

HC9 系列油壓缸 /Series Hydraulic Cylinders

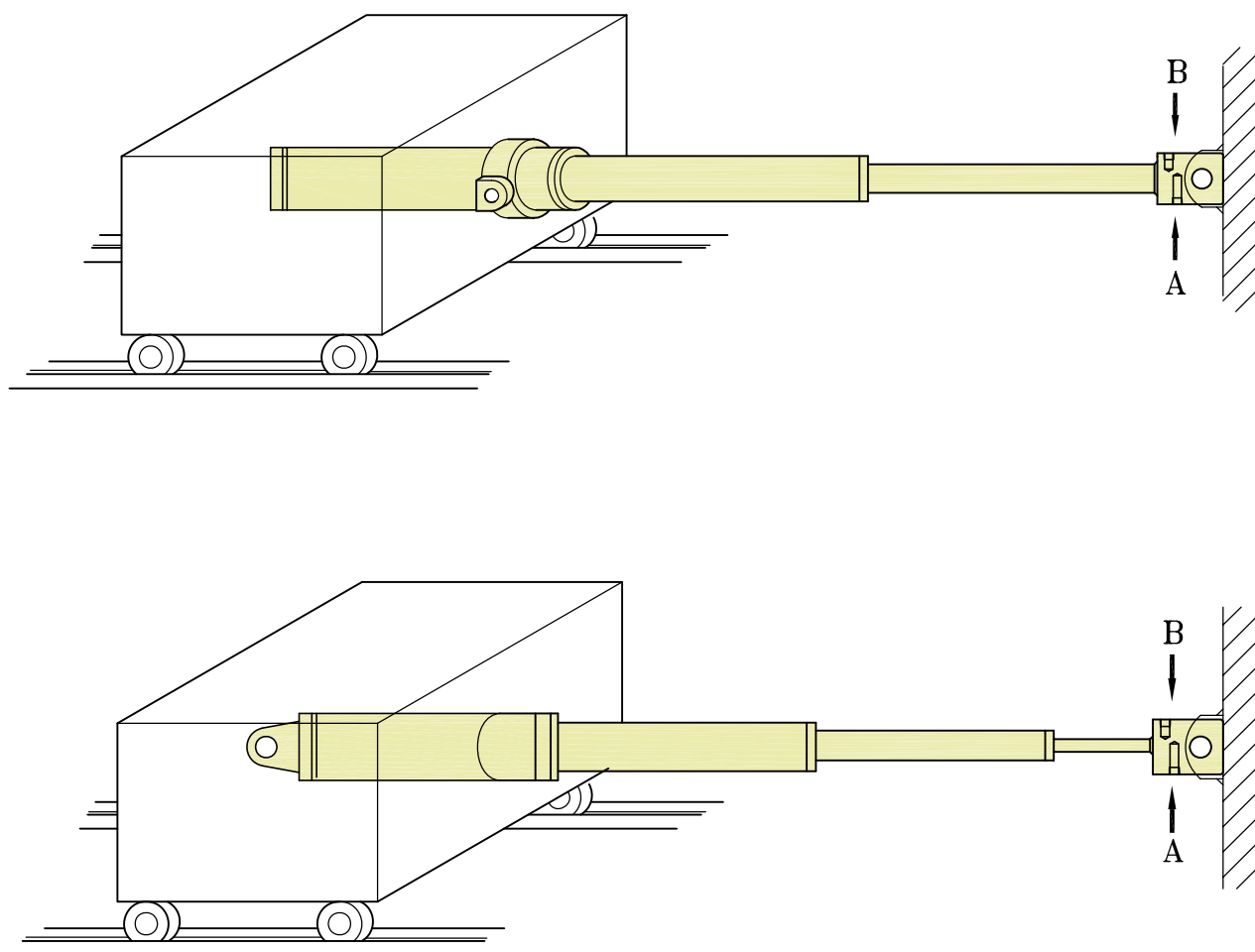
HC9—複動(軸端出入油口)多節油壓缸

HC9— (Port Position At Rod End)Multi-Stage Hyd. Cyl.

為節省空間經濟形設計:因為是多節式之行程，故縮短固定空間，並且集中於一節氣缸中，所設計之伸縮管式多節油壓缸

Economical saving space designs: Because those being with multi-stage stroke but can be reduced & concentrated in one cylinder. so that, for which no additive space occupied.

平面拉伸用途例 Plane stretch use example



規範 Specifications

最高使用壓力 Max.Operating Pressure	140 kgf/cm ²								
使用溫度範圍 Range of Ambient Temperature	-10°C ~ +50°C								
缸管內徑—節數 Cylinder Bore—Stage	95—2	90—3	125—2	125—3	150—3	150—4	160—3	200—3	200—4
常用速度 mm/sec Operating speed	150	150	128	128	118	118	118	110	110
標準行程限制 mm Permissible Stroke	2500	2500	3100	3100	3100	3100	3100	3500	3500

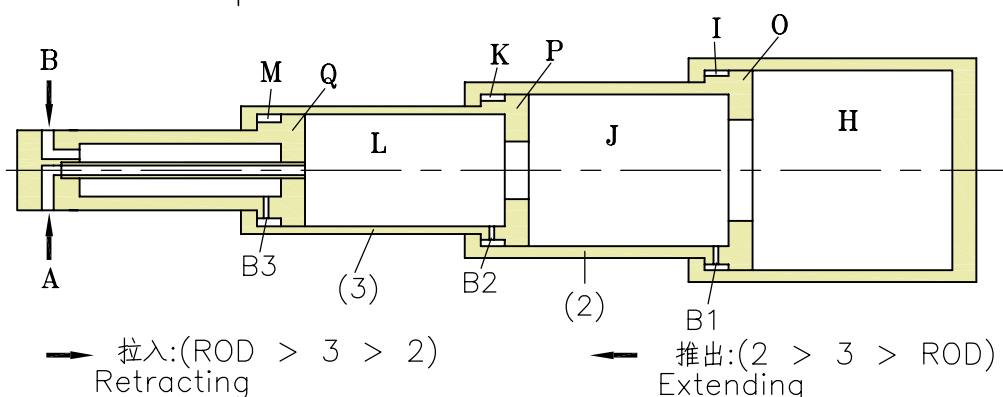
* 上表之數據是標準品，其最大之行程應考慮活塞桿裝置時其彎曲設定值，如果要求比上表之標準品更長時，請與敝公司商談 -

The above mentioned which means the standard model and the max. stroke also must considered the set bending value during installed. if want more longer size please consult us.

* 訂購內容索引 Ordering Index :

140	HC9	TC	125	2	1000
使用壓力 140 kgf/cm ² Max. Operating Pres.					衝程 Stroke mm 要考慮最大容許衝程 Max. Permissible stroke
HC9: 系列 HC9: Series Number					節數記號 Stage Symbol 2, 3, 4
固定座形式 Mounting TC, CA, CD					缸管內徑 Cylinder Bore mm ø95, ø125, ø150, ø160, ø200

* 動作原理 The Principle of Action:



* 推出原理 The Principle of Extending:

- * 從A油口流入的壓油，經由活塞桿內的導管進入H室，推動活塞O，第2節油缸動作同時在I室內的油，經由B1油孔回到K室，再經B2油孔回流到M室，然後由B3油孔從B油口排出 -
- * 當活塞O到達前蓋端時，壓油再推動活塞P，第3節油缸動作，同時在K室的油經由B2油孔，回到M室，再經由B3油孔，從B油口排出 -
- * 當活塞P到達前蓋端時，壓油再推動活塞Q，第4節活塞桿動作，同時在M室的油經由B3油孔，從B油口排出 -
- * The hyd. action oil flow from port A and pass through the piston rod guide tube into portion H and thrusts piston O. Meanwhile, the hyd. action oil in the portion I (2nd stage) which will flow through port B1 into portion K and flow through port B2 into portion M thus the oil flow through port B3 and discharged from port B.
- * During the piston O is approached to cyl. head and the hyd. action oil will thrust the piston P. Meanwhile, the third cyl. actioned also, the oil in port K flow through port B2 into portion M thus, the oil flow through port B3 and discharged from port B.
- * During the piston P is approached to cyl. head and the hyd. action oil will thrust the piston Q. Meanwhile, the fourth piston rod actioned thus the oil in portion M flow through port B3 and discharged from port B.

* 縮收原理 The Principle of Extracting :

- * 從B油口流入的壓油，經由B3油孔，進入M室，推動活塞Q，第4節活塞桿開始縮收，同時在L室的油，經由導管，從A油口排出 -
- * 當活塞Q到達活塞P內時，壓油經由B2油孔，進入K室，推動活塞P，第3節油缸縮收，同時在J室的油，經由導管，從A油口排出 -
- * 當活塞P到達活塞O內時，壓油經由B1油孔，進入I室，推動活塞O，第2節油缸縮收，同時在H室的油，經由導管，從A油口排出 -
- * The hyd. action oil flow from port B and pass through port B3 into portion M and thrusts piston Q. Meanwhile, the fourth piston rod will retract the hyd. action oil in portion L which will flow through piston rod guide tube and discharged from port A.
- * During the piston Q is approached to piston P and the hyd. action oil will flow through port B2 into portion K and thrusts piston P. Meanwhile, the third piston rod will retract the hyd. action oil in portion J which will flow through piston rod guide tube and discharged from port A.
- * During the piston P is approached to piston O and the hyd. action oil will flow through port B1 into portion I and thrusts piston O. Meanwhile, the second piston rod will retract also the hyd. action oil in portion H which will flow through piston rod guide tube and discharged from port A.

HC9

* 固定座形式 Mounting :

記號 Symbol	略 圖 Configuration	記號 Symbol	略 圖 Configuration
TC		CD	
CA			

* 油壓缸出力的算法 The Calculating of Hyd. Cyl. Output :

缸管內徑－節數 Cylinder Bore－Stage		95-2	90-3	125-2	125-3	150-3	150-4	160-3	200-3	200-4
各節缸管內徑 Stage Bore Dia	2nd	70	70	95	95	125	125	120	160	160
各節缸管內徑 Stage Bore Dia	3nd	—	50	—	70	95	95	80	120	120
各節缸管內徑 Stage Bore Dia	4nd	—	—	—	—	—	70	—	—	80
各節活塞桿徑 Stage Rod Dia	1nd	80	80	110	110	140	140	140	180	180
各節活塞桿徑 Stage Rod Dia	2nd	50	50	80	80	110	110	95	140	140
各節活塞桿徑 Stage Rod Dia	3nd	—	35	—	50	80	80	60	90	95.
各節活塞桿徑 Stage Rod Dia	4nd	—	—	—	—	—	50	—	—	60

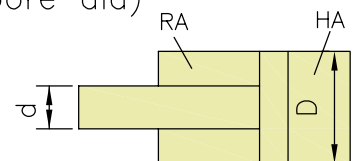
HC9—油壓缸，當推出時前蓋端面與後蓋端面同時受力，所以在推出時實際受力面積為油壓缸管外徑之面積 -

During the extending of HC9— hyd. cyl. and there are same stressed at cyl. head & cap. so that, the practical stressed area is the exterior area of hyd. cyl.

