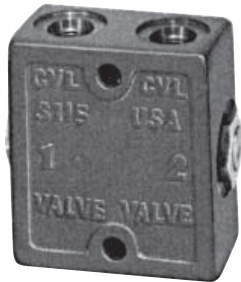


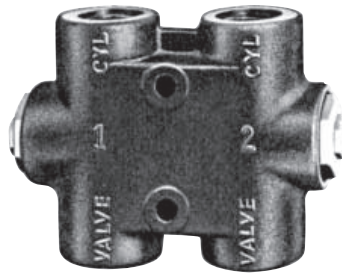
Bulletin HY14-2719-B1/US

Series LO and LOA Lock Valves

Pilot Operated Check Valves



Series LOA



Series LO

Effective: February 1, 2004
Supersedes: Cat. No. GPA-4-100 dated 3/95

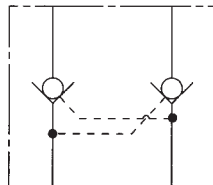
Features

- Hardened seats
- Ball/Spring checks
- High-tensile cast iron body

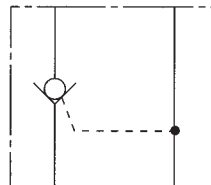
Description

Parker's Series LO and LOA lock valves are designed to lock a cylinder, or part of a circuit, without leakage while a control valve is in a neutral position. Lock valves function as check valves, allowing flow to a cylinder and blocking reverse flow until pilot pressure is applied to "unlock" the circuit.

These valves may be used to prevent movement of a load while the pressure source is inactive.



DOUBLE



SINGLE

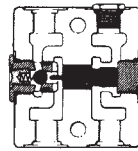
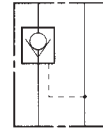
Specifications

	LO	LOA
Capacity (nominal)	25 GPM [94 litres/min]	10 GPM [37 litres/min]
Maximum Operating Pressure	3000 PSI [207 bar]	3000 PSI [207 bar]
Ratio of pilot piston area to check valve seat area	3.36 to 1	3.36 to 1
Shipping Weight	6 Pounds [2,7 kg]	2-3/4 Pounds [1,3 kg]

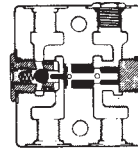
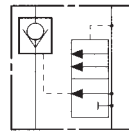
TYPES AVAILABLE

Besides model variations in port sizes and capacities, three different types are available.

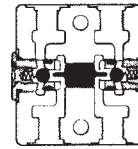
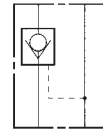
SINGLE TYPE (S), Designed for use with a single-acting cylinder or to lock one side of a double-acting cylinder.



SINGLE-UNLOADING TYPE (SU), available on Model LO only. May be used only with single-acting cylinders. This type unloads the pump after unlocking the circuit. "U" is stamped on the construction plug for identification.

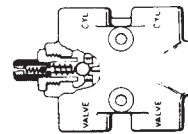


DOUBLE-TYPE (D), used with a double-acting cylinder or motor where it is necessary to lock in two directions.

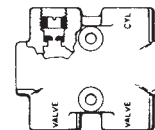


OPTIONS

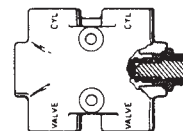
EXPANSION RELIEF (R), prevents build up of pressure in a locked circuit due to temperature rise.



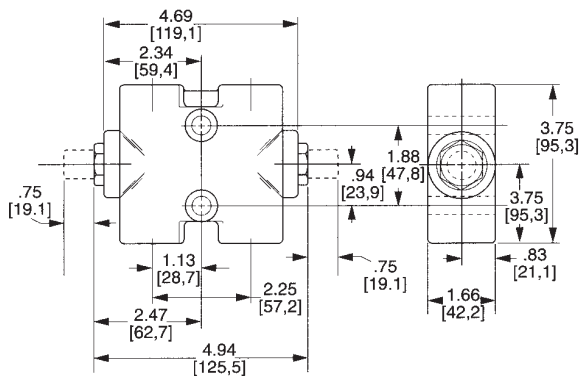
ORIFICE RESTRICTOR (T), restricts rate of return flow after unloading prevents chattering by maintaining unloading pressure. Not available for Model LOA.



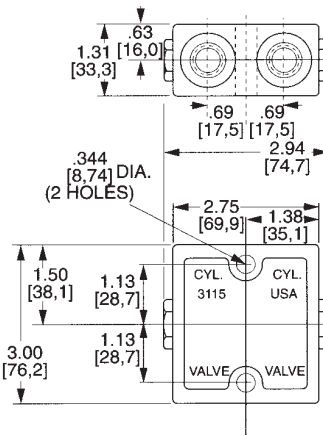
MANUAL UNLOCK (M), enables circuit to be unlocked manually in event that hydraulic unlocking pressure is insufficient. For S and SU options only. Not available for Model LOA.



