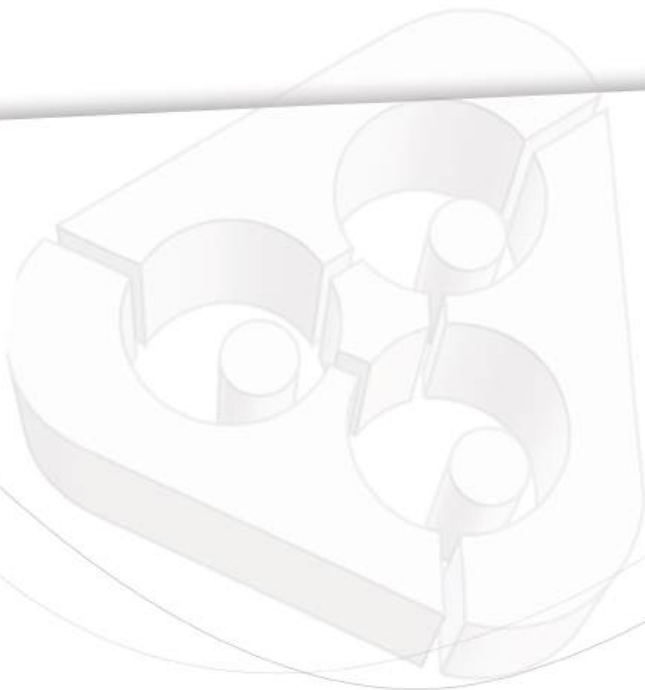




We have the right to modify the specification and design of machine without prior notice.

本公司對產品規格、設計特性均不斷研究改進，目錄規格若有變更，恕不另行通知。



Quality Proven Multiple Spindle Boring  
Head from LONG GER...

Designed And Engineered To Dramatically  
Improve Your Drilling Efficiency.



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**LONG GER INDUSTRY CO., LTD.**

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No.58-8, Shicheng St., Shigang Dist.,  
Taichung City 42241, Taiwan

TEL:886-4-2572 3767 FAX:886-4-2572 3668

E-Mail : longerbh@ms36.hinet.net

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# MULTIPLE SPINDLE BORING HEAD

For Metalworking Drilling Applications

金屬鑽孔用 多軸鑽孔頭



[www.longger.com.tw](http://www.longger.com.tw)



龍格工業有限公司

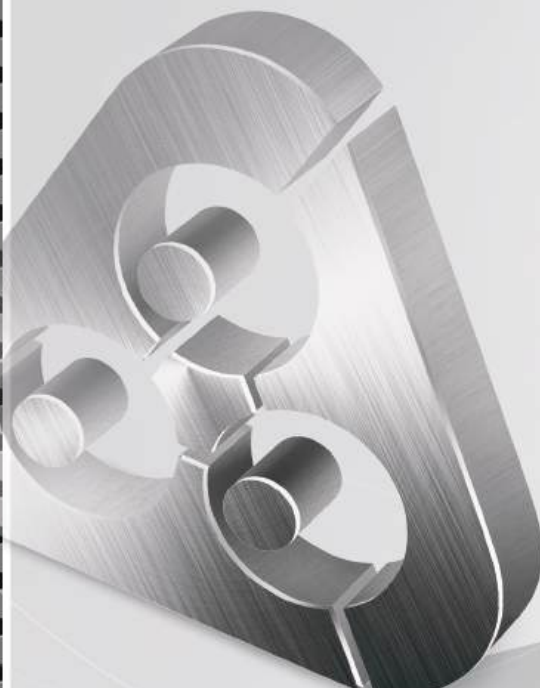
LONG GER INDUSTRY CO., LTD.

# Multiple Spindle Boring Head Metalwork Drilling Applications

龍格自創立以來，秉持“不斷創新突破，技術領先，完善服務”的經營理念，專業設計生產各式鐵工用多軸鑽孔頭，產品行銷世界各地。

一直以來，我們堅持最佳品質，以最豐富的生產技術經驗，徹底展現產品的精密度及經久耐用性，所有加工製程完全採用最先進精密的加工設備，為鑽孔頭的高精度，提供穩固的基礎並保證產品的最高品質。無論任何形式的鑽孔需求，龍格公司廣泛的產品系列，提供您全方位機型選擇，合乎您最精密且高效率的鑽孔作業。

龍格公司全系列多軸鑽孔頭在品質、性能及信賴度已建立崇高的榮譽，產品廣被使用。今後也將不斷自我提升，全力挑戰您的期望。鑽孔業界值得信賴的第一品牌---龍格。



Based on the company's concepts of " Constant Breakthrough; Technological Leadership; Comprehensive Service ", Long Ger designs and manufacturers a wide variety of multiple spindle boring heads to serve metalworking industries around the world.

At Long Ger, we insist on quality combined with the most extensive manufacturing experience, enabling Long Ger boring heads to fully present outstanding accuracy and durability.

Each boring head is manufactured by a series of sophisticated machining equipment, which provides a solid foundation for the high accuracy of boring heads and assure the best possible quality. No matter what type of drilling requirement might be, you have the most flexible choice among the comprehensive range of boring heads from Long Ger. Each one will fully meet your requirement for high precision and high efficiency drilling operations.

