

How to Order and Specify

Example: Model MH Steel Heavy Duty NFPA Air Cylinder

Steel Constructed Cylinder: Cap fixed clevis mount (MP1), 3 1/4" bore x 12" stroke, 1" diameter piston rod with 3/4"-16 x 1.12 short male threads. The front and rear end caps have NPT air supply ports at end cap side *position #1*, cushions adjustment screw at side *position #2* and nothing at *positions #3 and #4*. No proximity switches are required; however, this cylinder is equipped with a "Slip Tuff" specially coated rod cartridge (optional feature) in position **J** because of severe side loaded operating conditions.

End Cap Side Locations: **1 2 3 4** **1 2 3 4**

MH 3 325 x 12 AM - ACNN - ACNN - O/Z

Position No: **A B C D E F G H J**

A Cylinder Model: Specify MH in this position.

- 1 1/2" bore through 24" bore
- Longer lasting improved nitrile seals. (Std.)
- Machined steel cylinder heads. (Std.)
- Removable, internally lubricated, bearing cartridge. (Std.)
- D.O.M. Seamless tube with hard chrome plated I.D. (Std.)
- Internally lubricated for life; no in-line lubrication required. (Std.)
- 100,000 PSI yield, chrome plated piston rod (Std.)
- Adjustable cushions with captive screw. (Cushions are optional)
- In-port mounted proximity switches for near end of stroke position sensing (*optional*). These replace mechanical limit switches
- "Slip Tuff" coated rod cartridge for severe side loaded conditions (optional).

B Specify Cylinder Mounting Style: See inside for illustrations.

MH 0	No Mount	(MX0)	MH 14	End Lugs	(MS7)
MH 1	Foot Side Lugs	(MS2)	MH 15	Centerline Lugs	(MS3)
MH 2	Head Trunnion	(MT1)	MH 16	Side Tapped	(MS4)
MH 3	Cap Fixed Clevis	(MP1)	MH 17	Head Square Flange	(MF5)
MH 4	Head Rectangular Flange	(MF1)	MH 18	Cap Square Flange	(MF6)
MH 5	Cap Rectangular Flange	(MF2)	MH 19	Head Square Block (<i>For 8" and larger bores</i>)	(ME3)
MH 6	Intermediate Trunnion	(MT4)	MH 20	Cap Square Block (<i>For 8" and larger bores</i>)	(ME4)
<i>(See XI note on back page)</i>			MH 21	Cap Detachable Eye	(MP4)
MH 7	Cap Trunnion	(MT2)	MH 22	Cap Fixed Spherical Eye	(MP5)
MH 8	Head Tie Rod Extended	(MX3)	MH 24	Cap Detachable Clevis	(MP2)
MH 11	Cap Tie Rod Extended	(MX2)	MH 25	Cap Fixed Eye	(MP3)
MH 12	Head & Cap Tie Rod Extended	(MX1)	MH 27	Cap Detachable Clevis	(<i>Equals MP1 envelope dimensions</i>)
MH 13	End Angles	(MS1)			

C Specify Cylinder Bore

150	=	1 1/2" bore	500	=	5" bore
200	=	2" bore	600	=	6" bore
250	=	2 1/2" bore	800	=	8" bore
325	=	3 1/4" bore	1000	=	10" bore
400	=	4" bore	1200	=	12" bore

Note: For 14" bore through 24" bore call Peninsular.

D Specify Stroke Length

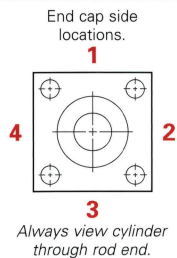
Peninsular MH Cylinders can be ordered in 1/4" increments with stroke lengths from 1/2" to over 15 feet.

For Stop Spool (Stop Tube) and Spring Return Extend applications, contact Peninsular to determine call out for correct stroke length to specify.

E Specify Piston Rod Diameter and Rod Threads: See Rod Chart on next page.

F-G Specify Plumbing Configuration for Front End Cap (F) and Rear End Cap (G)

- N** = No air supply port. No cushion adjustment screw.
A = Air supply port.
S = Proximity switch will be affixed by Peninsular to the cylinder head. (Complete position **H**)
M = Cylinder head is prepared to receive an "in-port" mounted proximity switch. Peninsular will not mount the switch to the cylinder head. (Specify 'O' in position **H**)
C = Cushion adjustment screw.
B = Cushion adjustment screw and port at same end cap side location.