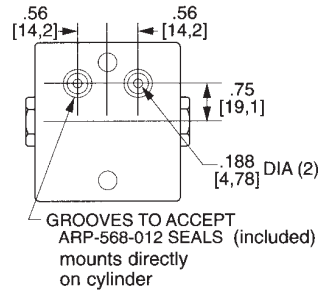
DIMENSIONS



MODEL LO



MODEL LOA



MODEL LOAC

APPLICATION DATA

Control

A 4-way control valve is required for all lock valve circuits, including single-acting cylinders, in order to apply unlocking pressure to the pilot circuit.

A control valve with a free-flow (motor) spool should be used on any circuit which includes a lock valve to prevent pressure build-up between the lock valve and the control valve.

Unlocking Pressure (Single-Acting Cylinders)

Pressure required in the pilot circuit of the valve to unlock a single-acting cylinder is 30% of the locked pressure.

Unlocking Pressure (Double-Acting Cylinders)

In double-acting cylinder installations the unlocking pressure is a function of trapped pressure, cylinder and rod areas as follows:

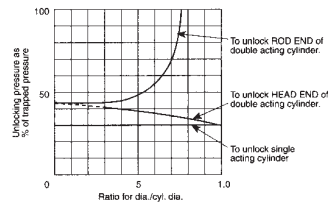
When cylinder HEAD END circuit is locked:

$$\text{Unlocking pressure} = 3.36 - \left(\frac{\text{Rod End "Locked" Pressure} \times (\text{Cyl. Area} - \text{Rod Area})}{\text{Cyl. Area}} \right)$$

When cylinder ROD END circuit is locked:

$$\text{Unlocking Pressure} = 3.36 - \left(\frac{\text{Head End "Locked" Pressure} \times (\text{Cyl. Area} - \text{Rod Area})}{\text{Cyl. Area}} \right)$$

Results of these formulae are shown graphically below for various ratios of rod/cylinder diameters.



CAUTION: Note that when the rod end of a double-acting cylinder is locked, if the rod diameter exceeds approximately .75 times the cylinder diameter, unlocking pressure becomes excessive and the lock valve should not be used.

EXAMPLE:

A 6" diameter double acting cylinder has a 2" diameter rod. Pressure trapped in head end is 1000 psi.

Using the formula

$$\text{Pressure needed to unlock head end} = \frac{1000}{3.36 - \left(\frac{28.27 - 3.14}{28.27} \right)} = 405 \text{ psi}$$

Using the graph

Ratio of rod dia./cyl. dia. = 2/6 = .333

Enter the graph at bottom edge at ratio .333 and move vertically to intersect "UNLOCK HEAD END" curve, then horizontally to 40.5 on percentage scale at left. 1000 psi x 40.5% = 405 psi unlocking pressure

DIMENSIONS ARE IN INCHES (MILLIMETERS) AND ARE FOR REFERENCE ONLY.

ORDER CODE

MODEL NO. LOA - C - 10 - S - R1

MODEL	
LO	Up to 25 GPM [94,6 litres/min]
LOA	Up to 10 GPM [37,9 litres/min]

LOA ONLY	
-	Standard Porting Location
C	Cylinder Manifold Mounting (LOA only)

PORT SIZES	
LO Only (4 Ports)	
10	SAE 10 (7/8" – 14 UNF)
50	1/2" – 14 NPT
51	1/2" – 14 BSP

LOA Only (4 Standard Ports or 2 Lower Ports if Cylinder Manifold Mount is specified)	
6	SAE 6 (9/16" – 18 UNF)
25	1/4" – 18 NPT
21	1/4" – 19 BSP (All Ports)
31	3/8" – 19 BSP (Manifold Mount)

LOCATION OF OPTION

Selected option may be located on either end or both ends on a "Double" Lock Model. Specify.

1	Left Side of Valve (Marked NOL 1 on Valve).
2	Right Side of Valve (Marked NO. 2 on Valve).

OPTIONS—Omit if no options wanted

R	Expansion Relief (Factory set at 3500 PSI [241 bar] cracking unless otherwise specified)
T	Orifice Restrictor (LO Valves only)
M	Manual Unlocking (LO Valves only)*

TYPE

S	Single
SU	Single Unloading (LO Valves only)
D	Double

NOTE: NPT ports are not recommended for pressures above 2000 PSI [138 bar].

WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the "Offer of Sale".

© Copyright 2004, Parker Hannifin Corporation, All Rights Reserved



Parker Hannifin Corporation
 Hydraulic Valve Division
 520 Ternes Avenue
 Elyria, Ohio, USA 44035
 Tel: (440) 366-5200
 Fax: (440) 366-5253
www.parker.com/hydraulicvalve

Bulletin HY14-2719-B1/US,
 3C, 2/04, PHD