For over years, Long Ger boring heads have established a high reputation for quality, performance and dependability, and have been widely applied in the industries around the world. However, we will never stop. We will constantly pursue higher technological level to fully meet new challenges. So for quality, for dependability, look into the most reliable top brand-Long Ger.





# Customized Multiple Spindle

## 客製化多軸鑽孔頭

### 客製產品介紹

- 可依據圖面或樣品，量身打造各式輕巧外觀鑽孔頭，有助於減少加工視線阻礙。
- 豐富的製造經驗與充沛的零件庫存，提供您快速且高品質產品。
- 2軸軸距可搭配C-4六角筒夾，最小軸距可為10mm。
- 全系列產品均使用最先進之機械加工，提供高精度產品。
- 鑽孔頭可搭配一般機械或各式專用機使用。
- 傳動齒輪為斜齒輪設計，傳動扭力高。
- 鑽孔頭可承受高速運轉達6000RPM。
- 主軸可正逆轉，適合鑽孔及攻牙作業。



# Boring Head



## Description of Customized Products

- According to customer's drawings or samples, customized manufacturing of various beautiful boring heads is available, that helps to reduce vision interference during machining.
- Extensive manufacturing experience in combination with sufficient parts stock provide fast service and high quality products.
- Distance between spindles is available to fit with C-4 hexagonal collet. Minimum distance between spindles can reach 10 mm.
- All products are machined by the advanced CNC machines to ensure high accuracy.
- The boring heads are applicable for general machines or various single - propose machines.
- The transmission gears are helical gears, providing high torque of transmission.
- The boring heads can resist high running speed up to 6,000 rpm.
- Reversible spindle running makes it suitable for both drilling and tapping operations.



# Customized Multiple Spindle

## 客製化多軸鑽孔頭



# Boring Head



Adjustable Boring Head  
可調式鑽孔頭



Customized Multiple  
Spindle Boring Head  
客製化多軸鑽孔頭



Notices for Ordering  
訂購注意事項



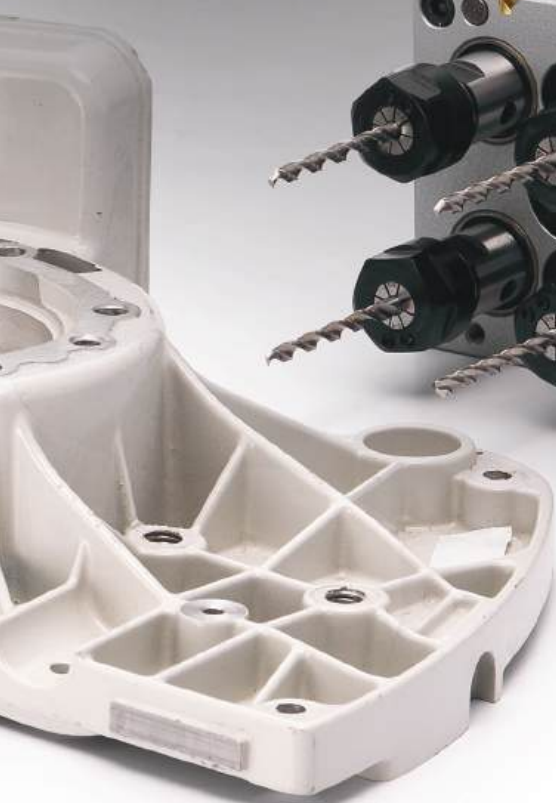
Accessories  
配件區



Mounting to Machine  
機械連接



Running Speed Table  
轉速表



# Introduction to Boring Head Parts

## 外觀各部名稱介紹

- |                                |              |
|--------------------------------|--------------|
| 1. Output Spindle              | 1. 刀具軸       |
| 2. Input Spindle               | 2. 中心軸       |
| 3. Graduated Adjuster Lock Nut | 3. 刻度轉換器固定螺帽 |
| 4. Graduated Adjuster          | 4. 刻度轉換器     |
| 5. Indicator                   | 5. 刻度對準線     |
| 6. Case                        | 6. 外殼        |
| 7. Back Cover                  | 7. 後蓋        |
| 8. Clamp                       | 8. 外束        |
| 9. Grease Nipple               | 9. 油嘴        |



## Description of Standard Boring Head

- All products are machined by the advanced CNC machines to ensure high accuracy.
- The boring heads are applicable for general machines or various single - propose machines.
- Compact body design meets human engineering principle and helps to reduce vision interference during machining.
- The exclusive use of arc graduation theorem allows for convenient adjustment of desired distance between spindles.
- The transmission gears are helical gears, providing high torque of transmission.
- The boring heads can resist high running speed up to 6,000rpm.
- Reversible spindle running makes it suitable for both drilling and tapping operations.

