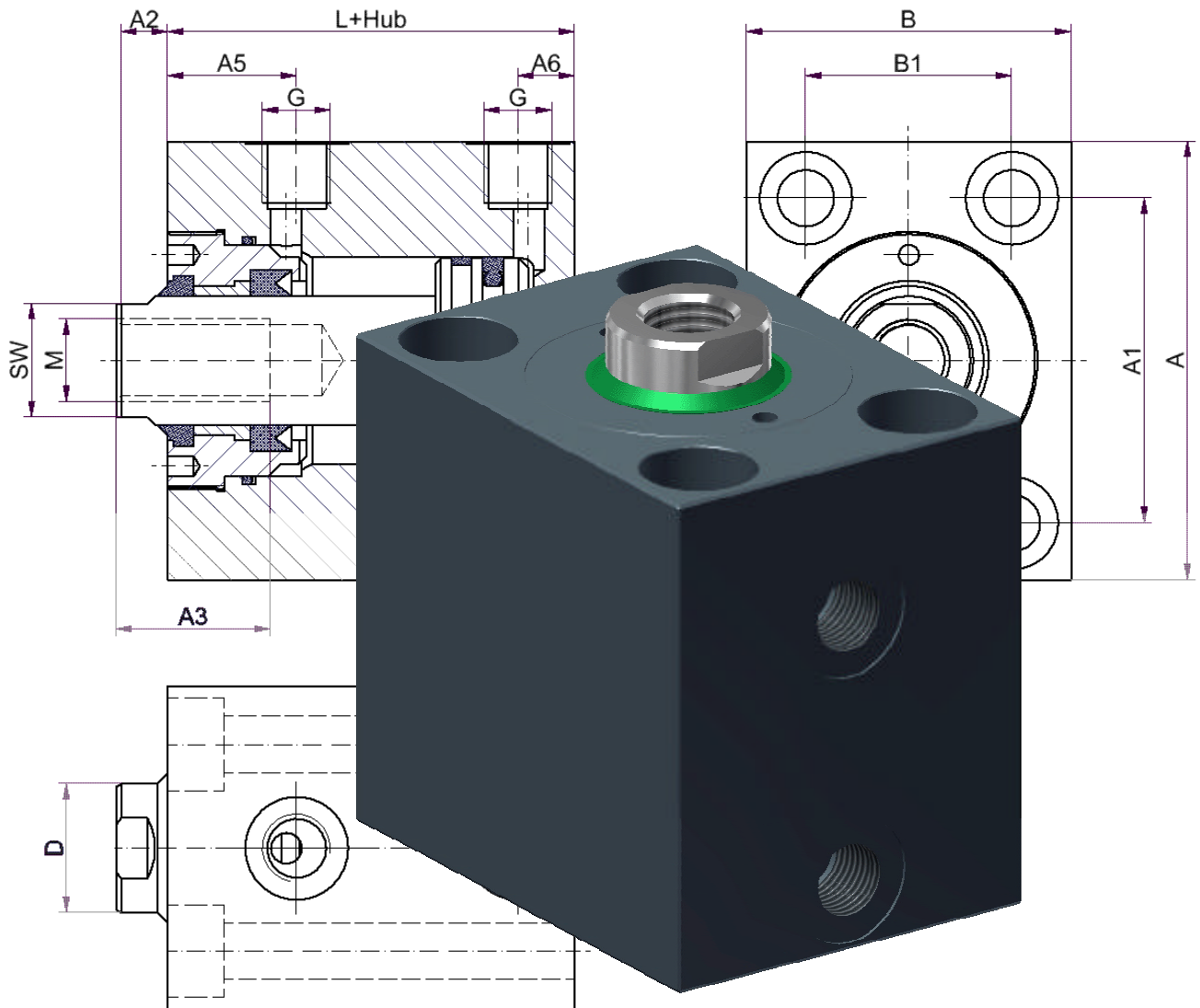


Hydraulic Block Cylinder HBZ 500



- Maximum operating pressure up to 500 bar with smallest installation dimensions

- Choice of 12 different piston sizes and 21 different configurations

- Seal arrangement for easy service

- Available for use with water

- Seal groove and diameter according to ISO 5597/1 and DIN ISO 7425/1

- Available with pressure resistant inductive proximity switches for end position sensing

