

Pascal Link Clamp

Highly flexible mounting design

One piece body design for higher rigidity and position tolerance

Link pin support is forged and integrated with the cylinder body for durability with high power.



Solid body (Carbon steel)

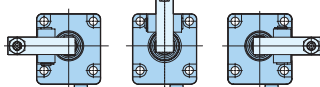
Non-breathing ram cylinder

Fully sealed ventless cylinder prevents coolant from entering the spring chamber to enhance durability and reliability.

Choice of forward, left and right clamp arm position

Three styles available with clamp arm direction according to the layout of workpieces or piping for the fixture.

Left Forward Right



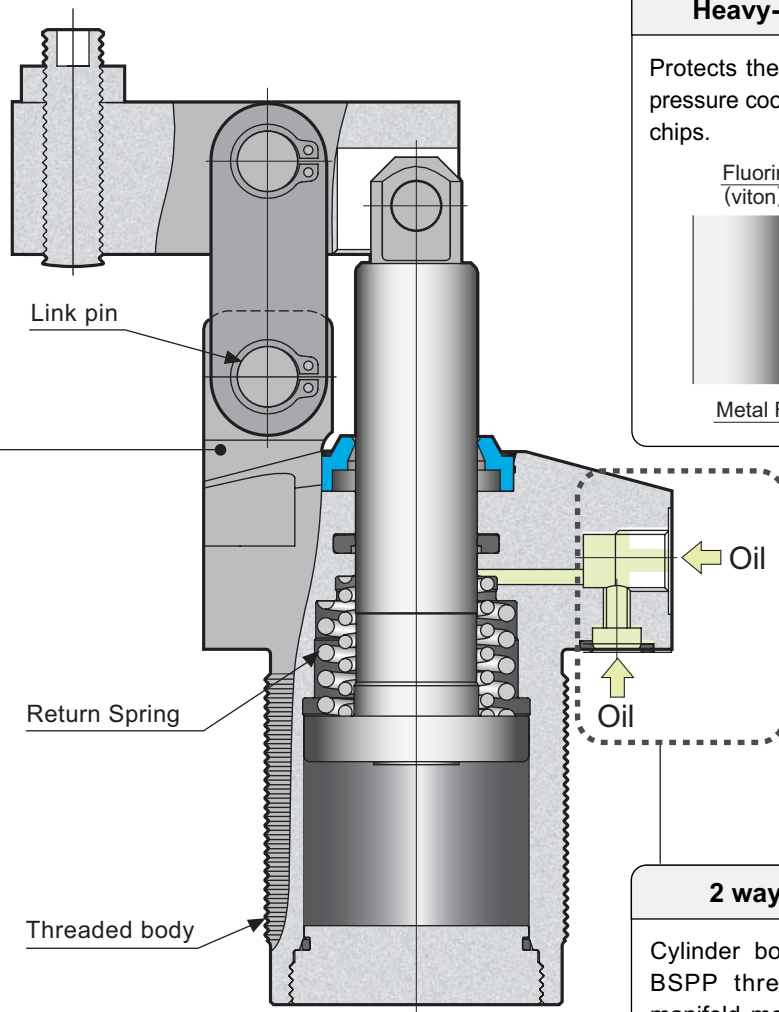
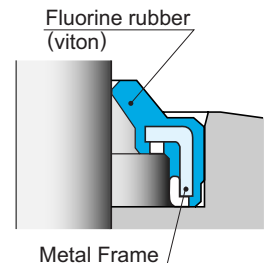
A variety of workpieces can be clamped by replacing the clamp arm. Standard and extended length arms are available as options.

Corrosion resistant body

Cylinder body and piston rod are ion-nitrided to enhance the durability against friction and rust.

Heavy-duty scraper

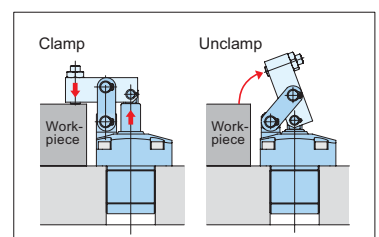
Protects the cylinder from high pressure coolant and machining chips.