## 標準鑽孔頭產品介紹

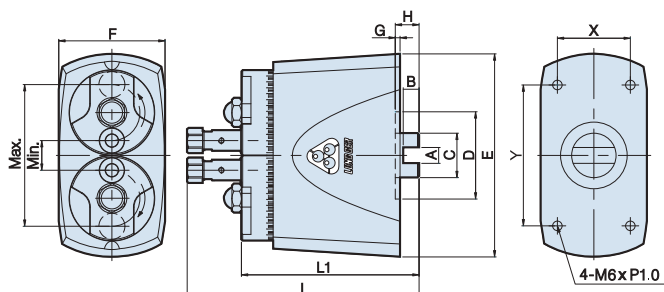
- 全系列產品均使用最先進之機械加工，提供高精度產品。
- 鑽孔頭可搭配一般機械或各式專用機使用。
- 輕巧外殼符合人體工學設計，有助於減少加工視線阻礙。
- 獨特弧度刻度原理，方便調整所需軸距。
- 傳動齒輪為斜齒輪設計，傳動扭力高。
- 鑽孔頭可承受高速運轉達6000RPM。
- 主軸可正逆轉，適合鑽孔及攻牙作業。



## 2-SPINDLE BORING HEAD

### 二軸鑽孔頭

- Adjustable spacing between spindles: 13.5mm ~ 164mm.
- Drilling capacity:  $\phi 1\text{mm} \sim \phi 14\text{mm}$ .
- Reversible spindle running makes it suitable for both drilling and tapping operations.
- 可調整軸距範圍：13.5mm ~ 164 mm。
- 鑽孔能力： $\phi 1\text{mm} \sim \phi 14\text{mm}$ 。
- 主軸可正逆轉，適合鑽孔及攻牙作業。



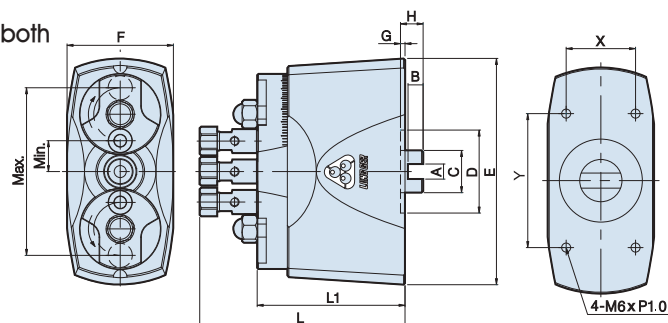
MODEL 型式	DIMENSIONS 尺寸(mm)											SPACING 間距(mm)			WEIGHT 重量	
	A	B	C	D	E	F	G	H	L1	L	X	Y	Min 最小	Max 最大	Max capacity 最大鑽孔能力	kg
2C-T5	10	10	28	55	106.5	57	3	15	115	150.5	40	73.8	13.5	73.5	$\phi 5$	3.6
2C-T7	10	10	28	55	127.5	67	3	15	112	154	46	88.8	18	90	$\phi 7$	4.5
2C-T8	10	10	28	55	191	109	3	16	120	165	70.7	70.7	25	151	$\phi 6$	8.7
2C-T10	10	10	28	55	143	82	3	15	114	159	46	88.8	22	106	$\phi 10$	5.5
2C-T12	10	10	28	55	166	92	3	16	120	170	46	88.8	26	126	$\phi 12$	7.3
2C-T16	10	10	28	55	211	114	3	16	138	198	70.7	70.7	36	164	$\phi 14$	10.7

## 3-SPINDLE (LINEAR) BORING HEAD

### 三軸鑽孔頭 (直線排列式)

- Used only for adjustable constant distance linear boring applications.
- Adjustable spacing between spindles: 14mm ~ 200mm.
- Drilling capacity:  $\phi 1\text{mm} \sim \phi 14\text{mm}$ .
- Reversible spindle running makes it suitable for both drilling and tapping operations.

- 限用於調整等距直線加工使用
- 可調整軸距範圍：14mm ~ 200mm。
- 鑽孔能力： $\phi 1\text{mm} \sim \phi 14\text{mm}$ 。
- 主軸可正逆轉，適合鑽孔及攻牙作業。



MODEL 型式	DIMENSIONS 尺寸(mm)											SPACING 間距(mm)			WEIGHT 重量	
	A	B	C	D	E	F	G	H	L1	L	X	Y	Min 最小	Max 最大	Max capacity 最大鑽孔能力	kg
3C-T5	10	10	28	55	121	58	3	18	107	142	40	73.8	14	88	$\phi 5$	3.7
3C-T7	10	10	28	55	150	71	3	17	112	154	46	88.8	20	112	$\phi 7$	4.0
3C-T10	10	10	28	55	162	76	3	17	114	159	46	88.8	22	128	$\phi 10$	6.0
3C-T12	10	10	28	55	191	92	3	15	118.5	168.5	46	88.8	26	152	$\phi 12$	8.7
3C-T16	10	10	28	72	251	114	3	15	141	201	70.7	70.7	36	200	$\phi 14$	14.7

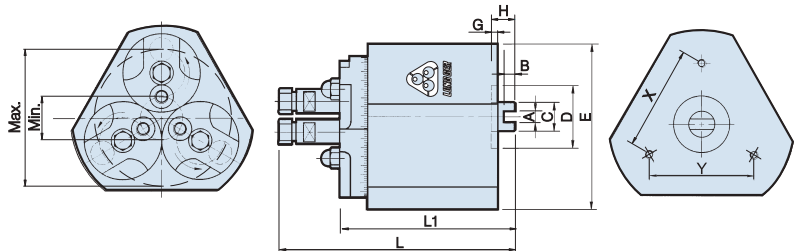
## 3-SPINDLE (CIRCULAR) BORING HEAD

### 三軸鑽孔頭 (弧形排列式)

- Used only for adjustable constant distance square triangular boring applications.
- Adjustable spacing between spindles:  $\varnothing 22\text{mm} \sim \varnothing 180\text{mm}$ .
- Drilling capacity:  $\varnothing 1\text{mm} \sim \varnothing 14\text{mm}$ .
- Reversible spindle running makes it suitable for both drilling and tapping operations.