H Optional Proximity Switches (If none required, specify "O" in Position H)

CYLINDER HEAD MOUNTED PROXIMITY SWITCHES - RF Inductive Proximity Switches are In-Port Mounted to a Precision Machined Surface on the Cylinder End Caps

Specify Switch Type **B11** = Balluff - Mini-Connector **T-11** = Turck Mini-Connector
 B31 = Balluff - Micro-Connector **T-31** = Turck Micro-Connector

Other Cylinder Head Mounted Proximity Switches are also available - Topworx, Namco, Pepperl & Fuchs, etc.
Proximity Switch Cordsets are available in various lengths - contact Peninsular for Ordering Information.

RF Inductive (Cylinder Head Mounted) Proximity Switch Probe Length Dimensions (both End Caps without Spacers)										
Bore Size	1 1/2"	2"	2 1/2"	3 1/4"	4"	5"	6"	8"	10"	12"
Probe Length	1.025"	1.025"	1.025"	1.025"	1.250"	2.062"	2.062"	2.875"	3.775"	4.562"

TIE ROD MOUNTED PROXIMITY SWITCHES - Magnetic Piston Sensing (Call Peninsular if Required)

0V to 120V AC/DC, NPN (Sinking) and PNP (Sourcing) - DC. Mini, Micro and other connectors are available. Proximity switch cordsets are available in various lengths. Magnetic inductive, hall effect and reed technologies are all available.

J Specify Optional Features with Slash Mark and Alpha Character(s)

/B Adjustable Stroke
/E Extended Piston Rod*
/F Bronze Rod Cartridge
/H Rod Boot Cover
/J Spring Extend
/K Spring Return
/N Stop Tube*
/R Threaded Stud Rod End
/S Scraper Ring
/U Non-Rotatable Piston Ring
/V Viton Seals
/XI Specify XI Dimension (MH6)
/Y Double Rod End
/Z "Slip Tuff" Coated Rod Cartridge

* Specify Length

E Specify Piston Rod Diameter and Rod Threads

First letter denotes Rod Diameter, specify:

A = (Standard Rod Diameter)
B = (Medium Rod Diameter)
C = (Large Rod Diameter)
D = (Oversized Rod Diameter)
E = (Oversized Rod Diameter)

Second letter denotes Rod Threads, specify:

M = (External NFPA Short Male)
F = (NFPA Short Female)
D = (NFPA Full Male)
I = (NFPA Intermediate Male)
A = (NFPA Long Male)
X = (Other Rod Ends — please specify)
S = (Spooled Rod End, Contact Peninsular for Dimensional Information)

Other rod sizes & thread sizes are available, please call Peninsular.

For Bore Sizes 14" through 24" bore, contact Peninsular.

