35MPa Connecting Rod Clamp

Compact, high-capacity, durable, cost-effective connecting rod clamp

Model Representation

HCLW①-②   (Example: HCLW16-F)

① Dimensions (refer to specification sheet)

HCLW	04 06 10 16 25 :

② Clamping arm installation direction

L: Left
F: Forward
R: Right

L: Left   F: Forward   R: Right

Specification

Model			HCLW04	HCLW06	HCLW10	HCLW16	HCLW25
Cylinder capacity (when the oil pressure is 35MPa)		(kN)	5.4	8.9	13.3	21.5	35.6
Clamping force ※	When the oil pressure is 35MPa	(kN)	3.8	5.8	9.2	15.2	24.0
	When the oil pressure is 25MPa	(kN)	2.7	4.1	6.5	10.8	17.2
	When the oil pressure is 15MPa	(kN)	1.6	2.5	3.9	6.5	10.3
Standard clamping arm length (LH)		(mm)	42	50	56.5	69.5	87.5
Bore of cylinder		(mm)	14	18	22	28	36
Main rod diameter		(mm)	12	14	18	22.4	28
Cylinder area (clamping)		(cm^2)	1.54	2.54	3.80	6.16	10.18
Full stroke		(mm)	23.5	26	29.5	36	45
Clamping stroke		(mm)	20.5	23	26.5	33	42
Stroke margin		(mm)	3	3	3	3	3
Maximum flow		(L/min)	0.38	0.69	1.18	2.39	5.08
Cylinder capacity	Clamping	(cm^3)	3.6	6.6	11.2	22.2	45.8
	Release	(cm^3)	1.0	2.6	3.7	8.0	18.1
Mass		(kg)	0.9	1.7	2.3	4.4	7.4

Operating oil pressure range: 1 to 35MPa (HCLW04: 3 to 35MPa)   Guaranteed withstand pressure: 52.5MPa   Operating ambient temperature: 0 to 70℃
Used fluid: ordinary mineral oil-based hydraulic oil (equivalent to ISO-VG32)
※: It indicates the clamping force when installing the standard clamping arm.
※: The clamping force varies with the length of the clamping arm.
Chlorine cutting fluid can also be used in the environment of spraying.

Performance curve

The tightening force varies with the length of the clamping arm and the oil pressure. Calculate the clamping force according to the following formula.

Calculation formula of clamping force	$F = Fc \times \dfrac{HG}{(LH-HG)} \times \eta$

2. When the HK size of the clamping arm used is smaller than the value in the table on the right, please determine the maximum operating pressure according to the following oil pressure calculation formula. The smaller the HK size, the greater the force acting on the connecting rod mechanism. If it is used beyond the maximum allowable load Fa, it will cause malfunction due to overloading of the connecting rod.

Oil pressure calculation formula	$Pa \leq \dfrac{10 \times Fa \times (LH-HG)}{A(HG \times \eta L + H - HG)}$

F : Clamping force kN
Fc : Cylinder capacity kN (refer to performance table)
LH=HG+HK : Clamping arm length mm (refer to the figure on the right)
η : Output efficiency (0.9)
Pa : Maximum operating oil pressure MPa
Fa : Maximum allowable load of connecting rod kN (refer to the table below)
A : Cylinder area (clamping) cm2 (refer to specification sheet)

F: Clamping force (kN) P: Operating oil pressure (MPa) LH: Clamping arm length (mm)   ※: Length of standard clamping arm
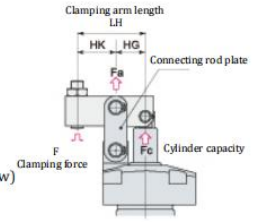
Model		HCLW04	HCLW06	HCLW10	HCLW16	HCLW25
HG	(mm)	18.5	21.0	24.5	30.5	37.5
LH※	(mm)	42.0	50.0	56.5	69.5	87.5
Fa	(KN)	9.2	14.7	22.5	36.7	59.6