D=缸管內徑 / Cylinder bore

d=活塞桿徑(次節缸管外徑) / Piston rod dia(The second bore dia)

$$HA = \frac{\pi D^2}{4} \quad RA = \frac{\pi (D^2 - d^2)}{4}$$



當HA與RA同時受同樣壓力時，推出時之受力面積為：

There are same stressed at HA & RA and the stressed area during extending for then.

$$\frac{\pi D^2}{4} - \frac{\pi (D^2 - d^2)}{4} = \frac{\pi (D^2 - D^2 + d^2)}{4} = \text{活塞桿面積} / \text{Piston rod area}$$

推出力的算法為(HA-RA)xP，縮收力的算法為RAXP

The calculating of extending force is(HA-RA)xP and the extracting force which is RAXP.

$$F = A \times P \times \beta \quad F = \text{出力(kgf)} \quad A = \text{面積(cm}^2\text{)} \quad P = \text{壓力(kgf/cm}^2\text{)} \quad \beta = \text{負荷率(\%)} \\ \text{Output} \quad \text{Area} \quad \text{Pressure} \quad \text{Load rating}$$

決定油壓缸的實際出力是必須考慮油壓缸之滑動部的抵抗，配管上及機器之壓力損失等因素 -

負荷率是油壓缸實際負載之出力與從回路設定壓力計算的理論出力(油壓缸理論出力)之比率，謂之負荷率 - 本目錄之計算例題是以負荷率80%而計算的 -

As for the practical output of hyd. cyl. which must considered the sliding resistance of cyl. and pressure loss of piping & machinery etc., factor.

Also the load rating is the comparison ratio for the practical output and the theoretical setting of hyd. cyl. and which are calculated at 80% in this literatures.

HC9

活塞有效斷面積 **Effective Section Area of Piston:** (cm²)

機種 Model	有效面積 Effective Area	推出 Extending				拉入 Retracting			
		1 節 1st	2 節 2nd	3 節 3rd	4 節 4th	1 節 1st	2 節 2nd	3 節 3rd	4 節 4th
95-2		50.2	38.5	—	—	20.6	18.8	—	—
95-3		50.2	28.3	19.6	—	20.6	10.2	10	—
125-2		95	63.6	—	—	27.7	20.6	—	—
125-3		95	50.2	38.5	—	27.7	20.6	18.8	—
150-3		153.9	95	63.6	—	22.8	27.7	20.6	—
150-4		153.9	95	50.2	38.5	22.8	27.7	20.6	18.8
160-3		165	86.6	63.6	—	35.9	36.1	35.3	—
200-3		268.7	165	122.7	—	45.3	35.9	36.1	—
200-4		268.7	165	86.6	63.6	45.3	35.9	36.1	35.3

*** 例題 For Example:**

HC9— **125-2形複動式多節油壓缸，設使用壓力為100kgf/cm²時，求推出及縮收之各節出力為多少?(kgf) $F=A \times P \times \beta$ 公式 Formula

HC9— **125-2 double acting multi-stage hyd. cyl. and the operating pressure : 100kgf/cm² for which derived the extending & extracting of stage? (kgf)

推出之各節壓力 / Extending pressure of stage :

(1)第1節 /1st stage : $A=95\text{cm}^2$, $F=95 \times 100 \times 0.8=7600\text{kgf}$

(2)第2節 /2nd stage : $A=63.6\text{cm}^2$, $F=63.6 \times 100 \times 0.8=5090\text{kgf}$

縮收之各節壓力 / Extracting pressure of stage :

(1)第1節 /1st stage : $A=27.7\text{cm}^2$, $F=27.7 \times 100 \times 0.8=2220\text{kgf}$

(2)第2節 /2nd stage : $A=20.6\text{cm}^2$, $F=20.6 \times 100 \times 0.8=1650\text{kgf}$

*** 如何選擇機種 How To Select The Suited Model:**

又今預使用複動式多節油壓缸且設使用壓力為100kgf/cm²時，縮收之荷重，為在最後一節 - (第3節或第4節)時需要2800kgf，求使用3節的複動式油壓缸，與使用4節的複動式油壓缸，其機種為何?

Now if want employed the double acting multi-stage hyd. cyl. and the operating pressure : 100kgf/cm² also the extracting load at the last stage.(3rd or 4th stage)and with load 2800kgf for which derived 3rd or 4th hyd. cyl.

$$A = \frac{F}{P \times \beta} \quad \text{公式 Formula} \quad A = \frac{2800\text{kgf}}{100\text{kgf/cm}^2 \times 0.8} = 35\text{cm}^2$$

