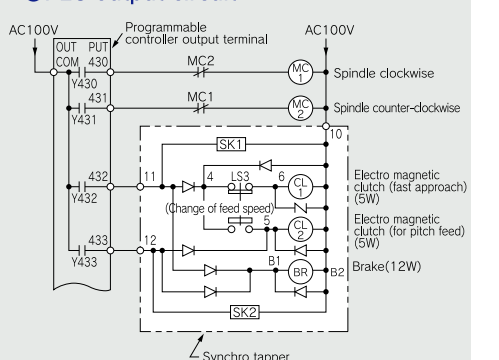
●PLC input circuit



●PLC circuit



●PLC output circuit

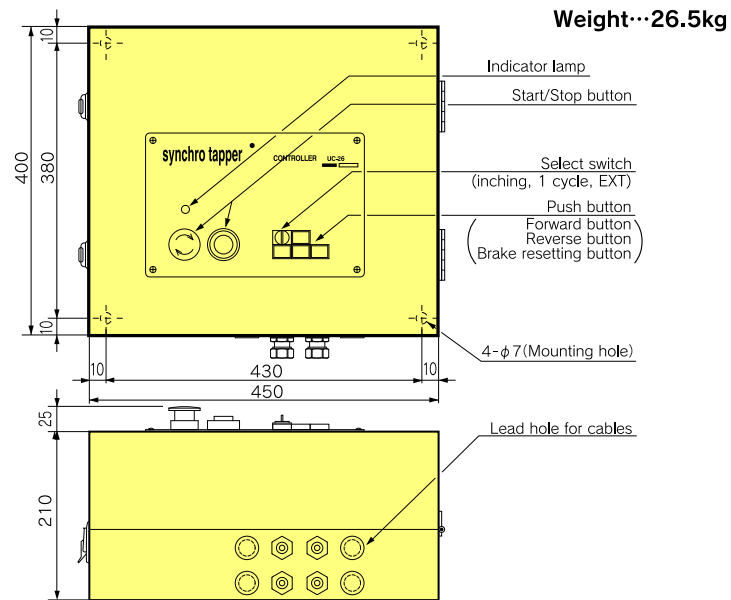


Note :
Power source which AC100V power is converted into DC45V power inside the unit body is supplied for the electro magnetic clutch. (By using special electro magnetic clutch, direct supply of power source of DC24V is possible upon request.)
(The control circuit of the Synchro Tapper exclusive controller UC-24U is not the same as this circuit example.)

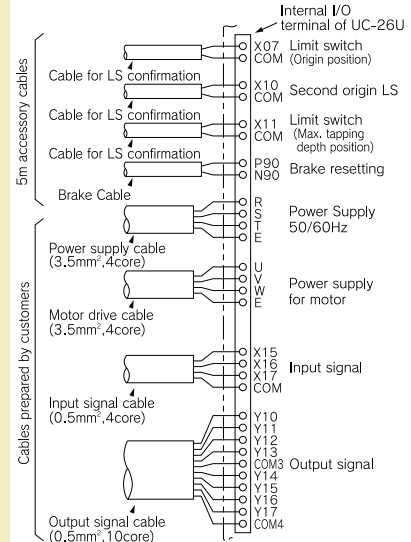
Electric system diagram ► STE-H/L model

Controller UC-26U model



- Dimensions (mm)



- Wiring of power supply, I/O signals.

