

CHELIC®

Ver. 1-2

CAT-2408

AUTOMATION

氣立可 自動化元件

氣動執行器

PNEUMATIC ACTUATOR



The Keystone of Industrial 4.0

產品特色

FEATURE



鋁型材（CT）缸體，內表面細磨精加工，內部和外部均採用高級防腐技術，氣缸摩擦係數小，使用壽命長，抗腐蝕性能強。

雙活塞齒輪齒條式設計，結構緊湊、安裝位置對稱、改變輸出軸轉向方便，使用壽命長、動作迅速。活塞齒條背面裝有複合軸承及導向環，動作精確、摩擦係數小、使用壽命延長。

組合式預負荷鍍層彈簧，工作壽命長。

高精度齒輪和齒條，嚙合間隙小、精度高，輸出功率大。不銹鋼緊固件，安全美觀，抗腐蝕性強。

Extruded aluminum CT body with both internal and external corrosion protection having honed cylinder surface for longer life and low coefficient of friction.

Dual piston rack and pinion design for compact construction, symmetric mounting position, high-cycle life and fast operation, reverse rotation can be accomplished in the field by simply inverting the pistons.

Multiple bearings and guides on racks and pistons, low friction, high cycle life and prevent shaft blowout.

Modular preloaded spring cartridge design, with coated spring for simple versatile range, greater safety and corrosion resistance, longer cycle life.

Fully machined teeth on piston and pinion for accurate low backlash rack and pinion engagement, maximum efficiency, stainless steel fasteners for long term corrosion resistance.

■ 訂購稱呼代號 CT - 52 SR - CCW - S5 - C - DN8 - G

1 2 3 4 5 6 7

1 代號 MARK	缸徑 BORE(mm)
52	Ø10
63	Ø16
75	Ø20
83	Ø83
92	Ø92
105	Ø105
125	Ø125
140	Ø140
160	Ø160
190	Ø190
210	Ø210

2 代號 MARK	類型 TYPE
DA	双作用 DOUBLE ACTING
SR	單作用 SPRING RETURN

3 代號 MARK	裝配類型 ASSEMBLY
CCW	A 口進氣，逆時針打開 (標準型) AIR TO PORT A, TURN COUNTERCLOCKWISE TO OPEN (STANDARD)
CW	A 口進氣，順時針關閉 AIR TO PORT A, TURN CLOCKWISE TO CLOSED

4 代號 MARK	彈簧數量 SPRING(QTY)	代號 MARK	彈簧數量 SPRING(QTY)
S5	5	S9	9
S6	6	S10	10
S7	7	S11	11
S8	8	S12	12

● 僅適用於單作用，請參閱 P.8
ONLY AVAILABLE FOR SPRING RETURN, PLEASE REFER TO P.4

5 代號 MARK	顏色 COLOR
A	缸體本色硬氧；端蓋黑色氧化，整體灰白色噴塑 CYLINDER BODY WITH NATURAL HARD ANODIZING; END COVERS WITH BLACK ANODIZING, OVERALL SPRAYED WITH GRAY-WHITE PLASTIC
B	缸體本色硬氧；端蓋黑色氧化 CYLINDER BODY WITH HARD ANODIZING IN NATURAL COLOR; END COVER WITH BLACK ANODIZING
C	缸體黑色硬氧、端蓋黑色噴塑 CYLINDER BODY WITH BLACK HARD ANODIZING, END COVERS SPRAYED WITH BLACK PLASTIC

● 顏色樣式請參閱 P.4 COLOR STYLE PLEASE REFER TO P.4

6	球閥規格 BALL VALVE	
	DN8	DN40
	DN10	DN50
	DN15	DN65
	DN20	DN80
	DN25	DN100
	DN32	

● 詳細規格請參閱 P. 13
PLEASE REFER PAGE P. 13

7 球閥螺牙 BALL VALVE THREAD TYPE
G
NPT
BSPT

● 詳細規格請參閱 P. 13
PLEASE REFER PAGE P. 13

双作用 DOUBLE ACTING

双作用執行器的選用：

在正常操作條件下，双作用執行器

考慮的安全係數為 20%-30%

範例：

- 閥門力矩 = 100Nm
- 安全力矩 = 100 x (1+30%) = 130Nm
- 氣源壓力 = 5Bar

對照双作用執行器輸出力矩表，選配双作用執行器
最小規格為 CT-105DA

Sizing: Double Acting Actuator

The suggested safety factor for double acting actuators under normal working conditions is 20%-30%
Example:

- The torque needed by valve = 100Nm
- The torque considered safety factor (1+30%) = 130Nm
- Air supply = 5Bar

According to the above table, we can choose
the minimum model is CT-105DA

單作用 SPRING RETURN

單作用執行器的選用：

在正常操作條件下，單一作用執行器

考慮的安全係數為 30%-50%

範例：

- 閥門力矩 = 80Nm
- 安全力矩 = 80 x (1+30%) = 104Nm
- 氣源壓力 = 5Bar

對照單作用執行器輸出力矩表，可查到 CT-125 SR-S10
輸出力矩為

- 空氣行程 0° = 145.8N.m
- 空氣行程 90° = 91.0N.m
- 彈簧行程 90° = 156.8N.m
- 彈簧行程 0° = 104.7N.m