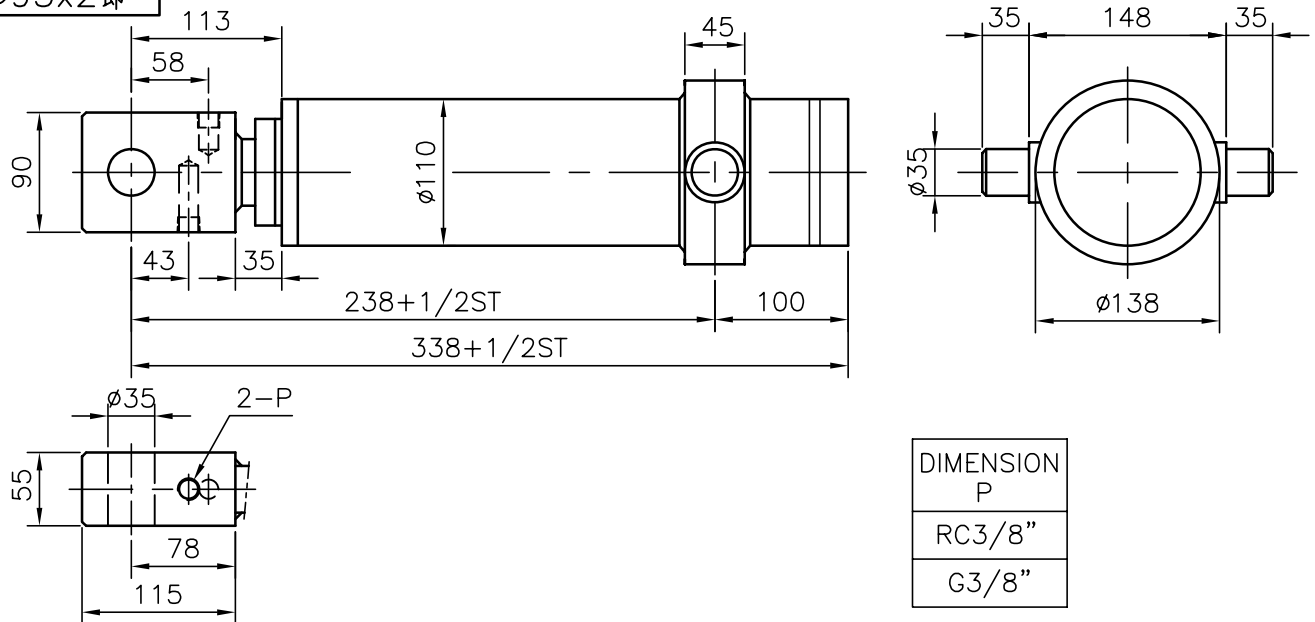
(1)如果要3節形時，則選用HC9— **200-3或HC9— **160-3

If selecting 3rd stage those are selected HC9— **200-3 or HC9— **160-3

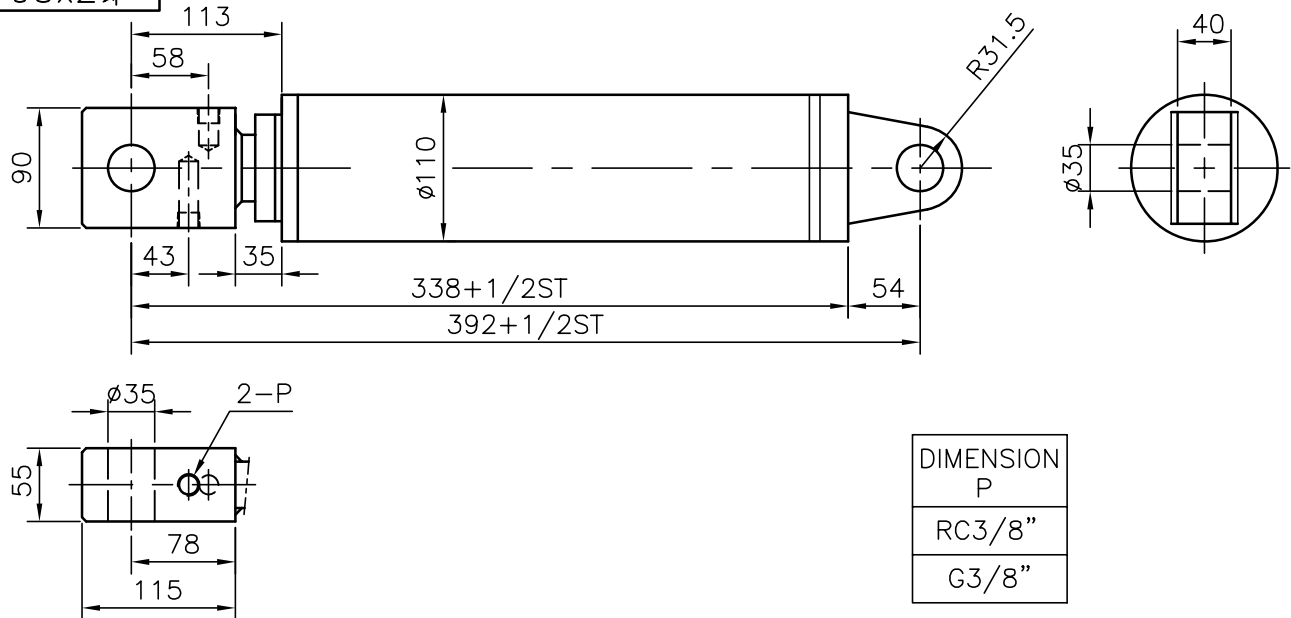
(2)如果要4節形時，則選用HC9— **200-4

If selecting 4th stage those are selected HC9—160-**200-4

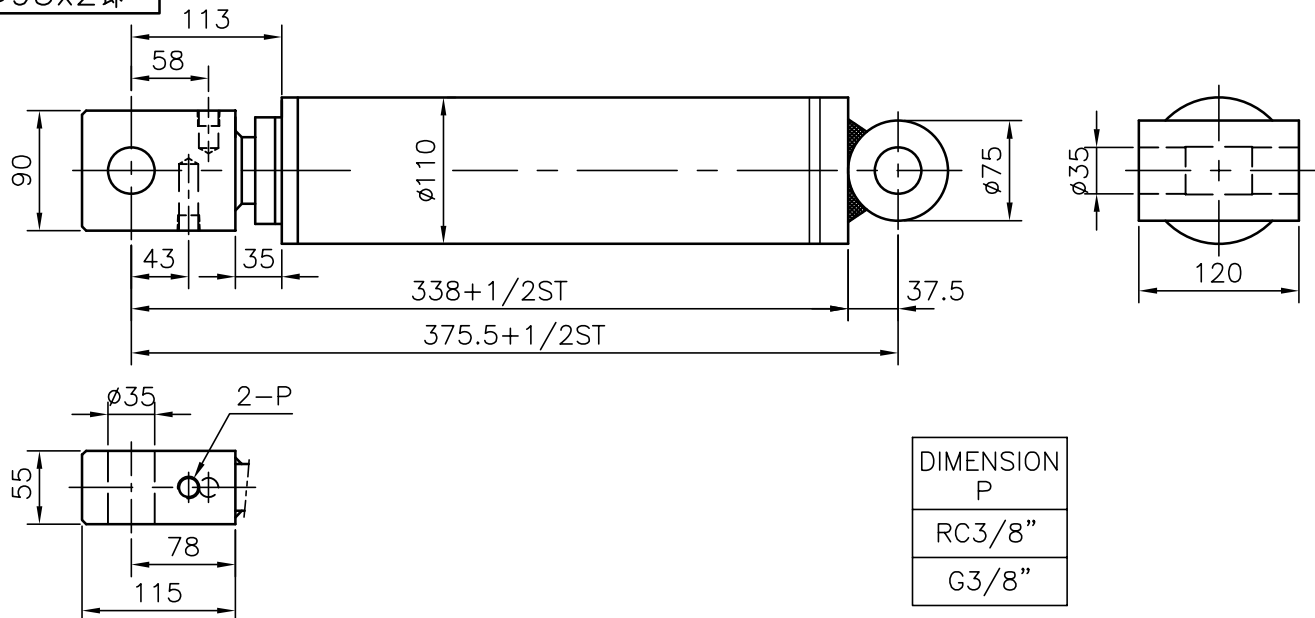
HC9-TC , 140kg/cm²
 ø95x2節



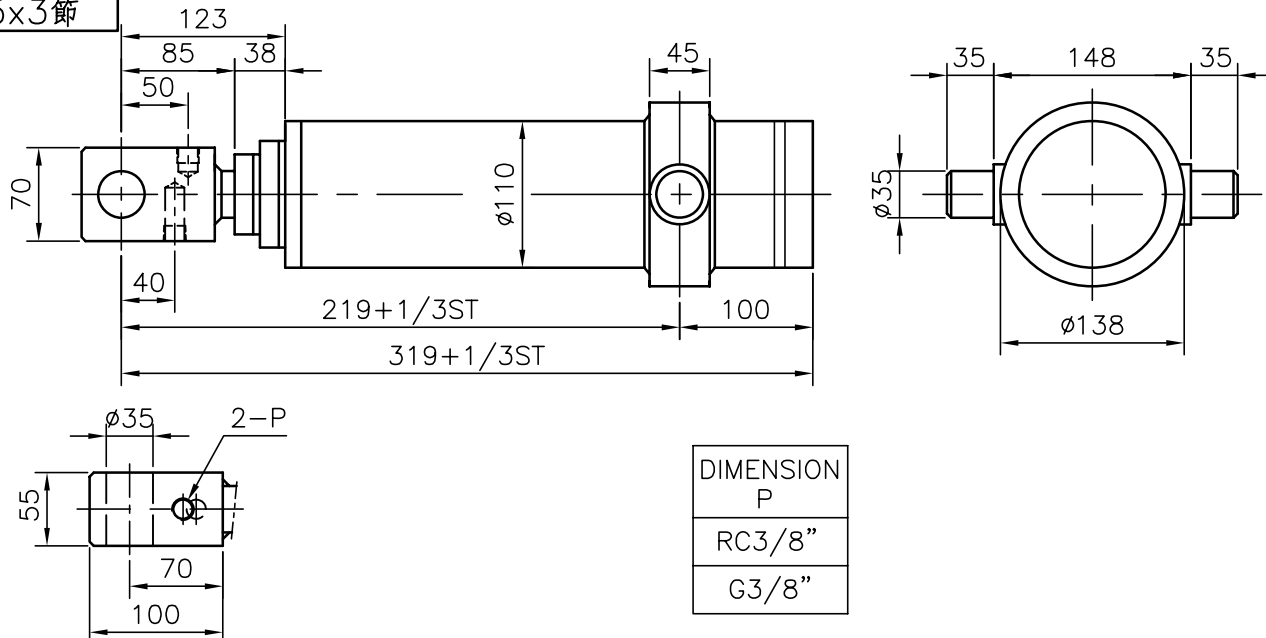
HC9-CA , 140kg/cm²
 ø95x2節



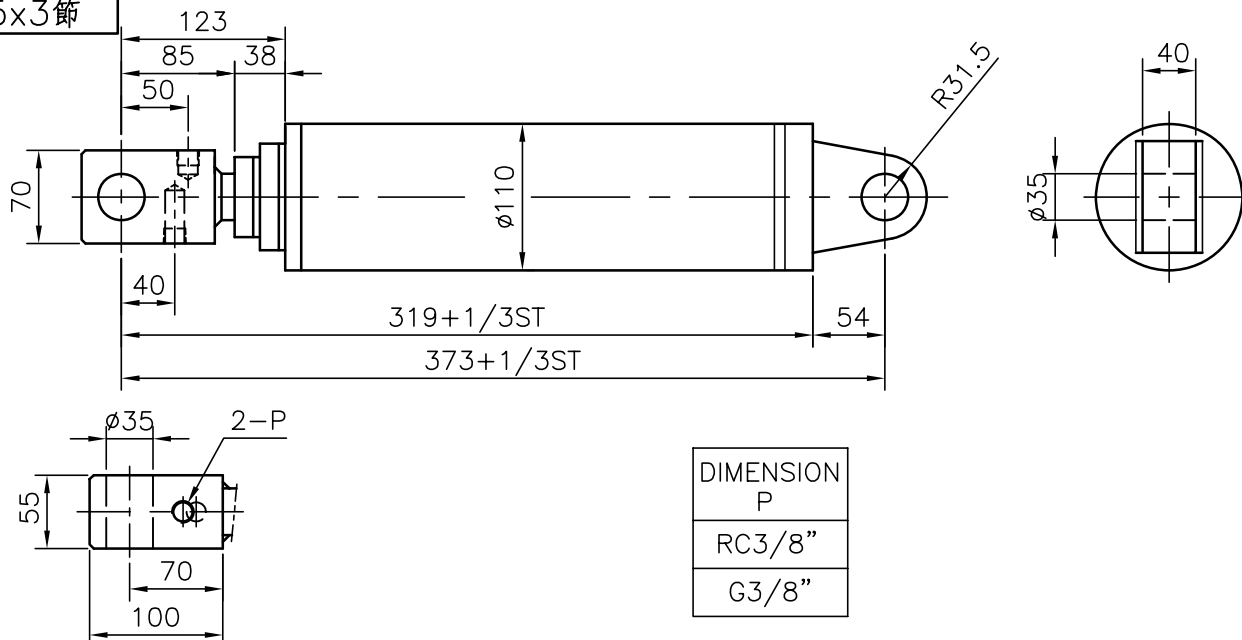
HC9-CD , 140kg/cm²
 ø95x2節



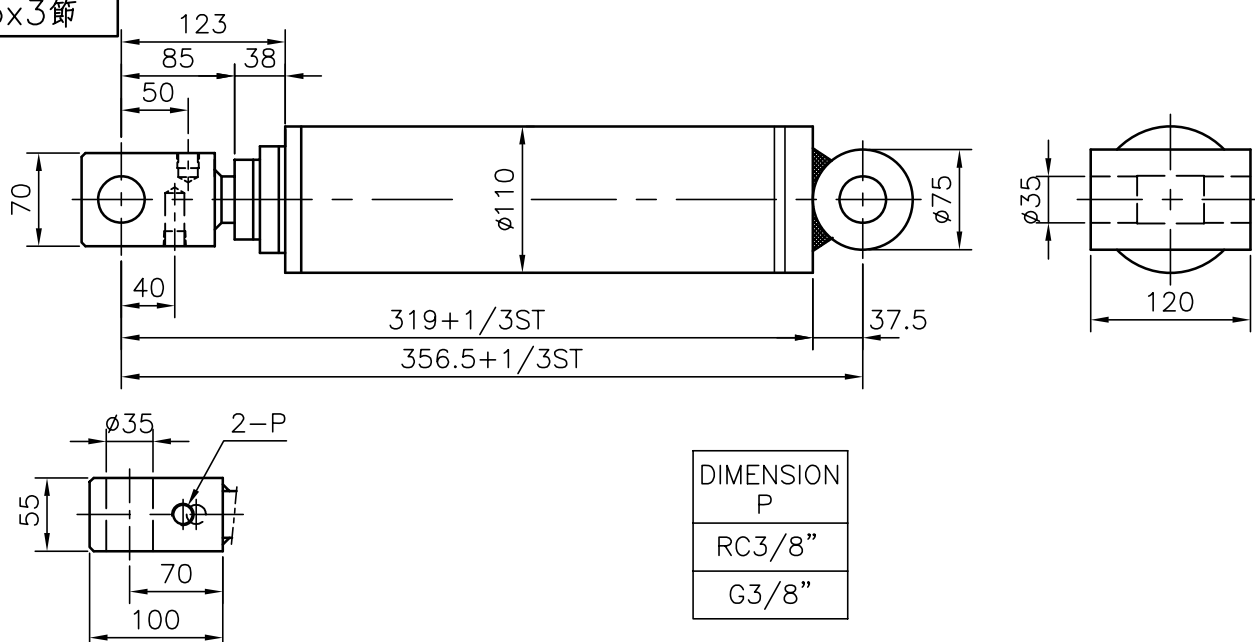
HC9-TC , 140kg/cm²
 ø95x3節



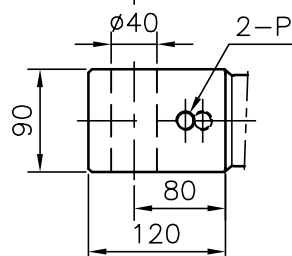
