



公司簡介

Company Profile

公司沿革：

1980年	創立億昌機械廠，使用傳統銑床加工齒條。
1983年	使用步進馬達定位傳動加工。
1989年	遷移新廠。
1992年	改名為原億昌機械股份有限公司
1993年	淘汰傳統機台，使用CNC齒條切削機。同時導入生產管理電腦資訊系統。 已增設至4台CNC設備、NC自動齒條壓直機
2006年	增設至1台CNC齒條成型研磨機，增設6台CNC齒條切削機
2009年	導入ISO9001 體系品質認證。增設一台CNC齒面研磨機
2011年	遷入新廠、新增四台CNC齒條研磨機
2012年	研發製造消除減速機
2013年	擴廠蓋新廠房、增設歐洲CNC齒條研磨機，現有12台CNC齒條切削機床

全面性技術：

●	傳動設備產品線齊全：包含消除減速機、齒條、齒輪。
●	規格完整：模數M0.5~M12
●	產品精密：DIN 5~10
●	服務多元：可依照客戶圖面生產



生產設備

Production Facilities

●	龍門銑床機台
●	自動化電腦切齒機
●	齒面成形研磨機
●	刀具研磨機
●	自動壓直機
●	硬度測試機
●	三次元檢驗機台



產品用途

Applications

●	適用於各式CNC工作母機： 精密切割機、車床、銑床、鑽床、磨床、自動化機械系統(機器手臂)、自動化倉儲系統等。
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Introduction

Company Profile

HISTORY :

1980	Established Yi Chang Machinery specialized in rack manufacturing with traditional milling machines.
1983	Applied to Stepper Motors.
1989	Moved to new factory.
1992	Renamed “Yuan Yi Chang Machinery Co., Ltd.”
1993	Traditional machines were replaced of CNC gear cutting machines. Production system is computerized. 6 CNC machines and NC automatic rack straightening machine built up.
2009	Certified by International Standard Organization ISO9001. Built up one set of CNC Tooth Grinding Machine.
2011	Moved to new factory; built up 4 new sets of tooth grinding machines.
2012	Developed and manufactured Anti-Backlash Gear Reducer.
2013	Expanded land and a European CNC teeth grinding machine. Currently, 12 sets of tooth cutting machines.

Diversity Technology:

●	Full ranges of transmission equipment products: Anti-Backlash Gear Reducers, Racks, Gears.
●	Complete Specifications: Module M0.5~M12
●	High end and Wide Precision: DIN 5~10
●	Diversity Services: Customized production procedure



Equipments

Production Facilities

●	Gantry Milling Machines
●	Automatic Computerized Tooth Cutting Machines.
●	Tooth Milling Machines.
●	Cutter Milling Machines.
●	Automatic Straightening Machines.
●	Hardness Tester Machine
●	Cubic Measuring Machines.

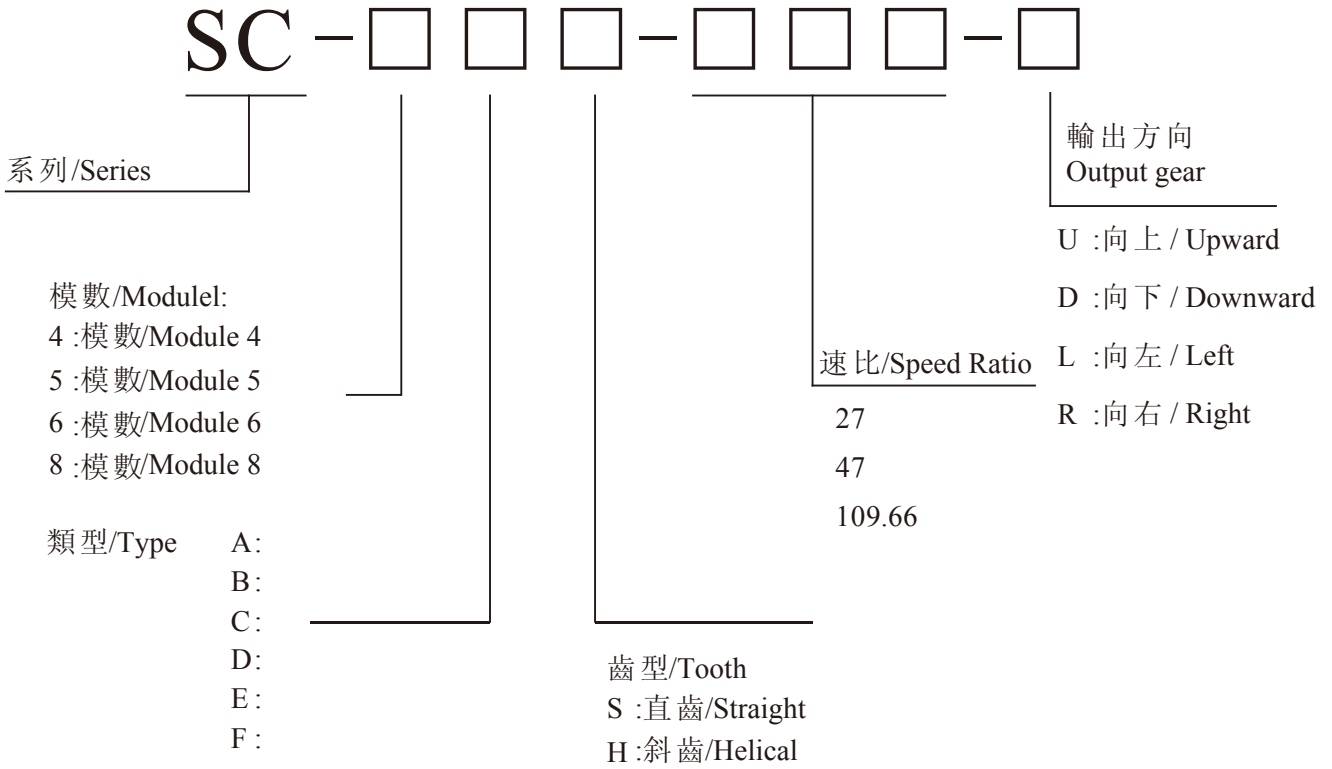


Purpose

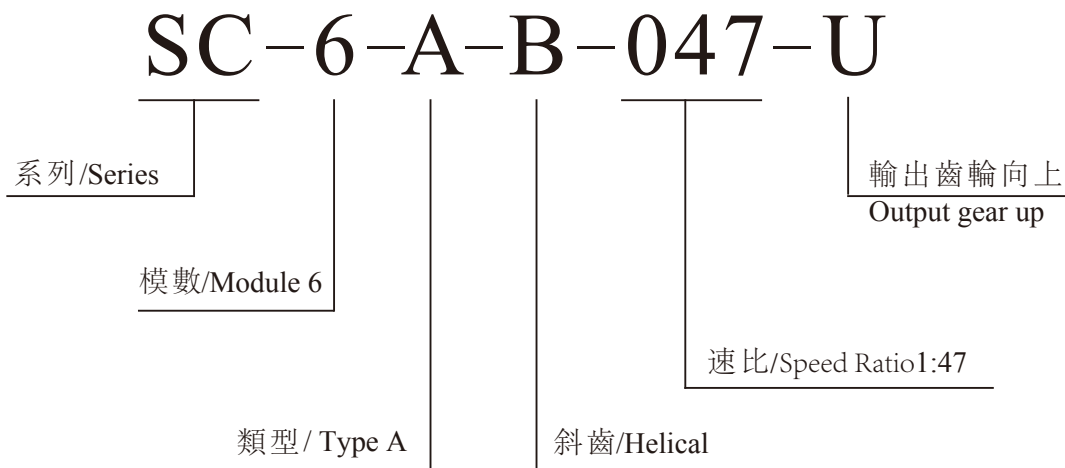
Applications

●	Suitable for all kinds of CNC machining centers: Cutting Machines, Turning Machines (Lathes), Milling Machines, Drilling Machines, Grinding Machines, Automatic Robotics System, and Automatic Warehouse Storage System.
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型號說明



舉例 / Example:



產品目錄 Product Catalog

型號 Code	變速比 Ratio	齒型 Type	輸出齒輪安裝方式 Installtion	頁碼 Page
SC-4AS-D	27	直齒 Straight	朝下 Downward	44
SC-4AB-D	27	斜齒 Helical	朝下 Downward	44
SC-5AS-D	27	直齒 Straight	朝下 Downward	44
SC-5AB-D	27	斜齒 Helical	朝下 Downward	44
SC-6AS-D	47	直齒 Straight	朝下 Downward	45
SC-6AB-D	47	斜齒 Helical	朝下 Downward	45
SC-8AS-D	47	直齒 Straight	朝下 Downward	45
SC-8AB-D	47	斜齒 Helical	朝下 Downward	45
SC-4BS-D	27	直齒 Straight	朝下 Downward	46
SC-4BB-D	27	斜齒 Helical	朝下 Downward	46
SC-5BS-D	27	直齒 Straight	朝下 Downward	46
SC-5BB-D	27	斜齒 Helical	朝下 Downward	46
SC-6BS-D	47	直齒 Straight	朝下 Downward	47
SC-6BB-D	47	斜齒 Helical	朝下 Downward	47
SC-8BS-D	47	直齒 Straight	朝下 Downward	47
SC-8BB-D	47	斜齒 Helical	朝下 Downward	47
SC-4CS-D	27	直齒 Straight	朝下 Downward	48
SC-4CB-D	27	斜齒 Helical	朝下 Downward	48
SC-5CS-D	27	直齒 Straight	朝下 Downward	48
SC-5CB-D	27	斜齒 Helical	朝下 Downward	48
SC-6CS-D	47	直齒 Straight	朝下 Downward	49
SC-6CB-D	47	斜齒 Helical	朝下 Downward	49
SC-8CS-D	47	直齒 Straight	朝下 Downward	49
SC-8CB-D	47	斜齒 Helical	朝下 Downward	49
SC-6DS-U	47	直齒 Straight	朝上 Upward	50
SC-6DB-U	47	斜齒 Helical	朝上 Upward	50
SC-8DS-U	47	直齒 Straight	朝上 Upward	50
SC-8DB-U	47	斜齒 Helical	朝上 Upward	50
SC-6ES-U	109.66	直齒 Straight	朝上 Upward	51
SC-6EB-U	109.66	斜齒 Helical	朝上 Upward	51
SC-8ES-U	109.66	直齒 Straight	朝上 Upward	51
SC-8EB-U	109.66	斜齒 Helical	朝上 Upward	51



消隙減速機

Anti-Backlash Reducer

產品簡介 Product Description

為什麼要選用雙輸出消隙減速機？

通常機床行程超過6米就要採用齒輪，齒條傳動，傳統的對定位精度要求不高的機床均採用非消隙傳動機構（梯形絲桿、蝸桿蝸母條、蝸輪蝸桿減速機），成本低，製造安裝簡單，但同時也產生了一些問題，如定位精度及重複定位精度差（並且無法通過電氣補償來解決）、抖動、爬行、噪音、鏜孔時嚴重橢圓、插補加工時嚴重超差、加工端面時嚴重不垂直、工件表面光潔度差等一系列的問題。

基于以上原因，同時人們對機床性能精度的要求也越來越高，傳統的傳動機構已不能滿足人們的使用要求，為滿足市場的需要，我公司經多方調研，採取各家所長，結合國內外先進的設計理念，多次論證試驗，推出高性能消隙減速機，在實際的生產過程中積累了豐富的經驗，經過不斷的技術改進，水平的不斷提高，目前已成功的應用到數控落地鏜床、數控龍門鏜銑床、數控車床、數控磨床、軋輥磨床、數控轉臺等大型設備上，並得到用戶的一致好評。

Why to select a dual output Anti-Backlash Reducer?

Generally, when machine stroke runs over 6 meters, it has to be adopted racks and pinions for transmission purpose. Traditional machine centers demand lower on positioning accuracy all adopt non-anti-backlash devices (trapezoidal screw worm snail mother article, worm reducer) because of low-cost and simple installation. Therefore, it occurs some problems accordingly, , such as positioning and repeatability of positioning accuracy both are poor, (it can't be resolved through electrical compensation) It also has a plenty of problems like jitter, crawling, severe noise, bores become oval, tolerance is poor, end finish is not vertical and poor surface finish etc.

Based on the above reasons, performance requirements of precision machines accelerate high. Traditional transmission devices can't meet the requirements. After multilateral researches, in order to meet the needs of the market, YYC consolidates advanced design concepts, and accumulates experiences, continuously improves technology. Our Anti-Backlash Reducer is successfully applied to large equipment like floor boring machine, CNC gantry milling machine, CNC lathe, CNC grinders, rolling roll grinding machine, CNC turret and other large equipment.

消隙減速機的主要特性

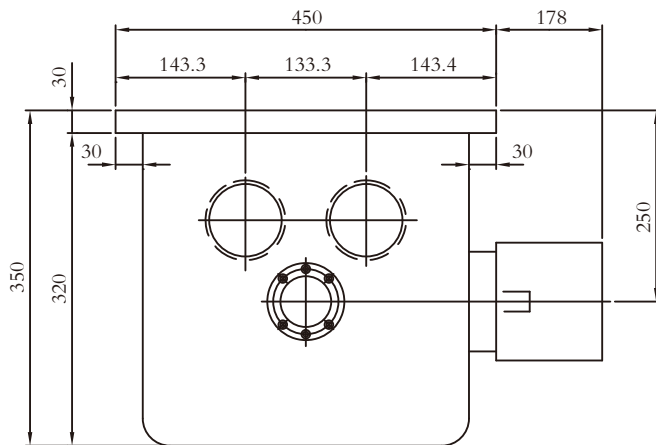
The main features of the anti-backlash Reducer

- 1) 高精度 / High-precision
- 2) 高剛性 / High rigidity
- 3) 自動補償功能 / Automatic compensation function
- 4) 長壽命 / Long life
- 5) 易安裝 / Easy to install
- 6) 免維護 / Maintenance-free

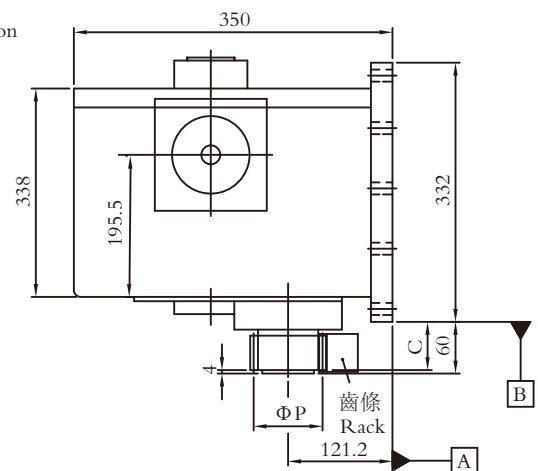
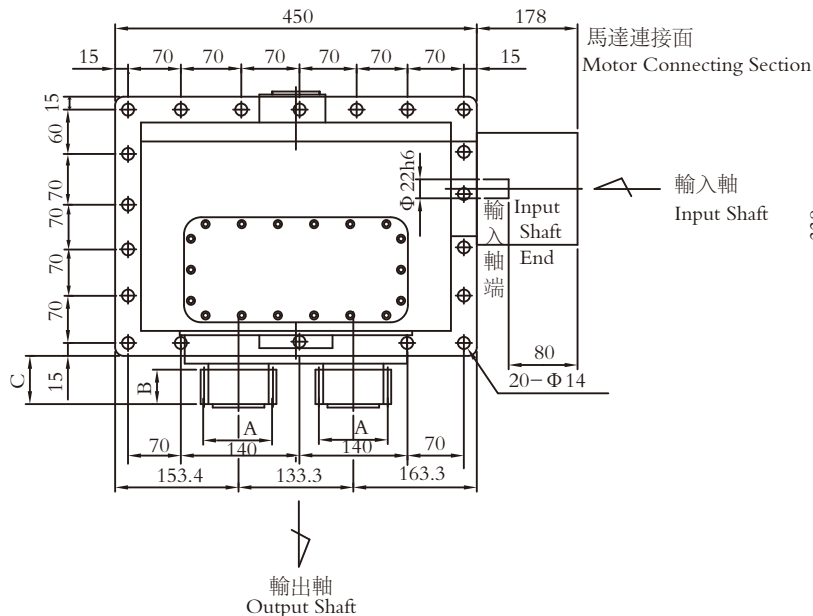
選型工作表

Selection worksheet

客戶名稱/Customer		聯繫人/Contact	
		電話/Tel	
設備類型/Device Type			
項目/Project	數據/Data	記錄/Record	備註/Remark
負載/Load			
工作外力/external forces			
加速度 /Acceleration			
單次移動距離 Single position distance			
單次定位時間 Single positioning time			
安裝方式/Installation			
工作速度/Working speed			
最大速度/Max speed			
行程/Stroke			
摩擦係數 Attrition Modulus			