MANAGEMENTSYSTEM



Hydraulic Block Cylinder HBZ 500

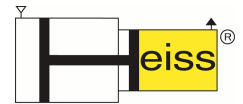


Table of contents:

General Information / Technical Data	2
Overview of Attachments	3
Special Designs and Functional Modes	5
General Information about Inductive Proximity Switches	6
Datasheets of Configurations	7
Piston Force Diagram	20
Type Designation	21

General Information:

Block cylinders are very compact cylinders with smallest installation dimensions for short stroke operation. By default these cylinders are fabricated with ground and hard-chrome plated rods for the operating conditions as listed below.

Special designs of any kind can be incorporated. Intermediate sizes and piston diameters of up to 500mm can be delivered.

Upon request the cylinders can be fitted with vent valves. Please indicate the desired position for the vents when ordering.

CAD data is available from our electronic catalogue available on CD - please contact us for your copy – or online from the download area at www.heiss.de.

Technical Data:

Operating pressure:

500 bar, for higher operating pressures please contact us.

Operating fluids:

Hydraulic oil on the basis of mineral oils, for example H, HL, HLP-oils per DIN 51524/51525. Other operating fluids like fire resisting fluids or water may be used upon request.

Operating temperature:

By default the cylinder is fitted with seals for a temperature range from -20°C to +80°C. High temperature resistant seals can be fitted without changes in design.

Piston travel speed:

Maximum of 0.5 m/s. Please contact us for higher piston travel speeds.

Cylinder stroke:

Standard strokes listed in the data sheets can be reduced user-defined. Block cylinders are also available with larger stroke. Please contact us when exceeding the piston diameter-stroke ratio of 1:3.

Tolerances:

Stroke tolerances and stroke dependent dimensions according to DIN ISO 2768 - g T1 (previously DIN 7168 - g)

Other tolerances according to DIN ISO 2768 - m T1 (previously DIN 7168 - m)

Attachment elements:

Ball and socket joint heads, rod clevis and rod end plain eyes as well as tappet screws and tappet pins can be found in our main catalogue under Accessories.

Position sensing:

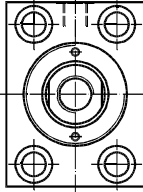
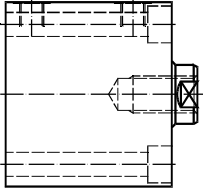
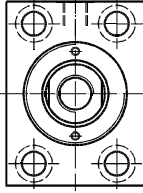
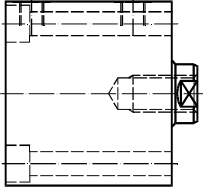
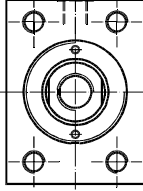
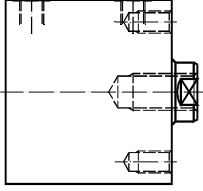
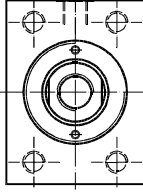
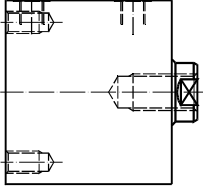
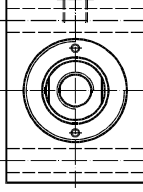
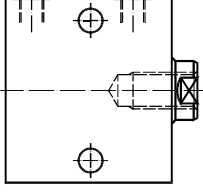
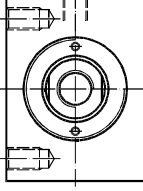
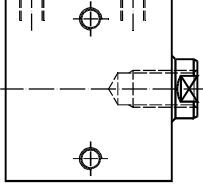
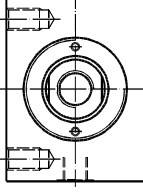
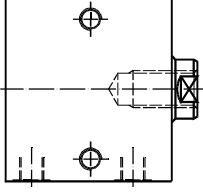
Various methods for position sensing are available:

- Pressure resistant inductive proximity switches for end position sensing (see following pages)
- Magnetic field sensors also for sensing of intermediate positions (The length of the cylinder increases with this option, see product catalogue HBZ 350)
- Multi-limit switches via shift linkage with adjustable switching points.
- Continuous shift linkage for external sensing.
- Position measuring systems with various output signals for position determination.