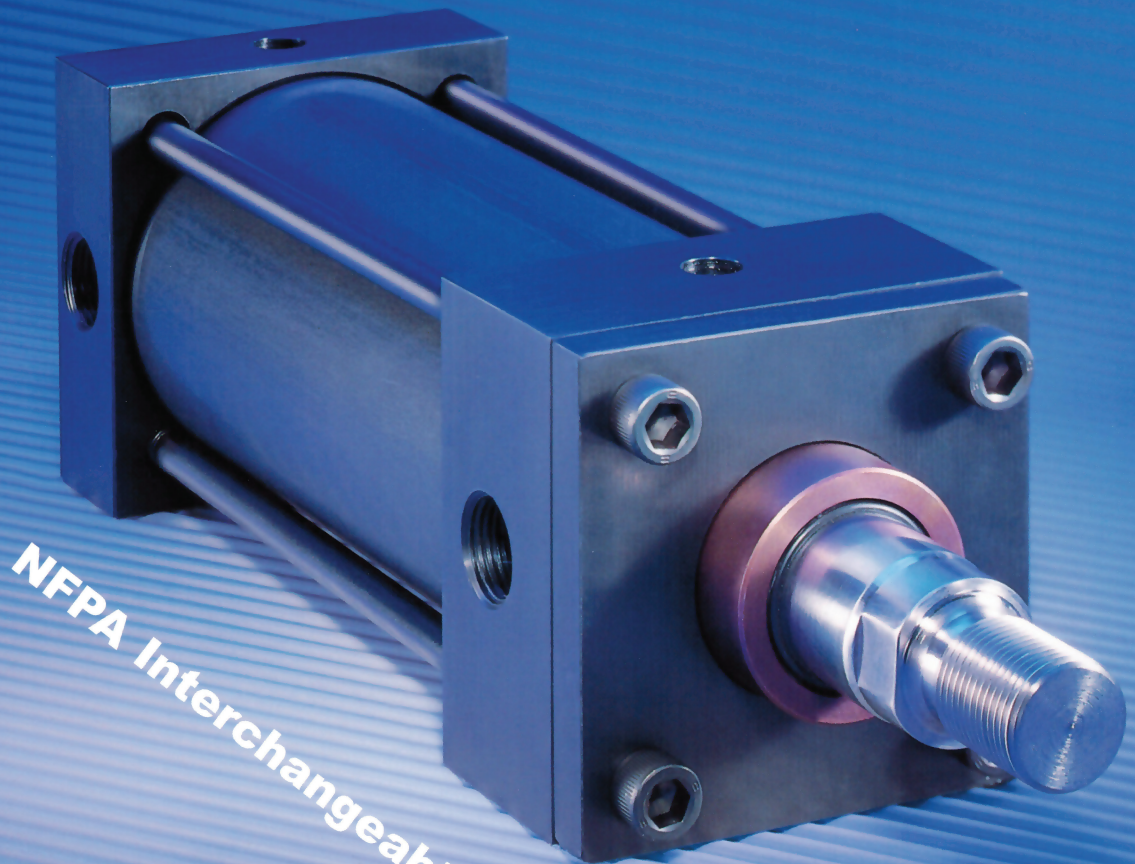
Bore Size	Rod Diameter	Short Male Specify "M"	Short Female Specify "F"	Full Male Specify "D"	Intermediate Male Specify "I"	Long Male Specify "A"
1.50	A = 0.62	7/16"-20 x 0.75	7/16"-20 x 0.75	5/8"-18 x 0.75	1/2"-20 x 0.75	1/2"-20 x 1.12
	B = 1.00	3/4"-16 x 1.12	3/4"-16 x 1.12	1"-14 x 1.12	7/8"-14 x 1.12	7/8"-14 x 1.87
2.00	A = 0.62	7/16"-20 x 0.75	7/16"-20 x 0.75	5/8"-18 x 0.75	1/2"-20 x 0.75	1/2"-20 x 1.12
	B = 1.00	3/4"-16 x 1.12	3/4"-16 x 1.12	1"-14 x 1.12	7/8"-14 x 1.12	7/8"-14 x 1.87
2.50	A = 0.62	7/16"-20 x 0.75	7/16"-20 x 0.75	5/8"-18 x 0.75	1/2"-20 x 0.75	1/2"-20 x 1.12
	B = 1.00	3/4"-16 x 1.12	3/4"-16 x 1.12	1"-14 x 1.12	7/8"-14 x 1.12	7/8"-14 x 1.87
3.25	C = 1.38	1"-14 x 1.62	1"-14 x 1.62	1-3/8"-12 x 1.62	1-1/4"-12 x 1.62	1-1/4"-12 x 2.50
	A = 1.00	3/4"-16 x 1.12	3/4"-16 x 1.12	1"-14 x 1.12	7/8"-14 x 1.12	7/8"-14 x 1.87
4.00	B = 1.38	1"-14 x 1.62	1"-14 x 1.62	1-3/8"-12 x 1.62	1-1/4"-12 x 1.62	1-1/4"-12 x 2.50
	C = 1.75	1-1/4"-12 x 2.00	1-1/4"-12 x 2.00	1-3/4"-12 x 2.00	1-1/2"-12 x 2.00	1-1/2"-12 x 3.00
5.00	A = 1.00	3/4"-16 x 1.12	3/4"-16 x 1.12	1"-14 x 1.12	7/8"-14 x 1.12	7/8"-14 x 1.87
	B = 1.38	1"-14 x 1.62	1"-14 x 1.62	1-3/8"-12 x 1.62	1-1/4"-12 x 1.62	1-1/4"-12 x 2.50
6.00	C = 1.75	1-1/4"-12 x 2.00	1-1/4"-12 x 2.00	1-3/4"-12 x 2.00	1-1/2"-12 x 2.00	1-1/2"-12 x 3.00
	D = 2.00	1-1/2"-12 x 2.25	1-1/2"-12 x 2.25	2"-12 x 2.25	1-3/4"-12 x 2.25	1-3/4"-12 x 3.50
8.00	A = 1.00	3/4"-16 x 1.12	3/4"-16 x 1.12	1"-14 x 1.12	7/8"-14 x 1.12	7/8"-14 x 1.87
	B = 1.38	1"-14 x 1.62	1"-14 x 1.62	1-3/8"-12 x 1.62	1-1/4"-12 x 1.62	1-1/4"-12 x 2.50
