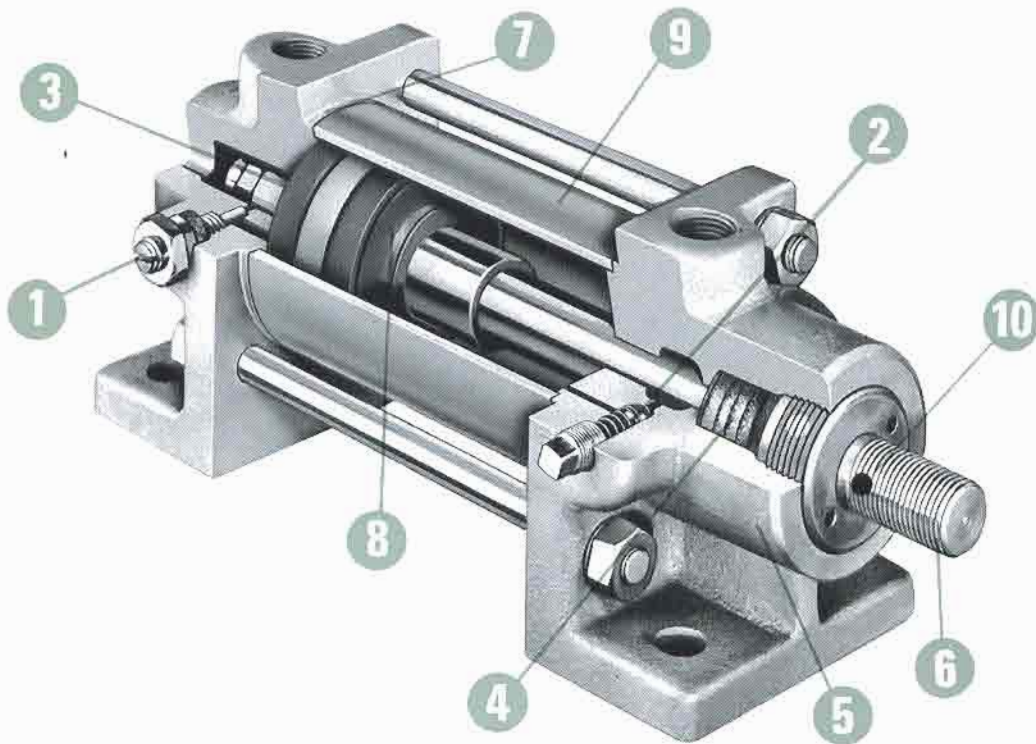


NOPAK Cylinder Design

PRODUCE DEFINITE OPERATING ADVANTAGES



Sectional view of a NOPAK Double-Acting Cylinder with Built-in, Self-Regulating Cushions. It graphically illustrates 8 other features of NOPAK Cylinder construction which contribute to smooth, efficient performance, under severe operating conditions.

MOUNTINGS Classes 1, 2 and M are available in the five standard mountings designated as Models A, C, D, E and F, illustrated on pages 6 to 11 inclusive.

TYPES OF CUSHIONING ACTION

(CLASSES 1 - 2 and M)

Self-Regulating Cushion Type (Operates Automatically)

The self-regulating cylinder head requires no adjustment. Once the cylinder is assembled, its operation is entirely automatic. As the cushion sleeve enters the bore in the cylinder head, the air or fluid is trapped between the piston and the cylinder head, forming a pneumatic or hydraulic cushion.

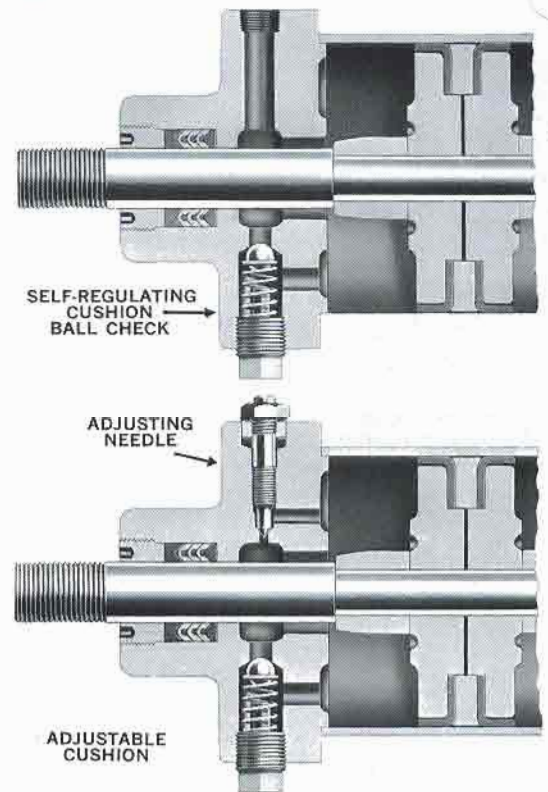
Pre-determined taper on the cushion sleeve and tolerance between it and bore in the cylinder head provide the self-regulating, positive cushion action. This maximum cushion effect remains constant at all times without needing adjustment.

