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CLS001
01-2015
Rotary lever clamp
hydraulic, up to 400 bar, single- and double acting

Double acting   Single acting

→ **Advantages:**

✓ **Clamping without shear force**

✓ **Compact design**

✓ **Very few parts**

✓ **Cost-efficient**

✓ **Length of clamping arm variable**

✓ **No interference contour while loading and unloading**

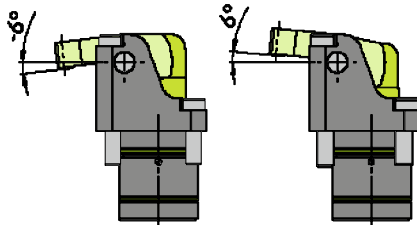✓ **Mounting in feeder plate possible**

Description:

Because of their compact design, rotary lever clamps are particularly suitable for use in clamping devices with low Installation spaces.

Due to the large opening angle of the clamping lever they allow easy loading and unloading of the fixture.

The lower housing part is recessed in the clamping fixture. Oil supply comes through drilled channels.

The clamping forces are depending on the length of release lever. Clamping forces and clamping lever lengths can be found on the following pages.

Clamping range
from 6° to -6°

The rotary lever clamps are supplied with fixing screws.

The clamping levers are not included in the scope of supply. They must be ordered as an accessory (page 4-5).

The clamping forces are depending on the length of the lever. In a clamped position the lever should be at 90° angle to the housing.

Actual Clamping force F_S in response to the piston force F_K and Length of lever arm L
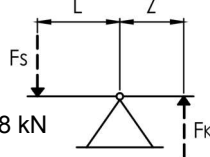
Example:

Rotary lever clamp size 20
working pressure 400 bar, piston force F_K = 18 kN
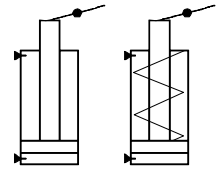Dim. Z (page 3) = 15,0 mm
Length of lever L
Actual Clamping force F_S = 12,0 kN

Clamping force $F_S = \dfrac{F_K \times Z}{L} = \dfrac{18\ kN \times 15,0\ mm}{22,5\ mm} = 12,0\ kN$

Recommendations for use:

The clamping lever is actuated by the piston.

For single acting cylinders the clamping lever is opened via the spring return inside of the piston.
For double-acting cylinders this is done by the pressure media.

During the installation of the rotary lever clamp, the flange should be adjusted to the height of the workpiece.

For mounting on the device, housing blocks of aluminum and steel are available on request.

The cylinder is suitable for all mounting positions.

We recommend as a medium - hydraulic oils acc. DIN 51524 (HL, HLP).

Rotary lever clamps can generate high forces. Workpieces and fixtures must be designed for such loads.

During operation consists crushing hazard. The accident prevention regulations are therefore mandatory.

The rotary lever clamping cylinders should be checked regularly for pollution and they have to be cleaned if necessary.

Optional with included pneumatical query available (page 2)!

Clamping lever open

Control open

Control closed

bottom view

Control-clamped
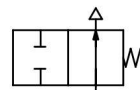
Control-open

Special solutions on request!