HCLW 04

$F = \dfrac{2.56 \times P}{LH-18.5}$ is the unusable range

Oil pressure (MPa)	Cylinder capacity (kN)	Clamping force (kN) — Clamping arm length LH (mm)								Minimum arm length Min.LH (mm)
		30	35	42	50	60	80	100	120	
35	5.4			3.8	2.8	2.2	1.5	1.1	0.9	42
30	4.6			3.3	2.4	1.9	1.2	0.9	0.8	35.3
25	3.9		3.9	2.7	2.0	1.5	1.0	0.8	0.6	30.5
20	3.1	4.5	3.1	2.2	1.6	1.2	0.8	0.6	0.5	30
15	2.3	3.3	2.3	1.6	1.2	0.9	0.6	0.5	0.4	↑
10	1.5	2.2	1.6	1.1	0.8	0.6	0.4	0.3	0.3	↑
5	0.8	1.1	0.8	0.5	0.4	0.3	0.2	0.2	0.1	↑
3	0.5	0.7	0.5	0.3	0.2	0.2	0.1	0.1	0.1	30
Maximum operating oil pressure (MPa)		24.4	29.7	35	35	35	35	35	35	

HCLW 06

$F = \dfrac{4.81 \times P}{LH-21.0}$ is the unusable range

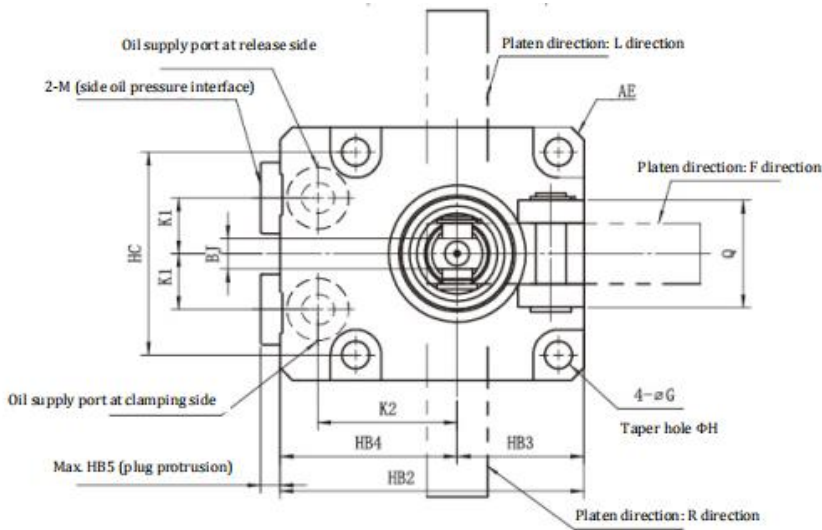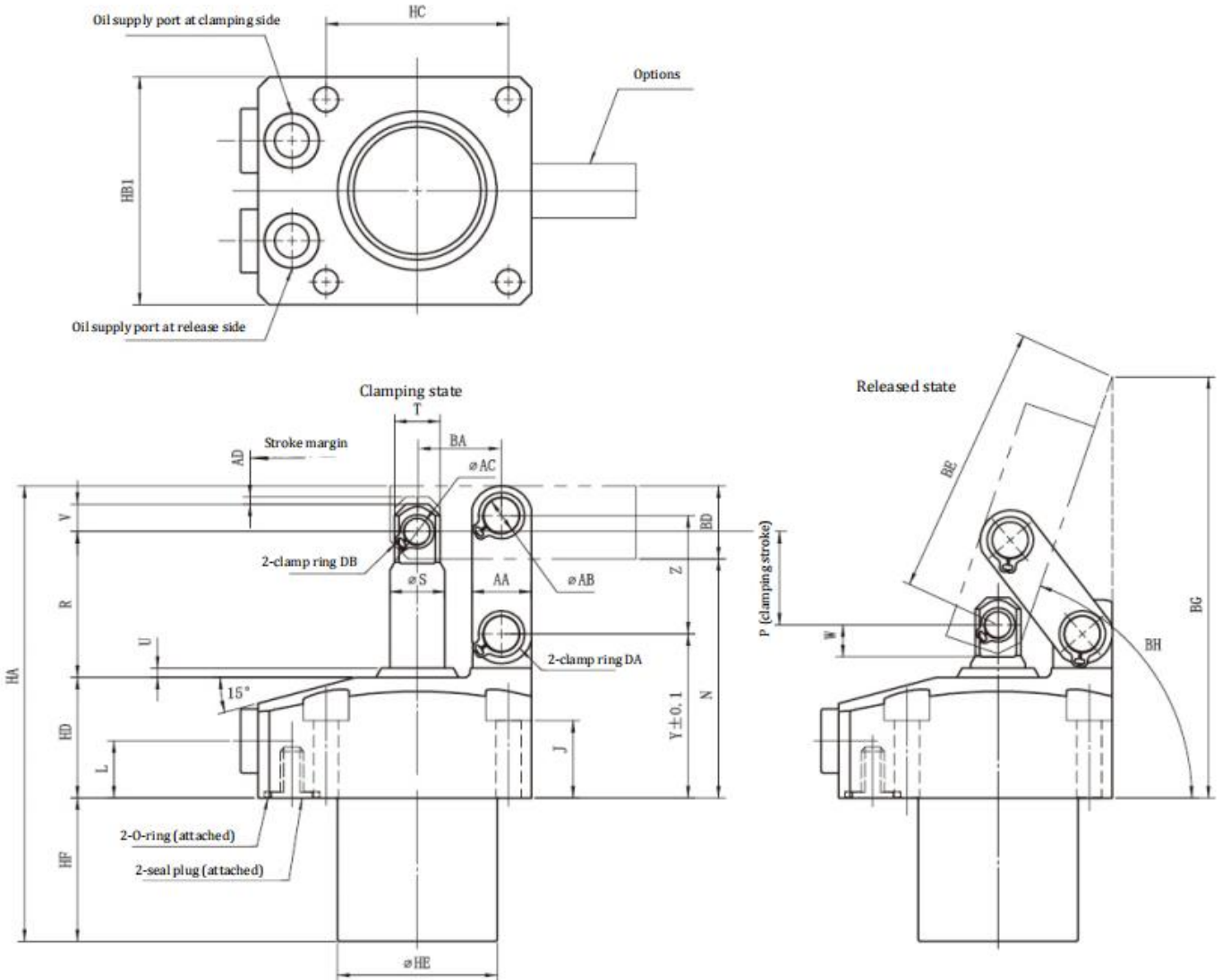| Oil pressure (MPa)	Cylinder capacity (kN)	Clamping force (kN) — Clamping arm length LH (mm)								Minimum arm length Min.LH (mm)
		35	45	50	60	80	100	120		
35	8.9			5.8	4.3	2.9	2.1	1.7		50
30	7.6		6.0	5.0	3.7	2.4	1.8	1.5		41.5
