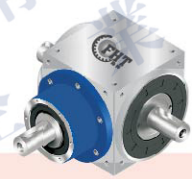


產品目錄 CONTENTS

AT

軸輸入轉向器
Shaft Input Steering Gearbox



01-08

AT-F

法蘭輸入90度減速器
Flange Input 90 Degree Reducer



09-24

PAW-A(B)

標準型90度減速機
Standard Type 90 Degree Reducer



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PT

標準型轉向器
Standard Type Steering Gearbox



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AAW-AS(BS)

精密型90度減速機
Precision Type 90 Degree Reducer



39-47

AAW-BS

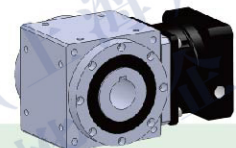
90度螺桿減速機
90 Degree Screw Reducer



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AATM

精密型轉向器
Precision Type Steering Gearbox



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AAT

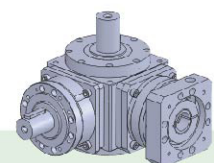
精密型轉向器
Precision Type Steering Gearbox



54-56

AATM-2AX

90度兩軸轉向器
90 Degree Two Shaft Steering Gearbox



59-60

減速機的訂購 Purchase of Reducer



AT065

L

1

S1

減速機型號：Reducer Mode
AT065, AT075, AT090, AT110, AT140,
AT170, AT210, AT240, AT280

減速比：Reduction Ratio
單節：1, 1.5, 2, 3, 4, 5

減速機型式：Reducer Type
L / L1 / H / C / R1 / LM / RM / 4M

軸型式選擇：Selection of Shaft Type
S1: 平滑直軸 Smooth Straight Shaft
S2: 附鍵直軸 Attached Key Straight Shaft

選用範例 Selection Example：AT065-L-1-S1



AT210

FL1

200

S1

MOTOR

減速機型號：Reducer Model
AT065, AT075, AT090, AT110, AT140,
AT170, AT210, AT240, AT280

減速比：Reduction Ratio
單節：1, 1.5, 2, 3, 4, 5
雙節：7, 10, 15, 20, 25, 35, 50
三節：75, 100, 125, 150, 200,
250, 350, 500

馬達型號：Motor Model
馬達製造商及型號
Motor Manufacture & Model

減速機型式：Reducer Types
FL / FLM1 / FLM2 / FL1 / FL1M1 / FL1M2 /
FR1 / FR1M1 / FR1M2 / FH / FHM1 / FHM2 /
FC / FCM1 / FCM2

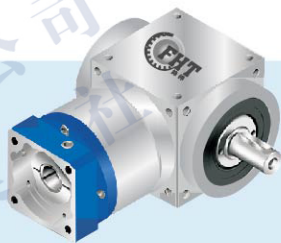
軸型式選擇：Shaft Type Selection
S1: 平滑直軸 Smooth Straight Shaft
S2: 附鍵直軸 Attached Key Straight Shaft

選用範例 Selection Example：AT210-FL1-200-S1 / SIEMENS 1FK6 032-6AK71

ATF 輸入法蘭型系列

Input Flange series 產品規格

減速機性能資料 Performance Files Reducer



規 格 Specification		節 數 Stages	比 數 Ratio	AT065 FL AT065 FL1 AT065 FH AT065 FC AT065 FR1	AT075 FL AT075 FL1 AT075 FH AT075 FC AT075 FR1	AT090 FL AT090 FL1 AT090 FH AT090 FC AT090 FR1	AT110 FL AT110 FL1 AT110 FH AT110 FC AT110 FR1	AT140 FL AT140 FL1 AT140 FH AT140 FC AT140 FR1	AT170 FL AT170 FL1 AT170 FH AT170 FC AT170 FR1	AT210 FL AT210 FL1 AT210 FH AT210 FC AT210 FR1	AT240 FL AT240 FL1 AT240 FH AT240 FC AT240 FR1	AT280 FL AT280 FL1 AT280 FH AT280 FC AT280 FR1
額定輸出力矩 T_{2N} Rated output torque	Nm	1	1	25	45	78	150	360	585	1,300	2,150	3,200
			1.5	25	45	78	150	360	585	1,300	2,150	3,200
			2	24	42	68	150	330	544	1,220	2,010	3,050
			3	18	33	54	120	270	450	1,020	1,650	2,850
			4	13	28	48	100	224	376	860	1,410	2,300
		5	12	25	40	85	196	320	740	1,210	2,000	
		2	7	12	12	33	91	91	91	195	358	358
			10	24	28	68	150	208	208	430	846	846
			15	18	33	54	120	270	312	645	1,269	1,269
			20	13	28	48	100	224	376	860	1,410	1,692
			25	12	25	40	85	196	320	740	1,210	2,000
			35	12	25	40	85	196	320	740	1,210	1,790
		50	12	25	40	85	196	320	740	1,210	1,465	
		3	75	-	-	-	120	210	312	585	1,269	1,269
			100	-	-	-	100	224	376	780	1,410	1,692
			125	-	-	-	85	196	320	740	1,210	2,000
			150	-	-	-	120	135	312	390	975	975
			200	-	-	-	100	180	376	520	1,300	1,300
			250	-	-	-	85	196	320	650	1,210	1,625
			350	-	-	-	85	196	320	740	1,210	1,790
		500	-	-	-	85	196	320	740	1,210	1,465	
最大加速力矩 T_{2B} Max. acceleration torque	Nm	1,2,3	1~500	1.5 倍額定輸出力矩 1.5 Times of Rated Output Torque								
最大加速輸入轉速 n_{1B} Max. acceleration input speed	rpm	1	1~5	7,500	6,500	5,500	4,500	3,500	3,000	2,200	2,000	1,700
		2	7~50	8,000	8,000	6,000	6,000	6,000	6,000	4,800	3,600	3,600
		3	75~500	-	-	-	8,000	8,000	6,000	6,000	6,000	6,000
背隙* Backlash	arcmin	1	1~5	≤6	≤6	≤6	≤6	≤6	≤6	≤6	≤6	≤6
		2	7~50	≤8	≤8	≤8	≤8	≤8	≤8	≤8	≤8	≤8
		3	75~500	-	-	-	≤10	≤10	≤10	≤10	≤10	≤10
容許徑向力 F_{2B}^2 Permissible radial force 輸出軸d2 Output axis	N	1,2,3	1~500	900	1,100	1,700	2,700	4,800	6,600	11,500	16,000	18,000
容許軸向力 F_{2aB}^2 輸出軸d2	N	1,2,3	1~500	450	550	850	1,350	2,400	3,300	5,750	8,500	9,000
使用壽命 Service life	hr	1,2,3	1~500	20,000*								
效率 η Efficiency	%	1	1~5	≥98%								
		2,3	7~500	≥94%								
使用溫度 Operating temperature	°C	1,2,3	1~500	-10 °C ~ 90 °C								
潤滑 Lubrication				合成潤滑油脂 Fully Synthetic Grease								
噪音值 (n=1500rpm, 無負載) Noise value (non-loaded)	dB (A)	1,2,3	1~500	≤71	≤72	≤76	≤77	≤78	≤79	≤81	≤83	≤84

