GERMA
HYDRAULIKZYLINDER

BUILT-IN CYLINDER with flange
DOUBLE-ACTING

TYPE 210

Operating pressure: max. 350bar
Lateral forces on the piston rod must be avoided

- **Piston diameter:** 16 mm – 63 mm
- **Stroke:** 16 mm – 63 mm
- **Seal variants:** NBR (80°C) and FKM (180°C)
- **Piston rod:** Internal or external thread
- **Accessories:** Thrust pieces
- **Possible custom series:** Special housing
  Special stroke lengths
  Special pistons

TYPE 210

Double-acting built-in cylinders are particularly suitable for use in **multi-clamping fixtures**. The cylinders are inserted **directly** into the **fixture body** and secured using the four supplied screws. This enables a **space-saving design** and eliminates the need for hydraulic lines, manifolds, and similar components. The pressure medium is supplied through internal bores.

Double-acting built-in cylinders allow movement under pressure in **both directions**. The pressure medium can be supplied on the piston side either directly from below **or** at any **desired position** below the fit diameter.

The newly developed built-in cylinder utilizes the **proven tandem sealing system** of our 600 series block cylinders.

The built-in cylinders can be **fully** integrated into the fixture body. Both **individual connections** and **series connections** for multiple cylinders can be realized. When multiple cylinders are installed in the fixture body, they can be supplied via **deep-hole drilling** through all mounting bores, with one oil port for supply and one for return. **The tolerance specifications according to the dimension table must be strictly observed.**

PERFORMANCE FEATURES

TYPE 210

- **High force output**
- **Very compact and space-saving design**
- **Dadurch mehr Teile pro Vorrichtung/Spannturm**
- **Easy to machine installation bore**
- **Simple cylinder assembly**
- **Fully recessed housing**
- **Pressure oil supply without external piping**
- **Roller-burnished cylinder bore**

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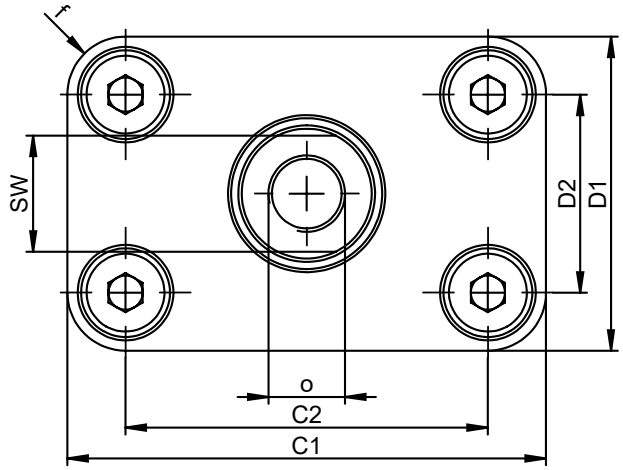
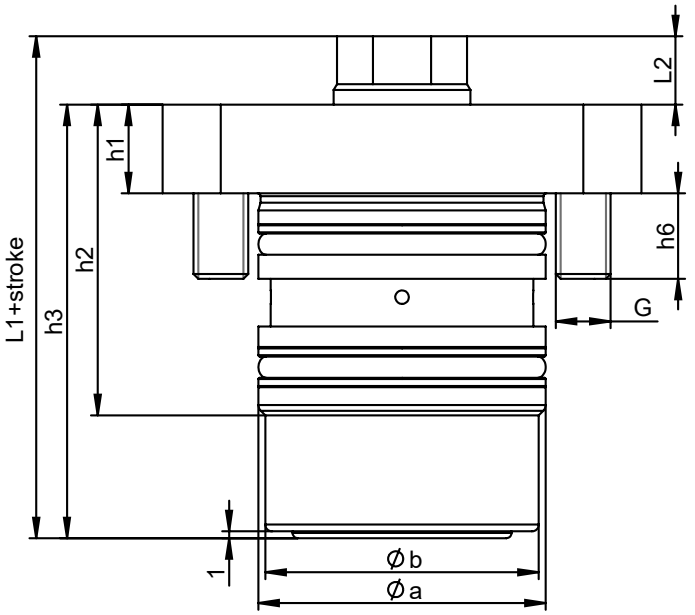
CYLINDER DIMENSION TABLE TYPE 210
AND ORDER NUMBER