所有輸出力矩均大於我們需求

Sizing: Spring Return Actuators

The suggested safety factor for spring return actuator under normal working conditions is 30%-50%
Example:

- The torque needed by valve = 80Nm
- The torque consider safety factor (1+30%) = 104Nm
- Air supply = 5Bar

According to the table of spring return actuator's output, we
find output torque of CT-125 SR-S10 is:

- Air stroke 0° = 145.8N.m
- Air stroke 90° = 91.0N.m
- Spring stroke 90° = 156.8N.m
- Spring stroke 0° = 104.7N.m

All the output torque is larger than we needed.

A



缸體本色硬氧；端蓋黑色氧化，
整體灰白色噴塑

Cylinder body with natural hard
anodizing; end covers with black
anodizing, overall sprayed with
gray-white plastic.

B



缸體本色硬氧；端蓋黑色氧化

Cylinder body with hard
anodizing in natural color; end
cover with black anodizing

C



缸體黑色硬氧、端蓋黑色噴塑

Cylinder body with black hard
anodizing, end covers sprayed
with black plastic.

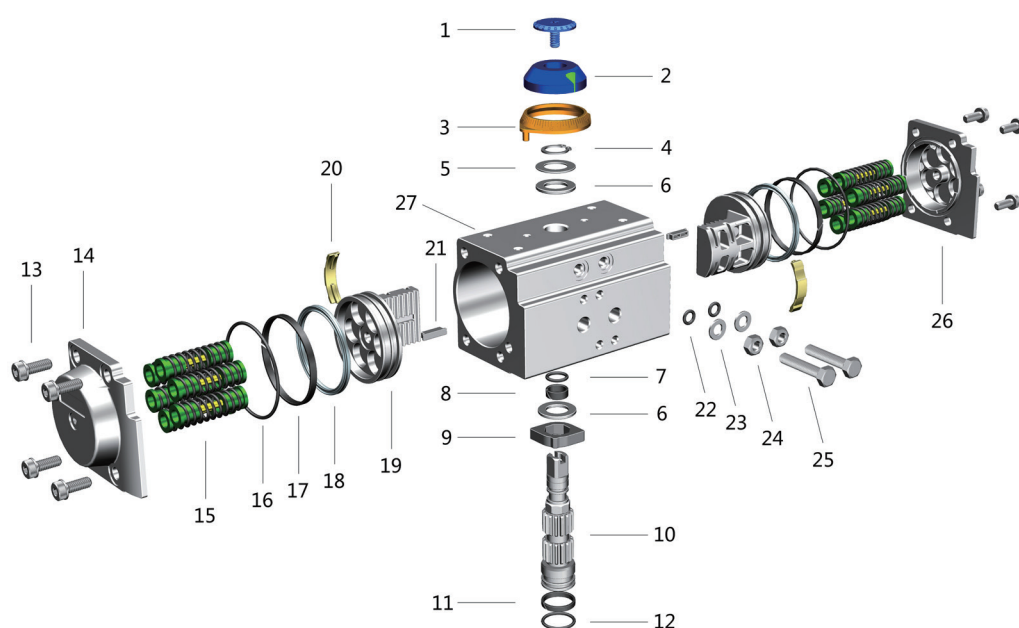


The standard color
Cylinder body with black hard anodizing,
end covers sprayed with black plastic.

主推顏色
缸體黑色硬氧、端蓋黑色噴塑

零件材質

MATERIAL



NO.	Part Name 零件名稱		Quantity 數量	Material 材質
1	Indicator Nut	指示螺帽	1	ABS
2	Indicator	指示器	1	ABS
3	Indicator	指示表	1	ABS
4	Elastic Ring	彈性擋圈	1	SS301
5	Shim	墊片	1	POM
6	Wear Pad	耐磨墊片	2	POM
7	Shaft Type O Ring	軸上 O 型圈	1	NBR
8	Wear Resistant Ring	耐磨環	1	POM
9	Adjusting Cam	調節凸輪	1	WCB
10	Output Shaft	輸出軸	1	C45
11	Wear Resistant Ring	耐磨環	1	POM
12	Shaft Under the O Ring	軸下 O 型圈	1	NBR
13	End Cap Bolt	端蓋螺栓	8	SS301
14	Left End Cover	左端蓋	1	Die casting Alu
15	Spring Set	彈簧組	12	55CrSi
16	End Cover Type O Ring	端蓋 O 型圈	2	NBR
17	Wear Resistant Ring	耐磨環	2	POM
18	Piston Seal Ring	活塞密封圈	2	NBR
19	Piston	活塞	2	Die casting Alu
20	Piston Guide Shoe	活塞導向瓦	2	POM
21	Guide Block	導向塊	2	PA66
22	Bolt with O Ring	調節螺栓 O 型圈	2	NBR
23	Shim	墊片	2	SS301
24	Nut	螺帽	2	SS301
25	Adjusting Bolt	調節螺栓	2	SS301
26	Right End Cover	右端蓋	1	Die casting Alu
27	Cylinder Body	缸體	1	6005-T5