2 way oil supply

Cylinder body designed with BSPP threaded ports and manifold mount oil feed holes. Removable plugs allow for easy changeover.

Single acting model **CLV**



Model		CLV06	CLV10	CLV16	CLV25
Cylinder force at 5000 psi		1550 lbs	2430 lbs	3800 lbs	5470 lbs
Retun spring force	at clamp position (Fs)	58 lbs	102 lbs	117 lbs	168 lbs
	at unclamp position	28 lbs	43 lbs	66 lbs	90 lbs
Clamping force ※1	at 5000 psi	970 lbs	1600 lbs	2590 lbs	3580 lbs
	at 3500 psi	670 lbs	1100 lbs	1790 lbs	2480 lbs
	at 2000 psi	370 lbs	600 lbs	990 lbs	1370 lbs
Standard clamp arm length (LH)		1.97 in	2.22 in	2.74 in	3.44 in
Rod diameter		0.63 in	0.79 in	0.98 in	1.18 in
Cylinder effective area (A)		0.31 in ²	0.49 in ²	0.76 in ²	1.10 in ²
Full stroke		1.02 in	1.16 in	1.42 in	1.77 in
Piston rod stroke		0.91 in	1.04 in	1.30 in	1.65 in
Safety stroke		0.12 in	0.12 in	0.12 in	0.12 in
Cylinder oil capacity		0.32 in ³	0.57 in ³	1.08 in ³	1.95 in ³
Maximum oil flow rate		33 in ³ / min	61 in ³ / min	118 in ³ / min	217 in ³ / min
Recommended inner diameter of pipe ※2		0.19 in	0.19 in	0.25 in	0.25 in
Maximum allowable weight of clamp arm ※3		0.9 lbs	1.5 lbs	2.7 lbs	5.1 lbs
Weight		3.5 lbs	5.1 lbs	9.7 lbs	16.3 lbs

Working pressure range 500~5000 psi, Ambient temperature 32~158°F

※1 : With standard length clamp arm (G1 series, See page 9) equipped

※2 : When multiple clamps are connected in single circuit or when long tubing lengths are used.

※3 : Under the condition that the standard length clamp arm is extended to the longitudinal direction only.

※ : Fluorine rubber (Viton) is adopted at the sealing portions for protection against chlorine coolant. (This is not a heat proof specification)

Model ordering (Example : CLV16-F)

① Size (Refer to specification table.)

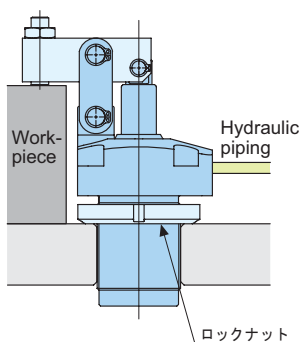
② Clamp arm mounting direction (Refer to below diagram.)

CLV	06	—	L : Left F : Forward R : Right
	10		
	16		
	25		

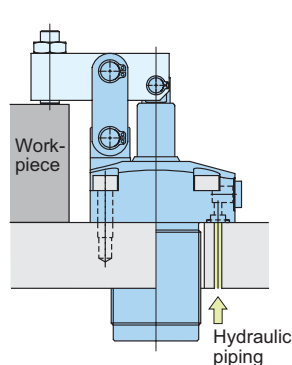
Mounting example

Clamp arm mounting direction

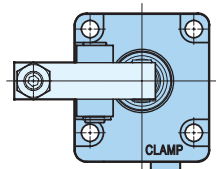
Threaded body mount with piping connection



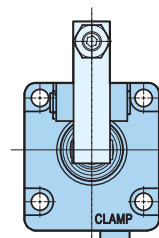
Manifold mount using upper flange



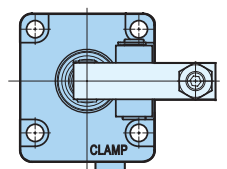
CLV ① -L
Left



CLV ① -F
Forward



CLV ① -R
Right



Clamp arm length (LH) and clamping force (Performance table and diagram)

The clamping force varies according to the clamp arm length and hydraulic force.