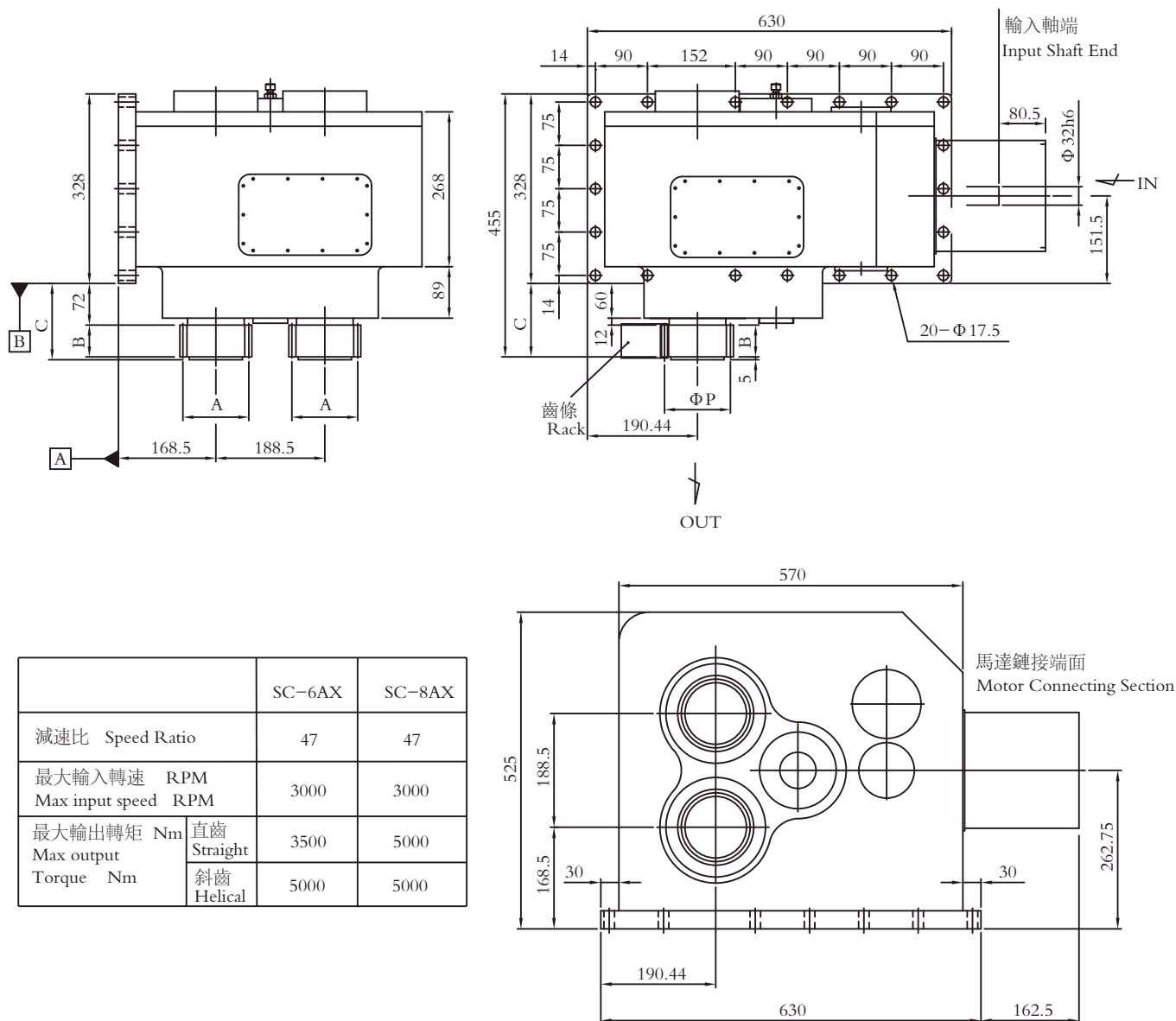
		SC-4AX	SC-5AX
減速比 Speed Ratio		27	27
最大輸入轉速 RPM Max input speed RPM		3000	3000
最大輸出轉矩 Nm Max output Torque Nm	直齒 Straight	1000	1000
	斜齒 Helical	1000	1200



	A	B	C	直 齒 Straight P	斜 齒 Helical P
SC-4AX	M4X20T	40	56	80	84.88
SC-5AX	M5X17T	50	66	85	90.79

齒輪箱對安裝基面的要求: 1. 平面度 0.03mm; 2. 垂直度 0.03mm (兩個方向, 對導軌基面)
齒條對安裝基面的要求: 1. 直線度 0.01mm/1000; 2. 平行度 0.01mm、1000 (兩個方向, 對導軌基面) ; 3. 垂直度 0.05mm

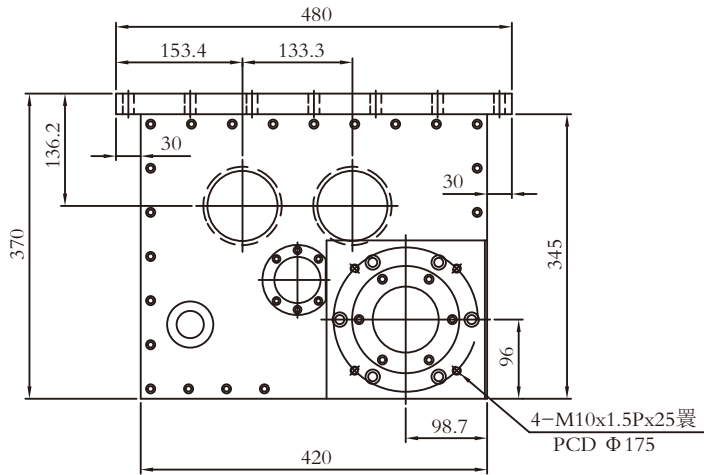
Requirements of gear box installation base level: 1. Planeness 0.03mm, 2 Verticality: 0.03mm (Two directions toward level of slide way)
Requirements of rack installation base level: :1 , Straight Line 0.01 mm /1000, 2. Parallel 0.01mm, 1000 (Two directions toward level of slide way) ; 3.Verticality: 0.05mm



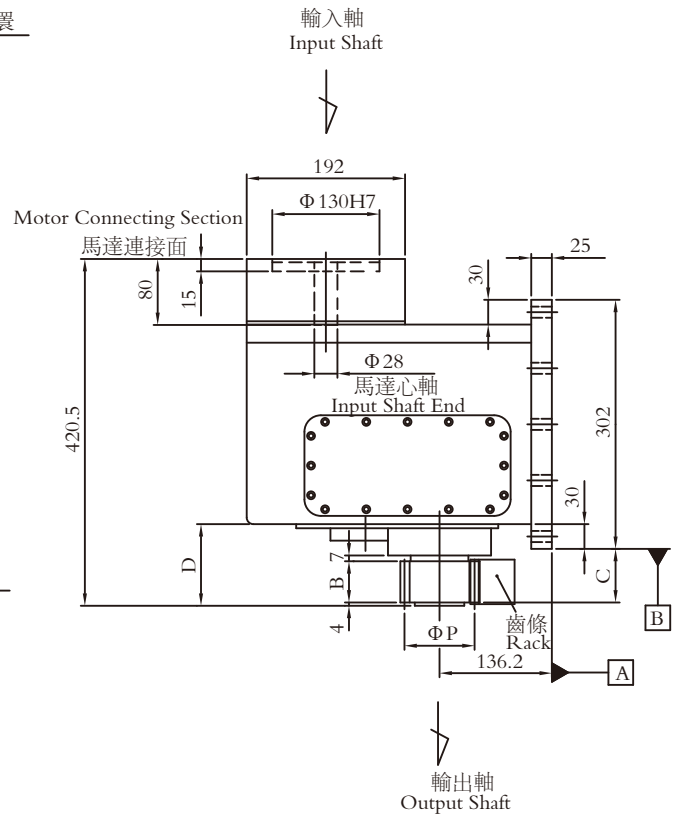
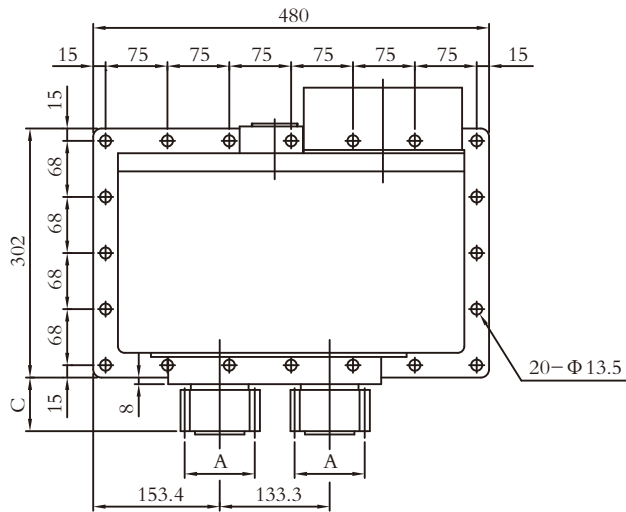
	SC-6AX	SC-8AX
減速比 Speed Ratio	47	47
最大輸入轉速 RPM Max input speed RPM	3000	3000
最大輸出轉矩 Nm Max output Torque Nm	直齒 Straight 3500 斜齒 Helical 5000	5000

	A	B	C	直齒 Straight P	斜齒 Helical P
SC-6AX	M6X19T	55	132	114	120.96
SC-8AX	M8X17T	75	152	136	144.3