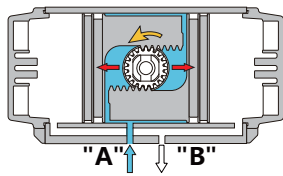
双作用執行器

DOUBLE ACTING ACTUATORS

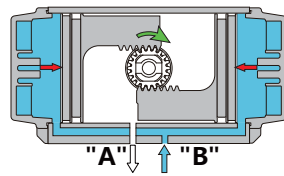
工作原理

OPERATION PRINCIPLE

CHELIC®



0° close



90° open

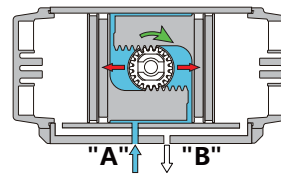
CCW

A 口進氣，壓縮空氣推動活塞向外運動，使執行器輸出軸逆時針旋轉（0°→90°），B 口排氣

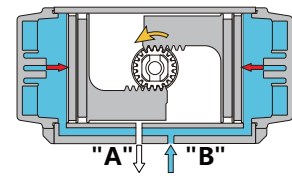
B 口進氣，壓縮空氣推動活塞向內運動，使執行器輸出軸順時針旋轉（90°→0°），A 口排氣

Air to port A forces the pistons outwards, causing the drive shaft to turn counterclockwise while the air is being exhausted from port B

Air to port B forces the pistons inwards, causing the drive shaft to turn clockwise while the air is being exhausted from port A



90° open



0° Close

CW

A 口進氣，壓縮空氣推動活塞向外運動，使執行器輸出軸順時針旋轉（0°→90°），B 口排氣

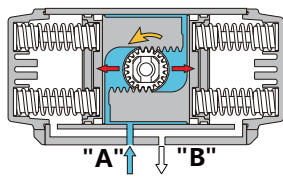
B 口進氣，壓縮空氣推動活塞向內運動，使執行器輸出軸逆時針旋轉（90°→0°），A 口排氣

Air to port A forces the pistons outwards, causing the drive shaft to turn clockwise while the air is being exhausted from port B

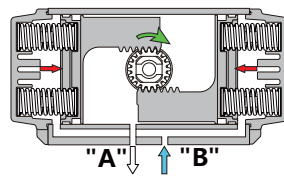
Air to port B forces the pistons inwards, causing the drive shaft to turn counterclockwise while the air is being exhausted from port A

單作用執行器

SPRING RETURN ACTUATORS



0° close



90° open

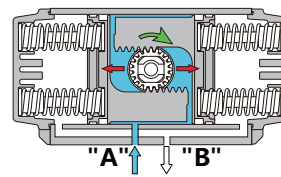
CCW

A 口進氣，壓縮空氣克服彈簧力，推動活塞向外運動，執行器輸出軸逆時針轉動（0°→90°），B 口排氣

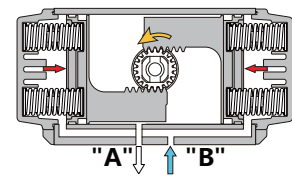
執行器消氣，活塞在彈簧力的作用下向內運動，執行器輸出軸順時針轉動（90°→0°），A 口排氣

Air to port A forces the pistons outwards, causing the spring to compress, the drive shaft turns counter clockwise while air is being exhausted from port B

Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The drive shaft turns clockwise while air is being exhausted from port A



90° open



0° Close

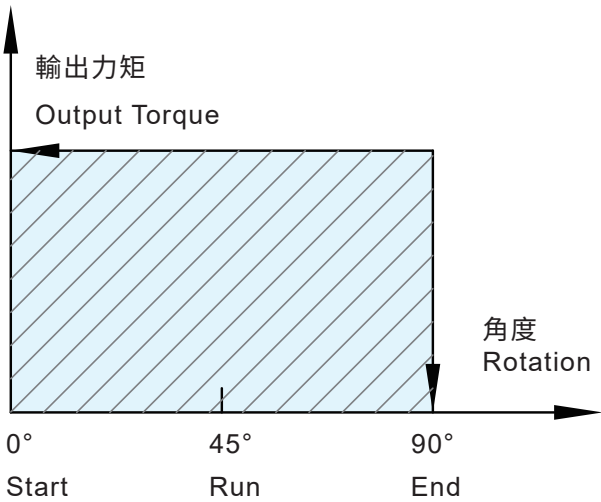
CW

A 口進氣，壓縮空氣克服彈簧力，推動活塞向外運動，執行器輸出軸順時針轉動（0°→90°），B 口排氣

執行器消氣，活塞在彈簧力的作用下向內運動，執行器輸出軸逆時針轉動（90°→0°），A 口排氣

Air to port A forces the pistons outwards, causing the spring to compress, the drive shaft turns clockwise while air is being exhausted from port B

Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The drive shaft turns counterclockwise while air is being exhausted from port A



输出扭矩

OUTPUT TORQUE

Unit: Nm

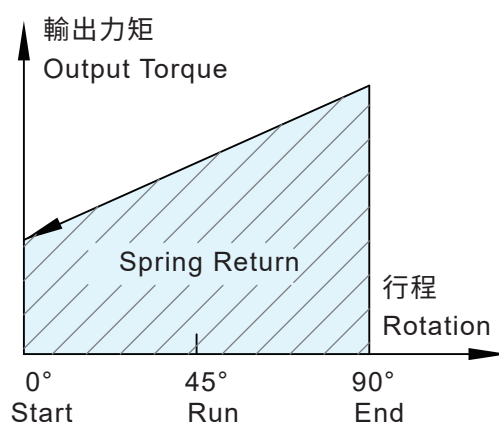
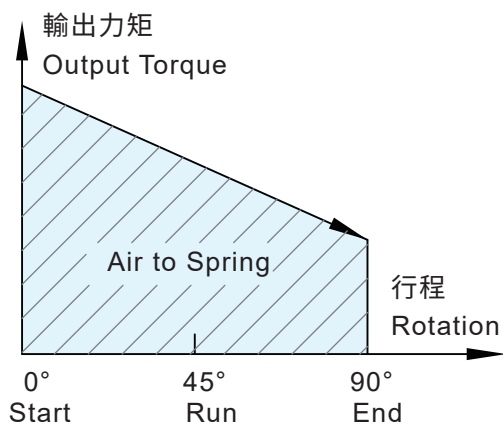
氣源壓力 AIR SUPPLY PRESSURE								
MODEL \ AIR PRESSURE		2.5 Bar	3 Bar	4 Bar	5 Bar	6 Bar	7 Bar	8 Bar
CT-52DA		9.2	11	14.7	18.4	22.1	25.8	29.5
CT-63DA		15.1	18.1	24.1	30.1	36.1	42.1	48.2
CT-75DA		25.2	30.2	40.3	50.3	60.4	70.5	80.5
CT-83DA		38.5	46.2	61.6	77.1	92.5	107.9	123.3
CT-92DA		56.8	68.2	90.9	113.6	136.3	159.1	181.8
CT-105DA		82.2	98.7	131.6	164.4	197.3	230.2	263.1
CT-125DA		128	154	205	256	308	359	410
CT-140DA		219	263	351	439	526	614	702
CT-160DA		334	401	535	668	802	935	1069
CT-190DA		538	646	861	1077	1292	1508	1723
CT-210DA		658	789	1052	1316	1579	1842	2105

單作用輸出力矩

OUTPUT TORQUE OF SPRING RETURN ACTUATORS

工作原理
OPERATION PRINCIPLE

CHELIC®



輸出扭矩

OUTPUT TORQUE

Unit: Nm

氣源壓力 AIR SUPPLY PRESSURE																彈簧輸出扭矩 SPRINGS OUTPUT	
氣壓 AIR PRESSURE		2.5 Bar		3 Bar		4 Bar		5 Bar		6 Bar		7 Bar		8 Bar			
MODEL	SPRING(QTY)	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
CT-52SR	S5	5.4	3.7													3.8	5.5
	S6	4.7	2.5	6.5	4.3											4.5	6.7
	S7	3.9	1.4	5.7	3.2	9.4	6.9									5.3	7.8
	S8			5	2.1	8.7	5.8	12.4	9.5							6	8.9
	S9					7.9	4.7	11.6	8.4	15.3	12.1					6.8	10
	S10					7.2	3.6	10.9	7.3	14.6	11	18.3	14.7	22	18.4	7.5	11.1
	S11							10.1	6.2	13.8	9.9	17.5	13.6	21.2	17.3	8.3	12.2
	S12							9.4	5.1	13.1	8.8	16.8	12.5	20.5	16.2	9	13.3
CT-63SR	S5	9.3	6.6													5.8	8.5
	S6	8.2	4.9	11.2	7.9											6.9	10.2
	S7	7	3.2	10	6.2	16	12.2									8.1	11.9
	S8			8.9	4.5	14.9	10.5	20.9	16.5							9.2	13.6
	S9					13.7	8.7	19.7	14.7	25.7	20.7					10.4	15.4
	S10					12.6	7	18.6	13	24.6	19	30.6	25	36.7	31.1	11.5	17.1
	S11							17.4	11.3	23.4	17.3	29.4	23.3	35.5	29.4	12.7	18.8
	S12							16.3	9.6	22.3	15.6	28.3	21.6	34.4	27.7	13.8	20.5
CT-75SR	S5	14.1	10.0													10.5	14.5
	S6	11.9	6.9	16.9	11.9											12.7	17.4
	S7	9.7	3.9	14.7	8.9	24.8	19.0									14.8	20.3
	S8			12.4	5.8	22.5	15.9	32.5	25.9							16.9	23.2
	S9					20.3	12.9	30.3	22.9	40.4	33					19.0	26.1
	S10					18.1	9.8	28.1	19.8	38.2	29.9	48.3	40.0	58.3	50.0	21.1	29.0
	S11							25.9	16.8	36.0	26.9	46.1	37.0	56.1	47.0	23.2	31.9
	S12							23.7	13.7	33.8	23.8	43.9	33.9	53.9	43.9	25.3	34.7