- 限用於調整等距三角形加工使用
- 可調整軸距範圍： $\varnothing 22\text{mm} \sim \varnothing 180\text{mm}$ 。
- 鑽孔能力： $\varnothing 1\text{mm} \sim \varnothing 14\text{mm}$ 。
- 主軸可正逆轉，適合鑽孔及攻牙作業。



MODEL 型式	DIMENSIONS 尺寸(mm)											SPACING 間距(mm)			WEIGHT 重量
	A	B	C	D	E	G	H	L1	L	X	Y	Min 最小	Max 最大	Max capacity 最大鑽孔能力	kg
33C-T5	10	10	28	55	110	3	15	116	153	72.7	72.7	$\varnothing 22$	$\varnothing 82$	$\varnothing 5$	4.6
33C-T7	10	10	28	55	126	3	15	107	149	86.8	86.8	$\varnothing 28$	$\varnothing 100$	$\varnothing 7$	5.5
33C-T10	10	10	28	55	150	3	15	111	156	86.8	86.8	$\varnothing 32$	$\varnothing 116$	$\varnothing 10$	7.3
33C-T12	10	10	28	55	177	3	15	119	169	86.8	86.8	$\varnothing 38$	$\varnothing 138$	$\varnothing 12$	10.5
33C-T16	10	10	28	62	225	3	15	138	198	86.8	86.8	$\varnothing 52$	$\varnothing 280$	$\varnothing 14$	15.5

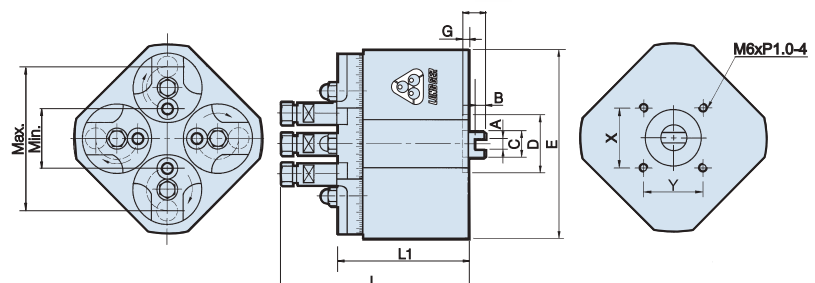
## 4-SPINDLE (CIRCULAR) BORING HEAD

### 四軸鑽孔頭 (弧形排列式)

- Used only for adjustable constant distance boring applications.
- Adjustable spacing between spindles:  $\varnothing 34\text{mm} \sim \varnothing 206\text{mm}$ .
- Drilling capacity:  $\varnothing 1\text{mm} \sim \varnothing 14\text{mm}$ .
- Reversible spindle running makes it suitable for both drilling and tapping operations.



- 限用於調整等距四方形加工使用
- 可調整軸距範圍： $\varnothing 34\text{mm} \sim \varnothing 206\text{mm}$ 。
- 鑽孔能力： $\varnothing 1\text{mm} \sim \varnothing 14\text{mm}$ 。
- 主軸可正逆轉，適合鑽孔及攻牙作業。



MODEL 型式	DIMENSIONS 尺寸(mm)											SPACING 間距(mm)			WEIGHT 重量
	A	B	C	D	E	G	H	L1	L	X	Y	Min 最小	Max 最大	Max capacity 最大鑽孔能力	kg
4C-T5	10	10	28	55	121	3	15	115	150	70.7	70.7	$\varnothing 34$	$\varnothing 94$	$\varnothing 5$	5.8
4C-T7	10	10	28	55	145	3	15	117	149	70.7	70.7	$\varnothing 42$	$\varnothing 114$	$\varnothing 7$	7.3
4C-T10	10	10	28	55	170	3	15	109	154	70.7	70.7	$\varnothing 48$	$\varnothing 132$	$\varnothing 10$	9.0
4C-T12	10	10	28	55	192	3	15	118.5	168.5	70.7	70.7	$\varnothing 58$	$\varnothing 158$	$\varnothing 12$	13.0
4C-T16	10	10	28	80	260	3	15	145	205	70.7	70.7	$\varnothing 78$	$\varnothing 206$	$\varnothing 14$	21.7



# Notices for Ordering Multiple Spindle Boring Head 客製化多軸鑽孔頭訂購注意事項

## 1 MACHINING APPLICATION 加工用途:

<input type="checkbox"/> <b>Drilling 鑽孔</b>	<input type="checkbox"/> <b>Tapping 攻牙</b>	<input type="checkbox"/> <b>Other 其他</b>

## 2 WORKPIECE MATERIAL 工件材質:

<input type="checkbox"/> <b>Aluminum 鋁</b>	<input type="checkbox"/> <b>Copper 銅</b>	<input type="checkbox"/> <b>Iron 鐵</b>	<input type="checkbox"/> <b>Cast iron 鑄鐵</b>	<input type="checkbox"/> <b>Other 其他</b>
--	--	--	--	--

SPECIFY DISTANCE BETWEEN SPINDLES AND NUMBER OF SPINDLES. ALSO, INDICATE HOLE DIAMETER AND DEPTH:

## 3 孔距、軸數指定並標示孔徑及深度:

	<b>PARADIGM 範例</b>
	<p><b>3D Drawing 立體表達</b></p>
	<p><b>2D Drawing 平面表達</b></p>

## 4 RUNNING SPEED 轉速:

The running speed for all customized boring heads can reach 6,000rpm with 1:1 of speed ratio. Upon request, running speed can be increased or decreased.

