TELEDYNE HYSON

SUPER NITRO-DYNE Compression Tanks

Purpose:

The compression tank serves as the reservoir for the "Swept Volume" of nitrogen forced from the cylinders by the closing action of the press.

Compression tanks are available in four diameters, 3.5", 5", 8", and 10". The length is a factor of the volume required. The die designer should specify the length as a specific requirement of the job. Multiple tanks can be connected together in series, if space restrictions prohibit the use of one single larger tank.

How to Determine Compression Tank Size:

The volume of nitrogen necessary should be established before the system is built. The pressure increase caused by the closing of the press can affect the success of the operation.

The first step in determining the required volume is to find the "Swept Volume" (S.V.) of nitrogen pushed from the cylinder during its working stroke. The following formula is used in that determination:

S.V. = Effective piston area X working stroke X No. of cylinders

From this the tank volume is determined as follows:

$$\text{Required tank volume} = \frac{100}{\text{\% of desired pressure rise}} \times \text{Total Swept Volume}$$

General Points to Remember:

Pressure increase or rise is generally limited to:
- 10 to 15% or less for pads and cushions
- 40% or more for cam returns and strippers
- Systems under 50 cu. in. not recommended.

System pressure with the die closed should never exceed recommended pressure limits of the system. **Example:** A system designed with a compression tank allowing a 33% pressure rise as the die closes, should not be charged above 1125 psi in the die open position. Therefore 1500 psi in the die closed position.

Example of Tank Size Determination:

A die requires 10 tons of force thru 1.5" of working stroke.

Allowable pressure rise is 10% and a minimum of 4 cylinders are required to distribute the force.

Cylinders are:

4 — Model BBC 2.5 x 1.5"

Piston Area — 3.44 sq. in.

Total Swept Volume (S.V.) = 3.44 sq. in. x 1.5" x 4 = 20.64 cu. in.

Compression tank volume =

$$\frac{100}{10} \times 20.64 \text{ cu. in.} = 206 \text{ cu. in.}$$

You can choose one of the four stock tanks available, provided your required volume is near that of one of the stock tanks, or you can specify a special tank using the chart on the following page.

Our example shows a required volume of 206 cubic inches. We may choose the SCT-320 or specify SCT-5, F (overall length) = 18-1/2" or other combinations of tube size and length as required. Extra volume in a system is generally not a problem; often the next largest standard tank can be used. When this is not the case, you can specify a special tank as described on the next page.

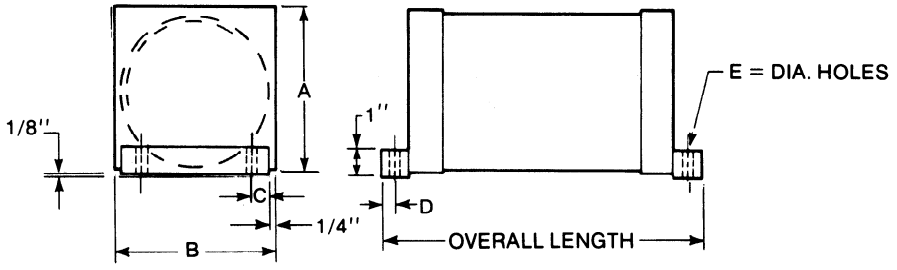
Piston Areas

Cylinder	BCQ	MOR1	BBC2.5	BC4	BC6
Effective Piston Area	.44 sq. in.	1.77	3.44	5.42	7.98
	2.8 cm^2	9.5	22.2	34.9	51.5

Standard Tank Models:

Teledyne Hyson maintains several tank sizes in stock to provide for immediate delivery at a low cost.

Standard tanks come in 4 sizes with port locations as specified in the chart. Where special tank or port requirements are necessary,



Standard Tanks

Model	Volume	Overall Length	No. of Ports Face 1 & 5	Port Size	A	B	C	D	E
SCT-50	50 in^3	12"	3	3/4—16	4-1/4	4-1/2	1/2	1/2	7/16
SCT-160	160 in^3	24"	3	3/4—16					
SCT-320	320 in^3	24"	4	3/4—16	5-7/8	6	1/2	1/2	7/16
SCT-730	730 in^3	24"	5	3/4—16	8-7/8	10	3/4	3/4	11/16