單作用輸出力矩

OUTPUT TORQUE OF SPRING RETURN ACTUATORS

工作原理
OPERATION PRINCIPLE

CHELIC®

Unit: Nm

氣源壓力 AIR SUPPLY PRESSURE																彈簧輸出扭矩 SPRINGS OUTPUT	
氣壓 AIR PRESSURE		2.5 Bar		3 Bar		4 Bar		5 Bar		6 Bar		7 Bar		8 Bar			
MODEL	SPRING(QTY)	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
CT-83SR	S5	21.9	14.3													15.8	23.0
	S6	18.5	9.4	26.2	17.1											19.0	27.6
	S7	15.2	4.6	22.9	12.3	38.3	27.7									22.1	32.2
	S8			19.6	7.4	35.0	22.8	50.5	38.3							25.3	36.8
	S9					31.6	18.0	47.1	33.5	62.5	48.9					28.5	41.4
	S10					28.3	13.2	43.8	28.7	59.2	44.1	74.6	59.5	90.0	74.9	31.6	46.0
	S11							40.5	23.8	55.9	39.2	71.3	54.6	86.7	70.0	34.8	50.6
	S12							37.1	19.0	52.5	34.4	67.9	49.8	83.3	65.2	38.0	55.2
CT-92SR	S5	32.2	20.6													23.3	34.4
	S6	27.3	13.4	38.7	24.8											28.0	41.2
	S7	22.4	6.1	33.8	17.5	56.5	40.2									32.7	48.1
	S8			28.9	10.3	51.6	33.0	74.3	55.7							37.3	55.0
	S9					46.7	25.8	69.4	48.5	92.1	71.2					42.0	61.9
	S10					41.8	18.5	64.5	41.2	87.2	63.9	110.0	86.7	132.7	109.4	46.7	68.7
	S11							59.5	34.0	82.2	56.7	105.0	79.5	127.7	102.2	51.4	75.6
	S12							54.6	26.8	77.3	49.5	100.1	72.3	122.8	95.0	56.0	82.5
CT-105SR	S5	48.9	30.4													31.6	49.2
	S6	42.2	20.0	58.7	36.5											38.0	59.1
	S7	35.6	9.7	52.1	26.2	85.0	59.1									44.3	68.9
	S8			45.4	15.8	78.3	48.7	111.1	81.5							50.6	78.7
	S9					71.7	38.4	104.5	71.2	137.4	104.1					56.9	88.6
	S10					65.0	28.0	97.8	60.8	130.7	93.7	163.6	126.6	196.5	159.5	63.3	98.4
	S11							91.1	50.4	124.0	83.3	156.9	116.2	189.8	149.1	69.6	108.3
	S12							84.5	40.1	117.4	73.0	150.3	105.9	183.2	138.8	75.9	118.1
CT-125SR	S5	72.9	45.5													52.4	78.4
	S6	61.9	29.0	87.9	55.0											62.8	94.1
	S7	50.8	12.5	76.8	38.5	127.8	89.5									73.3	109.7
	S8			65.8	22.0	116.8	73.0	167.8	124.0							83.8	125.4
	S9					105.8	56.5	156.8	107.5	208.8	159.5					94.2	141.1
	S10					94.8	40.0	145.8	91.0	197.8	143.0	248.8	194.0	299.8	245.0	104.7	156.8
	S11							134.8	74.5	186.8	126.5	237.8	177.5	288.8	228.5	115.2	172.4
	S12							123.7	58.0	175.7	110.0	226.7	161.0	277.7	212.0	125.7	188.1
CT-140SR	S5	128.7	83.3													85.8	129.0
	S6	110.6	56.1	154.6	100.1											102.9	154.8
	S7	92.6	29.0	136.6	73.0	224.6	161.0									120.1	180.5
	S8			118.5	45.8	206.5	133.8	294.5	221.8							137.3	206.3
	S9					188.5	106.7	276.5	194.7	363.5	281.7					154.4	232.1
	S10					170.4	79.5	258.4	167.5	345.4	254.5	433.4	342.5	521.4	430.5	171.6	257.9
	S11							240.3	140.4	327.3	227.4	415.3	315.4	503.3	403.4	188.7	283.7
	S12							222.3	113.2	309.3	200.2	397.3	288.2	485.3	376.2	205.9	309.5