1. 減速比 ($i=N_1/N_{2a}$) Reduction Ratio

* 連續運轉降低使用壽命二分之一。

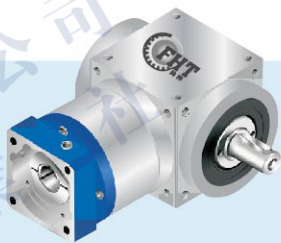
2. 作用於輸出軸中心位置 @ n_{1a}

* 背隙值為在 2% 額定力矩 T_{2N} 的扭力下所測得

ATF 輸入法蘭型系列

Input Flange Series 產品規格

減速機轉動慣量 Rotary inertia of reducer



規 格 Specification		節 數 Stage	比 數 Ratio	AT065 FL	AT075 FL	AT090 FL	AT110 FL	AT140 FL	AT170 FL	AT210 FL	AT240 FL	AT280 FL
				AT065 FL1	AT075 FL1	AT090 FL1	AT110 FL1	AT140 FL1	AT170 FL1	AT210 FL1	AT240 FL1	AT280 FL1
				AT065 FH	AT075 FH	AT090 FH	AT110 FH	AT140 FH	AT170 FH	AT210 FH	AT240 FH	AT280 FH
				AT065 FC	AT075 FC	AT090 FC	AT110 FC	AT140 FC	AT170 FC	AT210 FC	AT240 FC	AT280 FC
				AT065 FR1	AT075 FR1	AT090 FR1	AT110 FR1	AT140 FR1	AT170 FR1	AT210 FR1	AT240 FR1	AT280 FR1
轉動慣量 J _r Rotary inertia	kg · cm ²	1	1	0.51	1.30	3.14	7.62	23.54	59.09	195.96	365.38	787.63
			1.5	0.46	1.15	2.80	6.65	19.34	49.38	156.02	279.62	584.28
			2	0.44	1.10	2.68	6.23	17.72	45.44	140.80	245.78	500.26
			3	0.43	1.09	2.64	6.08	17.16	44.11	135.51	233.75	471.56
			4	0.43	1.08	2.63	6.05	17.03	43.79	134.14	230.77	464.76
			5	0.43	1.08	2.63	6.04	16.99	43.69	133.71	229.71	462.08
		2	7	0.15	0.15	0.50	2.79	2.79	2.79	9.91	29.26	29.26
			10	0.15	0.15	0.50	2.80	2.80	2.80	9.96	29.43	29.43
			15	0.15	0.15	0.50	2.80	2.80	2.80	9.96	29.43	29.43
			20	0.15	0.15	0.50	2.80	2.80	2.80	9.96	29.43	29.43
			25	0.15	0.15	0.50	2.80	2.80	2.80	9.96	29.43	29.43
			35	0.15	0.15	0.50	2.79	2.79	2.79	9.91	29.26	29.26
			50	0.15	0.15	0.50	2.79	2.79	2.79	9.89	29.20	29.20
		3	75	-	-	-	2.80	2.80	2.80	9.96	29.43	29.43
			100	-	-	-	2.80	2.80	2.80	9.96	29.43	29.43
			125	-	-	-	2.80	2.80	2.80	9.96	29.43	29.43
			150	-	-	-	2.79	2.79	2.79	9.89	29.20	29.20
			200	-	-	-	2.79	2.79	2.79	9.89	29.20	29.20
			250	-	-	-	2.79	2.79	2.79	9.89	29.20	29.20
			350	-	-	-	2.79	2.79	2.79	9.89	29.20	29.20
			500	-	-	-	2.79	2.79	2.79	9.89	29.20	29.20