Basic designation		210-016	210-025	210-032	210-040	210-050	210-063
Piston Ø	(mm)	16	25	32	40	50	63
Rod Ø	(mm)	10	16	20	25	32	40
Compressive force per 100 bar	(kN)	2,0	4,9	8,0	12,6	19,6	31,2
Tensile force per 100 bar	(kN)	1,2	2,9	4,9	7,7	11,6	18,6
L1	(mm)	36	41	48,5	52	62	73
L2	(mm)	6	7	10	10	10	14
h1	(mm)	9	12	13	14,5	16	19
h2	(mm)	35,5	41	45,5	48	55	60
h6	(mm)	9	10,5	12,5	17	22	26
a	(mm)	24	34	42	52	64	80
b	(mm)	21,8	32,2	40	49,2	60,8	76,7
C1	(mm)	45	56	70	84	100	128
C2	(mm)	34	43	53	63	75	95
D1	(mm)	28	38	46	57	69	87
D2	(mm)	17	25	29	36	44	54
f	(mm)	5,5	6,5	8,5	10,5	12,5	16,5
SW	(mm)	8	13	17	22	27	36
G		M5	M6	M8	M10	M12	M16
o		M6x12	M10x15	M12x15	M16x25	M20x30	M27x40
Stroke stage 1	(mm)	**16**	**20**	**25**	**25**	**25**	**30**
h3	(mm)	46	54	63,5	67	77	89
Order number		**210-016-016**	**210-025-020**	**210-032-025**	**210-040-025**	**210-050-025**	**210-063-030**
Stroke stage 2	(mm)	**50**	**50**	**50**	**50**	**50**	**63**
h3	(mm)	80	84	88,5	92	102	122
Order number		**210-016-050**	**210-025-050**	**210-032-050**	**210-040-050**	**210-050-050**	**210-063-063**

Note: The screws are included in the scope of delivery.

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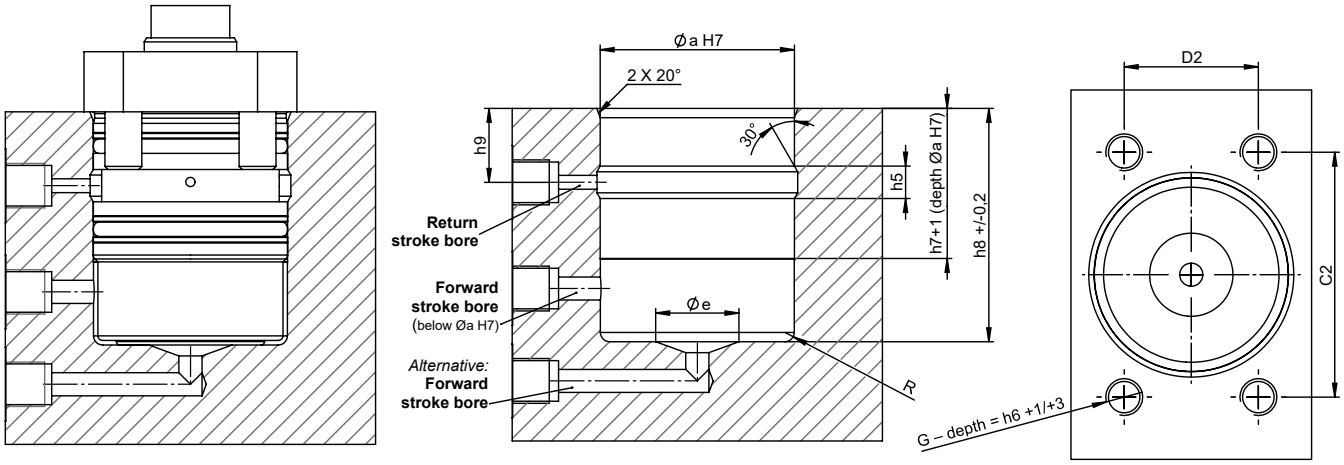
DIMENSION TABLE TYPE 210

INSTALLATION BORE – SURFACE-MOUNTED INSTALLATION



Basic designation		210-016	210-025	210-032	210-040	210-050	210-063
a	(mm)	24	34	42	52	64	80
C2	(mm)	34	43	53	63	75	95
D2	(mm)	17	25	29	36	44	54
e max.	(mm)	7	8	10	12	14	16
G		M5	M6	M8	M10	M12	M16
h5 max.	(mm)	6	6	7	8	10	11
h6	(mm)	9	10,5	12,5	17	22	26
h7	(mm)	26,5	29	32,5	33,5	39	41
h9	(mm)	12,5	14	16	16	17,5	19
R max.	(mm)	1,5	1,5	2	2	2	2
Stroke stage 1	(mm)	**16**	**20**	**25**	**25**	**25**	**30**
h8	(mm)	37	42	50,5	52,5	61	70
Stroke stage 2	(mm)	**50**	**50**	**50**	**50**	**50**	**63**
h8	(mm)	71	72	75,5	77,5	86	103

Note: The supply bore for the return stroke should be deburred using a ball countersink or relieved at a 30° angle. The ratio of the flow cross-sections of the bores for forward and return stroke should be approximately 1.6.