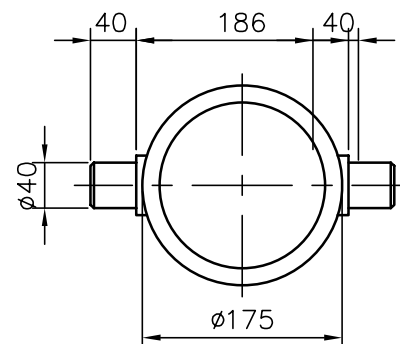
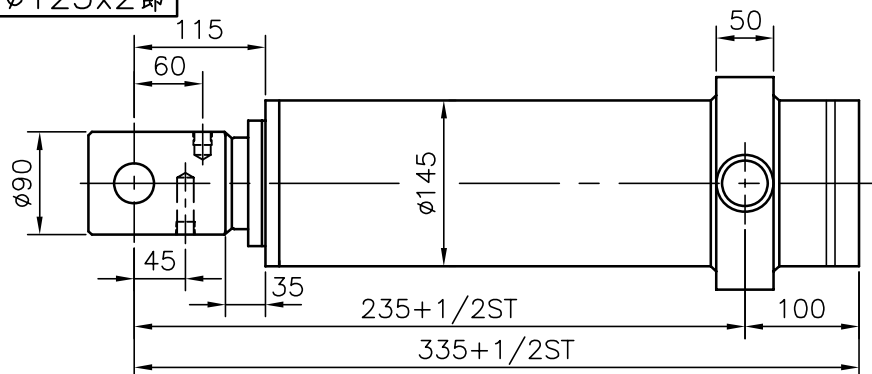
HC9-CA , 140kg/cm²
 ø95x3節



HC9-CD , 140kg/cm²
 ø95x3節

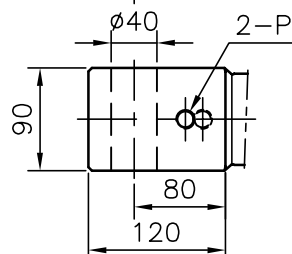
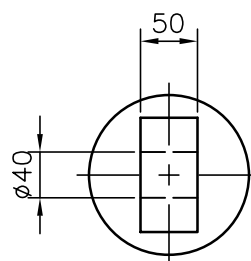
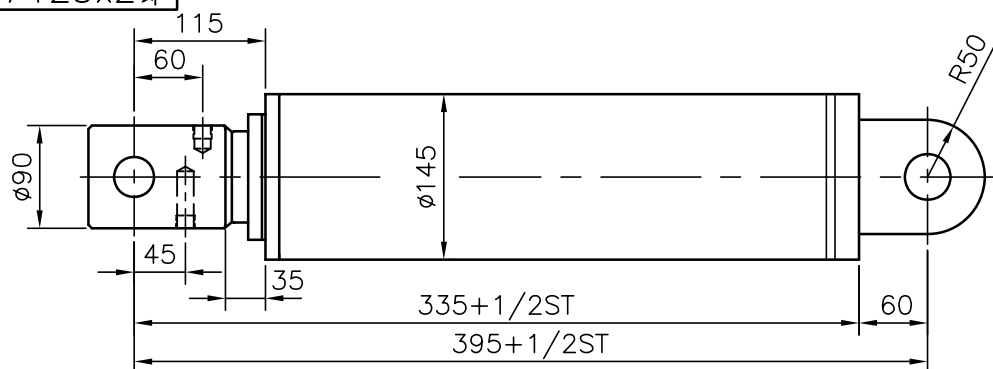


HC9-TC
ø125x2節



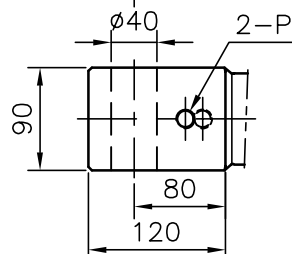
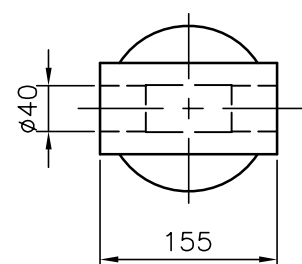
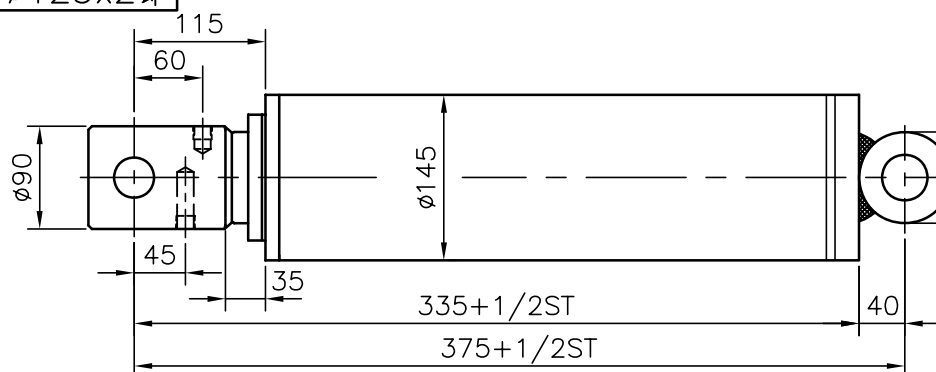
DIMENSION
P
RC3/8"
G3/8"

HC9-CA , 140kg/cm²
 ø125x2節



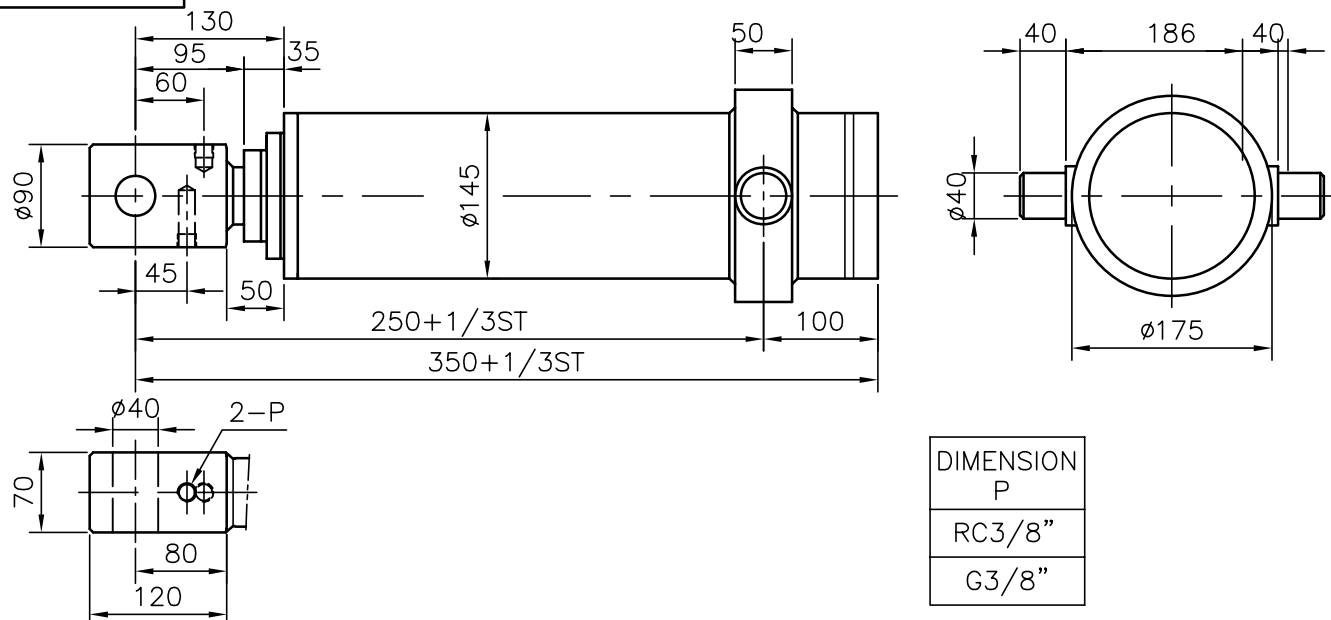
DIMENSION
P
RC3/8"
G3/8"

HC9-CD , 140kg/cm²
 ø125x2節

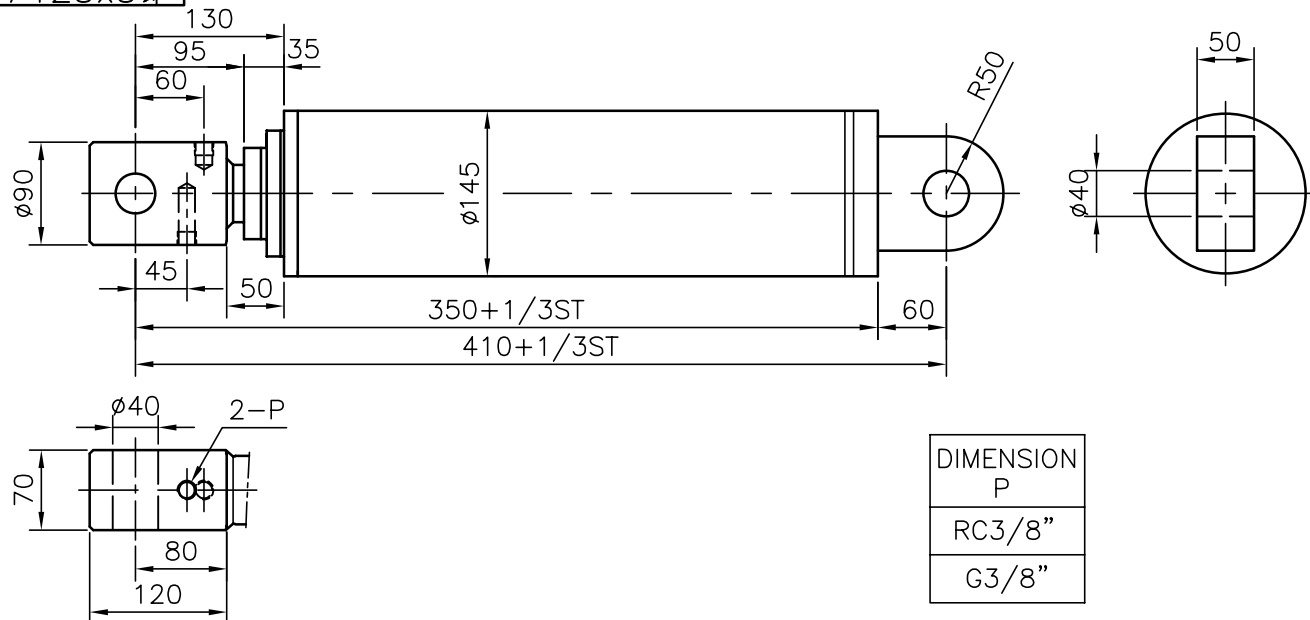


DIMENSION
P
RC3/8"
G3/8"