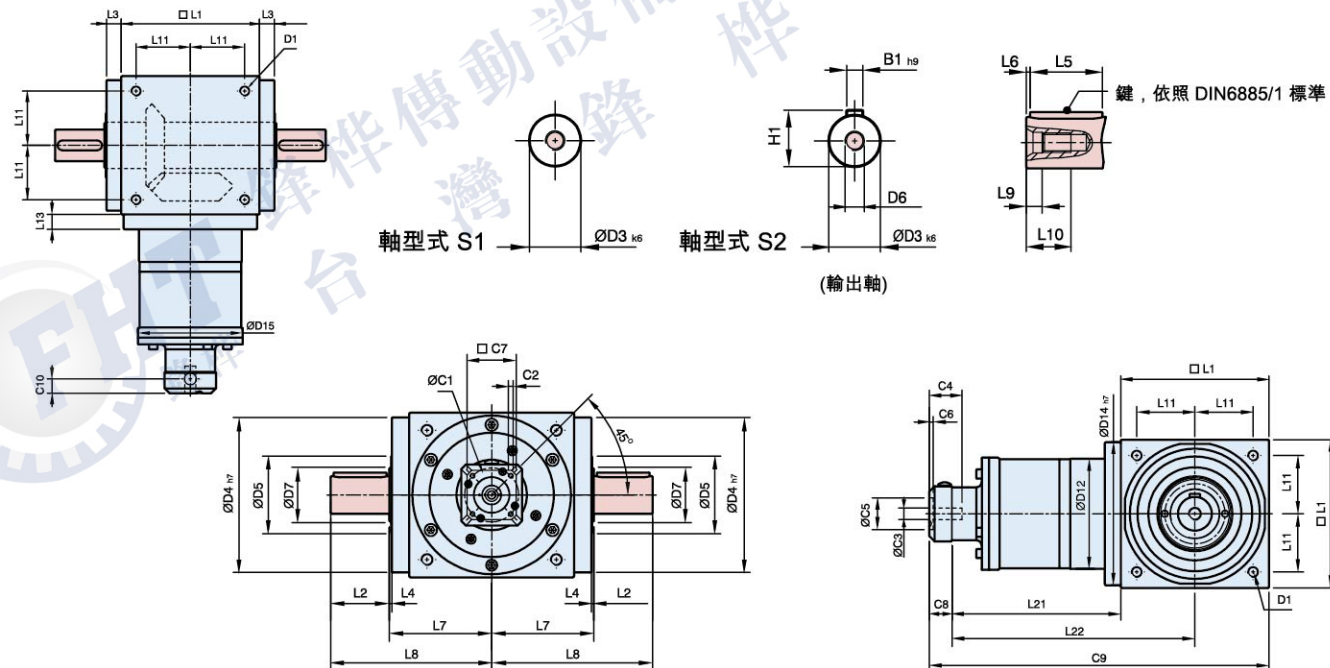
重量 Weight

減 速 機 型 號 Reducer model	節 數 Stage	比 數 Ratio	AT065	AT075	AT090	AT110	AT140	AT170	AT210	AT240	AT280
FL 系列 FL Series	1	1~5	2.8	4.4	7.1	12.1	20.9	36.1	69.4	101.2	158.3
	2	7~50	3.2	4.8	8.1	14.3	24.2	38.5	74.1	112.4	171.0
	3	75~500	-	-	-	13.9	23.7	38.8	73.4	110.2	168.7
FL1 系列 FL1 Series	1	1~5	2.7	4.3	7.1	11.9	20.3	35.5	68.3	99.6	156.0
	2	7~50	3.2	4.8	8.0	14.2	23.9	37.9	73.0	110.8	168.6
	3	75~500	-	-	-	13.8	23.4	38.2	72.3	108.6	166.4
FH 系列 FH Series	1	1~5	2.6	4.1	6.7	11.4	18.9	32.9	63.2	92.5	146.0
	2	7~50	3.1	4.6	7.7	13.6	22.4	35.3	67.9	103.7	158.7
	3	75~500	-	-	-	13.3	21.9	35.6	67.2	101.5	156.5
FC 系列 FC Series	1	1~5	2.9	4.4	7.2	11.8	20.4	35.0	66.5	96.0	151.7
	2	7~50	3.3	4.9	8.2	14.1	24.1	37.4	71.2	107.2	164.4
	3	75~500	-	-	-	13.7	23.5	37.5	70.5	105.0	162.2
FR1 系列 FR1 Series	1	1~5	2.7	4.3	7.1	11.9	20.3	35.5	68.3	99.6	156.0
	2	7~50	3.2	4.8	8.0	14.2	23.9	37.9	73.0	110.8	168.6
	3	75~500	-	-	-	13.8	23.4	38.2	72.3	108.6	166.4

尺寸 (三節 3-stage, 減速比ratio $i=75\sim 500$)