25	6.4		5.0	4.1	3.1	2.0	1.5	1.2		35.5
20	5.1	6.9	4.0	3.3	2.5	1.6	1.2	1.0		35
15	3.8	5.2	3.0	2.5	1.9	1.2	0.9	0.7		↑
10	2.5	3.4	2.0	1.7	1.2	0.8	0.6	0.5		↑
5	1.3	1.7	1.0	0.8	0.6	0.4	0.3	0.2		↑
1	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1		35
Maximum operating oil pressure (MPa)		24.6	32.3	35	35	35	35	35		

HCLW 10

$F = \dfrac{8.38 \times P}{LH-24.5}$ is the unusable range

Oil pressure (MPa)	Cylinder capacity (kN)	Clamping force (kN) — Clamping arm length LH (mm)									Minimum arm length Min.LH (mm)
		40	50	56.5	60	80	100	120	140	160	
35	13.3			9.2	8.3	5.3	3.9	3.1	2.5	2.2	56.5
30	11.4		9.9	7.9	7.1	4.5	3.3	2.6	2.2	1.9	47
25	9.5		8.2	6.5	5.9	3.8	2.8	2.2	1.8	1.5	40.5
20	7.6	10.8	6.6	5.2	4.7	3.0	2.2	1.8	1.5	1.2	40
15	5.7	8.1	4.9	3.9	3.5	2.3	1.7	1.3	1.1	0.9	↑
10	3.8	5.4	3.3	2.6	2.4	1.5	1.1	0.9	0.7	0.6	↑
5	1.9	2.7	1.6	1.3	1.2	0.8	0.6	0.4	0.4	0.3	↑
1	0.4	0.5	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	40
Maximum operating oil pressure (MPa)		24.4	31.7	35	35	35	35	35	35	35	