10.00	C = 1.75	1-1/4"-12 x 2.00	1-1/4"-12 x 2.00	1-3/4"-12 x 2.00	1-1/2"-12 x 2.00	1-1/2"-12 x 3.00
	D = 2.50	1-7/8"-12 x 3.00	1-7/8"-12 x 3.00	2-1/2"-12 x 3.00	2-1/4"-12 x 3.00	2-1/4"-12 x 4.50
12.00	E = 3.00	2-1/4"-12 x 3.50	2-1/4"-12 x 3.50	3"-12 x 3.50	2-3/4"-12 x 3.50	2-3/4"-12 x 5.50
	A = 1.75	1-1/4"-12 x 2.00	1-1/4"-12 x 2.00	1-3/4"-12 x 2.00	1-1/2"-12 x 2.00	1-1/2"-12 x 3.00
14.00	B = 2.00	1-1/2"-12 x 2.25	1-1/2"-12 x 2.25	2"-12 x 2.25	1-3/4"-12 x 2.25	1-3/4"-12 x 3.50
	C = 2.50	1-7/8"-12 x 3.00	1-7/8"-12 x 3.00	2-1/2"-12 x 3.00	2-1/4"-12 x 3.00	2-1/4"-12 x 4.50
16.00	D = 3.00	2-1/4"-12 x 3.50	2-1/4"-12 x 3.50	3"-12 x 3.50	2-3/4"-12 x 3.50	2-3/4"-12 x 5.50
	E = 3.50	2-1/2"-12 x 3.50	2-1/2"-12 x 3.50	3-1/2"-12 x 3.50	3-1/4"-12 x 3.50	3-1/4"-12 x 6.50
18.00	A = 2.00	1-1/2"-12 x 2.25	1-1/2"-12 x 2.25	2"-12 x 2.25	1-3/4"-12 x 2.25	1-3/4"-12 x 3.50
	B = 2.50	1-7/8"-12 x 3.00	1-7/8"-12 x 3.00	2-1/2"-12 x 3.00	2-1/4"-12 x 3.00	2-1/4"-12 x 4.50
20.00	C = 3.00	2-1/4"-12 x 3.50	2-1/4"-12 x 3.50	3"-12 x 3.50	2-3/4"-12 x 3.50	2-3/4"-12 x 5.50
	D = 3.50	2-1/2"-12 x 3.50	2-1/2"-12 x 3.50	3-1/2"-12 x 3.50	3-1/4"-12 x 3.50	3-1/4"-12 x 6.50
22.00	E = 4.00	3"-12 x 4.00	3"-12 x 4.00	4"-12 x 4.00	3-3/4"-12 x 4.00	3-3/4"-12 x 7.50
	A = 2.00	1-1/2"-12 x 2.25	1-1/2"-12 x 2.25	2"-12 x 2.25	1-3/4"-12 x 2.25	1-3/4"-12 x 3.50
24.00	B = 2.50	1-7/8"-12 x 3.00	1-7/8"-12 x 3.00	2-1/2"-12 x 3.00	2-1/4"-12 x 3.00	2-1/4"-12 x 4.50
	C = 3.00	2-1/4"-12 x 3.50	2-1/4"-12 x 3.50	3"-12 x 3.50	2-3/4"-12 x 3.50	2-3/4"-12 x 5.50
26.00	D = 3.50	2-1/2"-12 x 3.50	2-1/2"-12 x 3.50	3-1/2"-12 x 3.50	3-1/4"-12 x 3.50	3-1/4"-12 x 6.50
	E = 4.00	3"-12 x 4.00	3"-12 x 4.00	4"-12 x 4.00	3-3/4"-12 x 4.00	3-3/4"-12 x 7.50