齒輪箱對安裝基面的要求: 1. 平面度 0.03mm; 2. 垂直度 0.03mm (兩個方向, 對導軌基面)
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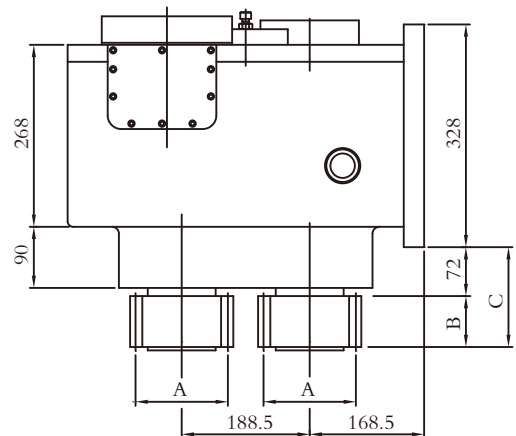
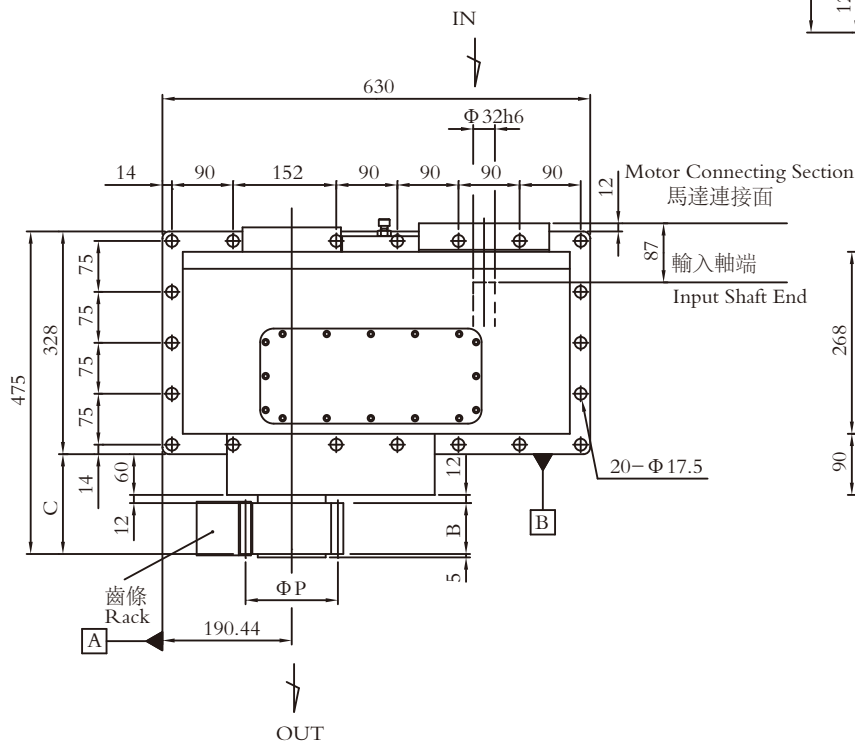
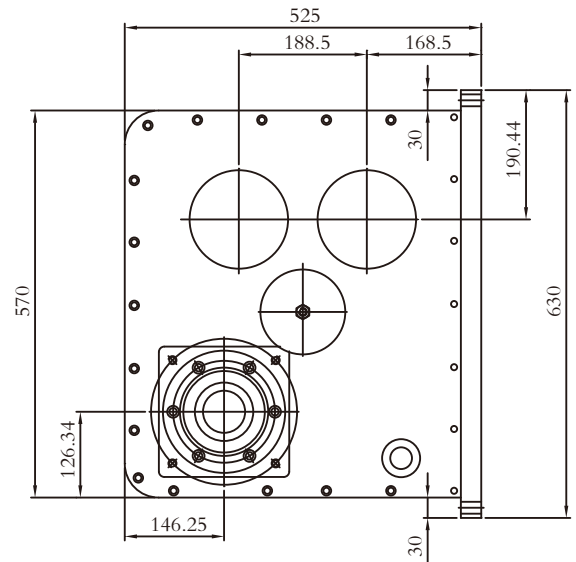
	SC-4BX	SC-5BX
減速比 Speed Ratio	27	27
最大輸入轉速 RPM Max input speed RPM	3000	3000
最大輸出轉矩 Nm Max output Torque Nm	1000	1000
	直齒 Straight	1000
	斜齒 Helical	1000



	A	B	C	D	直齒 Straight P	斜齒 Helical P
SC-4BX	M4X20T	40	55	89	80	84.88
SC-5BX	M5X17T	50	65	99	85	90.79

齒輪箱對安裝基面的要求: 1. 平面度 0.03mm; 2. 垂直度 0.03mm (兩個方向, 對導軌基面)
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Requirements of gear box installation base level: 1. Planeness 0.03mm, 2 Verticality: 0.03mm (Two directions toward level of slide way)
Requirements of rack installation base level: 1. Straight Line 0.01 mm /1000, 2. Parallel 0.01mm, 1000 (Two directions toward level of slide way); 3. Verticality: 0.05mm

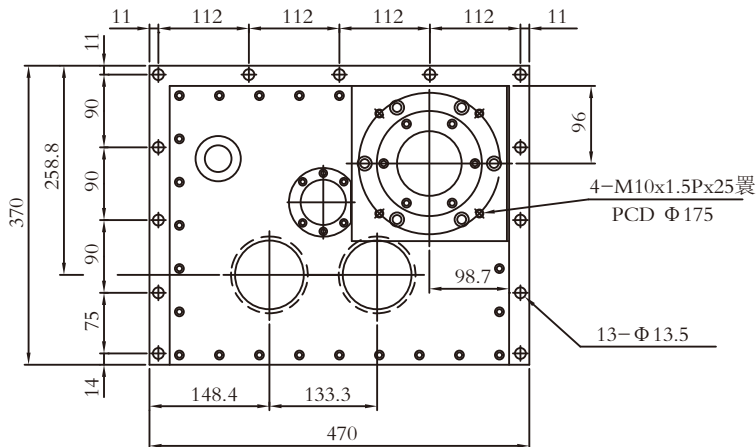
		SC-6BX	SC-8BX
減速比 Speed Ratio		47	47
最大輸入轉速 RPM Max input speed RPM		3000	3000
最大輸出轉矩 Nm Max output Torque Nm	直齒 Straight	3500	5000
	斜齒 Helical	5000	5000



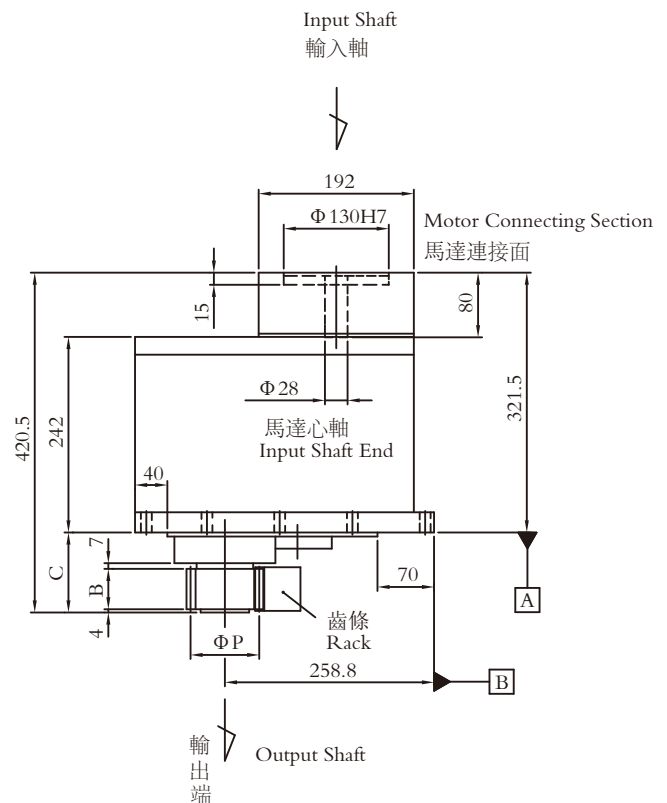
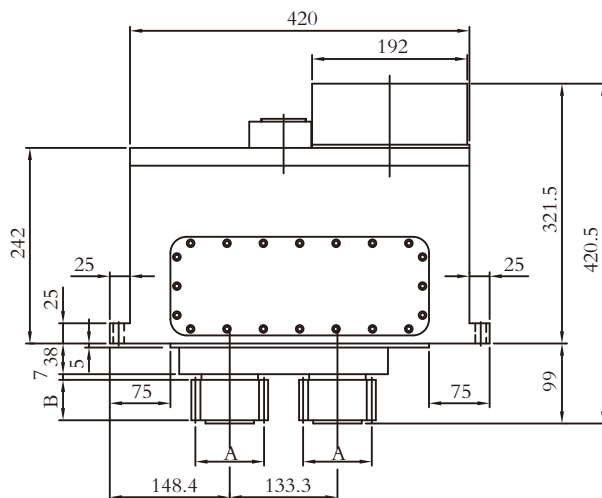
	A	B	C	直 齒 Straight P	斜 齒 Helical P
SC-6BX	M6X19T	55	132	114	120.96
SC-8BX	M8X17T	75	152	136	144.3

齒輪箱對安裝基面的要求: 1. 平面度 0.03mm; 2. 垂直度 0.03mm (兩個方向, 對導軌基面)
齒條對安裝基面的要求: 1. 直線度 0.01mm/1000; 2. 平行度 0.01mm、1000 (兩個方向, 對導軌基面) ; 3. 垂直度 0.05mm