Unit:mm



Unit:mm

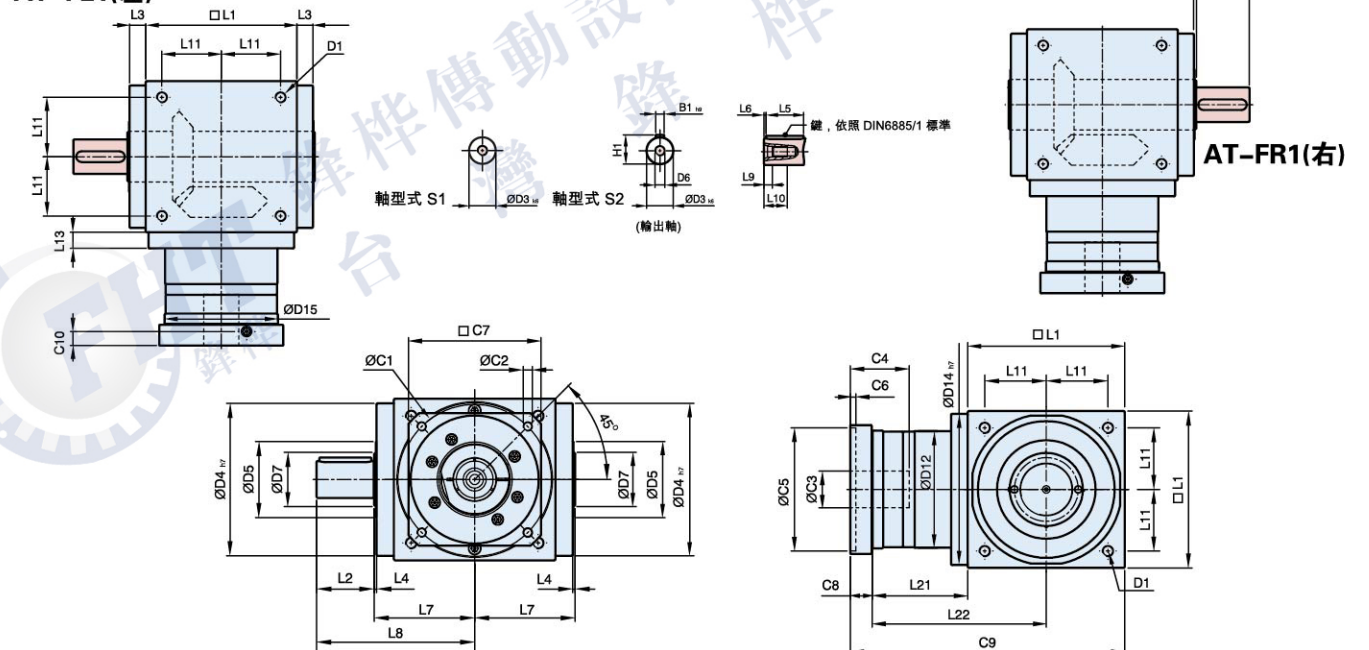
尺寸	AT110 FL	AT140 FL	AT170 FL	AT210 FL	AT240 FL	AT280 FL
D1	M8	M10	M12	M16	M16	M16
D3 _{k6}	22	32	40	50	55	60
D4 _{h7}	108	135	165	205	235	275
D5	53	68	83	104	124	144
D6	M8	M12	M16	M16	M16	M20
D7	33	47	55	75	85	110
D12	106	104	128	160	180	200
D14 _{h7}	108	135	165	205	235	275
D15	107	106	127	158	178	198
L1	110	140	170	210	240	280
L2	40	50	60	75	85	110
L3	15	15	15	20	25	25
L4	2	2	2	2	2	2
L5	32	45	50	70	80	100
L6	4	2.5	5	2.5	2.5	5
L7	72	87	102	127	147	167
L8	112	137	162	202	232	277
L9	7.2	10	12	12	12	15
L10	19	28	36	36	36	42
L11	44	55	67	85	95	110
L13	15	15	15	20	25	25
L21	136.5	159.5	183.5	226	269	278
L22	191.5	229.5	268.5	331	389	418
C1 ⁵	46	46	70	70	100	100
C2 ⁵	M4	M4	M5	M5	M6	M6
C3 ⁵	≤12	≤12	≤16	≤16	≤24	≤24
C4 ⁵	30	30	34	34	40	40
C5 ⁵	30	30	50	50	80	80
C6 ⁵	3.5	3.5	8	8	4	4
C7 ⁵	42	42	60	60	92	92
C8 ⁵	21.5	21.5	21.5	21.5	20	20
C9 ⁵	268	321	375	457.5	529	578
C10 ⁵	14.5	14.5	15.5	15.5	13	13
B1 _{h9}	6	10	12	14	16	18
H1	24.5	35	43	53.5	59	64

尺寸 (單節 1-stage, 減速比ratio i=1~5)



Unit:mm

AT-FL1(左)