單作用輸出力矩

OUTPUT TORQUE OF SPRING RETURN ACTUATORS

工作原理
OPERATION PRINCIPLE

CHELIC®

Unit: Nm

氣源壓力 AIR SUPPLY PRESSURE																彈簧輸出扭矩 SPRINGS OUTPUT	
氣壓 AIR PRESSURE		2.5 Bar		3 Bar		4 Bar		5 Bar		6 Bar		7 Bar		8 Bar			
MODEL	SPRING(QTY)	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
CT-160SR	S5	187.0	114.7													139.7	208.3
	S6	157.6	70.9	224.6	137.9											168	250
	S7	128.2	27.0	195.2	94.0	329.2	228.0									196	292
	S8			165.8	50.2	299.8	184.2	432.8	317.2							223	333
	S9					270.4	140.3	403.4	273.3	537.4	407.3					251	375
	S10					241.0	96.4	374.0	229.5	508.0	363.5	641.0	496.5	775.0	630.5	279	417
	S11							344.6	185.6	478.6	319.6	611.6	452.6	745.6	586.6	307	458
	S12							315.2	141.7	449.2	275.7	582.2	408.7	716.2	542.7	335	500
CT-190SR	S5	327	212													190	293
	S6	285	147	393	255											227	352
	S7	243	82	351	190	566	405									265	410
	S8			309	125	524	340	740	556							303	469
	S9					482	275	698	491	913	706					341	527
	S10					440	210	656	426	871	641	1087	857	1302	1072	379	586
	S11							614	361	829	576	1045	792	1260	1007	417	645
	S12							572	296	787	511	1003	727	1218	942	455	703
CT-210SR	S5	369	258													260	360
	S6	311	178	442	309											313	432
	S7	253	99	384	230	647	493									365	503
	S8			326	150	589	413	853	677							417	575
	S9					531	333	795	597	1058	860					469	647
	S10					473	253	737	517	1000	780	1263	1043	1526	1306	521	719
	S11							679	437	942	700	1205	963	1468	1226	573	791
	S12							621	357	884	620	1147	883	1410	1146	625	863