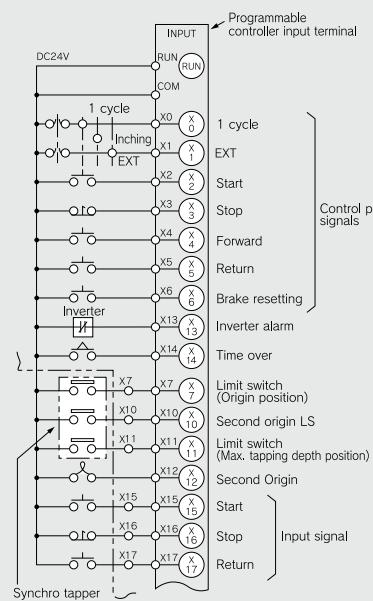


- Specifications of I/O signals

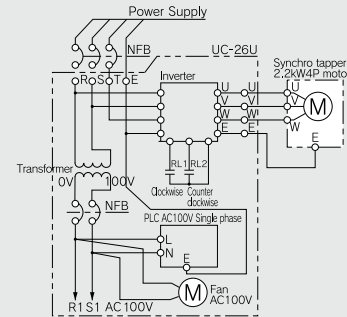
Input signal	Form	No-voltage contact
	Input time	Min. 0.1 second
	Circuit voltage	DC24V (Internal supply)
	Description	Start Return  ...Normal open contact Stop  ...Normal close contact point (Use relay contact for extremely light load, i.e. Omron G2A or MY2Z)
Output signal	Form	Brake resetting: DC90V(Inner-unit power supply) No-voltage contact output Max. applicable load AC200V 1A (Inductive load)
	Description	Origin: Output at original position End of 1 cycle: 0.5 sec. after 1 cycle Abnormality: Abnormal output signal (motor, cycle time over)

Controller Electric Circuit with Programmable Controller (Example)

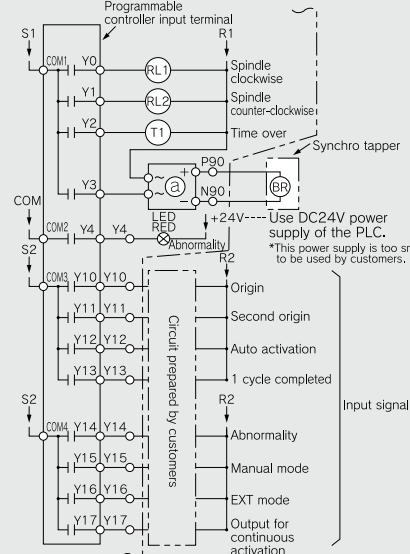
- PLC input circuit



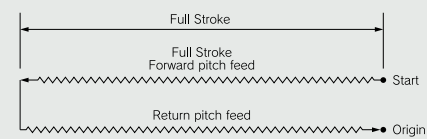
- Power and motor circuit



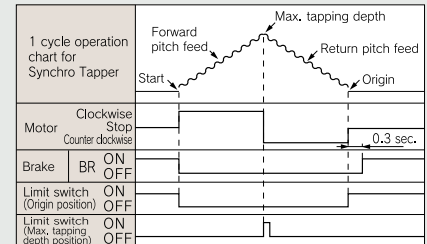
- PLC circuit



- Traveling chart of a cycle



- Operation chart for one cycle



Note:
Above is a sequence chart of mechanical movement.
The above diagram shows that the brake movement is off,
when the electric signal is on, and on when the electric signal is off.

- Note1. Prepare the control power supply R2-S2 for the PLC output circuit according to the circuit used by the customer.
2. The Limit switch inside the Synchro Tapper uses contact for extremely light load (Contact capacity Max.AC125V 0.1A, DC30V 0.1A).
3. For information on the PLC circuit for controller UC-26U, contact the nearest Sugino machine dealer.
4. Set the commutated stack at AC100V all wave commutation DC90V output for @ of the PLC output circuit.

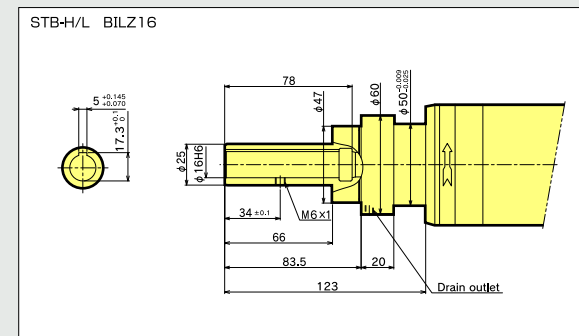
Adjustable Spindle Noses

Adjustable spindle nose is available for STB-H/L and STC-P type.
Designate preferred type when ordering.
Please specify the adjustable spindle nose when ordering your synchro tapper.
Sugino supplies adjustable spindle noses other than those shown below, upon request.