Select the most suitable model considering clamp arm length, working pressure applicable and mounting dimension, etc. with the following tables or diagrams according to the convenience.

Note :

The shorter the length of the clamp arm, the larger the forces are at the link structure.

Do not use in the nonusable area to avoid overloading the link structure.

<EXAMPLE : 1>

When clamp arm length (LH) 2.50 inches and clamping force 670 lbs are required, the applicable hydraulic pressures are as follows.

CLV06 - 5000 psi

CLV10 - 3000 psi

CLV16 - 1500 psi

CLV25 - 1000 psi

<EXAMPLE : 2>

When using model CLV10 with hydraulic pressure 5000 psi, clamping forces against the clamp arm are as follows.

LH= 6.00 in - 400 lbs

LH= 3.00 in - 990 lbs

LH= 2.00 in - 1960 lbs

LH= 1.50 in - Nonusable

CLV 06 indicates nonusable range.

Hydraulic pressure (psi)	Cylinder force (lbs)	Clamping force (lbs)								Minimum clamp arm length (in)
		Clamp arm length LH (in)								
		1.30	1.50	1.97	2.50	3.00	4.00	5.00		
5000	1550		1660	970	670	510	350	270	1.45	
4500	1400		1490	880	600	460	320	240	1.38	
4000	1250	1870	1310	770	530	410	280	210	1.30	
3500	1090	1620	1140	670	460	350	240	180	↑	
3000	930	1380	970	570	390	300	210	160	↑	
2500	780	1130	800	470	320	250	170	130	↑	
2000	620	890	630	370	250	190	130	100	↑	
1500	470	640	450	270	180	140	100	70	↑	
1000	310	400	280	170	110	90	60	50	↑	
500	160	150	110	60	40	30	20	20	1.30	
Maximum working pressure (psi)		4300	5000	5000	5000	5000	5000	5000		

CLV 10 indicates nonusable range.

Hydraulic pressure (psi)	Cylinder force (lbs)	Clamping force (lbs)										Minimum clamp arm length (in)
		Clamp arm length LH (in)										
		1.50	2.00	2.22	2.50	3.00	3.50	4.00	5.00	6.00		
5000	2430		1960	1600	1320	990	800	670	500	400	1.71	
4500	2190		1750	1440	1180	890	720	600	450	360	1.63	
4000	1950	2990	1550	1270	1040	790	630	530	400	320	1.50	
3500	1700	2600	1340	1100	910	680	550	460	340	280	↑	
3000	1460	2200	1140	940	770	580	470	390	290	230	↑	
2500	1220	1810	940	770	630	480	380	320	240	190	↑	
2000	970	1410	730	600	490	370	300	250	190	150	↑	
1500	730	1020	530	430	360	270	220	180	140	110	↑	
1000	490	620	320	270	220	160	130	110	80	70	↑	
500	240	230	120	100	80	60	50	40	30	20	1.50	
Maximum working pressure (psi)		4170	5000	5000	5000	5000	5000	5000	5000	5000		

CLV 16 indicates nonusable range.

Hydraulic pressure (psi)	Cylinder force (lbs)	Clamping force (lbs)										Minimum clamp arm length (in)
		Clamp arm length LH (in)										
		2.00	2.50	2.74	3.00	3.50	4.00	5.00	6.00	7.00		
5000	3800		3070	2590	2210	1730	1420	1050	830	690	2.07	
4500	3420	4470	2750	2330	1990	1550	1280	940	740	620	2.00	
4000	3040	3960	2430	2060	1760	1380	1130	830	660	550	↑	
3500	2660	3440	2120	1790	1530	1200	980	720	570	470	↑	
3000	2280	2930	1800	1520	1300	1020	840	620	490	400	↑	
2500	1900	2410	1480	1260	1070	840	690	510	400	330	↑	
2000	1520	1900	1170	990	840	660	540	400	320	260	↑	
1500	1140	1380	850	720	620	480	400	290	230	190	↑	
1000	760	870	540	450	390	300	250	180	140	120	↑	
500	380	360	220	190	160	120	100	70	60	50	2.00	
Maximum working pressure (psi)		4760	5000	5000	5000	5000	5000	5000	5000	5000		

CLV 25 indicates nonusable range.