Contact

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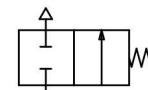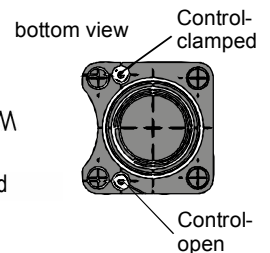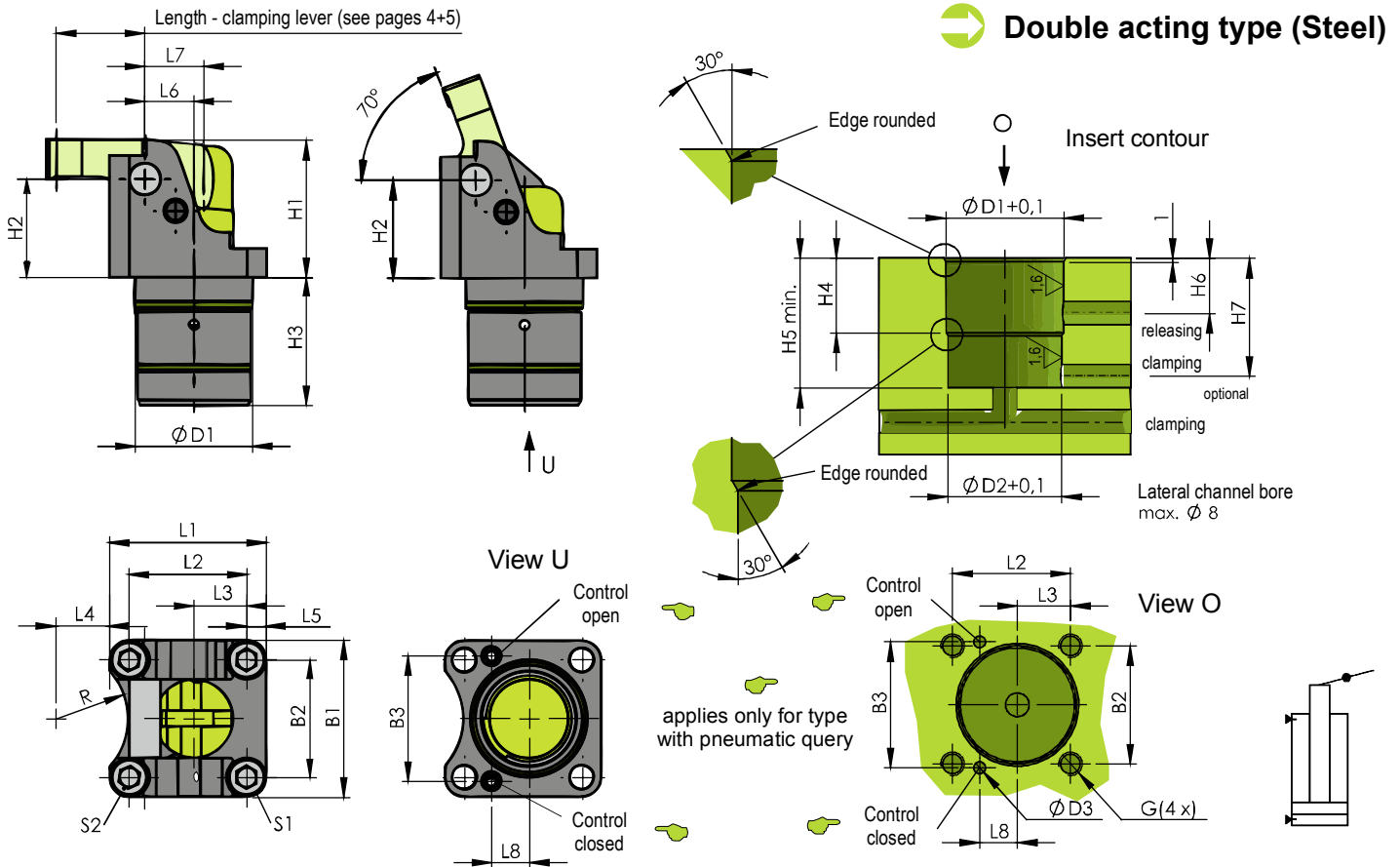01-2015
Rotary lever clamp

hydraulic, up to 400 bar, single- and double acting

Length - clamping lever (see pages 4+5)

Double acting type (Steel)

Insert contour

Edge rounded

Edge rounded

Lateral channel bore max. Ø 8

releasing
clamping
optional
clamping

View U

Control open

Control closed

applies only for type with pneumatic query

View O

Control open

Control closed

G (4 x)

Screws included in scope!

Part numbers without clamping lever!