Requirements of gear box installation base level: 1. Planeness 0.03mm, 2 Verticality: 0.03mm (Two directions toward level of slide way)
Requirements of rack installation base level: :1 , Straight Line 0.01 mm /1000, 2. Parallel 0.01mm, 1000 (Two directions toward level of slide way) ; 3.Verticality: 0.05mm



		SC-4CX	SC-5CX
減速比 Speed Ratio		27	27
最大輸入轉速 RPM Max input speed RPM		3000	3000
最大輸出轉矩 Nm Max output Torque Nm	直齒 Straight	1000	1000
	斜齒 Helical	1200	1200



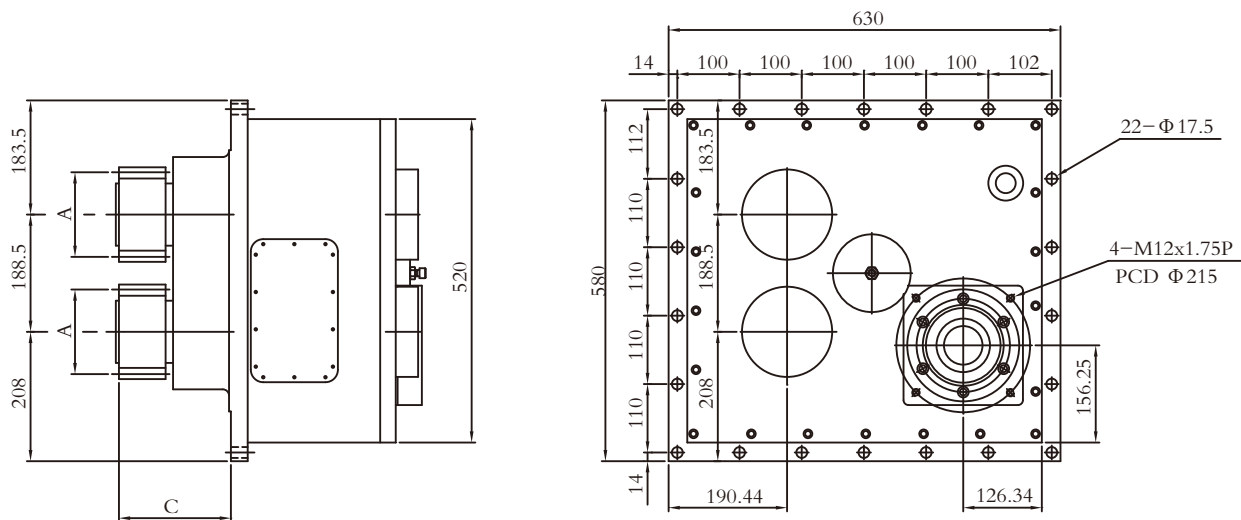
	A	B	C	直 齒 Straight P	斜 齒 Helical P
SC-4CX	M4X20T	40	89	80	84.88
SC-5CX	M5X17T	50	99	85	90.79

齒輪箱對安裝基面的要求: 1. 平面度 0.03mm; 2. 垂直度 0.03mm (兩個方向, 對導軌基面)

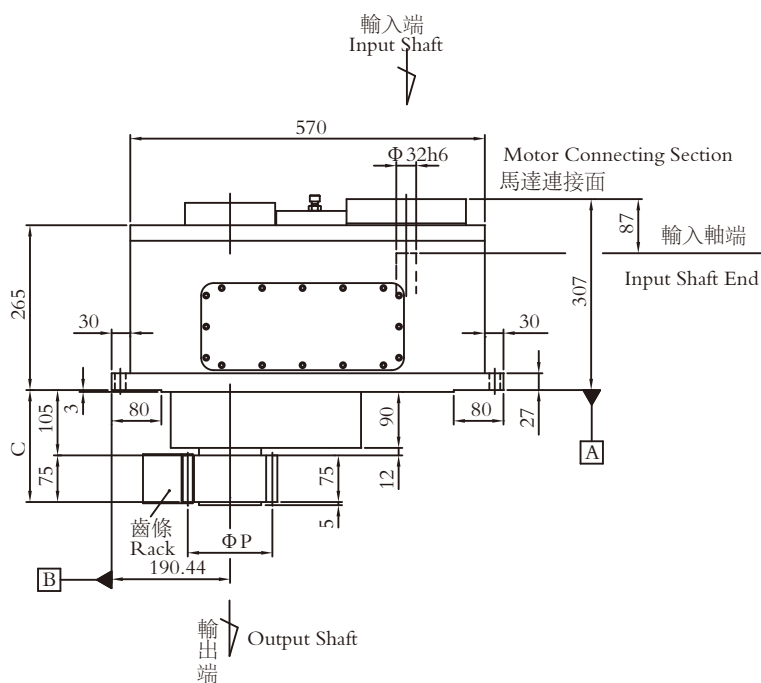
齒條對安裝基面的要求: 1. 直線度 0.01mm/1000; 2. 平行度 0.01mm、1000 (兩個方向, 對導軌基面); 3. 垂直度 0.05mm

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Requirements of rack installation base level :1, Straight Line 0.01 mm /1000, 2. Parallel 0.01mm, 1000 (Two directions toward level of slide way) ; 3.Verticality: 0.05mm



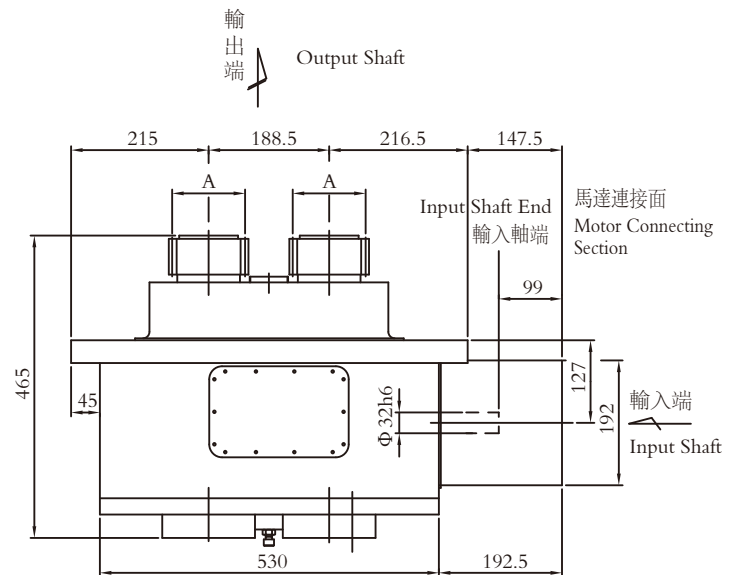
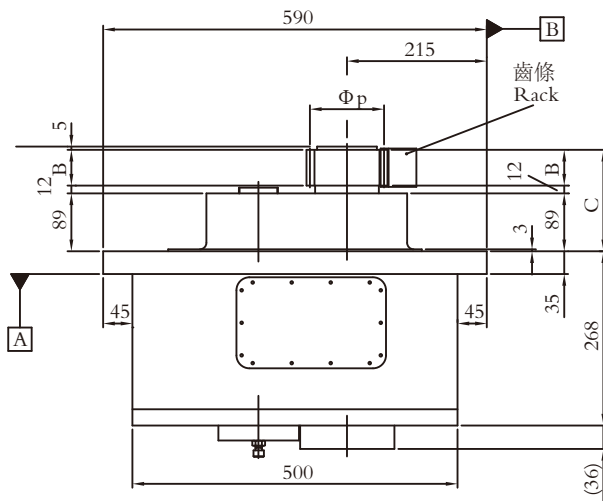
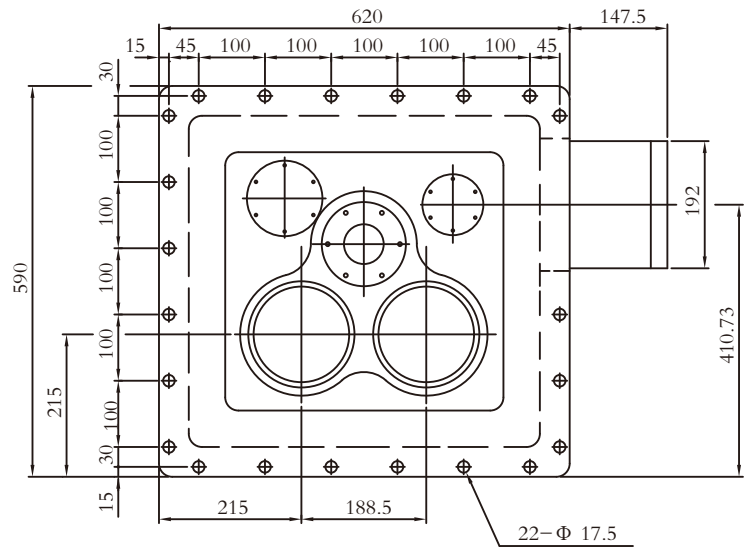
	SC-6CX	SC-8CX
減速比 Speed Ratio	47	47
最大輸入轉速 RPM Max input speed RPM	3000	3000
最大輸出轉矩 Nm Max output Torque Nm	直齒 Straight 3500 斜齒 Helical 5000	5000