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Peninsular AIR cylinders

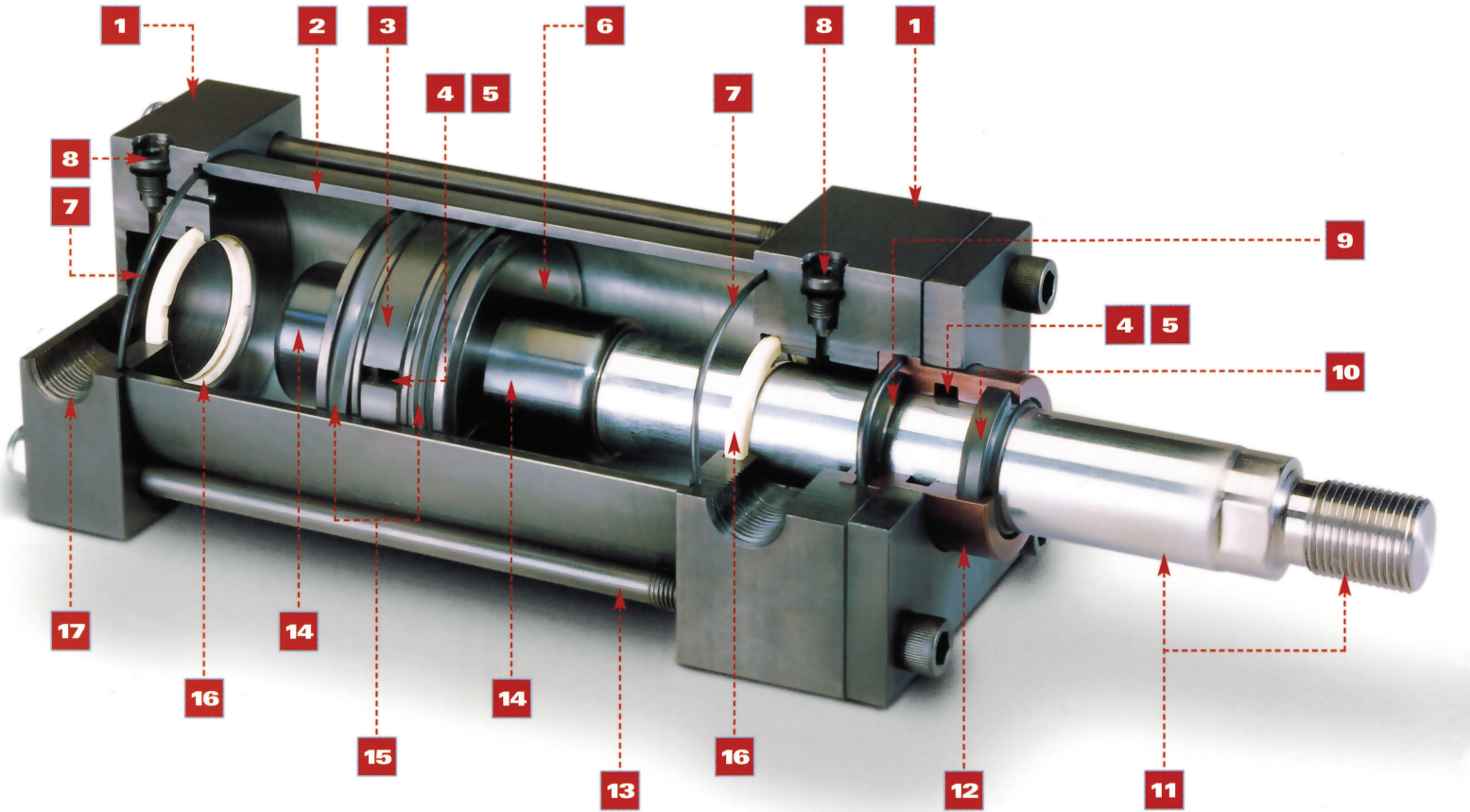
Steel / Pre-Lubricated
250 psi / Heavy Duty



MH Series steel air cylinders

Pre-Lubricated, 250 psi,
Heavy Duty Service

Feature for feature,
Peninsular Cylinders are exceptional!