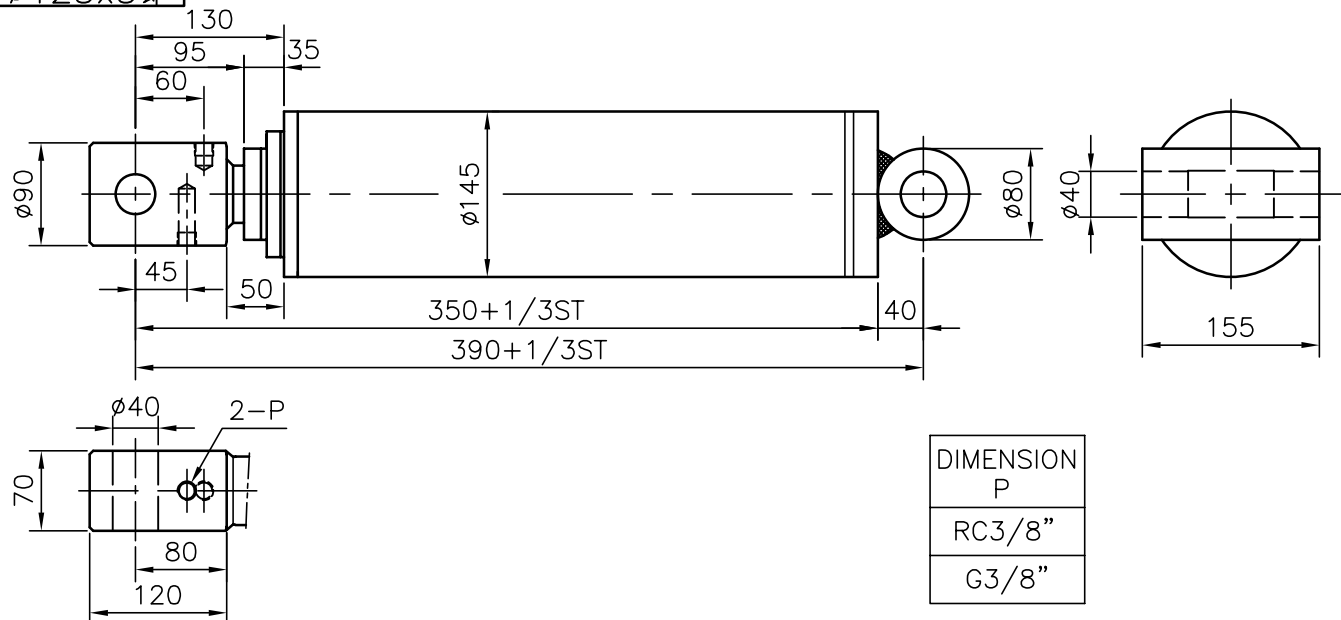
HC9-TC , 140kg/cm²
 ø125x3節



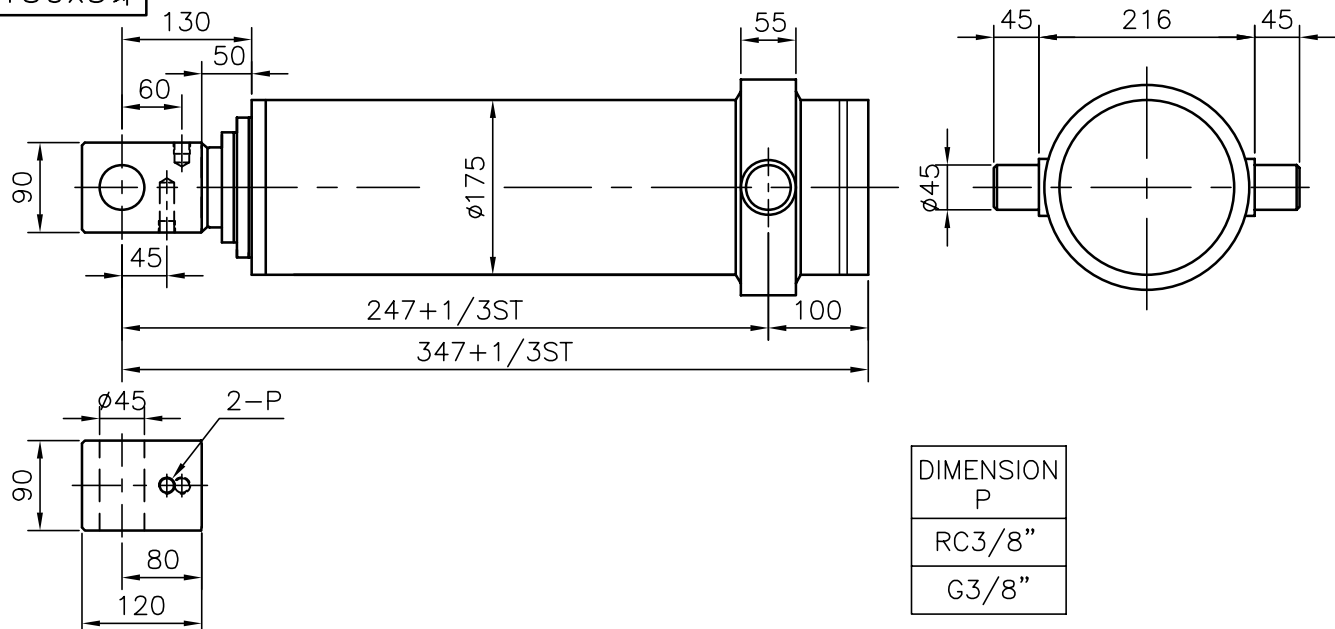
HC9-CA , 140kg/cm²
 ø125x3節



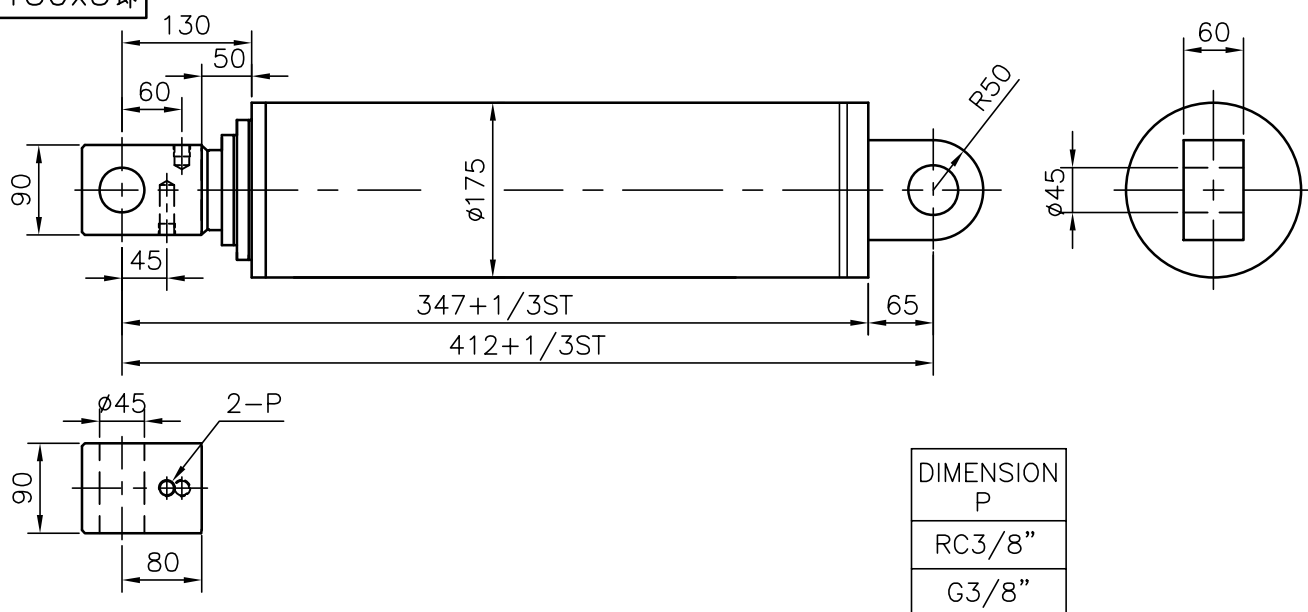
HC9-CD , 140kg/cm²
 ø125x3節



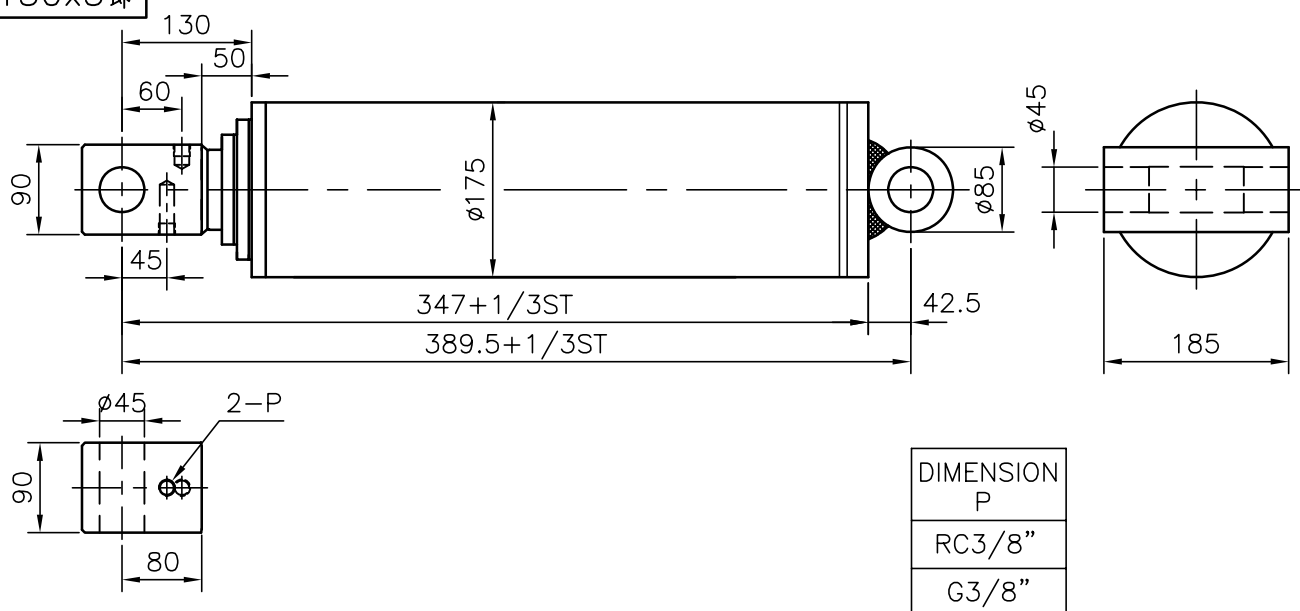
HC9-TC , 140kg/cm²
 ø150x3節