Hydraulic Block Cylinder HBZ 500



Overview of Configurations:

		Configu- ration	Description
		AD1	Axial attachment With through holes countersunk for cylinder head bolts according to DIN 912 on rod side Ports: Screw-in threads according to DIN 3852 Part 1+2
		AD2	Axial attachment With through holes countersunk for cylinder head bolts according to DIN 912 on bottom side Ports: Screw-in threads according to DIN 3852 Part 1+2
		AG1	Axial attachment With threaded blind holes on rod side Ports: Screw-in threads according to DIN 3852 Part 1+2
		AG2	Axial attachment With threaded blind holes on bottom side Ports: Screw-in threads according to DIN 3852 Part 1+2
		BD1	Radial attachment With through holes Ports: Screw-in threads according to DIN 3852 Part 1+2
		BG1	Radial attachment With threaded blind holes Connection on left hand side Ports: Screw-in threads according to DIN 3852 Part 1+2
		BG2	Radial attachment With threaded blind holes Connection on right hand side Ports: Screw-in threads according to DIN 3852 Part 1+2

Hydraulic Block Cylinder HBZ 500



Overview of Configurations:

	Configu- ration	Description
	CD1	Axial attachment With through holes countersunk for cylinder head bolts according to DIN 912 on rod side Ports: O-ring seals on bottom side
	CD2	Axial attachment With through holes counter sunk for cylinder head bolts according to DIN 912 on bottom side Ports: O-ring seals on rod side
	CG1	Axial attachment With threaded blind holes on rod side Ports: O-ring seals on rod side
	CG2	Axial attachment With threaded blind holes on bottom side Ports: O-ring seals on bottom side
	DD1	Radial attachment With through holes Ports: O-ring seals on side
	DG1	Radial attachment With threaded blind holes Ports: O-ring seals on side
	120	Nondifferential cylinder Can be combined with all configurations Ports: Choice of screw-in threads or O-ring seals

Hydraulic Block Cylinder HBZ 500



Special Designs:

The Block Cylinder is available with end-of-stroke dampers for longer strokes if needed. Functional modes 004, 005 and 006 require additional structural length "L+", which can be found in the lower table. Dimensions A6/A16 and A5/A15 are identical with dampers on both sides or on bottom side only. Basic dimensions remain identical with functional modes 001 and 002. Should the Block Cylinder be required with spring loaded return stroke please request the extra dimension sheet.

Symbol per DIN 24300	Functional mode	Description	Symbol per DIN 24300	Functional mode	Description
	001	Single acting pushing		005	Double acting, end-of-stroke damper on rod side
	002	Single acting pulling		006	Double acting, end-of-stroke damper on bottom side
	003	Double acting		001-F	Single acting pushing Spring loaded return stroke
	004	Double acting, end-of-stroke damper on both sides		002-F	Single acting pulling Spring loaded return stroke

- **X1** ... threaded pin installed at rod end (from M24x2 rod with male thread)
- **X2** ... rod end according to customers specifications (please provide dimensions/sketch with order)
- **X3** ... piston seals statically
- **X4** ... modified ports (explain with order)
- **X5** ... seals in servo-quality
- **X6** ... seals temperature resistant up to 200°C (Viton-seals)
- **X7** ... corrosion resistant model for use with water
- **X8** ... miscellaneous
- **XE**... with vent plug
- **XN**... with groove (XN1... ports on left hand side / XN2... ports on right hand side)
- **XZ**... with centering shoulder (with piston diameters 16 - 80mm not available in configuration CD2 and CG1)

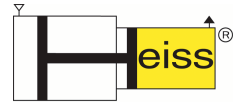
Installed threaded pin „X1“	Groove „XN1“ / „XN2“	Centering shoulder „XZ“
D und M depending on cylinder size	A4 and A14 depending on cylinder type	L and LIN depending on cylinder type