Unit:mm

尺寸	AT065 FL1/FR1	AT075 FL1/FR1	AT090 FL1/FR1	AT110 FL1/FR1	AT140 FL1/FR1	AT170 FL1/FR1	AT210 FL1/FR1	AT240 FL1/FR1	AT280 FL1/FR1
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D3 _{κ6}	13	16	18	22	32	40	50	55	60
D4 _{h7}	63	73	88	108	135	165	205	235	275
D5	31	35	43	53	68	83	104	124	144
D6	M4	M5	M5	M8	M12	M16	M16	M16	M20
D7	21	22	28	33	47	55	75	85	110
D12	62	72	86	106	104	128	160	180	200
D14 _{h7}	63	73	88	108	135	165	205	235	275
D15	62.9	72.9	87	107	105	127	158	178	198
L1	65	75	90	110	140	170	210	240	280
L2	19.5	30	35	40	50	60	75	85	110
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L5	16	25	28	32	45	50	70	80	100
L6	2	2.5	3.5	4	2.5	5	2.5	2.5	5
L7	47.5	54	62	72	87	102	127	147	167
L8	67	84	97	112	137	162	202	232	277
L9	4.5	4.8	4.8	7.2	10	12	12	12	15
L10	10	12.5	12.5	19	28	36	36	36	42
L11	27	30	36	44	55	67	85	95	110
L13	13	15	15	15	15	15	20	25	25
L21	49	60.5	63	69.5	85.5	95	130	144.5	135
L22	81.5	98	108	124.5	155.5	180	235	264.5	275
C1 ⁶	46	70	100	100	130	165	215	215	235
C2 ⁶	M4	M5	M6	M6	M8	M10	M12	M12	M12
C3 ⁶	★ ≤11 / ≤12	★ ≤14 / ≤15.875 / ≤16	≤19	≤24	≤32	≤38	≤42	≤48	≤55
C4 ⁶	30	34	40	40	50	60	85	85	116
C5 ⁶	30	50	80	80	110	130	180	180	200
C6 ⁶	3.5	8	4	4	5	6	6	6	6
C7 ⁶	42	60	90	90	115	142	190	190	220
C8 ⁶	19.5	19	17	17	19.5	22.5	29	29	63
C9 ⁶	133.5	154.5	170	196.5	245	287.5	369	413.5	478
C10 ⁶	13.25	13.5	10.75	10.75	13	15	20.75	20.75	53.5
B1 _{h9}	5	5	6	6	10	12	14	16	18
H1	15	18	20.5	24.5	35	43	53.5	59	64

★ AT065 FL1/FR1M1 提供 C3 ≤12 option. ★ AT075 FL1/FR1M1提供 C3 ≤16 option. ★ AT075 FL1/FR1M2提供 C3 ≤15.875 option.

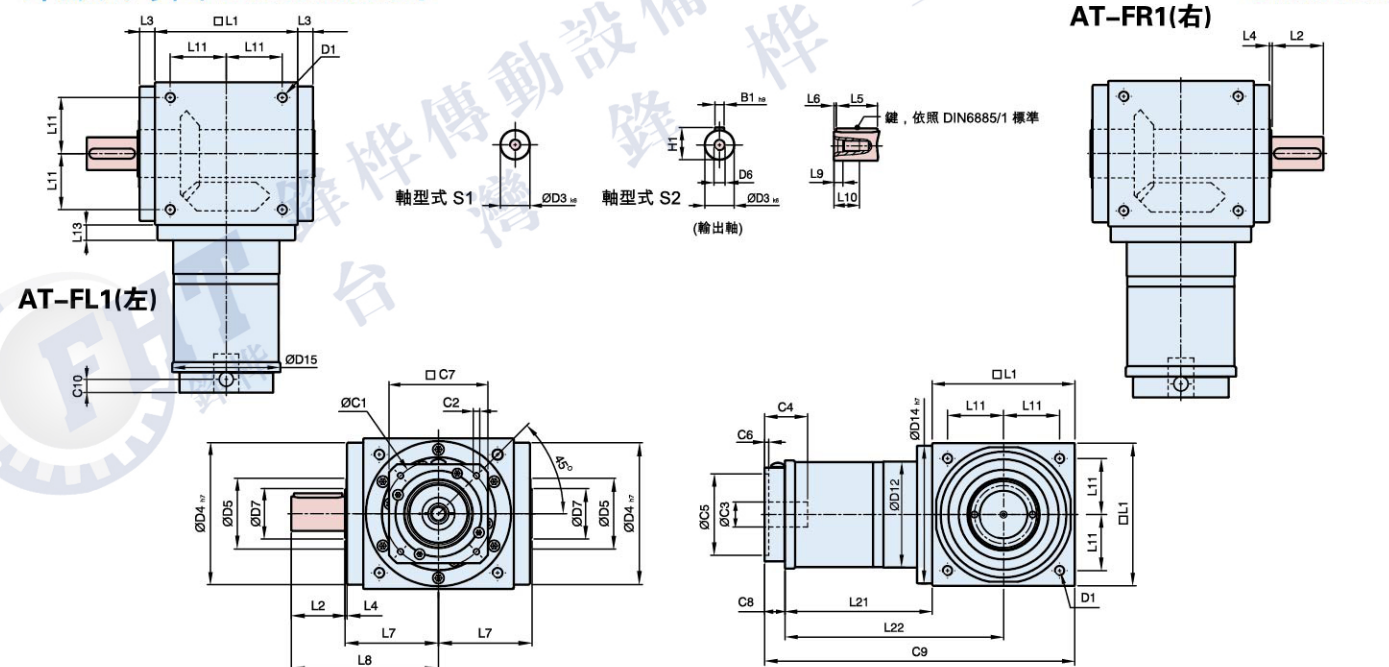
AT-FL1 (左) /AT-FR1(右)系列

單出軸型式 Single Output Shaft Type

尺寸 (雙節 2-stage, 減速比ratio i=7~50)



外形尺寸圖 Dimensions:



規格表 Specifications:

尺寸 Sizes	AT065 FL1/FR1	AT075 FL1/FR1	AT090 FL1/FR1	AT110 FL1/FR1	AT140 FL1/FR1	AT170 FL1/FR1	AT210 FL1/FR1	AT240 FL1/FR1	AT280 FL1/FR1
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D3 k6	13	16	18	22	32	40	50	55	60
D4 h7	63	73	88	108	135	165	205	235	275
D5	31	35	43	53	68	83	104	124	144
D6	M4	M5	M5	M8	M12	M16	M16	M16	M20
D7	21	22	28	33	47	55	75	85	110
D12	62	72	86	106	104	128	160	180	200
D14 h7	63	73	88	108	135	165	205	235	275
D15	62.9	72.9	87	107	106	127	158	178	198
L1	65	75	90	110	140	170	210	240	280
L2	19.5	30	35	40	50	60	75	85	110
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L5	16	25	28	32	45	50	70	80	100
L6	2	2.5	3.5	4	2.5	5	2.5	2.5	5
L7	47.5	54	62	72	87	102	127	147	167
L8	67	84	97	112	137	162	202	232	277
L9	4.5	4.8	4.8	7.2	10	12	12	12	15
L10	10	12.5	12.5	19	28	36	36	36	42
L11	27	30	36	44	55	67	85	95	110
L13	13	15	15	15	15	15	20	25	25
L21	75	84.5	99	122	144.5	157.5	206.5	239	248
L22	107.5	122	144	177	214.5	242.5	311.5	359	388
C1 ⁷	46	46	70	100	100	100	130	165	165
C2 ⁷	M4	M4	M5	M6	M6	M6	M8	M10	M10
C3 ⁷	≤12	≤12	≤16	≤24	≤24	≤24	≤32	≤38	≤38
C4 ⁷	30	30	34	40	40	40	50	60	60
C5 ⁷	30	30	50	80	80	80	110	130	130
C6 ⁷	3.5	3.5	8	4	4	4	5	6	6
C7 ⁷	42	42	60	92	92	92	115	142	142
C8 ⁷	21.5	21.5	21.5	20	20	20	24	31	31
C9 ⁷	161.5	181	210.5	252	304.5	347.5	440.5	510	559
C10 ⁷	14.55	14.5	15.5	13	13	13	16	21	21
B1 h9	5	5	6	6	10	12	14	16	18
H1	15	18	20.5	24.5	35	43	53.5	59	64

7. C1~C10 是公制標準馬達連接板之尺寸, 請上網點選"減速機選用"找出正確之尺寸。

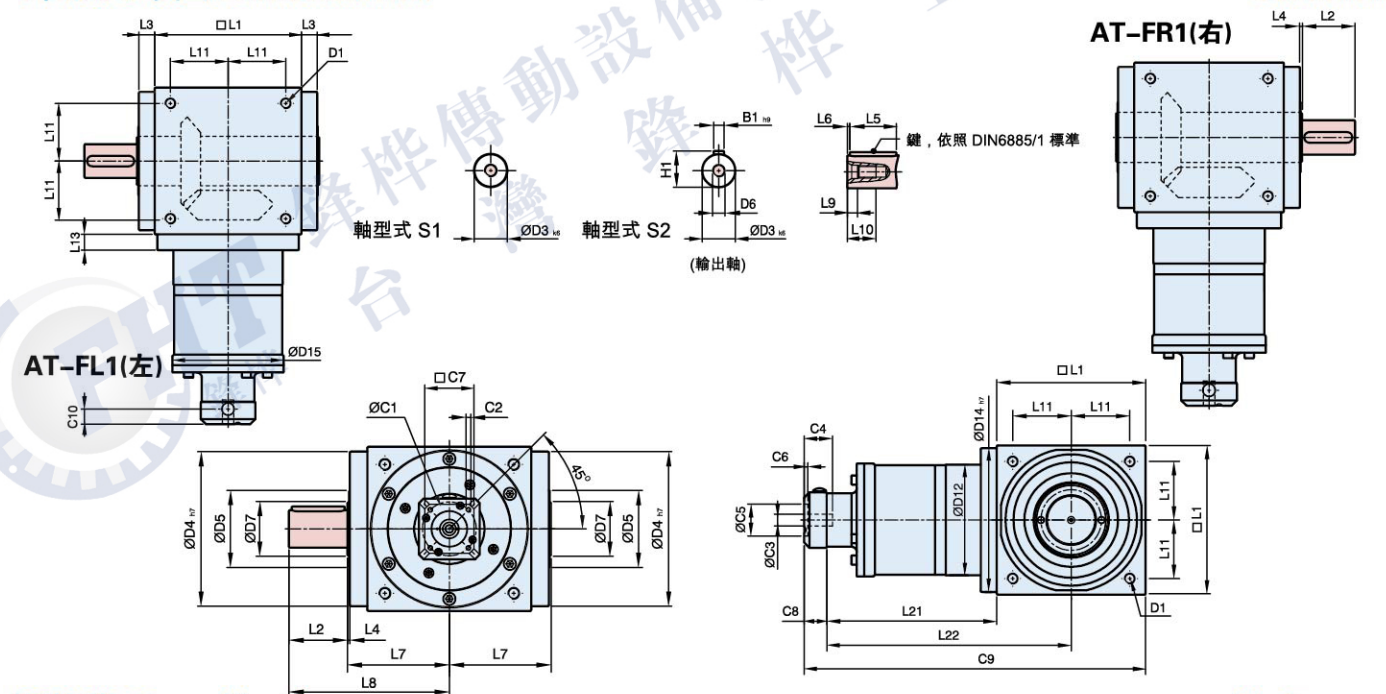
AT-FL1 (左) /AT-FR1(右)系列

單出軸型式 Single Output Shaft Type

尺寸 (三節 3-stage, 減速比ratio i=75~500)