Peninsular Cylinder Company

For over 50 years Peninsular has been manufacturing pneumatic and hydraulic cylinders for OEM and MRO applications that require top performance and extended service in destructive manufacturing environments.

Engineered and Built for Endurance

Peninsular Air Cylinders incorporate state-of-the-art design features that are fabricated to very strict tolerance specifications. The result is reliable and trouble-free operation under the most demanding conditions. In addition, you may design and configure all MH cylinders to your specific requirements. A 3D solid model and/or a 2D drawing can be printed or instantly downloaded into your CAD drawing at the push of a button (also see "easy order procedure". You may access our MH cylinder configurator

through our web site at: www.peninsularcylinders.com to initiate this cost free engineering benefit.

Choose From a Wide Selection

MH Cylinders are available in all NFPA mounting styles and rod diameters with bore sizes ranging from 1-1/2" to 24". In addition, MH Series Cylinders may also be custom designed to suit specific customer applications. "Viton" and other type seal materials are available to meet your specific needs. These cylinders are also available with metric dimensions. When ordering our Metric Air Cylinders use the prefix letter "I" for model designation; e.g. (IMH).

ISO 9001: 2008 Registered

MH Series Cylinders are manufactured to world class quality standards with a proven track record of superior performance and endurance. Consult the factory for more information.

Feature	Advantage	Benefit
1. Heads and Caps	Square, precision-machined steel.	Assures concentricity of tube, bearing, cushion and piston rod. Can be made proximity switch ready to accept same probe-length switches at each end without spacers.
2. Cylinder Tube	D.O.M. seamless 1020 to 1026 steel; precision honed to 12/15 micro inch finish; hard chrome plated .0003/.0005" thick on ID.	Resists wear, corrosion and dents; reduces wear on piston seals.
3. Wear Band	Delrin™ material.	Creates low friction, long lasting wear surface which prevents scoring of cylinder tube inner wall.
4. Lubrication Reservoirs	Located underneath wear band inside piston and also inside the bearing cartridge.	Provides effective way of metering maximum amount of lubricant to all areas over long time period. Not subject to air turbulence and contamination.
5. Lubricant (not shown)	Teflon™ based grease, is standard. USDA food grade approved grease is optional.	Long lasting lubrication of piston seals, inner cylinder wall surface and rod bearing cartridge seals and ID.
6. Piston	One-piece steel, black oxidized with uniform cushion hubs on both sides, threaded onto piston rod, staked and secured with Loc-Tite™.	Prevents rusting and air leakage; anchored onto piston rod with minimum undercut providing maximum strength. Additional pinning onto rod optional.
7. Tube Seals	Buna-N Nitrile axial placed O-Rings.	When combined with accurately torqued tie rods, prevents extrusion of seal and air leaks under pressure.
8. Cushion Adjustment Screw	Steel needle valve with Buna-N O-ring sealed screw, held captive with locking snap ring.	Accurate fine adjustment of cushioning speed; no air leakage and safe for all users due to internal captive screw.
9. Rod Seal	80 durometer, rounded lip, pre-lubricated, carboxylated nitrile cup style.	Smears grease through ID of rod cartridge extending seal life within. Resists abrasion; significantly increases life and prevents leakage around piston rod.
10. Rod Wiper	80 durometer, sharp double lip, pre-lubricated, carboxylated nitrile seal. Provides additional sealing benefit beyond the rod seal.	Inside edge always lubricated extends life significantly, prevents dirt and grit from entering bearing and cylinder.
11. Piston Rod	High yield strength steel, case hardened OD to 50-55 RC. Core hardness to 28-34 RC. Hard chrome plated .0003/.0005" thick and polished to 12/15 micro inch finish. Rolled threads.	Resists wear. All NFPA rod and thread sizes, including female and studded male ends available, plus metric threads. Provides positive connections to existing machine components.
12. Bearing Cartridge	Floating, self-aligning in either ductile iron or SAE 660 bronze with internal lubrication reservoir. Special "Slip Tuff" coated cartridge is also available for heavy side loaded applications. Retained by plate with cap screws; strong and shock resistant. A Buna-N O-ring located around the cartridge OD prevents leakage.	Float condition minimizes piston rod misalignment by reducing side loading. ID of bearing cartridge, rod seal and rod wiper lubricated on each stroke, reducing wear. Easily removed for maintenance without special tools to disassemble cylinder. Optional "Slip Tuff" bearing provides lubricist wear surface with hardness characteristics that significantly reduce galling and bearing cartridge failure under severe side loaded operating conditions.
13. Tie Rods	Made from 100,000 psi minimum yield, stress-proof, medium carbon steel with rolled threads at each end.	Provides maximum strength for connecting cylinder mounts and used with lock nuts to prevent loosening in service. Accurate torquing prevents leaks at tube seals.
14. Cushion Hubs	Steel with 8/12 micro inch finish RMS. Black oxidized to prevent rusting.	Uniform on each side of piston to eliminate different size seals and reduce parts inventory. Smooth finish stops seal wear and provides air-tight, accurate operation. Ideal for proximity switch application.
15. Piston Seals	80 durometer, rounded lip, pre-lubricated, carboxylated nitrile U cups.	Resists abrasion; when used with Peninsular's internal lubrication system, provides considerably less wear and increases operating life.
16. Cushion Seals	90 durometer floating check type Urethane seals eliminate ball checks and related parts.	Low friction breakaway and 100% air-tight cushioning assures smooth maximum effectiveness. Metal to metal cushions are eliminated and same size seals at each end reduce parts inventory.
17. Ports	NPT standard, SAE O-ring optional. Metric and other thread size options.	Universally adaptable to any hose or fitting.
18. Optional Proximity Switch Capability (not shown)	Allows for non-contact piston position sensing at near end of stroke. Precision machined cylinder heads and piston cushion hubs allow for in-port mounting of "RF inductive" proximity switches using the same switch probe length at each cylinder end without shims or spacers underneath the switch.	Self-contained switch probe not subject to contamination. This patented design creates the same air gap between the sensing probe and target (cushion hubs), thus providing consistent, reliable and repeatable stroke-to-go. Eliminates the design and construction of brackets necessary to mount mechanical limit switches.