Technical Data

Size	12	16	20	25	32	40	50
B1	27,00	34,00	40,00	52,00	66,00	78,00	98,00
B2	19,50	25,00	30,00	38,50	49,00	59,00	74,00
B3	22,60	27,00	32,00	42,00	53,00	64,00	80,00
D1	20,00	24,00	30,00	36,00	45,00	55,00	66,00
D2	19,40	23,00	29,00	35,00	44,00	53,00	64,00
D3 max.	Ø 2	Ø 3	Ø 3	Ø 3	Ø 6	Ø 6	Ø 6
G	M4 x 8	M5 x 11	M6 x 10	M8 x 12	M10 x 16	M12 x 18	M16 x 23
H1	21,00	28,00	35,00	43,75	56,00	70,00	87,50
H2	15,00	20,00	25,00	31,25	40,00	50,00	62,50
H3	21,00	26,00	32,50	37,00	42,00	47,00	57,50
H4	14,00	17,00	19,00	20,00	23,00	25,00	30,00
H5	21,50	26,50	33,00	38,00	43,00	48,00	58,50
H6	11,00	13,00	14,00	15,00	17,00	19,00	24,00
H7	23,00	26,00	31,00	33,00	38,00	40,00	53,00
L1	26,00	32,00	40,00	49,00	62,00	74,00	92,00
L2	18,50	23,00	30,00	35,50	45,00	55,00	68,00
L3	8,75	9,50	13,50	14,75	18,50	21,50	25,75
L4	7,50	10,00	13,50	11,00	9,00	12,00	14,50
L5	3,75	4,50	5,00	6,75	8,50	9,50	12,00
L6	7,50	10,00	12,50	15,63	20,00	25,00	31,25
Z	9,00	12,00	15,00	18,75	24,00	30,00	37,50
L8	5,40	7,20	9,60	11,00	13,00	14,00	17,50
R Radius	10,60	14,20	18,20	18,70	19,70	24,70	31,00
S1*	M4 x 10	M5 x 16	M6 x 16	M8 x 20	M10 x 25	M12 x 30	M16 x 40
S2*	M4 x 25	M5 x 35	M6 x 40	M8 x 50	M10 x 65	M12 x 80	M16 x 100
Effective piston area (cm^2)	1,77	2,54	4,52	7,06	10,17	15,90	23,75
Piston force at 100 bar (kN)	1,7	2,5	4,5	7,0	10,1	15,9	23,7
Piston force at 400 bar (kN)	7,0	10,1	18,0	28,2	40,6	63,6	95,0
Volume (ccm)	1,06	2,03	4,52	8,82	16,27	31,80	58,20
Weight	115 g	265 g	550 g	855 g	1755 g	2625 g	5325 g
Part number **without** pneum. query	IRLC12-001	IRLC16-001	IRLC20-001	IRLC25-001	IRLC32-001	IRLC40-001	IRLC50-001
Part number **with** pneum. query	IRLC12-002	IRLC16-002	IRLC20-002	IRLC25-002	IRLC32-002	IRLC40-002	IRLC50-002
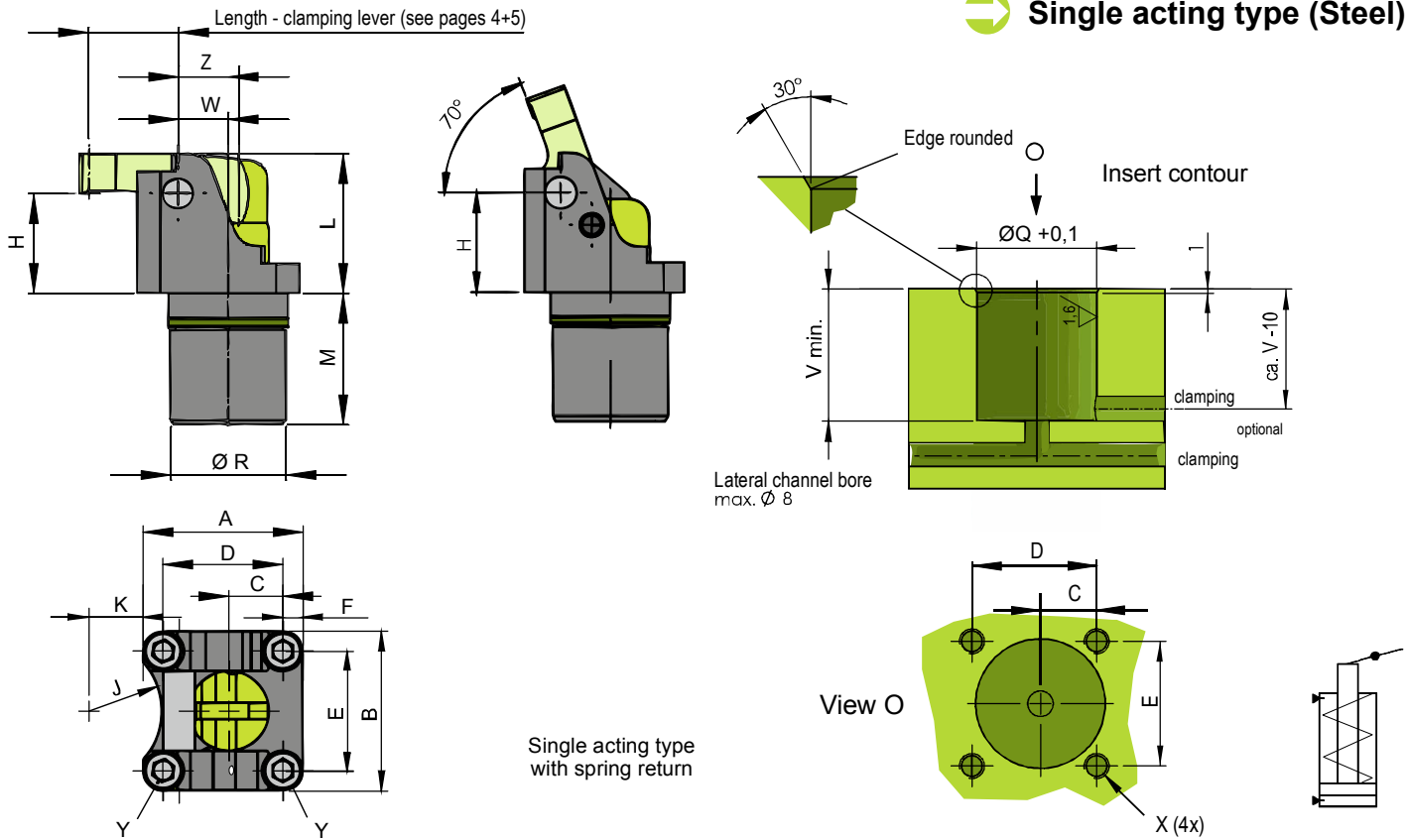
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CLS001
01-2015
Rotary lever clamp
hydraulic, up to 400 bar, single- and double acting