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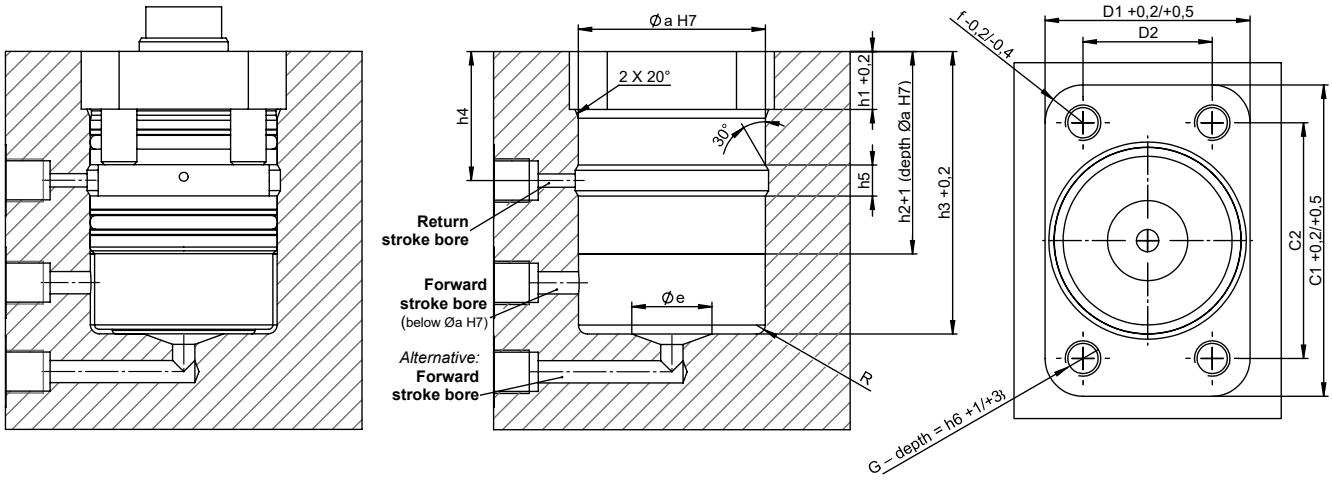
DIMENSION TABLE TYPE 210

INSTALLATION BORE – RECESSED INSTALLATION



Basic designation		210-016	210-025	210-032	210-040	210-050	210-063
a	(mm)	24	34	42	52	64	80
C1	(mm)	45	56	70	84	100	128
C2	(mm)	34	43	53	63	75	95
D1	(mm)	28	38	46	57	69	87
D2	(mm)	17	25	29	36	44	54
e max.	(mm)	7	8	10	12	14	16
f	(mm)	5,5	6,5	8,5	10,5	12,5	16,5
G		M5	M6	M8	M10	M12	M16
h1	(mm)	9	12	13	14,5	16	19
h2	(mm)	35,5	41	45,5	48	55	60
h4	(mm)	21,5	26	29	30,5	33,5	38
h5 max.	(mm)	6	6	7	8	10	11
h6	(mm)	9	10,5	12,5	17	22	26
R max.	(mm)	1,5	1,5	2	2	2	2
Stroke stage 1	(mm)	**16**	**20**	**25**	**25**	**25**	**30**
h3	(mm)	46	54	63,5	67	77	89
Stroke stage 2	(mm)	**50**	**50**	**50**	**50**	**50**	**63**
h3	(mm)	80	84	88,5	92	102	122

Note: The supply bore for the return stroke should be deburred using a ball countersink or relieved at a 30° angle. The ratio of the flow cross-sections of the bores for forward and return stroke should be approximately 1.6.

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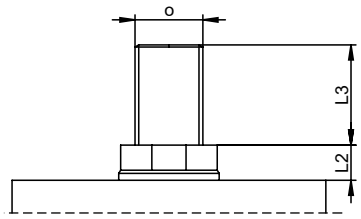
FURTHER VERSIONS
EXTERNAL THREAD • FKM SEALS

TYPE 210



Piston Ø	o	L2	L3
16	M6	6	12
25	M10	7	15
32	M12	10	15
40	M16	10	25
50	M20	10	30
63	M27	14	40

External thread on the piston rod

All built-in cylinders are alternatively available with an **external thread** on the piston rod.
For this version, the suffix „**-A**“* must be added to the order number.