Easy Order Procedure

Refer to the "How to order and specify" section of this brochure for ordering information or visit our MH cylinder configurator where you can design and configure your own MH cylinder. When complete, a solid picture of the cylinder you created will appear with its correct part number for ordering. Seal Kit part numbers and Cylinder accessories with their related part numbers are also configurable and will be attached to your MH cylinder if configured. Access our configurator through our web site at: www.peninsularcylinders.com (also see "engineered and built for endurance").

Complete Repair Facility

Peninsular repairs all air and hydraulic cylinder makes and models. All cylinders are performance tested before shipment. Estimates are provided prior to repair activity.

Field Service and Engineering Support

We understand the importance of technical assistance and the availability of products and repair parts. That's why we have a distributor network and technical representatives throughout the country. You can also reach our Customer Service Department for help.



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NFPA Mounting Styles

MH 0 No Mount 	MH 8 Head Tie Rod Extended (MX3) 	MH 18 Cap Square Flange (MF6)
MH 1 Foot Side Lugs (MS2) 	MH 11 Cap Tie Rod Extended (MX2) 	MH 19 Head Square Block (ME3)
MH 2 Head Trunnion (MT1) 	MH 12 Head and Cap Tie Rod Extended (MX1) 	MH 20 Cap Square Block (ME4)
MH 3 Cap Fixed Clevis (MP1) 	MH 13 End Angles (MS1) 	MH 21 Cap Detachable Eye (MP4)
MH 4 Head Rectangular Flange (MF1) 	MH 14 End Lugs (MS7) 	MH 22 Cap-Fixed Spherical Eye (MP5)
MH 5 Cap Rectangular Flange (MF2) 	MH 15 Centerline Lugs (MS3) 	MH 24 Cap Detachable Clevis (MP2)
MH 6 Intermediate Trunnion (MT4) 	MH 16 Side Tapped (MS4) 	MH 25 Cap-Fixed Eye (MP3)
MH 7 Cap Trunnion (MT2) 	MH 17 Head Square Flange (MF5) 	MH 27 Cap Detachable Clevis

Note: Specify XI dimension at position "J" when ordering an intermediate trunnion cylinder (MH 6). In the absence of an XI dimension, Peninsular will center the intermediate trunnion between the two end caps.