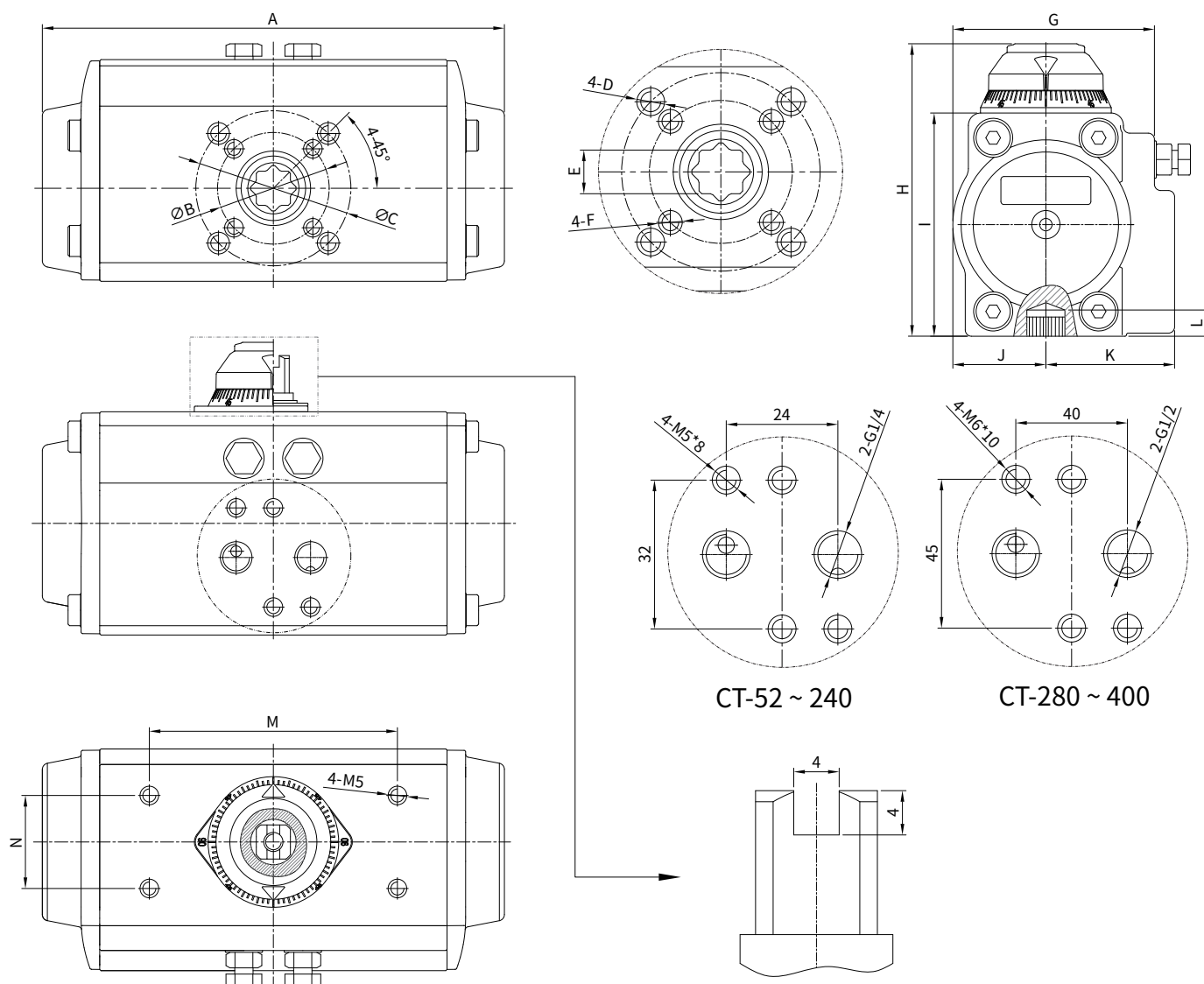
型號 CT

TYPE CT

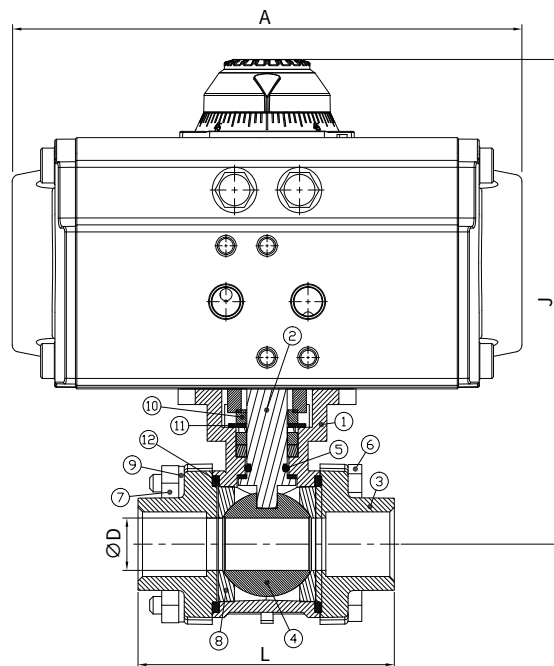
CHELIC®

外觀圖形尺寸

DIMENSIONS



Ø [MM]	A	ØB	ØC	D	E	F	G	H	I	J	K	L	M	N
CT-52	149	36	50	M6*10	11	M5*8	65	94.5	72	30	41.5	13	80	30
CT-63	162	50	70	M8*13	14	M6*10	72	110	87.5	36	47	18	80	30
CT-75	184	50	70	M8*13	14	M6*10	81	119.5	99.5	42	53	18	80	30
CT-83	204	50	70	M8*13	17	M6*10	88	128.8	108.8	46	57	21	80	30
CT-92	262	50	70	M8*13	17	M6*10	98	136.5	116.5	50	61	21	80	30
CT-105	268	70	102	M10*16	22	M8*13	109.5	153	133	57.5	64	26	80	30
CT-125	301	70	102	M10*16	22	M8*13	127.5	175	155	67.5	74.5	26	80	30
CT-140	390	102	125	M12*20	27	M10*16	137.5	192	172	75	77	31	130	30
CT-160	458	102	125	M12*20	27	M10*16	158	217	197	87	87	31	130	30
CT-190	525	140	140	M16*22	36	M16*22	189	260	230	103	103	36	130	30
CT-210	532	140	140	M16*22	36	M16*22	211	285	255	114	114	36	130	30



應用規格：Application Norm
公稱壓力：1.6-6.4MPa
適用溫度範圍：-25 °C ~ +200°C
適用介質：
水、油、氣體及某些腐蝕性液體 (W.O.G)
螺紋類型：
G, NPT, BSP, DIN259/299

Working Pressure: 1000PSI
Temperature Range: -25°C ~ +200°C
Suitable medium:
Water, Oil, air and some corrosive liquid
Thread type:
G, NPT, BSP, DIN259/299

NO.	Part Name 零件名稱	Material 材質	
1	Body 閥體	CF8M 不銹鋼	WCB 碳鋼
2	Stem 閥桿	SS316 不銹鋼	SS304 不銹鋼
3	Cap 閥蓋	CF8M 不銹鋼	WCB 碳鋼
4	Ball 球體	SS316 不銹鋼	SS304 不銹鋼
5	O Ring O型圈	VITON 橡膠	VITON 橡膠
6	Bolt 螺栓	SS304 不銹鋼	B8
7	Nut 螺帽	SS304 不銹鋼	FCD45
8	Ball Seat 球座	R-PTFE (15%)	R-PTFE (15%)
9	Washer 墊圈	SS304 不銹鋼	FCD45
10	Stem packing 填料	PTFE 聚四氟乙烯	PTFE 聚四氟乙烯
11	Thrust washer 止推墊圈	PTFE 聚四氟乙烯	PTFE 聚四氟乙烯
12	Stem packing 填料	PTFE 聚四氟乙烯	PTFE 聚四氟乙烯