Single acting type (Steel)

Length - clamping lever (see pages 4+5)

70°

30°
Edge rounded

Insert contour

ØQ +0,1

1,6

ca. V -10

clamping
optional
clamping

V min.

Lateral channel bore
max. Ø 8

Single acting type
with spring return

View O

X (4x)

Screws included in scope! | Part numbers without clamping lever! | **Technical Data**

Size	12	16	20	25	32	40	50
A	26,00	32,00	40,00	49,00	62,00	74,00	92,00
B	27,00	34,00	40,00	52,00	66,00	78,00	98,00
C	8,75	9,50	13,50	14,75	18,50	21,50	25,75
D	18,50	23,00	30,00	35,50	45,00	55,00	68,00
E	19,50	25,00	30,00	38,50	49,0	59,0	74,0
F	3,75	4,50	5,00	6,75	8,50	9,50	12,00
H	15,00	20,00	25,00	31,25	40,00	50,00	62,50
J Radius	10,60	14,20	18,20	18,70	19,70	24,70	31,00
K	7,50	10,00	13,50	11,00	9,00	12,00	14,50
L	21,00	28,00	35,00	43,75	56,00	70,00	87,50
M	23,00	26,00	32,50	37,00	47,00	55,00	62,50
Q Ø	20,00	24,00	30,00	36,00	45,00	55,00	66,00
R Ø	20,00	24,00	30,00	36,00	45,00	55,00	66,00
V	23,50	26,50	33,00	38,00	48,00	56,00	63,50
W	7,50	10,00	12,50	15,63	20,00	25,00	31,25
X	M4x8	M5x11	M6x10	M8x12	M10x16	M12x18	M16x23
Y (acc. to DIN 6912)*	M4x10/ M4x25	M5x16/ M5x35	M6x16/ M6x40	M8x20/ M8x50	M10x25/ M10x65	M12x30/ M12x80	M16x40/ M16x100
Z	9,00	12,00	15,00	18,75	24,00	30,00	37,50
Effective piston area (cm^2)	1,13	2,01	3,14	4,91	8,04	12,57	19,63
Piston force at 100 bar (kN)	1,1	1,9	3,0	4,7	7,8	12,3	19,3
Piston force at 400 bar (kN)	4,4	7,9	12,4	19,4	32,0	50,0	78,2
Volume (ccm)	0,68	1,61	3,14	6,14	12,90	25,20	49,10
Weight	110 g	200 g	405 g	700 g	1400 g	2460 g	5070 g
Part number	IRLC12-003	IRLC16-003	IRLC20-003	IRLC25-003	IRLC32-003	IRLC40-003	IRLC50-003

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Steel carbonized 1.7131 (16MnCr5)