Hydraulic pressure (psi)	Cylinder force (lbs)	Clamping force (lbs)										Minimum clamp arm length (in)
		Clamp arm length LH (in)										
		2.50	3.00	3.44	4.00	4.50	5.00	6.00	7.00	8.00		
5000	5470	6890	4630	3580	2800	2330	2000	1560	1280	1080	2.50	
4500	4930	6180	4150	3210	2510	2090	1800	1400	1150	970	↑	
4000	4380	5470	3680	2850	2220	1850	1590	1240	1010	860	↑	
3500	3830	4760	3200	2480	1930	1610	1380	1080	880	750	↑	
3000	3290	4050	2720	2110	1640	1370	1180	920	750	640	↑	
2500	2740	3340	2240	1740	1350	1130	970	760	620	520	↑	
2000	2190	2630	1760	1370	1070	890	760	590	490	410	↑	
1500	1640	1920	1290	1000	780	650	560	430	360	300	↑	
1000	1100	1200	810	630	490	410	350	270	220	190	↑	
500	550	490	330	260	200	170	140	110	90	80	2.50	
Maximum working pressure (psi)		5000	5000	5000	5000	5000	5000	5000	5000	5000		



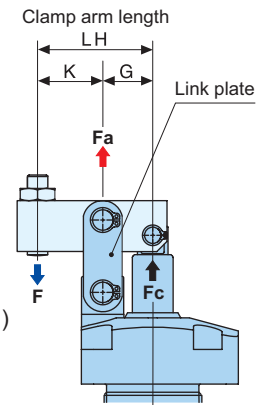
1.The clamping force varies according to the clamp arm length. The clamping force **F** can be calculated using the following formula.

Clamping force calculation formula $F = (F_c - F_s) \frac{G}{K} \times \eta$

2.When using a clamp arm length that is less than the **K** value specified from the chart, the maximum allowable hydraulic pressure will need to be calculated using the formula shown. If the operating pressure is not adjusted for the short clamp arm, the force at link structure may exceed the **Fa** value in the chart. If this force is exceeded, the linkage may be damaged.

Hydraulic pressure calculation formula $P_a \leq \left(\frac{F_a \times K}{G \times \eta + K} + F_s \right) \frac{1}{A}$

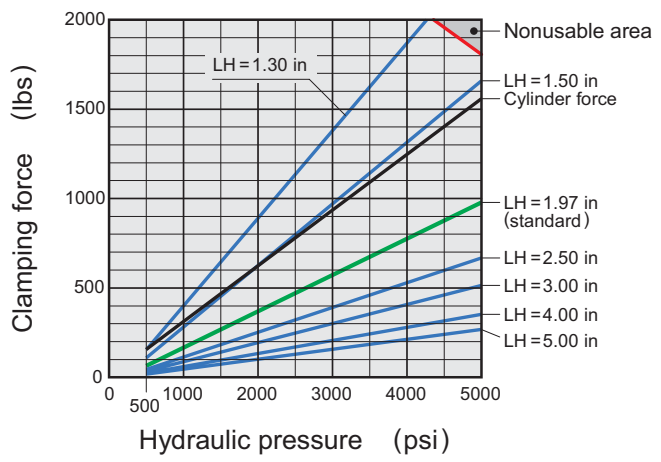
- F** : Clamping force (lbs)
- F_c** : Cylinder force (lbs) (refer to Performance diagram)
- F_s** : Return spring force at clamp position (refer to specification table)
- G, K** : Clamp arm length (in) (see figure on the right)
- η** : Output efficiency (0.9)
- P_a** : Max. allowable hydraulic pressure (psi)
- F_a** : Max. allowable force at link structure (lbs) (refer to the table below)
- A** : Cylinder area (in²) (refer to specification table)