SIZE	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
MODEL	CT52	CT52	CT52	CT52	CT52	CT63	CT63	CT75	CT83	CT105	CT125
D	11.6	12.7	15	20	25	32	40	50	65	80	100
L	68	68	75	80	90	108	120	141	165	188	256
A	149	149	149	149	149	162	162	184	204	268	301
J	145	145	145	148	153	173	181	198	230	258	318

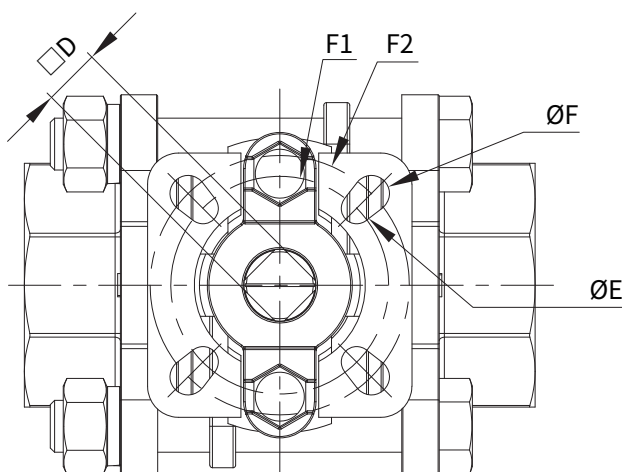
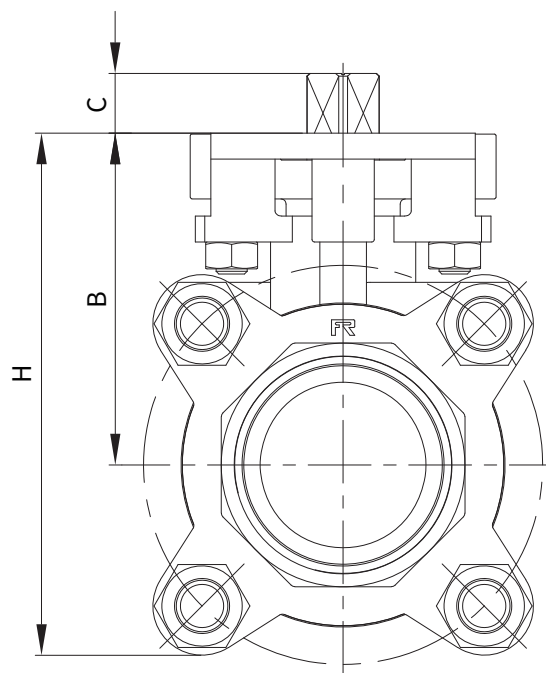
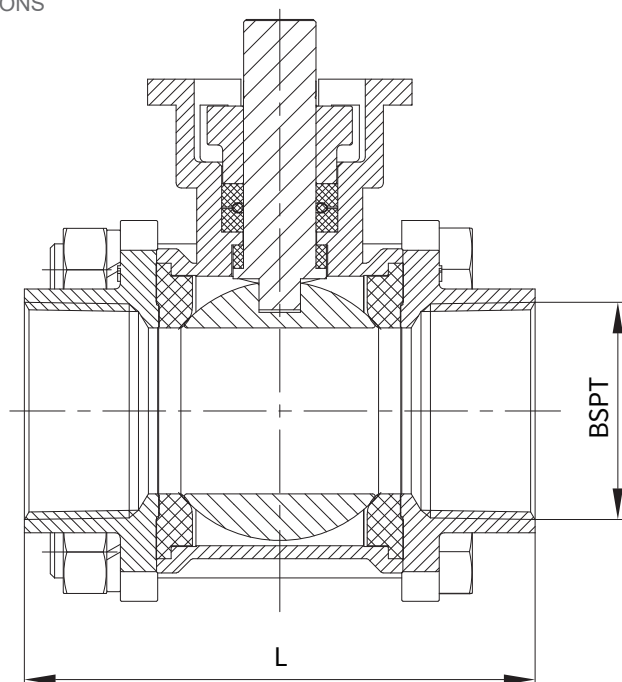
球閥

BALL VALVE

CHELIC

外觀圖形尺寸

DIMENSIONS



BALL VALVE	DN 8	DN 10	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100
MODEL	CT52	CT52	CT52	CT52	CT52	CT63	CT63	CT75	CT83	CT105	CT125
L	67	67	67	77	82	98	107	125	165	187	237
G NPT BSPT	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
B	50	50	50	53	58	63	70	78	101	105	143
H	73	73	73	78	88	100	108	123	162	174	242
C	10	10	10	10	11	11	18	17	21	19	23
□ D	9	9	9	9	11	11	14	14	17	17	17
F1	36	36	36	36	42	42	50	50	70	70	70
F2	50	50	50	50	50	50	70	70	102	102	102
ØE	6	6	6	6	6	7	7	7	9	9	9
ØF	7	7	7	7	7	9	9	9	11	11	11

MEMO



MEMO



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