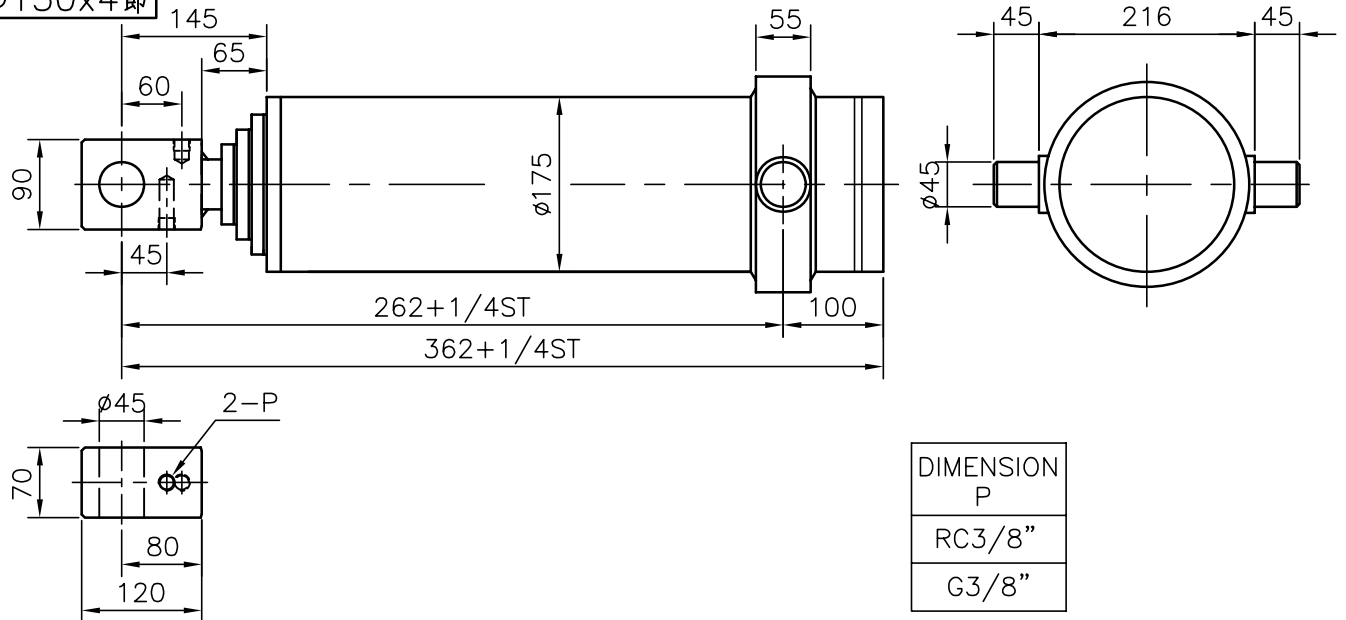
HC9-CA , 140kg/cm²
 ø150x3節



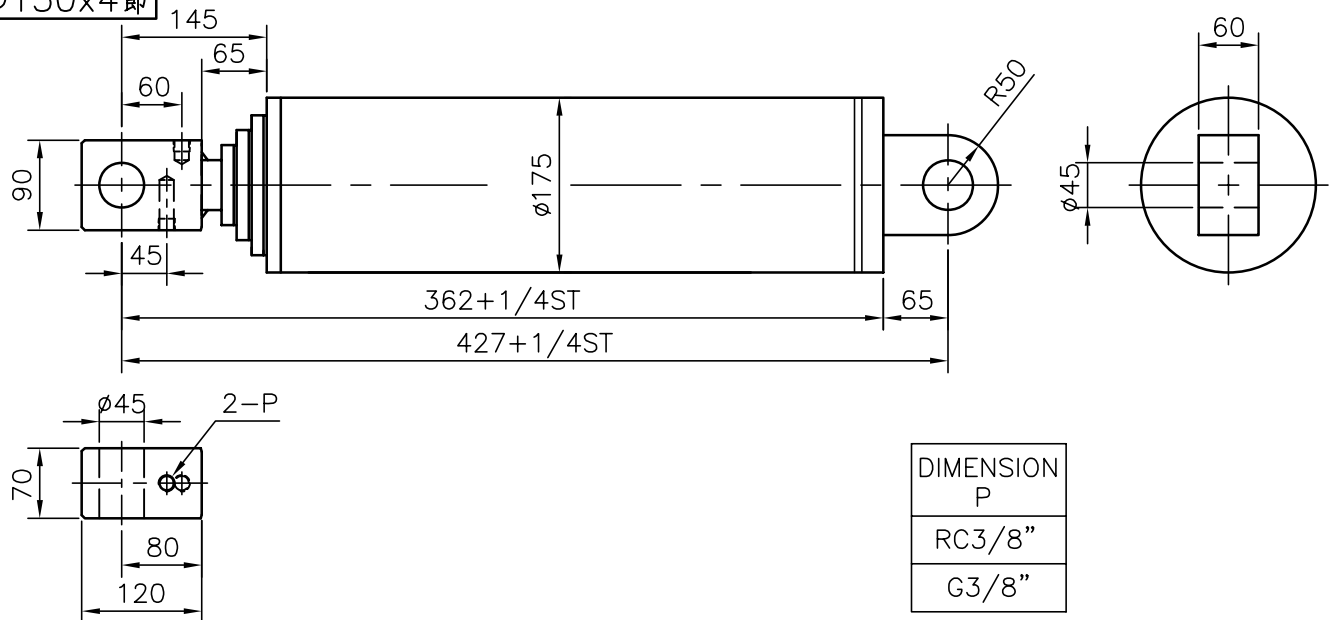
HC9-CD , 140kg/cm²
 ø150x3節



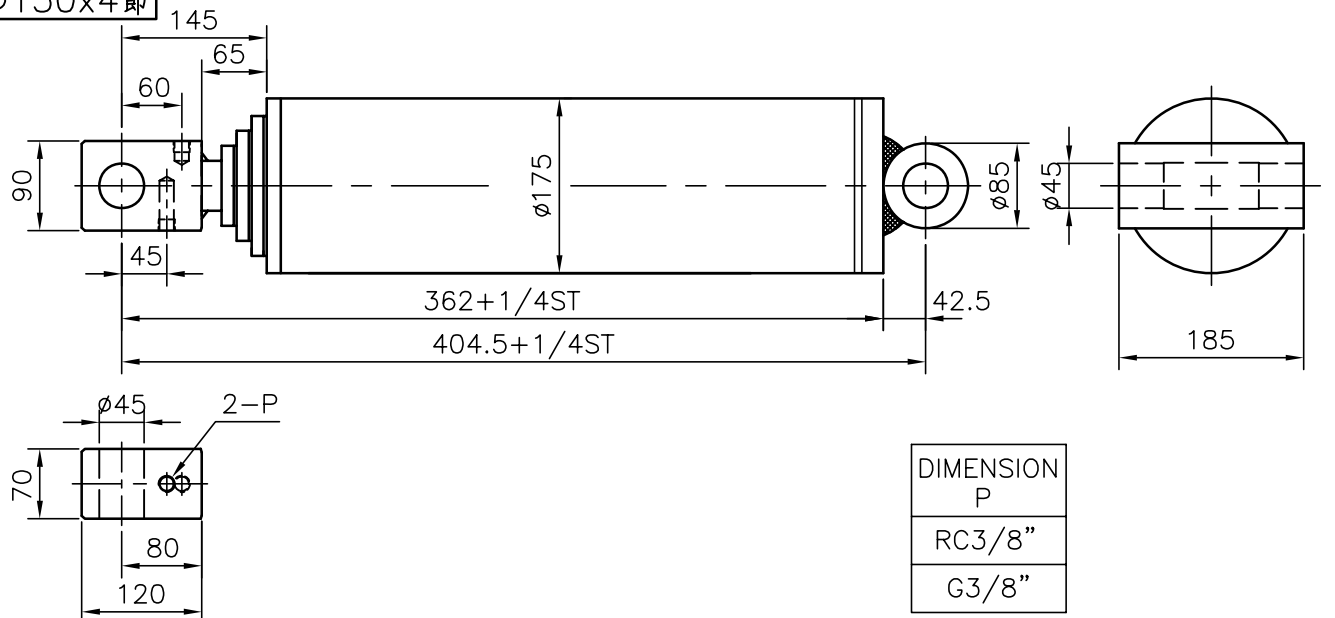
HC9-TC , 140kg/cm²
 ø150x4節



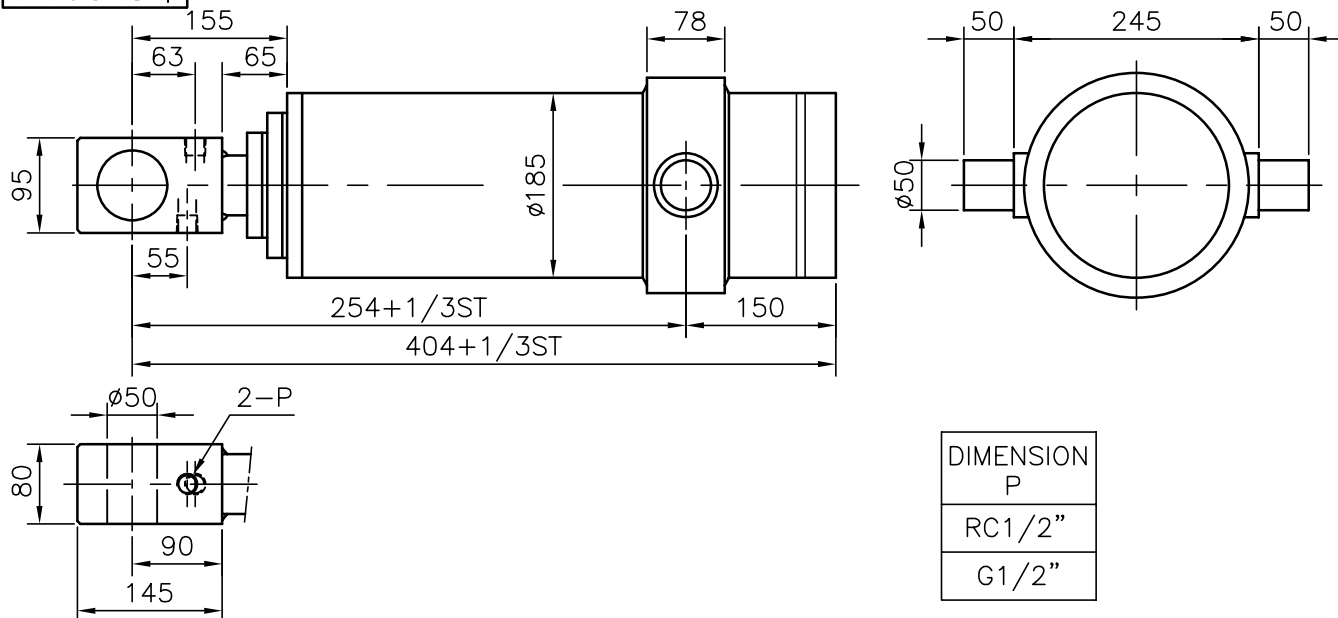
HC9-CA , 140kg/cm²
 ø150x4節