全客製化鑽孔頭轉速皆可達6000RPM，速比如未指定皆為1:1，亦可指定增速或減速。

**RATIO(rpm)**





速比(轉速)

**Input Spindle 傳動軸**

**Output Spindle 刀具軸**

## 5 SECTION OF SPINDLE TYPES 軸心樣式選擇:



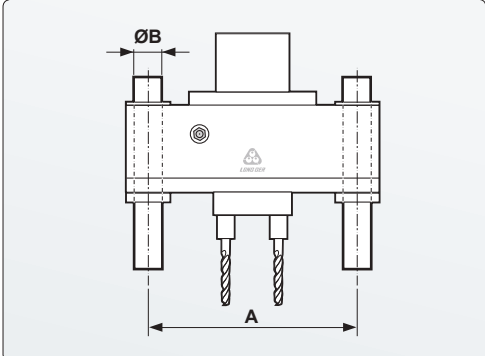
<p><b>ER Collet</b></p> <p>ER 筒夾</p>	<input type="checkbox"/> <b>ER-A type (Hex. nut)</b> ER-A 型 (六角螺帽)	<input type="checkbox"/> <b>ER-M type (small nut)</b> ER-M 型 (小徑螺帽)	
<p><b>Hex. Collet</b></p> <p>六角筒夾</p>	<input type="checkbox"/> <b>C type (for drilling)</b> C 型 (鑽孔用)	<input type="checkbox"/> <b>CT type (for tapping)</b> CT 型 (攻牙用)	
<p><b>Jacobs Taper Chuck</b></p> <p>JT 夾頭</p>			<input type="checkbox"/> JT1 <input type="checkbox"/> JT2 <input type="checkbox"/> JT3 <input type="checkbox"/> JT6 <input type="checkbox"/> JT33
<p><b>TM Collet</b></p> <p>TM 夾頭</p>			<input type="checkbox"/> TM (Refer to adjustable TM shank.) (參閱可調式 TM 柄)

※ For detailed specifications, refer to accessories list on P15~16.

※ 詳細規格請見其他配件 P15-16

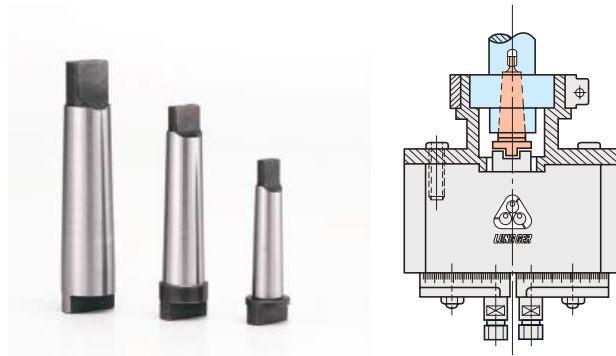
## 6 GUIDE ROD 導桿:



	<input type="checkbox"/> <b>Linear Bearing</b> 直線軸承	<input type="checkbox"/> <b>Bronze Sleeve</b> 銅套	<input type="checkbox"/> <b>A Distance 距離</b>	<input type="checkbox"/> <b>B Pitch 孔距</b>
<p><b>Type of Guide Rod</b></p> <p>導桿孔樣式</p>				



# Instruction of Mounting to Machine for Multiple Spindle Boring Head 多軸鑽孔頭機械連接方式

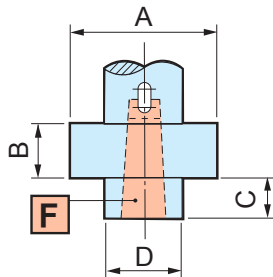


An assembly drawing of the boring head fitted onto a medium or heavy duty drilling machine.

鑽孔頭安裝於中型及大型鑽床之結構示意圖。

## Medium & Heavy Duty Drilling Machine

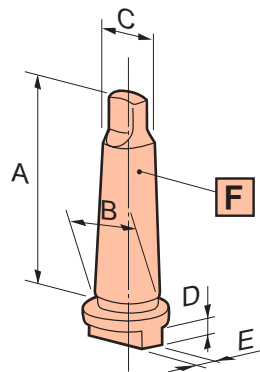
中型  
大型  
鑽床



When ordering the boring head for application on a medium or heavy duty drilling machine, please provide the dim. A, B, C, D. Unit:mm.

中型及大型鑽床主軸頭結構圖。訂購鑽孔頭時，請提供A, B, C, D尺寸，以mm為單位。

A	B	C	D



When ordering the boring head, please choose the specifications of spindle taper on drilling machine as the chart instructed.