Piston-ø	16	20	25	32	40	50	63	80	100	125	160	200
a1	21	22	27	35	35	40	49	54	75	86	102	128
a2	15	15	20	25	25	30	35	40	60	70	80	100
A7	8	8	10	12	12	15	20	24	28	35	42	55
A8	2	2	2	3	3	5	5	7	7	7	9	9
D4 f7	34	34	44	52	60	72	94	115	135	155	205	265
A10	2	2	2	3	3	3	3	4	4	5	5	5
L+ 004	25	26	34	34	48	50	52	57	65	89	110	135
L+ 005	6	8	12	13	15	15	18	20	25	35	45	55
L+ 006	19	18	22	21	33	35	34	37	40	54	65	80

Design subject to change

Revision B * 12.03.13

Hydraulic Block Cylinder HBZ 500



With Inductive Proximity Switches:

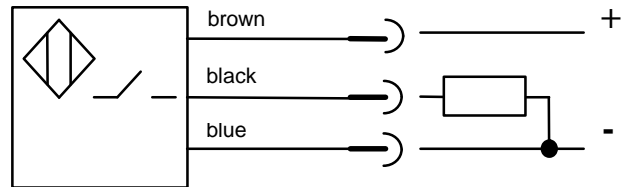
General Information to inductive proximity switches

Inductive proximity switches allow touch-free sensing of end positions of the hydraulic cylinders and are thus wear-free. They are inverse-polarity protected and are protected against inductive voltage peaks.

Specifications:

Output function	: PNP
Operating voltage U	: 10...30 V DC
Ripple max.	: ≤15 %
Current carrying capacity I _a	: 200 mA
No-load current I _r	: 10 mA
Switching frequency f _{max}	: 1000 Hz
Switching hysteresis H	: ≤15%
Nom. switching distance S _n	: 1,5 mm
Short-circuit protected	: yes
Pressure resistant	: to 500 bar
Ambient temperature	: -25...+70°C
Connection type	: angled connector with permanently attached cable (3m)
Cable type	: PVC/PUR oil resistant
Enclosure type	: IP 67 (DIN 40050)
Housing material	: 1.4104 (stainless steel)

Wiring diagram:



Attention!

Proximity switches are adjusted ex works. Should you loosen or readjust the proximity switches, do so only with the cylinder in the respective end-position. Otherwise the proximity switch may be screwed in too deep and may get damaged by the switching piston.

By default the switching point of the proximity switch is located exactly at the end-position of the Block Cylinder. Should the stroke be limited by external factors the switching point can be moved inward up to 6mm upon customers request. With your order please request the inward positioning of the switching point as follows:

- Inward positioning of the switching point on the rod side (**V**) for example by 2mm ⇒ **SV 2**
- Inward positioning of the switching point on the bottom side (**H**) for example by 3mm ⇒ **SH 3**
- Inward positioning of the switching point on both sides (**V & H**) for example by 1mm each ⇒ **SVH 1**

The desired code designation needs to be added to the type designation when ordering because the switching points cannot be moved subsequently.

By default the Block Cylinder is equipped with proximity switches on both sides. Should only one proximity switch be required, please, add for rod side position "V" or for bottom side position "H" to the designator for proximity switches "IN".

Example for ordering

HBZ500-50/32/25-AD1.003.INV.SV1

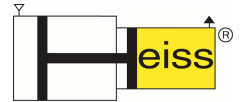
- Hydraulic block cylinder (HBZ) for maximum operating pressure of 500 bar
- Piston diameter 50 mm
- Piston rod diameter 32 mm
- Cylinder stroke 25 mm
- Axial attachment with through holes countersunk on rod side ports with screw-in threads (AD1)
- Functional mode: double acting (003)
- Inductive proximity switch (IN) on rod side (V)
- Modification of switching point position (S) on rod side (V) by 1 mm