Example: 210-032-025-A

FKM seals

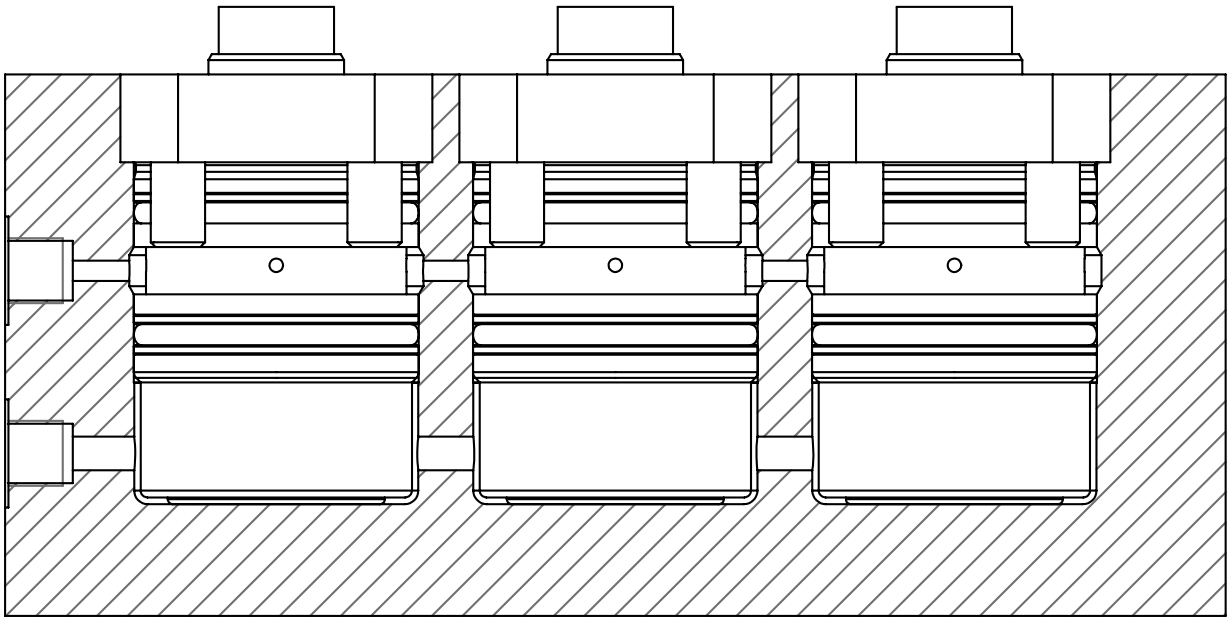
All built-in cylinders can optionally be equipped with **FKM seals**. These increase the permissible operating temperature from 80°C to 180°C. For this version, the suffix „**-V**“* must be added to the order number.

Example: 210-032-025-V

* Suffixes can be combined

INSTALLATION EXAMPLE
MULTIPLE CLAMPING

TYPE 210



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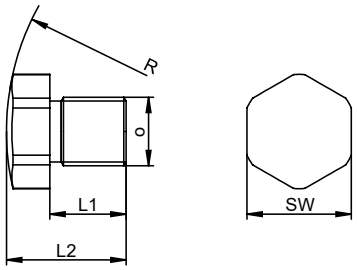
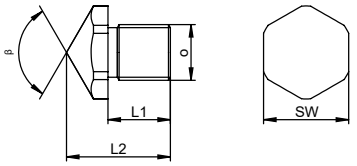


Order No.:	o	L1	L2	R	SW
DR-06	M6	10	20	20	10
DR-10	M10	12	22	35	17
DR-12	M12	14	24	45	19
DR-16	M16	20	30	60	24
DR-20	M20	25	35	60	30
DR-27	M27	30	47	100	41

Thrust pieces with radius

Radius thrust pieces are available for GERMA built-in cylinders. They can be screwed into the internal thread of the piston rod.



Order No.:	o	L1	L2	β	SW
DS-06	M6	10	22	90	10
DS-10	M10	12	27	90	17
DS-12	M12	14	29	120	19
DS-16	M16	20	35	120	24
DS-20	M20	25	40	120	30
DS-27	M27	30	50	120	41

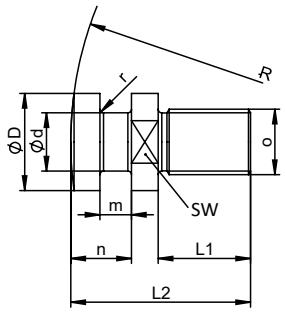
Pointed thrust pieces

Pointed thrust pieces are available for GERMA built-in cylinders. They can be screwed into the internal thread of the piston rod.

Thrust pieces with coupling pin

Thrust pieces with **coupling pin** are available for GERMA built-in cylinders. They can be screwed into the internal thread of the piston rod.

By means of the coupling – when used with a corresponding mating part – a **lateral-force-free** and **floating connection** between the hydraulic cylinder and the moving mass can be established.



Order No.:	o	L1	L2	D	d	m	n	R	r	SW
DK-10	M10	14	31,5	20	10	6,5	12	320	1	17
DK-12	M12	14	31,5	20	10	6,5	12	320	1	17
DK-16	M16	24	44	25	16	7	13	400	1	22
DK-20	M20	28	56	32	18	10	20	500	1	27
DK-27	M27	38	74	40	24	13	25	630	1,5	36

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