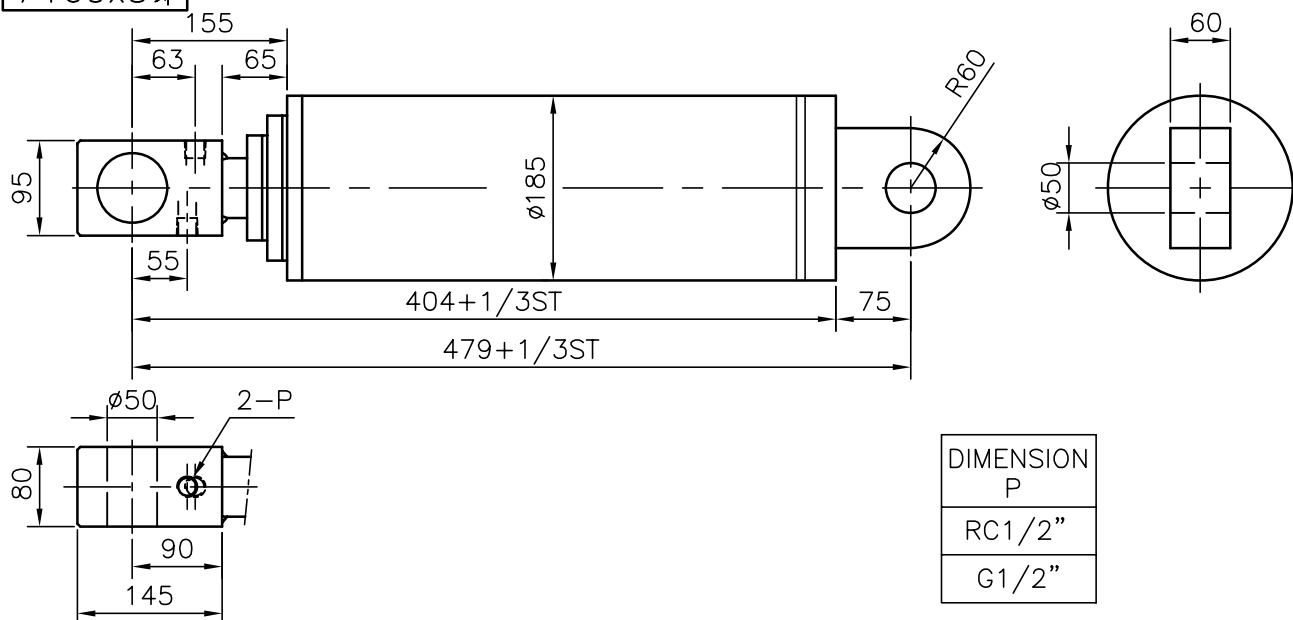
HC9-CD , 140kg/cm²
 ø150x4節



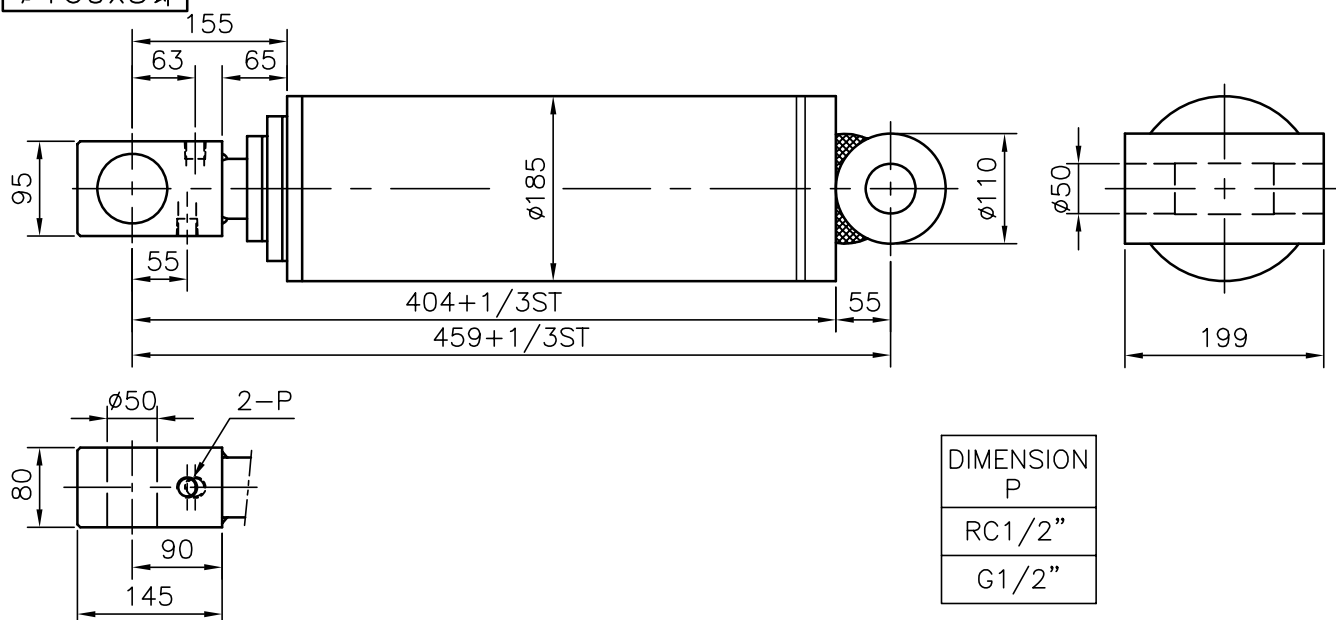
HC9-TC , 140kg/cm²
 ø160x3節



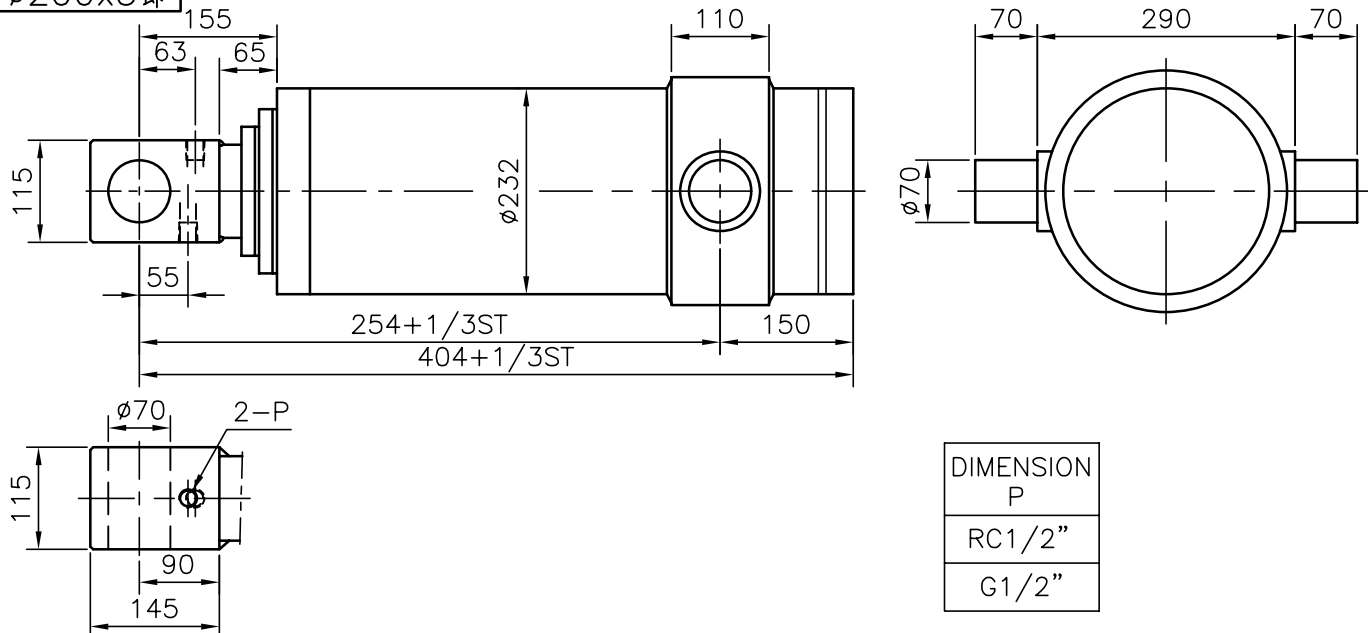
HC9-CA , 140kg/cm²
 ø160x3節



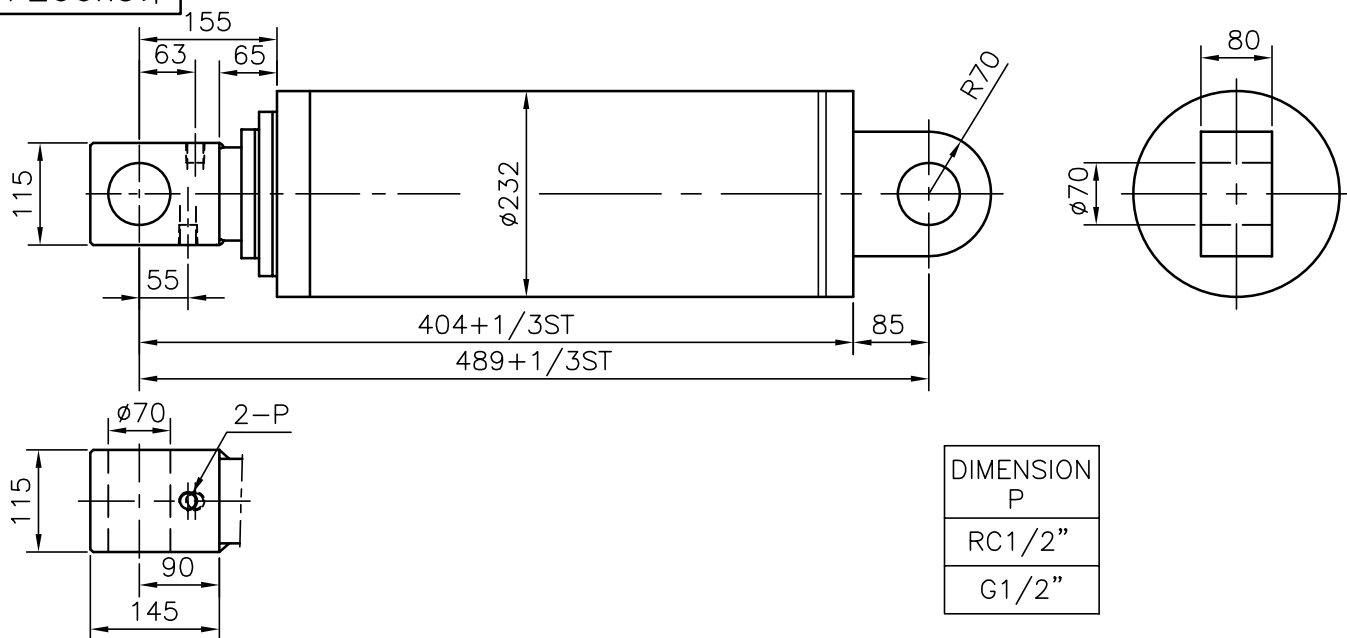
HC9-CD , 140kg/cm²
 ø160x3節