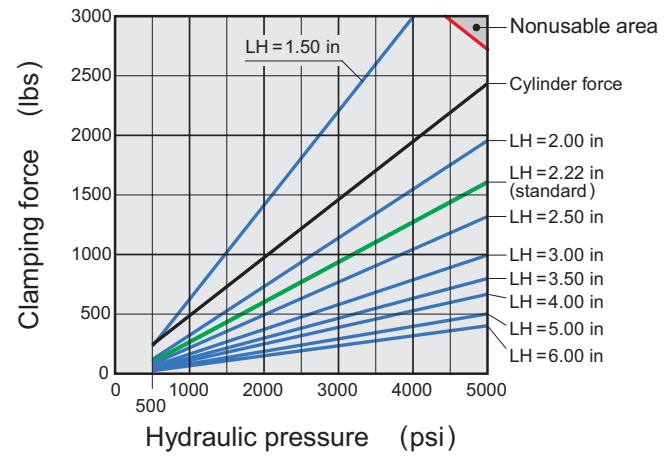
Model	CLV06	CLV10	CLV16	CLV25
G (in)	0.83	0.96	1.20	1.48
K※(in)	1.14	1.26	1.54	1.97
Fa (lbs)	3300	5050	8250	13400

※ Standard clamp arm length

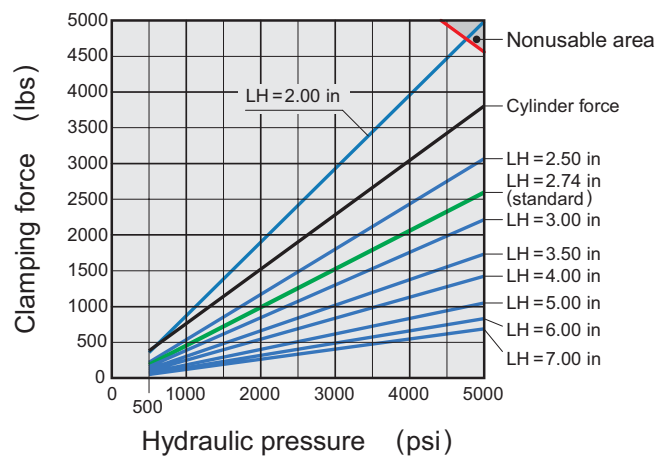
CLV 06



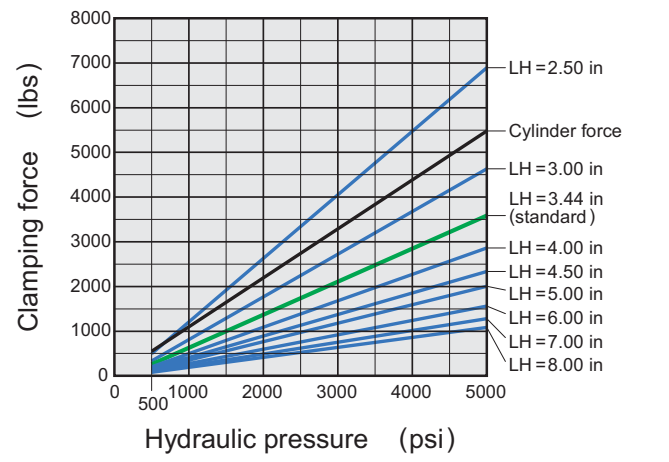
CLV 10



CLV 16



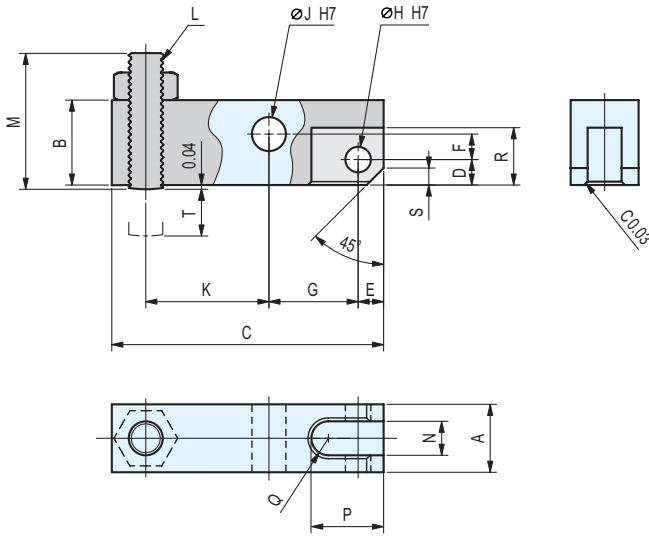
CLV 25



Clamp arms — standard and extended length type

(inch-accept where noted)

Standard length type model CLH ① -G1

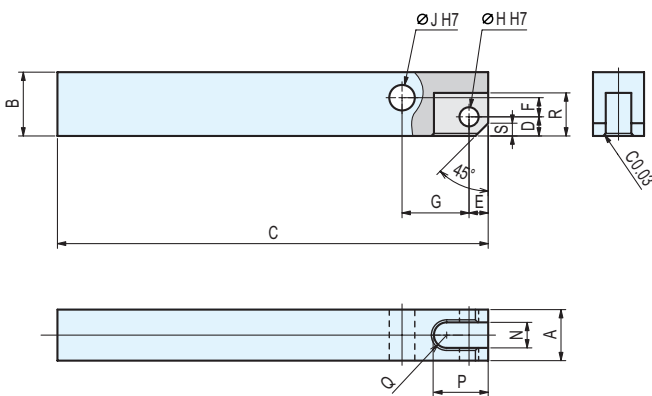


Material : Carbon steel Hardness : HRC13.8~27.6

Clamp arm model	CLH06-G1	CLH10-G1	CLH16-G1	CLH25-G1
A	0.626-0.630	0.744-0.748	0.862-0.866	1.256-1.260
B	0.79	0.98	1.22	1.50
C	2.52	2.89	3.56	4.55
D	0.24	0.31	0.35	0.49
E	0.24	0.28	0.39	0.51
F	0.24	0.30	0.37	0.37
G	0.83	0.96	1.20	1.48
H	0.236-0.237	0.315-0.316	0.472-0.473	0.551-0.552
J	0.315-0.316	0.394-0.395	0.551-0.552	0.630-0.631
K	1.14	1.26	1.54	1.97
L	M8	M10	M12	M16
M	1.26	1.54	1.89	2.28
N	0.315-0.319	0.394-0.398	0.433-0.437	0.630-0.634
P	0.67	0.79	1.04	1.42
Q	R0.16	R0.20	R0.22	R0.32
R	0.53	0.69	0.87	1.10
S	0.16	0.20	0.28	0.31
T (Adjustment length)	0.43	0.51	0.63	0.75
Clamp arm weight	0.3 lbs	0.5 lbs	0.9 lbs	2.2 lbs
Clamp model applied	CLW06 CLV06	CLW10 CLV10	CLW16 CLV16	CLW25 CLV25

(inch-accept where noted)