外形尺寸圖 Dimensions:

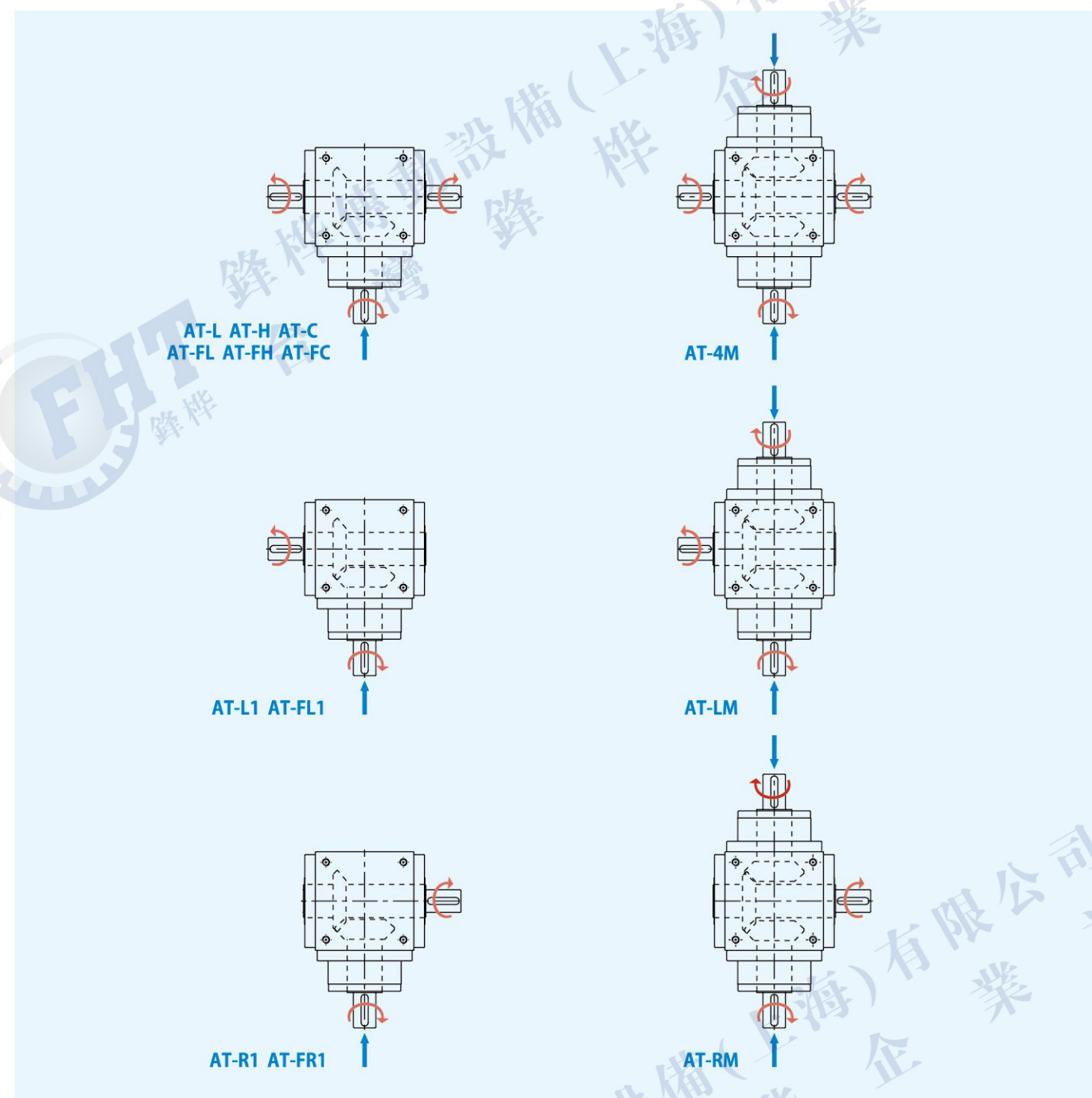


規格表 Specifications:

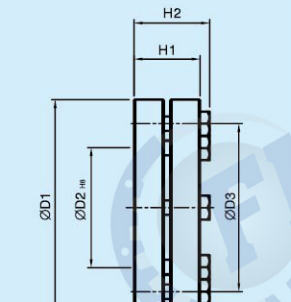
尺寸 Sizes	AT110 FL1/FR1	AT140 FL1/FR1	AT170 FL1/FR1	AT210 FL1/FR1	AT240 FL1/FR1	AT280 FL1/FR1
D1	M8	M10	M12	M16	M16	M16
D3 k6	22	32	40	50	55	60
D4 h7	108	135	165	205	235	275
D5	53	68	83	104	124	144
D6	M8	M12	M16	M16	M16	M20
D7	33	47	55	75	85	110
D12	106	104	128	160	180	200
D14 h7	108	135	165	205	235	275
D15	107	106	127	158	178	198
L1	110	140	170	210	240	280
L2	40	50	60	75	85	110
L3	15	15	15	20	25	25
L4	2	2	2	2	2	2
L5	32	45	50	70	80	100
L6	4	2.5	5	2.5	2.5	5
L7	72	87	102	127	147	167
L8	112	137	162	202	232	277
L9	7.2	10	12	12	12	15
L10	19	28	36	36	36	42
L11	44	55	67	85	95	110
L13	15	15	15	20	25	25
L21	136.5	159.5	183.5	226	269	278
L22	191.5	229.5	268.5	331	389	418
C1 ⁸	46	46	70	70	100	100
C2 ⁸	M4	M4	M5	M5	M6	M6
C3 ⁸	≤12	≤12	≤16	≤16	≤24	≤24
C4 ⁸	30	30	34	34	40	40
C5 ⁸	30	30	50	50	80	80
C6 ⁸	3.5	3.5	8	8	4	4
C7 ⁸	42	42	60	60	92	92
C8 ⁸	21.5	21.5	21.5	21.5	20	20
C9 ⁸	268	321	375	457.5	529	578
C10 ⁸	14.5	14.5	15.5	15.5	13	13
B1 h9	6	10	12	14	16	18
H1	24.5	35	43	53.5	59	64

8. C1~C10 是公制標準馬達連接板之尺寸, 請上網點選"減速機選用"找出正確之尺寸。

轉向圖 Diagram of Rotate Direction

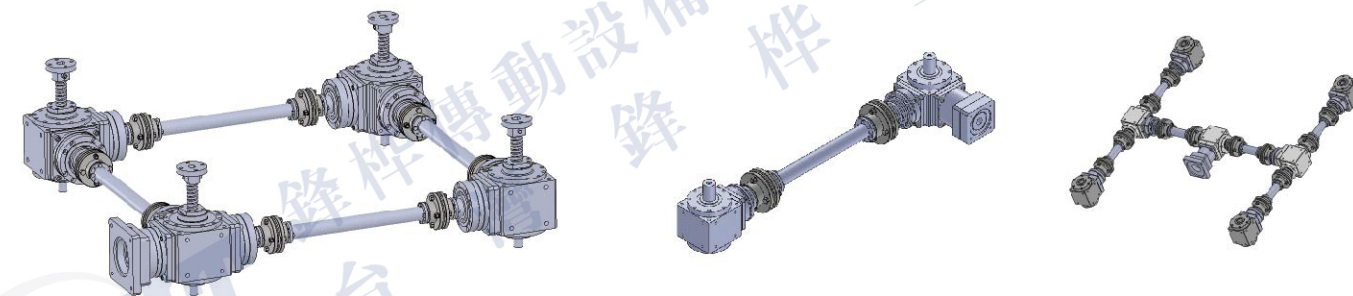


縮緊盤附件選配 Selection of Shrink Disc Accessories

	(單位: mm)					
	C / FC 系列	D1	D2	D3	H1	H2
	SSD-d16xdw14	41	16	26	15	18.5
	SSD-d22xdw18	50	22	36	19.5	23
	SSD-d25xdw22	50	25	38	19.5	23
	SSD-d44xdw32	80	44	61	25.5	29.5
	SSD-d50xdw40	90	50	70	27.5	31.5
	SSD-d62xdw50	110	62	86	30.5	34.5
	SSD-d68xdw55	115	68	86	30.5	34.5
	SSD-d75xdw60	138	75	100	32.5	38

適用於多軸連動場合：

TFT-LCD 升降機構、各種升降、水平連動機構... 等機構



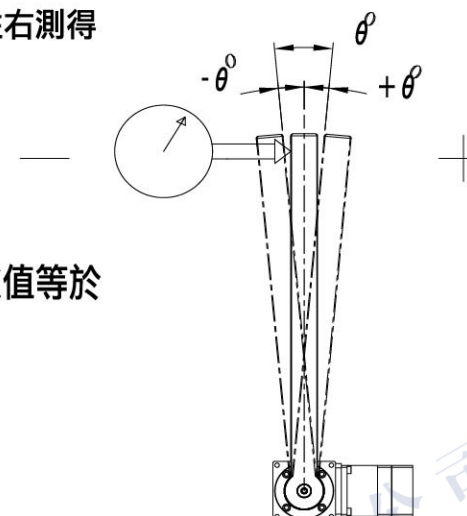
減速機-背隙測定值：

入力軸固定,出力軸施以微小力距(額定值的5%),測量棒往左再往右測得的 θ° (+ θ° 與 - θ°) 即為背隙。

背隙值的計算：

例:當 360° 裡最大 θ° 為 0.05° (3弧分),半徑500MM,背隙值等於 $(500 \times 2 \times \pi) \div (360 \times 60) \times 3 = 0.436\text{MM}$

θ° 為 0.05° (3弧分) = 0.436MM (背隙值或齒隙)



減速機-出力軸偏擺與同心度

- 1.輸出軸的偏擺與同心度的高低對其壽命有絕對的影響,出力軸偏擺過大易產生偏擺運動,對齒輪產生磨損壽命縮短。
- 2.全系列使用NSK錐形滾柱軸承,軸偏擺要求0.01MM以內(測量時施以定格扭矩的5%)。