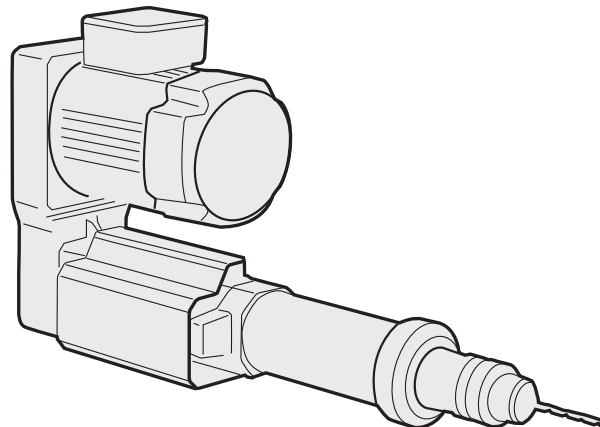
訂購鑽孔頭時，請圈選鑽床主軸錐度規格，如表內數據所示。

### **F** MORSE TAPER

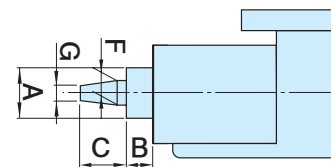
No.	<input type="checkbox"/> MT1	<input type="checkbox"/> MT2	<input type="checkbox"/> MT3	<input type="checkbox"/> MT4
A	65.5	80	99	124
B	12.065	17.78	23.825	31.267
C	9	14	19.1	25.2
D / E	10	10	10	10

## Drilling Spindle Head

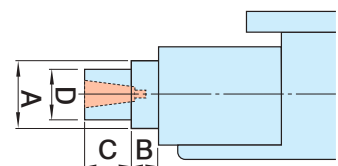
動力  
主軸



## JACOBS TAPER / DIN TAPER

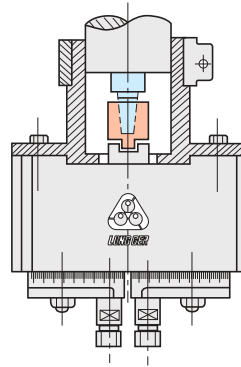


## MORSE TAPER



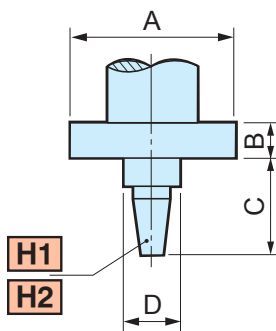
Light Drilling Machine

小型鑽床



An assembly drawing of the boring head fitted onto a light drilling machine.

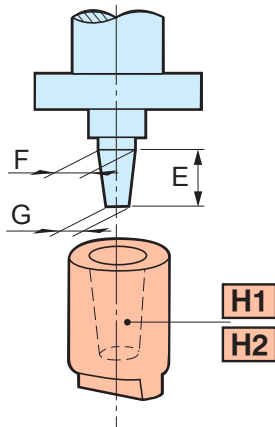
鑽孔頭安裝於小型鑽床之結構示意圖。



When ordering the boring head for application on a light drilling machine, please provide the dimensions A, B, C, H. Unit:mm.

小型鑽床主軸頭結構圖. 訂購鑽孔頭時, 請提供 A, B, C, D 尺寸, 以 mm 為單位。

A	B	C	D



When ordering the boring head, please choose the specifications of spindle taper on drilling machine as the chart instructed.

訂購鑽孔頭時, 請圈選鑽床主軸錐度規格, 如表內數據所示。

**H1** JACOBS TAPER

No.	<input type="checkbox"/> JT1	<input type="checkbox"/> JT2	<input type="checkbox"/> JT3	<input type="checkbox"/> JT6	<input type="checkbox"/> JT33
E	16.669	22.225	30.958	26.200	25.400
F	9.754	14.199	20.599	17.170	15.850
G	8.469	12.386	18.951	15.852	14.237

**H2** DIN TAPER

No.	<input type="checkbox"/> B10	<input type="checkbox"/> B12	<input type="checkbox"/> B16	<input type="checkbox"/> B18	<input type="checkbox"/> B22
E	14.500	18.500	24.000	32.00	40.500
F	10.094	12.065	15.733	17.78	21.793
G	9.400	11.100	14.500	16.20	19.800

Video For Mounting To Machine Operation  
機械連接操作影片

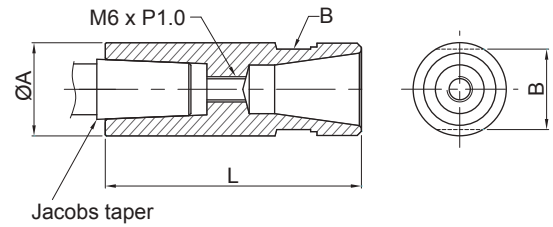




## Accessories 配件區

### ER Collet

### ER 套筒



MODEL 型式	øA mm	øB mm	L mm	Max capacity 夾持能力	Jacobs taper
JT-ER 11	ø 22	12	60.5	ø 7	JT1, JT2, JT3, JT6, JT33
JT-ER 16	ø 22	19	60.5	ø 10	
JT-ER 20	ø 25	21	70.0	ø 13	
JT-ER 25	ø 32	27	70.0	ø 16	
JT-ER 32	ø 36	33	77.0	ø 20	
JT-ER 40	ø 45	42	87.0	ø 25	