	A	B	C	直齒 Straight P	斜齒 Helical P
SC-6CX	M6X19T	55	160	114	120.96
SC-8CX	M8X17T	75	180	136	144.3

齒輪箱對安裝基面的要求: 1. 平面度 0.03mm; 2. 垂直度 0.03mm (兩個方向, 對導軌基面)
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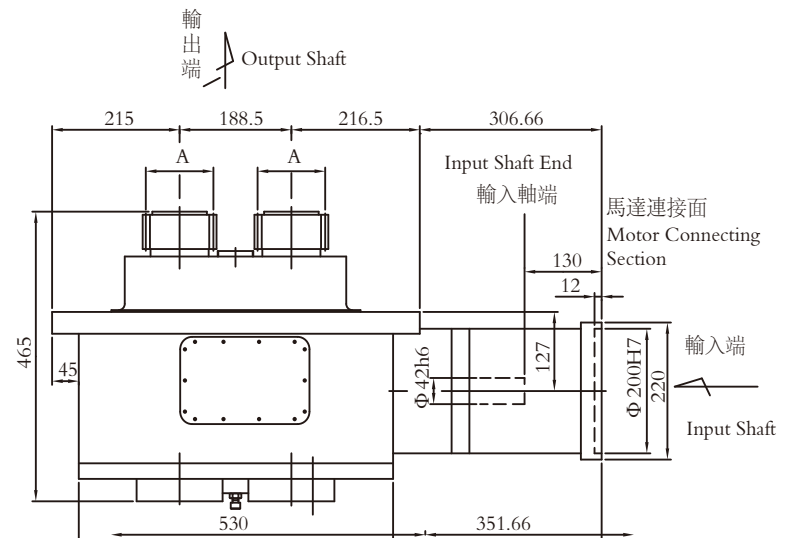
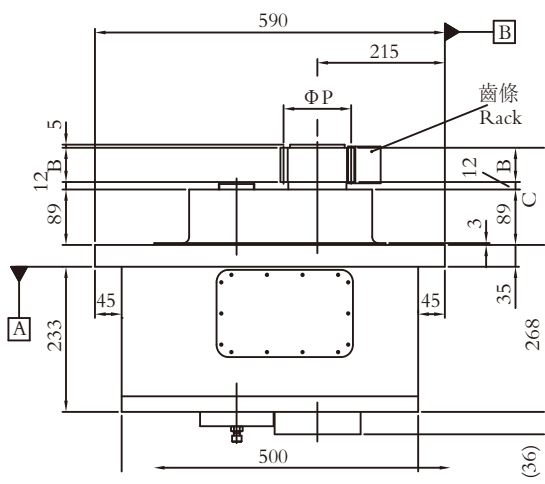
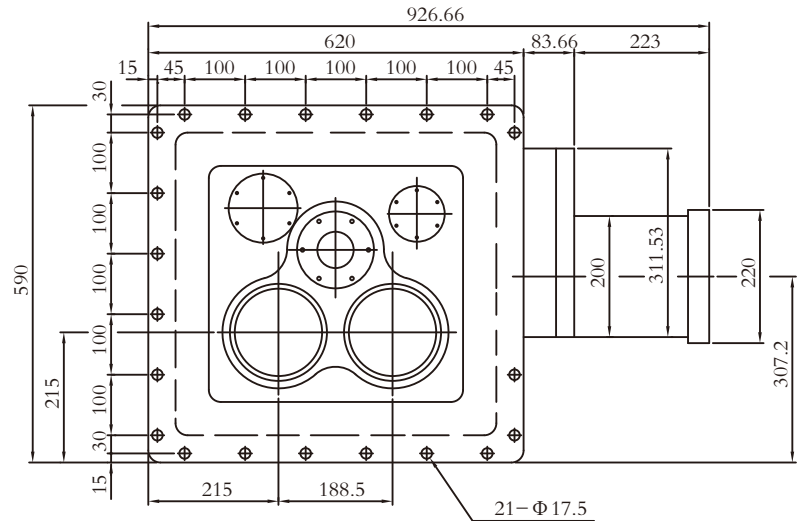
	SC-6DX	SC-8DX
減速比 Speed Ratio	47	47
最大輸入轉速 RPM Max input speed RPM	3000	3000
最大輸出轉矩 Nm Max output Torque Nm	直齒 Straight 3000 斜齒 Helical 5000	5000



	A	B	C	直齒 Straight P	斜齒 Helical P
SC-6DX	M6X19T	55	156	114	120.96
SC-8DX	M8X17T	75	176	136	144.3

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	SC-6EX	SC-8EX
減速比 Speed Ratio	109.66	109.66
最大輸入轉速 RPM Max input speed RPM	3000	3000
最大輸出轉矩 Nm Max output Torque Nm	直齒 Straight 3500 斜齒 Helical 5000	3500 5000



	A	B	C	直齒 Straight P	斜齒 Helical P
SC-6EX	M6X19T	55	156	114	120.96
SC-8EX	M8X17T	75	176	136	144.3

齒輪箱對安裝基面的要求: 1. 平面度 0.03mm; 2. 垂直度 0.03mm (兩個方向, 對導軌基面)
齒條對安裝基面的要求: 1. 直線度 0.01mm/1000; 2. 平行度 0.01mm、1000 (兩個方向, 對導軌基面); 3. 垂直度 0.05mm
Requirements of gear box installation base level: 1. Planeness 0.03mm, 2. Verticality: 0.03mm (Two directions toward level of slide way)
Requirements of rack installation base level: 1. Straight Line 0.01 mm /1000, 2. Parallel 0.01mm, 1000 (Two directions toward level of slide way); 3. Verticality: 0.05mm

最大容許扭矩 NM

在良好的油脂潤滑系統下及齒輪單面懸臂支撐條件下,齒側所能承受最大負荷

Maximal Torsibility

Under good lubricant condition with single arm of the pinion support, the maximal torsibility of tooth.

模数 1.5/Module 1.5

齒條材料及齒型 Rack Material and Tooth Profile		S45C 軟材 soft 直齒 straight		S45C 軟材 soft 斜齒 helical		S45C 調質 quenched+tempered 直齒 straight	S45C 調質 quenched+tempered 斜齒 helical	S45C 高頻淬火 Induction-hardened 直齒 straight		S45C 高頻淬火 Induction-hardened 直齒 straight	SCM440 表面淬火 Case-hardened 直齒 straight	SCM440 表面淬火 Case-hardened 斜齒 helical
齒條系列 Rack Code		CSTM		CHTM		CSTMQ	CHTMQ	CSTMH		CHTMH	MSTGH	MHTGH
相對配置齒輪 Recommended Pinion Code		S45C 軟材 soft	S45C 淬火 hardened	S45C 軟材 soft	S45C 淬火 hardened	S45C 淬火 hardened	SCM440 淬火 hardened	S45C 淬火 hardened	SCM440 淬火 hardened	SCM440 淬火 hardened	SCM440 淬火 hardened	SCM440 淬火 hardened
		CSM	CSMH	CHM	CHMH	CSMH	MHMH	CSMH	MSMH	MHMH	MSMH	MHMH
齒數 No. of pinion teeth	節圓直徑 Pitch circle dia. 斜齒 直齒 helical straight											
15		1.1	2.3	3.2		7.9						
17	25.5	1.6	3.2	4.5		16.0						
18	27.0	2.2	4.5	6.5		21.0						
20	30.0	3.2	6.5	9.1		32.0						
22	33.0	5.0	10.0	15.0		46.0						
25	37.5	10.0	20.0	30.0		60.0						
28	42.0	13.0	25.0	39.0		65.0						
32	48.0	20.0	38.0	53.0		75.0						
36	54.0	28.0	45.0	63.0		81.0						
40	60.0	40.0	68.0	95.0		108.0						

最大容許扭矩 NM

在良好的油脂潤滑系統下及齒輪單面懸臂支撐條件下,齒側所能承受最大負荷

Maximal Torsibility

Under good lubricant condition with single arm of the pinion support, the maximal torsibility of tooth.