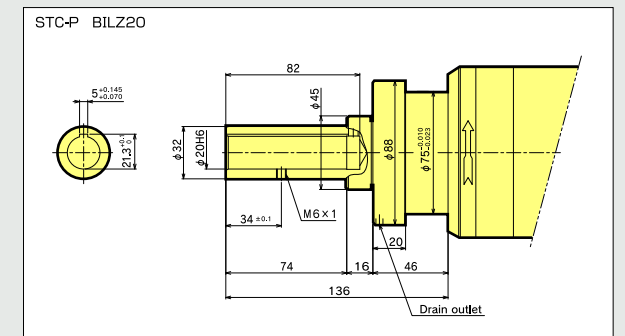


Dimensions (mm)

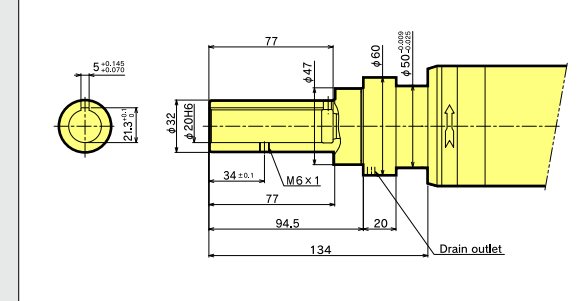
STB-H/L model



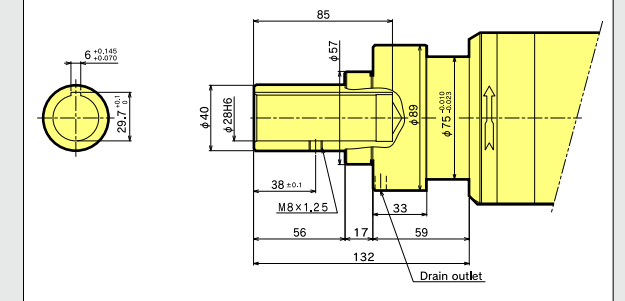
STC-P model



STB-H/L BILZ20



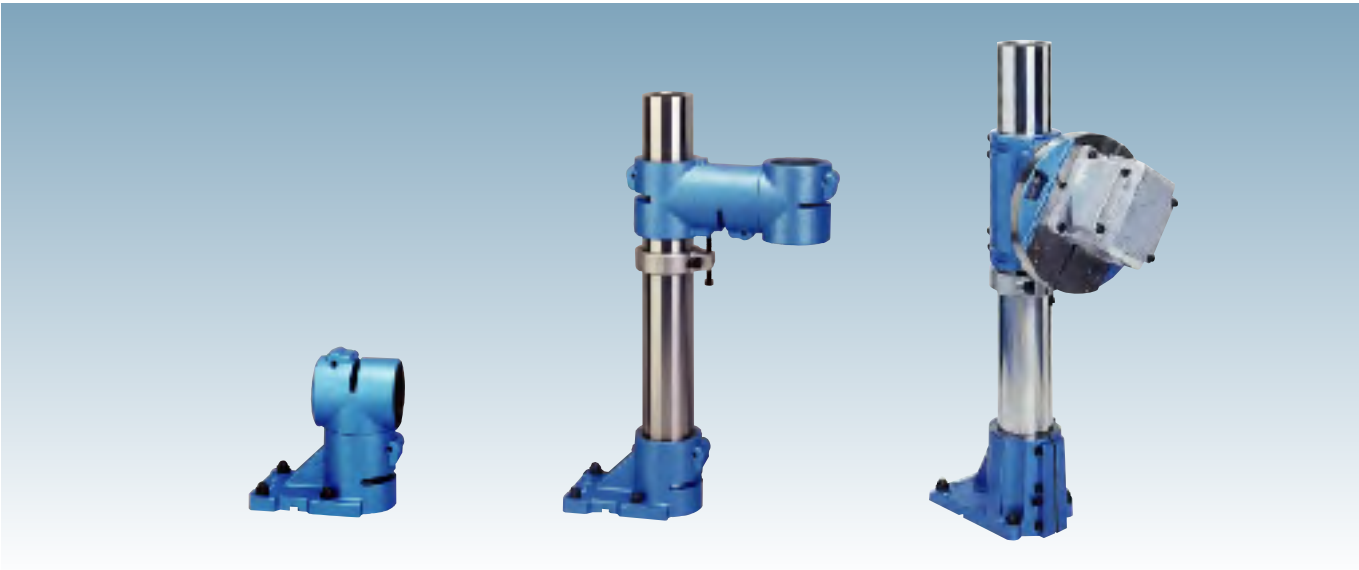
STC-P BILZ28



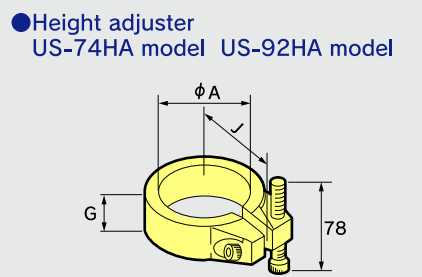
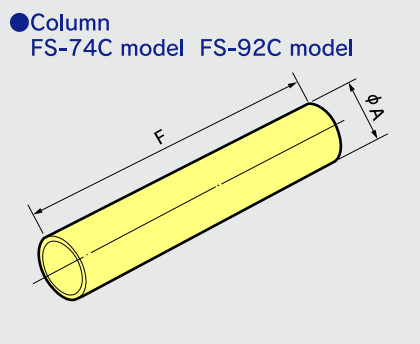
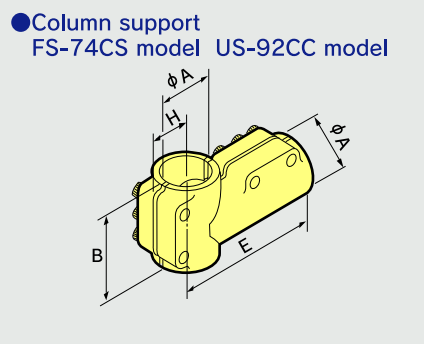
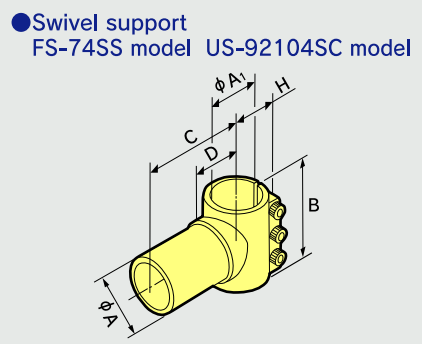
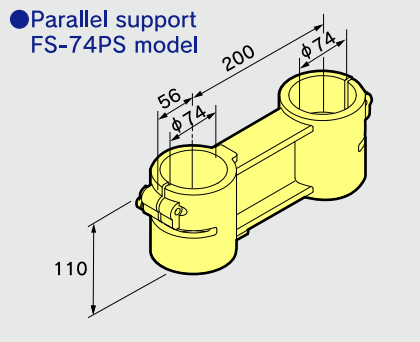
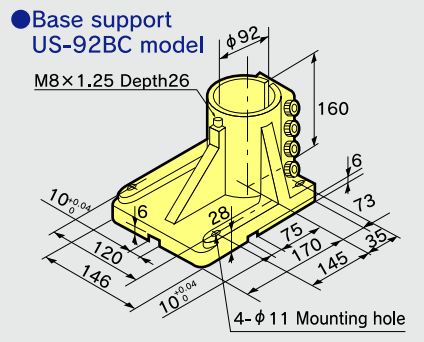
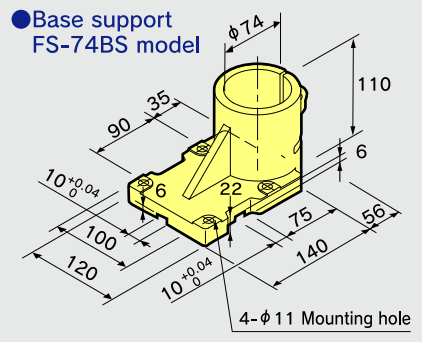
Note 1. Detailed dimension of the spindle head is the dimension suggested by NT Tools, Co.
2. Adjust the direction so that the drain outlet facing downward, when installing synchro taper in a horizontal position.

Flex Stands

Fixtures capable of holding Synchro Tappers at any angle.



Dimensions (mm)



Dimensions (mm)

Symbol	A	A ₁	B	C	D	E	F	G	H	J	Applicable synchro tapper
Model											
FS-74 US-74	74	74	110	135	45	140	600	30	56	65	STB-H model, STB-L model
FS-92 US-92	92	—	160	—	—	205	800	34	70	78	STC-P model
US-92104SC	92	104	190	221	66	—	—	—	77	—	

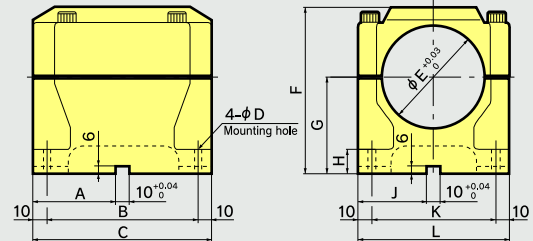
Note: US-92104SC type is a Swivel support exclusively for the Synchro Tapper STC-P316.