Extended length type model CLH ① -GL

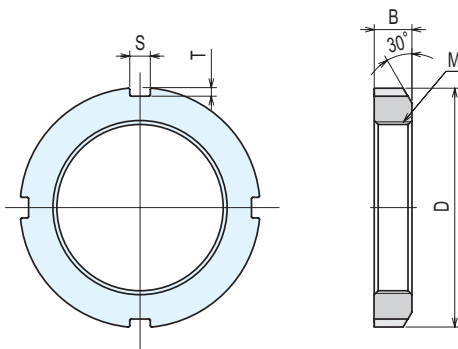


Material : Carbon steel Hardness : HRC13.8~27.6

Clamp arm model	CLH06-GL	CLH10-GL	CLH16-GL	CLH25-GL
A	0.626-0.630	0.744-0.748	0.862-0.866	1.256-1.260
B	0.79	0.98	1.22	1.50
C	5.31	7.09	7.87	9.06
D	0.24	0.31	0.35	0.49
E	0.24	0.28	0.39	0.51
F	0.24	0.30	0.37	0.37
G	0.83	0.96	1.20	1.48
H	0.236-0.237	0.315-0.316	0.472-0.473	0.551-0.552
J	0.315-0.316	0.394-0.395	0.551-0.552	0.630-0.631
N	0.315-0.319	0.394-0.398	0.433-0.437	0.630-0.634
P	0.67	0.79	1.04	1.42
Q	R0.16	R0.20	R0.22	R0.32
R	0.53	0.69	0.87	1.10
S	0.16	0.20	0.28	0.31
Clamp arm weight	0.7 lbs	1.4 lbs	2.1 lbs	4.3 lbs
Clamp model applied	CLW06 CLV06	CLW10 CLV10	CLW16 CLV16	CLW25 CLV25

(inch-accept where noted)

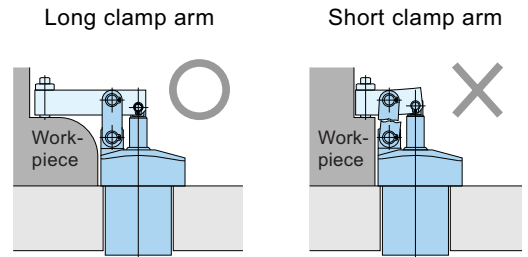
Locknut model CLH ① -VN



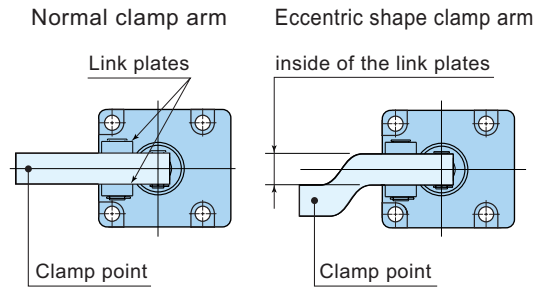
Locknut model	CLH06-VN	CLH10-VN	CLH16-VN	CLH25-VN
M	M45 × 1.5	M50 × 1.5	M60 × 2	M70 × 2
D	2.56	2.76	3.15	3.62
B	0.39	0.43	0.43	0.47
S	0.24	0.24	0.28	0.31
T	0.10	0.10	0.12	0.14
Clamp model applied	CLW06 CLV06	CLW10 CLV10	CLW16 CLV16	CLW25 CLV25

⚠ Caution in use

1. The shorter the length of the clamp arm, the larger the forces are at the link structure. If the clamping force exceeds the maximum allowable force at the link structure, damage may occur. Depending on the clamp arm length, the operating pressure to the cylinder may need to be reduced. Refer to the performance diagrams on page 4 and 10 to properly match the clamping force (hydraulic pressure) with the clamp arm length you plan to use.



2. If the workpiece contact point is not inside of the link plates, an eccentric shape clamp arm can be used (shown right). Please contact Pascal for pamphlet PA-169A showing the allowable offset lengths versus operating pressure. Exceeding the allowable offset can cause damage to the link structure and piston rod due to the heavy side loading.



3. Maximum clamping efficiency is achieved when the clamp arm's bottom surface is parallel to the cylinder mounting surface when the workpiece is clamped. The clamp arm should be no more than 3 degrees above or below parallel. The clamp arm's angle can be adjusted by using the adjustment bolt supplied with the standard clamp arm.