Design subject to change

Revision B * 12.03.13

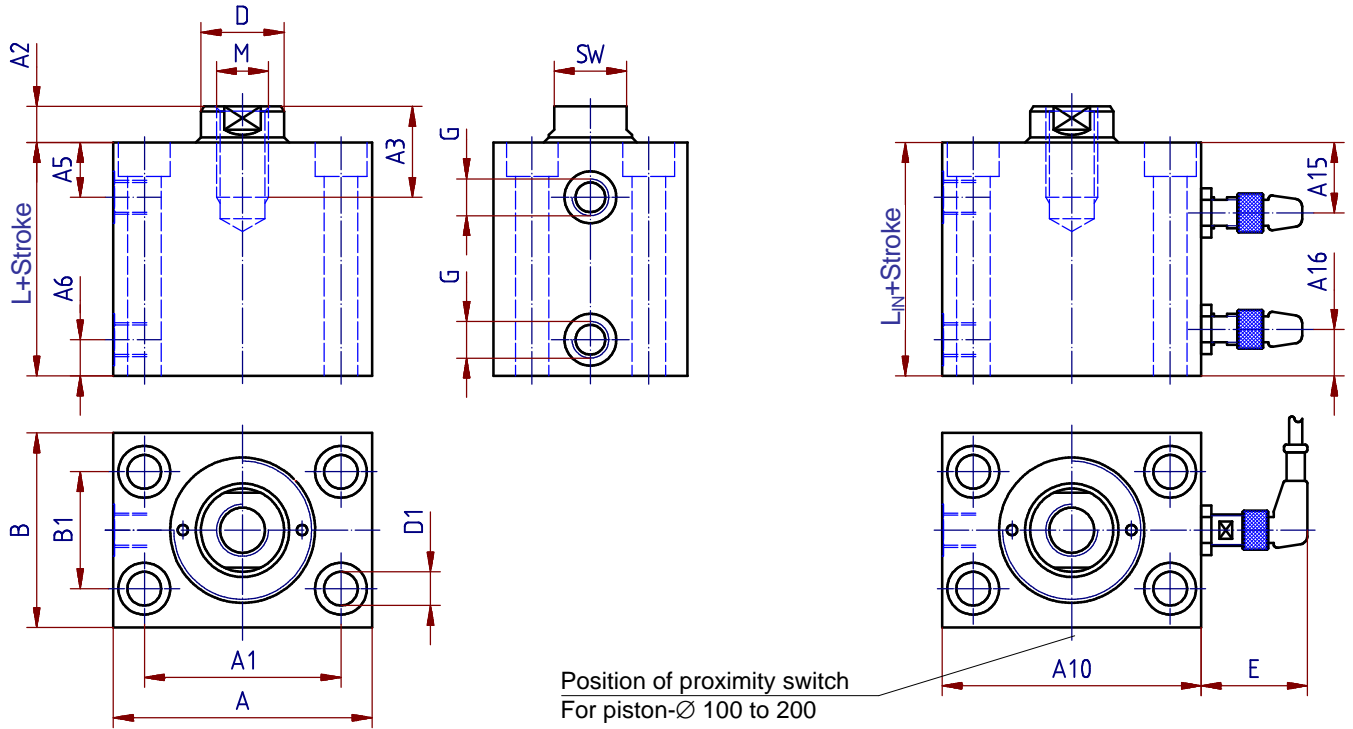
Hydraulic Block Cylinder HBZ 500

Configuration AD1



HBZ500 -.././.. -AD1.003

HBZ500 -.././.. -AD1.003.IN



- Counterbores for cylinder head bolts DIN 912
- Only bolts of strength category 12.9 should be used for installation

Piston-ø	16	20	25	32	40	50	63	80	100	125	160	200
D rod ø	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A5	17	17	19	23	25	27	28	34	37	47	55	65
A6	11	11	11	11	11	12	15	18	22	25	35	40
A10	75	75	65	75	85	100	125	160	200	230	300	380
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
B1	22	22	30	35	40	45	65	80	108	130	160	220
D1	7	7	9	11	11	14	18	22	26	33	39	52
E	46	49	56	51	50	50	44	36	50	49	40	50
G	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G3/4"
SW	8	10	14	17	22	30	36	46	55	75	95	120