模數 2/Module 2

齒條材料及齒型 Rack Material and Tooth Profile		S45C 軟材 soft 直齒 straight		S45C 軟材 soft 斜齒 helical		S45C 調質 quenched+tempered 直齒 straight	S45C 調質 quenched+tempered 斜齒 helical	S45C 高頻淬火 Induction-hardened 直齒 straight		S45C 高頻淬火 Induction-hardened 直齒 straight	SCM440 表面淬火 Case-hardened 直齒 straight	SCM440 表面淬火 Case-hardened 斜齒 helical
齒條系列 Rack Code		CSTM		CHTM		CSTMQ	CHTMQ	CSTMH		CHTMH	MSTGH	MHTGH
相對配置 齒輪 Recommended Pinion Code		S45C 軟材 soft CSM	S45C 淬火 hardened CSMH	S45C 軟材 soft CHM	S45C 淬火 hardened CHMH	S45C 淬火 hardened CSMH	SCM440 淬火 hardened MHMH	S45C 淬火 hardened CSMH	SCM440 淬火 hardened MSMH	SCM440 淬火 hardened MHMH	SCM440 淬火 hardened MSMH	SCM440 淬火 hardened MHMH
齒數 No. of pinion teeth	節圓直徑 Pitch circle dia. 斜齒 直齒 helical straight											
15	30	4.3	13.3				20.9		28.5		83.7	4.3
17	34	7.4	19.0				27.6		39.9		107.0	7.4
18	36	9.5	21.9				31.4		47.5		111.6	9.5
20	42.44 40	13.3	26.6	17.1	33.3		40.9	43.7	71.3		128.3	13.3
22	44	18.1	31.4				49.4	56.1	85.5		134.9	18.1
25	53.05 50	25.7	45.6	32.3	57.0		64.6	69.4	121.6		158.1	25.7
27	57.29			0.0	60.8			76.0				
28	59.41 56	31.4	60.8	0.0	76.0		77.9	83.6	133.0		172.1	31.4
30	63.66 60	41.8	70.3	52.3	87.4		95.0	99.8	144.4		184.1	41.8
32	67.90 64	52.3	78.9		99.8		110.2	114.0	154.9		195.3	52.3
36	76.39 72	71.3	113.1		142.5		133.0	142.5	164.4		213.9	71.3
40	80	93.1	128.3		161.5		177.7	185.3	190		232.5	93.1

最大容許扭矩 NM

在良好的油脂潤滑系統下及齒輪單面懸臂支撐條件下,齒側所能承受最大負荷

Maximal Torsibility

Under good lubricant condition with single arm of the pinion support, the maximal torsibility of tooth.

模數 3/Module 3

齒條材料及齒型 Rack Material and Tooth Profile			S45C 軟材 soft 直齒 straight		S45C 軟材 soft 斜齒 helical		S45C 調質 quenched+tempered 直齒 straight	S45C 調質 quenched+tempered 斜齒 helical	S45C 高頻淬火 Induction-hardened 直齒 straight		S45C 高頻淬火 Induction-hardened 直齒 straight	SCM440 表面淬火 Case-hardened 直齒 straight	SCM440 表面淬火 Case-hardened 斜齒 helical
齒條系列 Rack Code			CSTM		CHTM		CSTMQ	CHTMQ	CSTMH		CHTMH	MSTGH	MHTGH
相對配置 齒輪 Recommended Pinion Code			S45C 軟材 soft	S45C 淬火 hardened	S45C 軟材 soft	S45C 淬火 hardened	S45C 淬火 hardened	SCM440 淬火 hardened	S45C 淬火 hardened	S45C 淬火 hardened	SCM440 淬火 hardened	SCM440 淬火 hardened	SCM440 淬火 hardened
			CSM	CSMH	CHM	CHMH	CSMH	MHMH	CSMH	MSMH	MHMH	MSMH	MHMH
齒數 No. of pinion teeth	節圓直徑 Pitch circle dia. 斜齒 直齒 helical straight												
15	45		12.4	37.1			59.85		80.9				
17	51		20	63.2			95		137.6				
18	54		33.3	81			114.95		162.8	344.1		372	
20	63.66	60	43.7	83.0	52.3	96.9	131.1	137.8	200.0	362.7	381.3	390.6	469.7
22	70.03	66	62.7	103.8		121.6	161.5	172.9	283.7	381.3	399.9	437.1	492.9
25	79.57	75	92.2	151.6	104.	178.6	223.25	137.8	409.2	437.1	455.7	492.9	562.7
28	84		123.5	185.1			270.75	280.3	451.1	479.0	516.2	558	
30	95.49					266		337.3			511.5		669.6
32	96		186.2	261.7			380	394.3	474.3	502.2	523.6	576.6	
36	108		258.4	332.1			486.4	498.8	597.1	623.1	651.0	716.1	
40	120		323	427.5			589	608	595.2	744.0	762.6	818.4	

最大容許扭矩 NM

在良好的油脂潤滑系統下及齒輪單面懸臂支撐條件下,齒側所能承受最大負荷

Maximal Torsibility

Under good lubricant condition with single arm of the pinion support, the maximal torsibility of tooth.

模數 4/Module 4

齒條材料及齒型 Rack Material and Tooth Profile			S45C 軟材 soft 直齒 straight		S45C 軟材 soft 斜齒 helical		S45C 調質 quenched+ tempered 直齒 straight	S45C 調質 quenched+ tempered 斜齒 helical	S45C 高頻淬火 Induction- hardened 直齒 straight		S45C 高頻淬火 Induction- hardened 直齒 straight	SCM440 表面淬火 Case- hardened 直齒 straight	SCM440 表面淬火 Case- hardened 斜齒 helical
齒條系列 Rack Code			CSTM		CHTM		CSTMQ	CHTMQ	CSTMH		CHTMH	MSTGH	MHTGH
相對配置 齒輪 Recommended Pinion Code			S45C 軟材 soft CSM	S45C 淬火 hardened CSMH	S45C 軟材 soft CHM	S45C 淬火 hardened CHMH	S45C 淬火 hardened CSMH	SCM440 淬火 hardened MHMH	S45C 淬火 hardened CSMH	SCM440 淬火 hardened MSMH	SCM440 淬火 hardened MHMH	SCM440 淬火 hardened MSMH	SCM440 淬火 hardened MHMH
齒數 No. of pinion teeth	節圓直徑 Pitch circle dia. 斜齒 直齒 helical straight												
15	63.66	60	38	123.5		137.75	180.5	194.8	204.6	604.5	623.1		716.1
17		68	57	166.25			237.5	248.9	331.08	744	762.6	771.9	
18		72	80.75	190		212.8	275.5	289.8	418.5	809.1	837		
20	84.88	80	109.25	237.5	123.5	266	337.25	351.5	595.2	883.5	906.75	995.1	1134.6
22	93.37	88	156.75	285		318.25	408.5	422.8	827.7	976.5	1023	1116	1246.2
25	106.10	100	228	394.25	256.5	441.75	546.25	560.5	995.1	1069.5	1116	1236.9	1422.9
28		112	332.5	479.75			684	698.3	1134.6	1209	1255.5	1395	1599.6
30	127.32					636.5		817.0			1348.5		1711.2
32		128	465.5	665			913.9	935.8	1302	1385.7	1441.5	1581	1832.1
36		144	646	855			1140	1216.0	1441.5	1525.2	1581		
40		160	807	1045			1472.5	1567.5	1590.3	1767	1832.1	1860	

最大容許扭矩 NM

在良好的油脂潤滑系統下及齒輪單面懸臂支撐條件下,齒側所能承受最大負荷

Maximal Torsibility

Under good lubricant condition with single arm of the pinion support, the maximal torsibility of tooth.

模数 5/Module 5

齒條材料及齒型 Rack Material and Tooth Profile		S45C 軟材 soft 直齒 straight		S45C 軟材 Soft 斜齒 helical		S45C 調質 quenched+ tempered 直齒 straight	S45C 調質 quenched+ tempered 斜齒 helical	S45C 高頻淬火 Inductioned hardened 直齒 straight		S45C 高頻淬火 Inductioned hardened 斜齒 helical	SCM440 高頻淬火 Case— hardened 直齒 straight	SCM440 高頻淬火 Case— hardened 斜齒 helical
齒條系列 Rack Code		CSTM		CHTM		CSTMQ	CHTMQ	CSTMH		CHTMH	MSTGH	MHTGH
相對配置 齒輪 Recommended Pinion Code		S45C 軟材 soft CSM	S45C 淬火 hardened CSMH	S454C 軟材 soft CHM	S45C 淬火 hardened CHMH	S45C 淬火 hardened CSMH	S45C 淬火 hardened MHMH	S45C 淬火 hardened CSMH	SCM440 淬火 hardened MSMH	SCM440 淬火 hardened MHMH	SCM440 淬火 hardened MSMH	SCM440 淬火 hardened MHMH
齒數 No.of pinion teeth	節圓直徑 Pitch circle dia. 斜齒 直齒 helical straight											
12	63.66 60	47.5	142.5		161.5	180.5	285	260.4	716.1	837	855.6	976.5
13	65	57	171			218.5		306.9	771.9			
15	79.58 75	85.5	247		285	304		418.5	883.5	1069.5	1023	1209
17	85	114	332.5			389.5		678.9				0
18	95.9 90	152	380		427.5	437	617.5	841.65		1348.5		1534.5
19	95	180.5	427.5	247		494		995.1				
20	100	218.5	475		532	560.5		1069.5				
21	105	266	532			608		1274.1	1348.5		1581	
22	110	313.5	579.5			674.5		1441.5				
24	127.32 120	408.5	703	522.5	788.5	798	1140	1488	1562.4	1832.1		2046
25	125	465.5	760		855	874		1543.8	1627.5		1860	
30	150	760	1140			1282.5		1860				
36	190.98				1425		1710			2790		3069

最大容許扭矩 NM

在良好的油脂潤滑系統下及齒輪單面懸臂支撐條件下,齒側所能承受最大負荷

Maximal Torsibility

Under good lubricant condition with single arm of the pinion support, the maximal torsibility of tooth.