HCLW 16

$F = \dfrac{16.90 \times P}{LH-30.5}$ is the unusable range

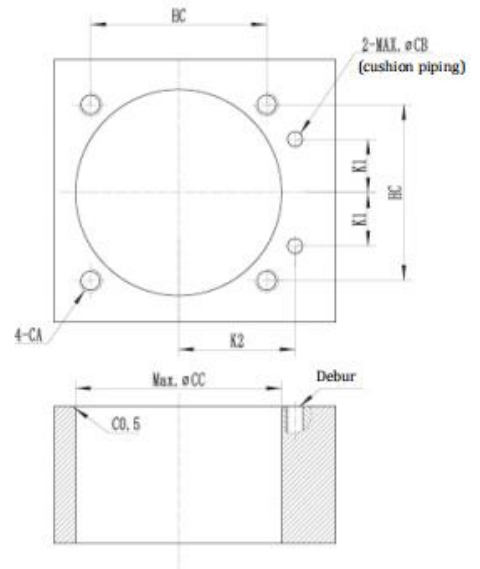| Oil pressure (MPa)	Cylinder capacity (kN)	Clamping force (kN) — Clamping arm length LH (mm)									Minimum arm length Min.LH (mm)
		50	60	69.5	80	100	120	140	160	180	
35	21.6			15.2	11.9	8.5	6.6	5.4	4.6	4.0	69.5
30	18.5		17.2	13.0	10.2	7.3	5.7	4.6	3.9	3.4	58.5
25	15.4		14.3	10.8	8.5	6.1	4.7	3.9	3.3	2.8	50.5
20	12.3	17.3	11.5	8.7	6.8	4.9	3.8	3.1	2.6	2.3	50
15	9.2	13.0	8.6	6.5	5.1	3.6	2.8	2.3	2.0	1.7	↑
10	6.2	8.7	5.7	4.3	3.4	2.4	1.9	1.5	1.3	1.1	↑
5	3.1	4.3	2.9	2.2	1.7	1.2	0.9	0.8	0.7	0.6	↑
1	0.6	0.9	0.6	0.4	0.3	0.2	0.2	0.2	0.1	0.1	50
Maximum operating oil pressure (MPa)		24.8	30.9	35	35	35	35	35	35	35	

HCLW 25

$F = \dfrac{34.35 \times P}{LH-37.5}$ is the unusable range

Oil pressure (MPa)	Cylinder capacity (kN)	Clamping force (kN) — Clamping arm length LH (mm)									Minimum arm length Min.LH (mm)
		60	65	87.5	100	120	140	160	180	200	
35	35.6			24.0	19.2	14.6	11.7	9.8	8.4	7.4	87.5
30	30.5			20.6	16.5	12.5	10.1	8.4	7.2	6.3	73
25	25.5		31.2	17.2	13.7	10.4	8.4	7.0	6.0	5.3	62.5
20	20.4	30.5	25.0	13.7	11.0	8.3	6.7	5.6	4.8	4.2	60
15	15.3	22.9	18.7	10.3	8.2	6.2	5.0	4.2	3.6	3.2	↑
10	10.2	15.3	12.5	6.9	5.5	4.2	3.4	2.8	2.4	2.1	↑
5	5.1	7.6	6.2	3.4	2.7	2.1	1.7	1.4	1.2	1.1	↑
1	1.0	1.5	1.2	0.7	0.5	0.4	0.3	0.3	0.2	0.2	60
Maximum operating oil pressure (MPa)		23.5	26.3	35	35	35	35	35	35	35	