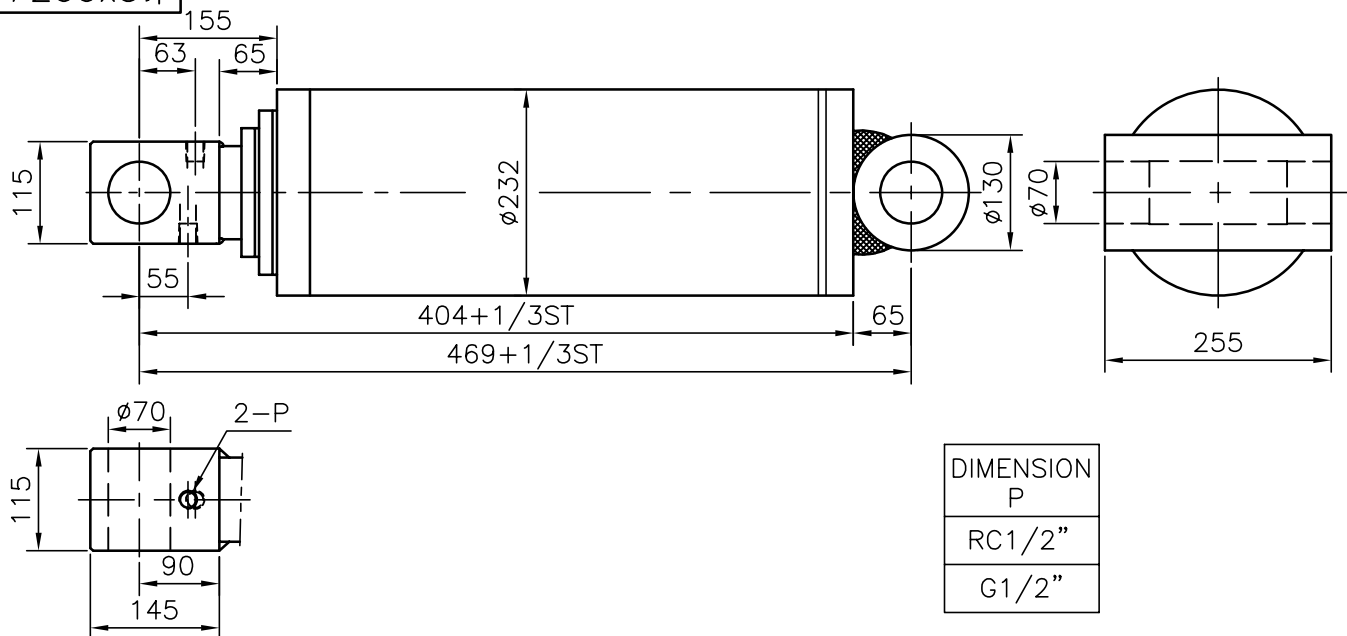
HC9-TC , 140kg/cm²
 ø200x3節



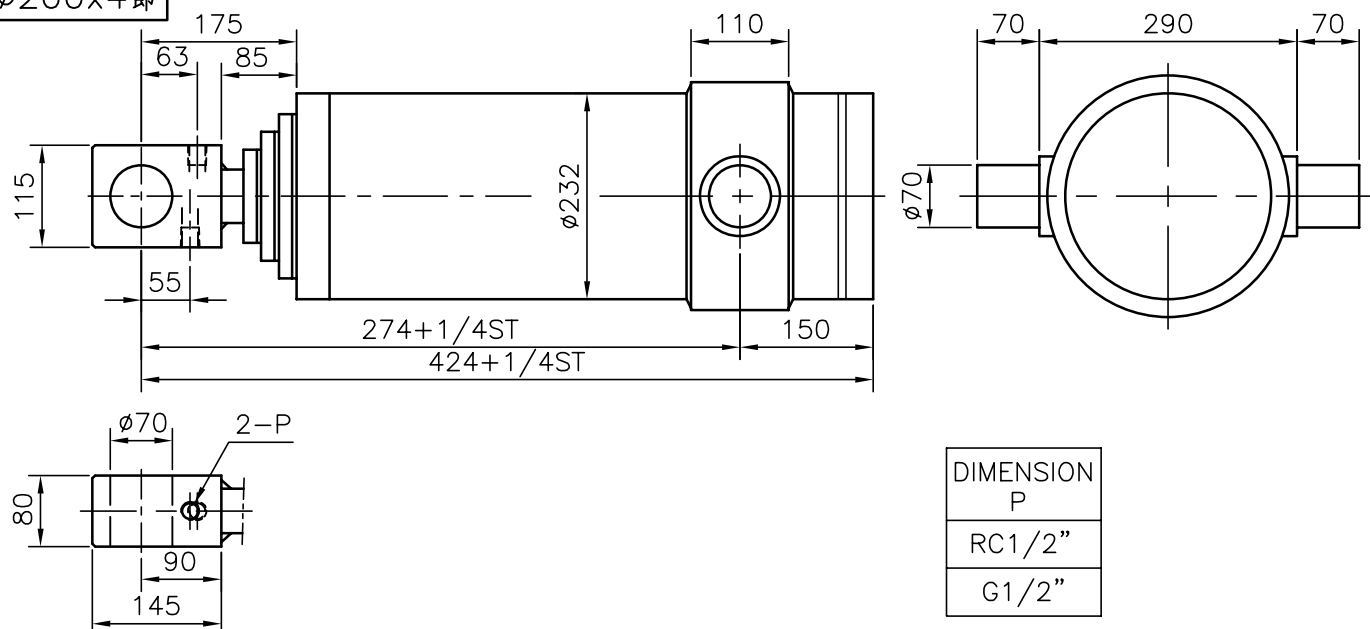
HC9-CA , 140kg/cm²
 ø200x3節



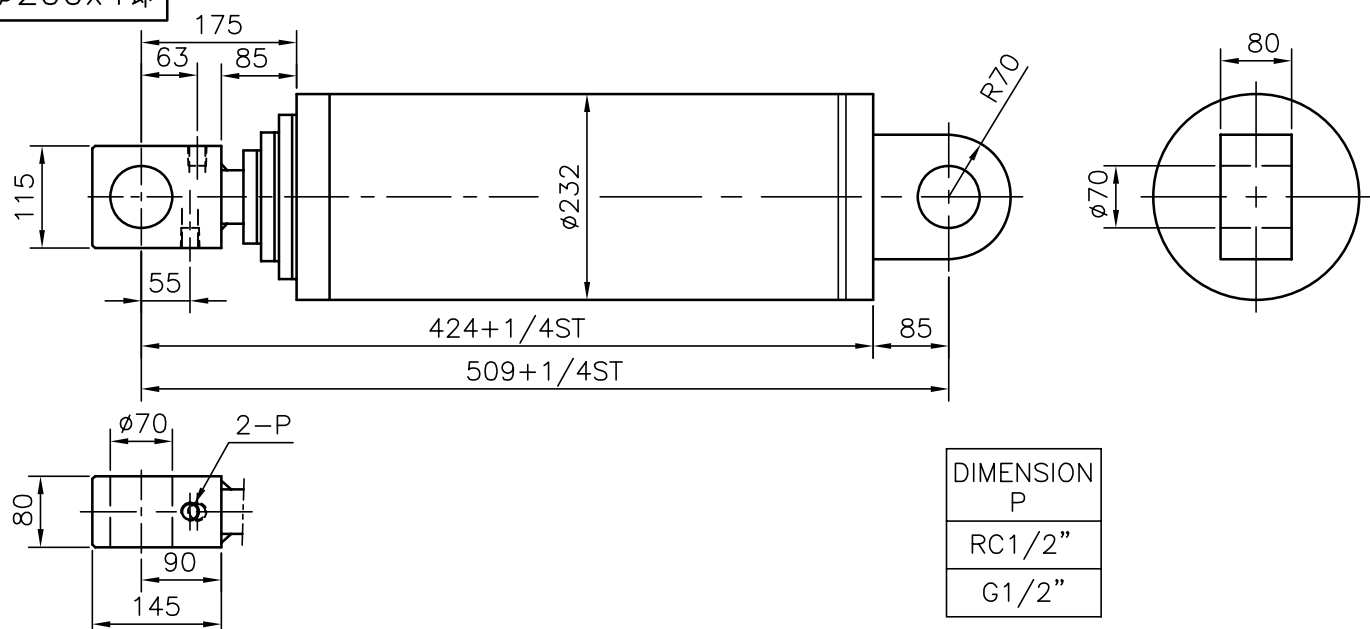
HC9-CD , 140kg/cm²
 ø200x3節



HC9-TC , 140kg/cm²
 ø200x4節



HC9-CA , 140kg/cm²
 ø200x4節



HC9-CD , 140kg/cm²
 ø200x4節