Level Clamps

Fixture to set Synchro Tappers parallel to machine base.
2 types available for different centering.



Dimensions (mm)



Dimensions (mm)

Symbol	A	B	C	D	E	F	G	H	J	K	L	Applicable synchro tapper
Model												
LC-74	60	110	130	9	74	120	70	18	50	90	110	STB-H model, STB-L model
LC-74H						150	100					
LC-104	90	170	190	11	104	148	80	20	70	130	150	STC-P model
LC-104H						188	120					

The example of use



Flex Stands
(FS-92 model H sets)



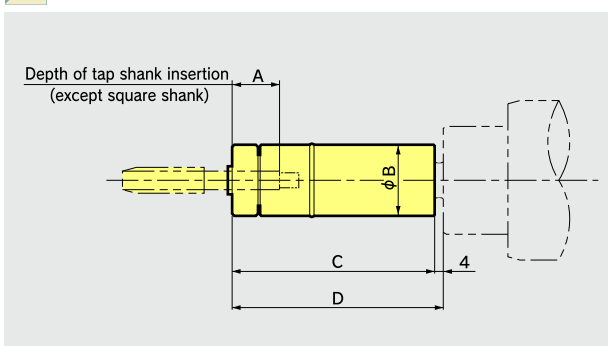
Dedicated drilling & tapping machine for computer parts

Tap Holders

Single tapping head for STB-H/L and STC-P type.



Dimensions (mm)



Capacity (mm)

Spec. Model	Chuck capacity	Type of tap holding	Symbol				Applicable synchro tapper
			A	B	C	D	
1TC-100C	M1 ~M3	Centering	22	33	94	98	STB-H108
1TC-100F	M3 ~M12	Floating	22	33	94	98	STB-H108 STB-L108
1TD-160F	M3 ~M16	Floating	19	40	95	99	STC-P316
1TD-220F	M12~M22	Floating	21 (M12~M16) 25 (M17~M22)	54	109	113	STC-P316

Multi-Spindle tapping head

Using the Multi-Spindle tapping head will improve productivity.
Custom made tapping heads that are optimum to your processing specification are also available.

●Spindle pitch adjustable type



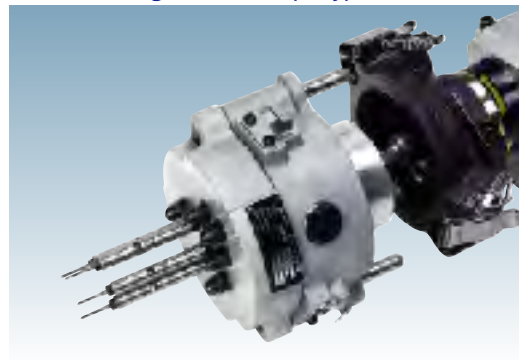
Tapper heads with adjustable center distances.

●Fixed spindle type



Sugino can provide Tapper Heads for your special requirements.

●Quick change "Catch-Clip" type



Attaching and detaching of head ass'y can be easily done by catch clip. The changing time required is only 1~2 minutes. Reduction of idling time is possible.

●Offset fixed type



Tapper head which avoids interference between tapping unit and jig fixture or workpiece.

synchro tapper™

Servo series

The tapping unit is equipped with AC Servo motor to achieve high accuracy and efficient tapping.

synchro tapper™ ST1 model

Compact-type tapping unit with unit total length 322mm.
Upgrades efficiency for tapping small size threads.

Tapping capacity

Aluminium M5
Steel M3.5

Motor

0.4kW AC servo motor

Stroke

Max.20mm



synchro tapper™ ST2 model

Repeatability of $\pm 0.03\text{mm}$ or less at full stroke end
can be achieved.

Tapping capacity

Aluminium M6
Steel M5

Motor

0.6kW AC servo motor

Stroke

Max.60mm



synchro tapper™ ST3 model

High speed tapping at max. $4,000\text{min}^{-1}$ can be done.

Tapping capacity

Aluminium M12
Steel M 7

Motor

1.8kW AC servo motor

Stroke

Max.120mm



synchro tapper™ ST4 model

It is a powerful unit with capacity to
tap large holes up to M27 in aluminum.

Tapping capacity

Aluminium M27
Steel M20

Motor

2.7kW AC servo motor

Stroke

Max.120mm