### Adjustable TM Shank Collet

### 可調式 TM柄 筒夾

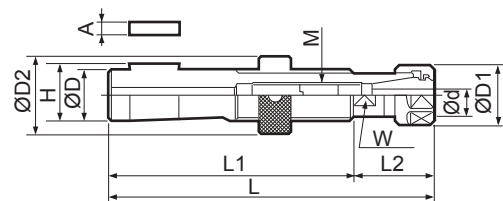


FIG 1

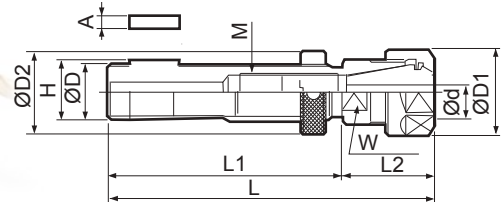
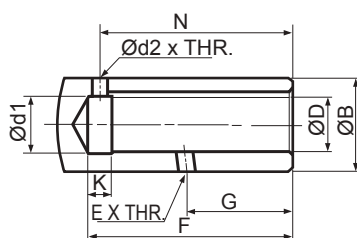


FIG 2

MODEL 型式	øD mm	Range 夾持範圍	øD1 mm	øD2 mm	FIG	L mm	L1 mm	L2 mm	A mm	H mm	W mm	M mm	Collet 筒夾規格
AAA19-ER16-32	19	0.5~7.0	28	32	2	108	76	32	4	20.7	19	M12x1.0	ER 16
AAA22-ER16-32	22	0.5~7.0	28	32	2	124	92	32	5	24.2	19	M12x1.0	ER 16
AAA26-ER16-32	26	0.5~7.0	28	39	1	124	92	32	5	28.2	19	M12x1.0	ER 16
AAA22-ER20-36	22	0.5~13.0	34	32	2	128	92	36	5	24.2	21	M14x1.0	ER 20
AAA26-ER20-36	26	0.5~13.0	34	39	2	128	92	36	5	28.2	21	M14x1.0	ER 20
AAA28-ER20-36	28	0.5~13.0	34	41	1	128	92	36	5	30.2	21	M14x1.0	ER 20

### FITTED SPINDLE NOSE DIMENSIONS

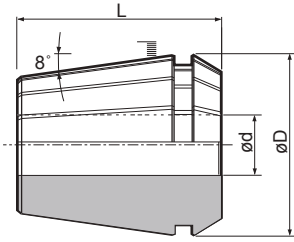
### 配合之主軸端尺寸



øD(H6) mm	øB mm	ød1 mm	ød2 mm	E mm	F mm	G mm	K mm	N mm	H mm	A mm
14	29	17	5	M6x1	69	36	8	65	17.8	4
19	32	20	5	M6x1	69	36	8	65	20.8	4
22	35	23	6	M6x1	85	43	10	80	24.3	5
26	40	27	6	M6x1	85	43	10	80	28.3	5
28	42	29	6	M6x1	85	43	10	80	30.3	5

## ER Collet

### ER 彈性筒夾



MODEL	Ød	ØD	L	Weight	
	Size range (mm)		mm		
ER 8	1.0 - 5.0		8.5	13.5	0.005 kgs
ER 11	1.0 - 7.0		11.5	18.0	0.01 kgs
ER 16	1.0 - 10.0		17.0	27.5	0.03 kgs
ER 20	1.0 - 13.0		21.0	31.5	0.04 kgs
ER 25	2.0 - 16.0		26.0	34.0	0.06 kgs
ER 32	2.0 - 20.0		33.0	40.0	0.10 kgs
ER 40	3.0 - 26.0		41.0	46.0	0.25 kgs
ER 50	12.0 - 34.0		52.0	60.0	0.45 kgs

## Hex. Collet

### 六角筒夾

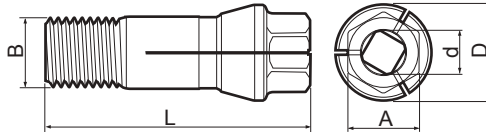


## CT type

(for tapping)

### CT 型

(攻牙用)



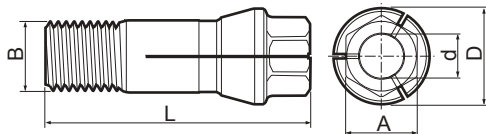
MODEL	Ød	ØD	L	B	A	Max. Capacity 最大挾持能力
	mm	mm	mm	UNF	mm	
CT-5	3~5	10.8	31.5	5/16~24	8	M4x0.7
CT-6	3~6	13.1	36	3/8~24	10	M6x1.0
CT-9	3~7	17.0	46	1/2~20	14	M8x1.25
CT-12	3~9	21.0	50	5/8~18	17	M12x1.75

## C type

(for drilling)

### C 型

(鑽孔用)