模數6/Module 6

齒條材料及齒型 Rack Material and Tooth Profile		S45C 軟材 soft 直齒 straight		S45C 軟材 Soft 斜齒 helical		S45C調質 quenched+tempered 直齒 straight	S45C調質 quenched+tempered 斜齒 helical	S45C 高頻淬火 Induction. hardened 直齒 straight		S45C 高頻淬火 Induction. hardened 直齒 straight	SCM440 表面淬火 Case－hardened 直齒 straight	SCM440 表面淬火 Case－hardened 斜齒 helical
齒條系列 Rack Code		CSTM		CHTM				CSTMH		CHTMH	MSTGH	MHTGH
相對配置 齒輪 Recommended Pinion Code		S45C 軟材 soft	S45C 淬火 hardened	S45C 軟材 soft	S45C 淬火 hardened	S45C 淬火 hardened	SCM440 淬火 hardened	S45C 淬火 hardened	SCM440 淬火 hardened	SCM440 淬火 hardened	SCM440 淬火 hardened	SCM440 淬火 hardened
		CSM	CSMH	CHM	CHMH	CSMH	MHMH	CSMH	MSMH	MHMH	MSMH	MHMH
齒數 No.of pinion teeth	節圓直徑 Pitch circle dia. 斜齒 直齒 helical straight											
13	82.76 78				399				1348.5	1534. 5	1581	1813.5
15	90	161.5	446.5					739.35				
19	114	342	622.25					1720.5				
20	127.3 120	408.5	769.5	460.8	864.5			2046		2604		2976
21	126	484.5	921.5					2278.5	2418		2790	
25	159.15 150	826.5	1330	926.3	1491.5			2743.5	2883	3301.5	3348	3813

最大容許扭矩 NM

在良好的油脂潤滑系統下及齒輪單面懸臂支撐條件下,齒側所能承受最大負荷

Maximal Torsibility

Under good lubricant condition with single arm of the pinion support, the maximal torsibility of tooth.

模数8/Module 8

齒條材料及齒型 Rack Material and Tooth Profile		S45C軟材 soft 直齒 straight		S45C軟材 soft 斜齒 helical		S45C調質 quenched+ tempered 直齒 straight	S45C調質 quenched+ tempered 斜齒 helical	S45C 高頻淬火 Induction- hardened 直齒 straight		S45C 高頻淬火 Induction- hardened 直齒 straight	SCM440 表面淬火 Case- hardened 直齒 straight	SCM440 表面淬火 Case- hardened 斜齒 helical
齒條系列 Rack Code		CSTM		CHTM				CSTMH			MSTGH	MHTGH
相對配置 齒輪 Recommended Pinion Code		S45C 軟材 soft CSM	S45C 淬火 hardened CSMH	S45C 軟材 soft CHM	S45C 淬火 hardened CHMH	S45C 淬火 hardened CSMH	SCM440 淬火 hardened MHMH	S45C 淬火 hardened CSMH	SCM440 淬火 hardened MSMH	SCM440 淬火 hardened MHMH	SCM440 淬火 hardened MSMH	SCM440 淬火 hardened MHMH
齒數 No.of pinion teeth	節圓直徑 Pitch circle dia. 斜齒 直齒 helical straight											
12	96.00	218.5	665					976.5				
15	120.00	399	1092.5					1767				
18	152.79			912	1805							6510
20	160.00	997.5	1995	1197	2375			4185			6324	
25	200.00	1995	3230					6975				

最大容許扭矩 NM

在良好的油脂潤滑系統下及齒輪單面懸臂支撐條件下,齒側所能承受最大負荷

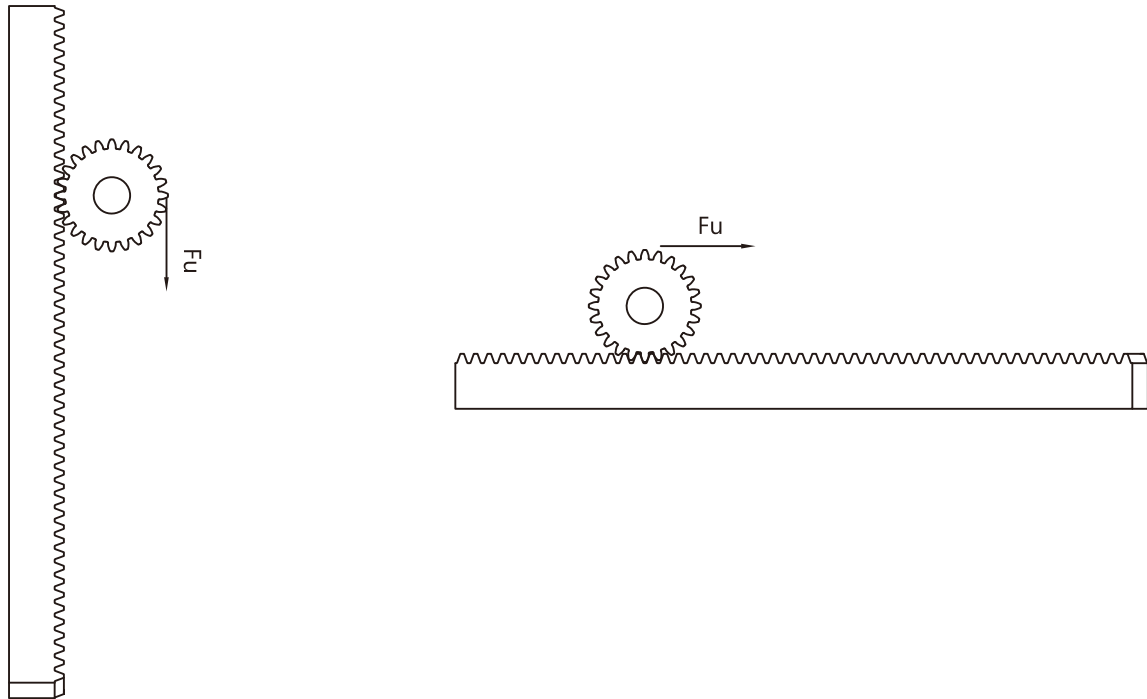
Maximal Torsibility

Under good lubricant condition with single arm of the pinion support, the maximal torsibility of tooth.

模数 10/Module 10

齒條材料及齒型		S45C 軟材 soft 直齒 straight		S45C 軟材 soft 直齒 helical		S45C調質 quenched+ tempered 直齒 straight	S45C調質 quenched+ tempered 斜齒 helical	S45C 高頻淬火 induction- hardened 直齒 straight		S45C 高頻淬火 Induction- hardened 直齒 straight	S4M440 高頻淬火 Case- hardened 直齒 straight	S4M440 表面淬火 Case- hardened 斜齒 helical
齒條系列		CSTM						CSTMH			MSTGH	MHTGH
相對配置 齒輪		S45C 軟材 soft CSM	S45C 淬火 hardened CSMH	S45C 軟材 soft CHM	S45C 淬火 hardened CHMH	S45C 淬火 hardened CSMH	SCM440 淬火 hardened MHMH	S45C 淬火 hardened CSMH	SCM440 淬火 hardened MSMH	SCM440 淬火 hardened MHMH	SCM440 淬火 hardened MSMH	SCM440 淬火 hardened MHMH
齒數 No. of pinion teeth	節圓直徑 Pitch circle dia. 斜齒 直齒 helical straight											
15*												
18*	190.99											12555
20*	200.00		3800					9300			12090	

齒條傳動形式 (selection rack and pinion drive)



上升/下降 Upward/Downward

$$F_u = m \cdot g + m \cdot a$$

水平 (Driving horizontally)

$$F_u = m \cdot g \cdot \mu + m \cdot a$$

名稱 (Description)	公式 (formula)	單位 (dimension)
加速度 (Acceleration)	$a = \frac{v}{t} = \frac{2 \cdot s}{t^2}$	m/s ²
速度 (Speed)	$v = \frac{s}{t} = \sqrt{2 \cdot a \cdot s}$	m/s
距離 (Distance)	s	m
時間 (Time)	t	s
轉速 (Rpm)	$n = \frac{v \cdot 60}{\pi \cdot d_0}$	1/min
分度圓直徑 (Pitch Diameter)	d ₀	mm
扭矩 (Torque)	$M = \frac{F_u \cdot d_0}{2000}$	Nm
功率 (Power)	$P = \frac{M \cdot n}{9550} = \frac{F_u \cdot n \cdot d_0}{19100}$	kw

設計參數

使用係數 1.0
齒間連接安全係數 1.0
防齒裂安全係數 1.4
使用壽命 20,000h

Power

application factor: 1.0
Safety Factor of Teeth Connection 1.0
Safety Factor of prevention of teeth cracking 1.4
Life Time 20,000 hrs 20,000h

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