Adjustable Cushion Type

The adjustable cushion is often desirable where load relations to cylinder capacity are apt to vary a great deal. After the cushion is adjusted, by means of the needle valve, the speed at which the piston continues to the end of its stroke is governed by the foregoing adjustment.

Non-Cushioned Cylinders

NOPAK cylinders can also be furnished with non-cushioned stroke, providing motion at constant speed for full travel. As there is no provision for cushioning, this type is recommended only where the piston speed is very slow, where the stroke is very short, or where the piston is stopped on the work before it reaches the end of full stroke.



Either or Both Ends May be Cushioned

Standardized design and interchangeable components, within each class of construction, permit the cushioning of either or both ends, with either Adjustable or Self-Regulating Cushions.

and Construction Features

- 1 Adjustable Cushion provides variable cushioning capacity, preventing noisy, damaging metal-to-metal impact of piston against cylinder heads.
 - 2 Quick-opening ball check-valve assures quick starting under full power. Permits line pressure to act on full piston area instantaneously.
 - 3 Special Molded Composition Wide Lip self-sealing cup packings furnished as standard. Hi-Temp Seals are available at extra cost.
 - 4 Positive Seal V-ring Stack-Packing. On cylinders 1½" through 6", three Nylok inserts lock the threaded packing gland in place and maintain proper packing compression. Larger diameters employ a piston rod bushing, packing gland and bolted retainer ring.
 - 5 Iron Alloy Cylinder Heads for durability and long life. Through a large combination of standard and special heads, it is possible to furnish cylinders with mountings for Special Applications. Double rod-end cylinders can also be furnished.
 - 6 Class 1 and 2 cylinders are regularly supplied with hard chrome plated steel piston rods*, threaded in one of three types of rod ends (B-1, B-2, B-3), fine thread series unless otherwise specified. Alternate ¼" oversize diameter rods (OB) can be accommodated in all standard rod head castings. (Oversize diameter rod is standard in 8" bore and in Class M cylinders.) Special alloy piston rods can be furnished to specification. Wrench Flats are NOT standard but are available as an option. Dimension C will increase, consult factory.
 - 7 Leakproof gasket seal between cylinder wall and head on Class 1 cylinders. Recessed gasket on Class 2 and Class M cylinders.
 - 8 Piston Follower and Follower Ring made of aluminum, wherever suitable. Weight is reduced 60% resulting in: (a) Quicker starting and increased power, (b) Longer cup-packing life due to reduced friction in horizontally mounted cylinders, (c) Reduced impact at end of stroke, (d) Less weight per assembly.
 - 9 Cylinder Tubes are of hard coated aluminum material, 1½" diameter thru 8". Honed and chrome plated I.D. steel tubing is furnished for 10" thru 14" diameter cylinders. Class M cylinders have honed steel tubing with welded flanges.
 - 10 NEW: Use drift pinhole to prevent rod rotation when attaching rod end accessories.
- * Standard piston rod material is high tensile 100,000 psi minimum yield, ground, polished, and flash chrome plated .0003/.0005 to provide a hard long-wearing surface with low friction. Consult factory for other than air applications.

PISTON ASSEMBLY TYPES



Cup Packing Type:

Cup packings, self-sealing by line pressure, are furnished as standard equipment in Class 1, 2 and Class M Mill Type cylinders. In these assemblies, a wide piston bearing area, plus light metal alloy followers, protect cups from excessive friction and wear. Different types of cups are recommended for different types of service, as follows:

1. Type A – For low pressure, air, oil or water. (Water Glycol Fire Resistant Fluids.) Temperature -20°F to +225°F.
2. Type B – Higher Temperatures -20°F to +325°F oil or air service. (Phosphate Ester Fire Resistant Fluids.)



The above is a simplified statement for general purpose and average conditions. Information on specific media and temperatures exceeding the above ratings should be referred to the Nopak Engineering Department.

Piston Ring Type:

This type may be specified in low or high hydraulic pressure, honed steel tubing cylinder. Three multiple seal lapped piston rings are precision fitted into the grooves of the cast iron piston. Rings and piston are cast iron for oil; bronze for water.

This type of piston construction is recommended where maximum life is of great importance, providing some piston by-pass is allowable; also for extremely high temperature air or hydraulic applications where heat resistant cup packings might fail.



Optional Piston Designs:

Piston illustrated is U-cup type, one of many types which can be furnished to specifications.