Overall dimension

Oil supply port at clamping side

HC

Options

HB1

Oil supply port at release side

Clamping state

Released state

T

AD

Stroke margin

BA

V

øAC

BD

2-clamp ring DB

øS

AA

øAB

Z

R

BE

BG

U

N

P (clamping stroke)

W

2-clamp ring DA

15°

HA

HD

V±0.1

BH

L

J

2-O-ring (attached)

HF

2-seal plug (attached)

øHE

Oil supply port at release side

Platen direction: L direction

2-M (side oil pressure interface)

AE

Platen direction: F direction

HC

K1

BJ

K1

Q

Oil supply port at clamping side

K2

4-øG

HB4

HB3

Taper hole ΦH

Max. HB5 (plug protrusion)

HB2

Platen direction: R direction

Installation hole processing drawing

HC

2-MAX. øCB (cushion piping)

K1

HC

K1

4-CA

K2

Max. øCC

Debur

C0.5

Overall dimension

Model	HCLW04-F L/R	HCLW06-F L/R	HCLW10-F L/R	HCLW16-F L/R	HCLW25-F L/R
HA	100.1	122.1	132.6	162.1	197.1
HB1	50	60	70	86	108
HB2	60	69	77	96	108
HB3	25	30	35	43	54
HB4	35	39	42	53	56
HB5	3.8	3.8	3.8	4.8	4.8
HC	40	47	54	65	85
HD	26.5	31	32.5	40	47
HE	$35_{-0.2}^{0}$	$45_{-0.2}^{0}$	$50_{-0.2}^{0}$	$60_{-0.2}^{0}$	$70_{-0.2}^{0}$
HF	31.6	42.6	42.6	51.1	63.1
G	5.5	6.8	9	11	14
H	10	12	15	18.5	20.5
J	17	17	17	20	21
K1	11	11.5	13	15	20
K2	27.5	30	33	40	43
L	12.5	15	15	17	17
M[※1]	G1/8	G1/8	G1/8	G1/4	G1/4
N	52.5	59.5	65	80	96
P	20.5	23	26.5	33	42
Q	21	28	37	46	56
R	32	34.5	40.5	49	61.5
S	12 f7	14 f7	18 f7	22.4 f7	28 f7
T	10	12	15	20	26
U	2	2	2.5	2.5	2.5
V	6	6	8	11	13
W	7	7	9	10.8	14.5
Y	36	41.5	45	54.5	65
Z	26	30	35.5	44	53
O-seal ring[※2]	8.8×1.9	8.8×1.9	8.8×1.9	8.8×1.9	8.8×1.9
AA	13	15	19	25	32
AB	$6_{0}^{+0.012}$	$8_{0}^{+0.015}$	$10_{0}^{+0.015}$	$14_{0}^{+0.018}$	$16_{0}^{+0.018}$
AC	$6_{0}^{+0.012}$	$6_{0}^{+0.015}$	$8_{0}^{+0.015}$	$12_{0}^{+0.018}$	$14_{0}^{+0.018}$
AD	3	3	3	3	3
AE	C2.5	C2.5	C3	C3.5	C5.5
AF	-	43	48	57.5	67.5
BA	18.5	21	24.5	30.5	37.5
BD	16	20	25	31	38
BE	59.6	71.7	78.7	98.2	133.5
BG	92.5	107.9	117.4	144.7	189.2
BH	About 71°	About 70°	About 70°	About 69°	About 72°
BJ[※3]	6	8	10	11	16
CA	M5	M6	M8	M10	M12
CB	7	7	7	7	7
CC	$36_{-0.2}^{-0.1}$	$47_{-0.2}^{-0.1}$	$52_{-0.2}^{-0.1}$	$62_{-0.2}^{-0.1}$	$72_{-0.2}^{-0.1}$
DA[※4]	STW-6	STW-6	STW-8	STW-12	STW-14
DB[※4]	STW-6	STW-8	STW-10	STW-14	STW-16