Clamping lever - Standard
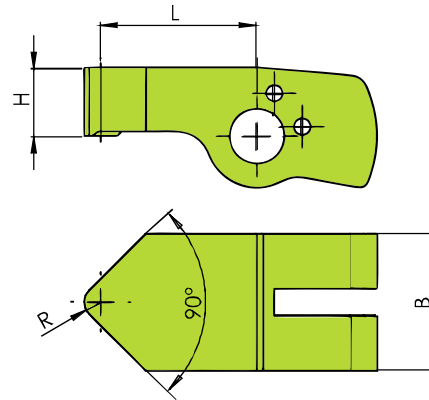
Part number	Size	Clamping force at 100 bar [kN]	L	B	H	R
10 1301	12	1,7	9,0	12	6,0	1,5
10 1302	12	1,1	13,5	12	6,0	1,5
10 1303	12	0,8	18,0	12	6,0	1,5
10 1304	12	0,7	22,5	12	6,0	1,5
10 1305	16	2,5	12,0	16	8,0	2,0
10 1306	16	1,7	18,0	16	8,0	2,0
10 1307	16	1,2	24,0	16	8,0	2,0
10 1308	16	1,0	30,0	16	8,0	2,0
10 1309	20	4,5	15,0	20	10,0	2,5
10 1310	20	3,0	22,5	20	10,0	2,5
10 1311	20	2,2	30,0	20	10,0	2,5
10 1312	20	1,8	37,5	20	10,0	2,5
10 1313	25	7,0	19,0	25	12,5	3,0
10 1314	25	4,7	28,5	25	12,5	3,0
10 1315	25	3,5	38,0	25	12,5	3,0
10 1316	25	2,8	47,5	25	12,5	3,0
10 1317	32	10,1	24,0	32	16,0	4,0
10 1318	32	6,7	36,0	32	16,0	4,0
10 1319	32	5,0	48,0	32	16,0	4,0
10 1320	32	4,0	60,0	32	16,0	4,0
10 1321	40	15,9	30,0	40	20,0	5,0
10 1322	40	10,6	45,0	40	20,0	5,0
10 1323	40	7,9	60,0	40	20,0	5,0
10 1324	40	6,3	75,0	40	20,0	5,0
10 1325	50	23,4	38,0	50	25,0	6,0
10 1326	50	15,9	56,0	50	25,0	6,0
10 1327	50	11,8	75,0	50	25,0	6,0
10 1328	50	9,5	94,0	50	25,0	6,0

Calculation

Actual Clamping force F_S in response to the piston force F_K and Length of lever arm L
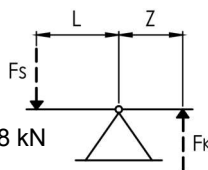
Example:

Rotary lever clamp size 20
working pressure 400 bar, piston force F_K = 18 kN
Dim. Z (page 3) = 15,0 mm
Length of lever L
Actual Clamping force F_S = 12,0 kN

Clamping force $F_S = \dfrac{F_K \times Z}{L} = \dfrac{18 \text{ kN} \times 15,0 \text{ mm}}{22,5 \text{ mm}} = 12,0$ kN
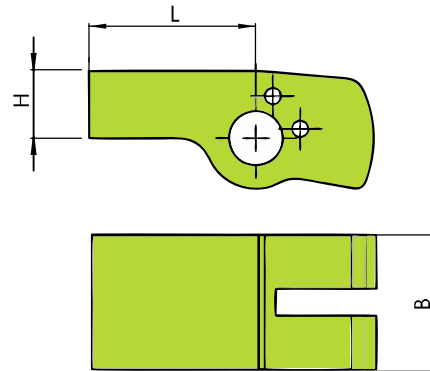
Attention:

On request for size 16-50 there are clamping levers available with a modified operating point. For these ones the clamping length is the same, but the operating point corresponding to the piston is moved. Herewith the clamping force can be increased about the factor 1,2 to 1,5.

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Steel (not carbonized) 1.7131 (16MnCr5)
Tool steel   1.2842 (90MnCrV8)

Clamping lever - semifinished

Part number Steel	Part number Tool-steel	Size	L	B	H
10 1331	10 2328	12	15	12	6,0
10 1332	10 2329	12	24	12	6,0
10 1333	10 2330	16	20	16	8,0
10 1334	10 2331	16	32	16	8,0
10 1335	10 2332	20	25	20	10,0
10 1336	10 2333	20	40	20	10,0
10 1337	10 2334	25	31	25	12,5
10 1338	10 2335	25	50	25	12,5
10 1339	10 2336	32	40	32	16,0
10 1340	10 2337	32	64	32	16,0
10 1341	10 2338	40	50	40	20,0
10 1342	10 2339	40	80	40	20,0
10 1343	10 2340	50	62	50	25,0
10 1344	10 2341	50	100	50	25,0

Attention:

Clamping levers from 16MnCr5 must be hardened after mechanical processing!

Special levers on Request!

Calculation

Actual Clamping force F_S in response to the piston force F_K and Length of lever arm L
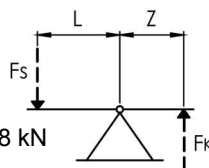
Example:

Rotary lever clamp size 20
working pressure 400 bar, piston force F_K = 18 kN
Dim. Z (page 3) = 15,0 mm
Length of lever L
Actual Clamping force F_S = 12,0 kN

Clamping force F_S = $\dfrac{F_K \times Z}{L}$ = $\dfrac{18 \text{ kN} \times 15,0 \text{ mm}}{22,5 \text{ mm}}$ = 12,0 kN