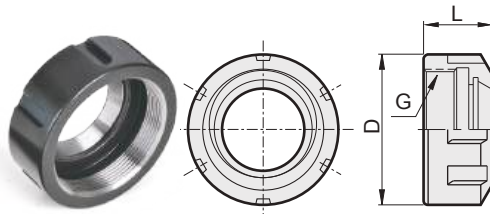


MODEL	Ød	ØD	L	B	A	Max. Capacity 最大挾持能力
	mm	mm	mm	UNF	mm	
C-5	2~5	10.8	31.5	5/16~24	8	Ø5
C-6	2~6	13.1	36	3/8~24	10	Ø6
C-9	2~9	17.0	46	1/2~20	14	Ø9
C-12	2~12	21.0	50	5/8~18	17	Ø12

## ER-A Nut

### ER-A 螺帽

(標準)



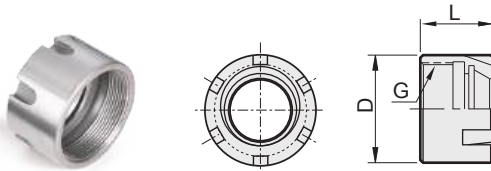
MODEL	ØD	L	G	Weight
	mm	mm		
ER 11-A	19	11.5	M14 x 0.75P	0.04 kgs
ER 16-A	28	17	M22 x 1.5P	0.05 kgs
ER 20-A	34	19	M25 x 1.5P	0.09 kgs
ER 25-A	42	20	M32 x 1.5P	0.13 kgs
ER 32-A	50	23	M40 x 1.5P	0.14 kgs
ER 40-A	63	25	M50 x 1.5P	0.25 kgs
ER 50-A	78	35	M64 x 2.0P	0.50 kgs

## ER-A Nut

(small nut)

### ER-M 螺帽

(小徑螺帽)



MODEL	ØD	L	G	Weight
	mm	mm		
ER 8-M	12	10.8	M10 x 0.75P	0.005 kgs
ER 11-M	16	12	M13 x 0.75P	0.02 kgs
ER 16-M	22	18	M19 x 1.0P	0.03 kgs
ER 20-M	28	19	M24 x 1.0P	0.045 kgs
ER 25-M	35	20	M30 x 1.0P	0.05 kgs



# Running Speed Table

## 轉速表

Material 材質	Stainless Steel 不鏽鋼		Aluminum 鋁		Iron 鐵		Cast Iron 鑄鐵		Copper Alloy 合金鋼		Brass & Bronze 青、黃銅		Plastic 塑膠	
	V值±2 V value ±2		V值±10 V value ±10		V值±5 V value ±5		V值±5 V value ±5		V值±2 V value ±2		V值±7 V value ±7		V值±5 V value ±5	
Cutting cond 切削條件	8	4	50	25	25	12	30	15	28	14	60	30	34	17
V Tool (刀具)														
Speed (轉速) RPM														
ø Dia. (直徑) mm														
ø 2	1275	635	7960	3980	3980	1910	4780	2390	4460	2230	9555	4780	5415	2705
ø 3	850	425	5310	2655	2650	1275	3185	1590	2970	1485	6370	3185	3610	1805
ø 4	640	320	3980	1990	1990	955	2390	1195	2230	1115	4780	2390	2705	1355
ø 5	510	255	3185	1590	1590	765	1910	955	1785	890	3820	1910	2165	1085
ø 6	425	210	2655	1330	1330	640	1590	795	1485	745	3185	1590	1805	900
ø 7	365	180	2275	1140	1140	545	1365	680	1275	635	2730	1365	1545	775
ø 8	320	160	1990	995	995	480	1195	600	1115	555	2390	1195	1355	680
ø 9	285	140	1770	885	885	425	1060	530	990	495	2125	1060	1205	600
ø 10	255	125	1590	800	800	380	955	480	890	445	1910	955	1085	540
ø 11	230	115	1450	725	725	350	870	435	810	405	1740	870	985	490
ø 12	210	105	1330	665	665	320	795	400	745	370	1590	795	900	450
ø 13	195	100	1225	610	610	295	735	365	685	340	1470	735	835	420
ø 14	180	90	1135	570	570	270	680	340	635	320	1365	680	775	385
ø 15	170	85	1060	530	530	255	640	320	600	300	1275	640	720	360
ø 16	160	80	995	500	500	240	600	300	560	280	1195	600	680	340
ø 17	150	75	935	470	470	225	560	280	525	260	1125	560	640	320
ø 18	140	70	885	440	440	210	530	265	495	250	1060	530	600	300
ø 19	135	67	835	420	420	200	500	250	470	235	1005	500	570	285
ø 20	130	65	795	400	400	190	480	240	445	225	955	480	540	270
ø 25	100	50	640	320	320	155	380	190	355	180	765	380	430	220
ø 30	85	45	530	265	265	130	320	160	300	150	635	320	360	180
ø 40	65	30	400	200	200	95	240	120	225	110	480	240	270	135
ø 50	50	25	320	160	160	75	190	95	175	90	380	190	220	110

Remarks  
備註

$$S \text{ Speed} = \frac{1000 \times V \text{ Cutting Speed 切削速度}}{3.14 \times D \text{ Tool Dia. 刀直徑}}$$

- Above data may vary according to workpiece material and cutting tool material.
- 加工時視切削情形的切削材料或切削刀具材質再做增減。



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Date:

Member:

Place:

A series of horizontal dotted lines providing a space for writing.