Design subject to change

Revision B * 12.03.13

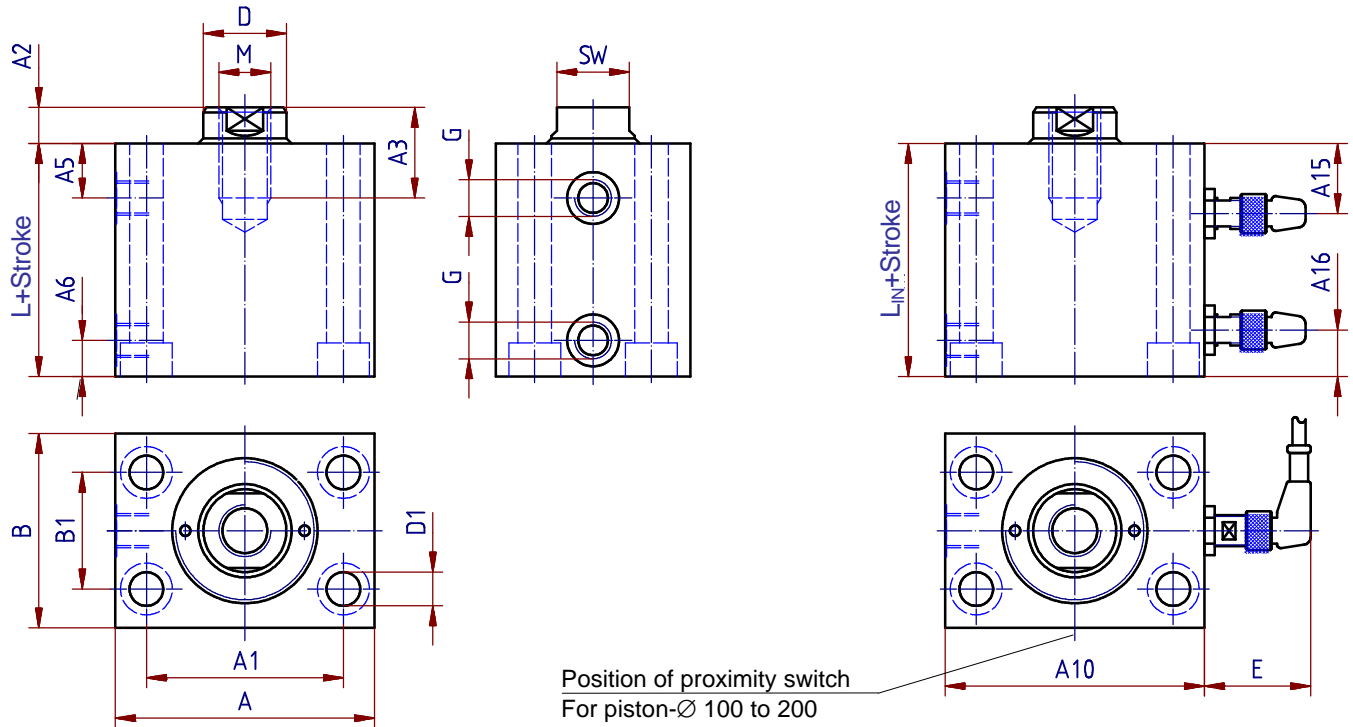
Hydraulic Block Cylinder HBZ 500

Configuration AD2



HBZ500 -.././.. -AD2.003

HBZ500 -.././.. -AD2.003.IN



- Counterbores for cylinder head bolts DIN 912 except piston-Ø 16 and 20.
- Only bolts of strength category 12.9 should be used for installation.

Piston-ø	16	20	25	32	40	50	63	80	100	125	160	200
D rod ø	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A5	17	17	19	23	25	27	28	34	37	47	55	65
A6	11	11	11	11	11	12	15	18	22	25	35	40
A10	75	75	65	75	85	100	125	160	200	230	300	380
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
B1	22	22	30	35	40	45	65	80	108	130	160	220
D1	7	7	9	11	11	14	18	22	26	33	39	52
E	46	49	56	51	50	50	44	36	50	49	40	50
G	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G3/4"
SW	8	10	14	17	22	30	36	46	55	75	95	120

Design subject to change

Revision B * 12.03.13

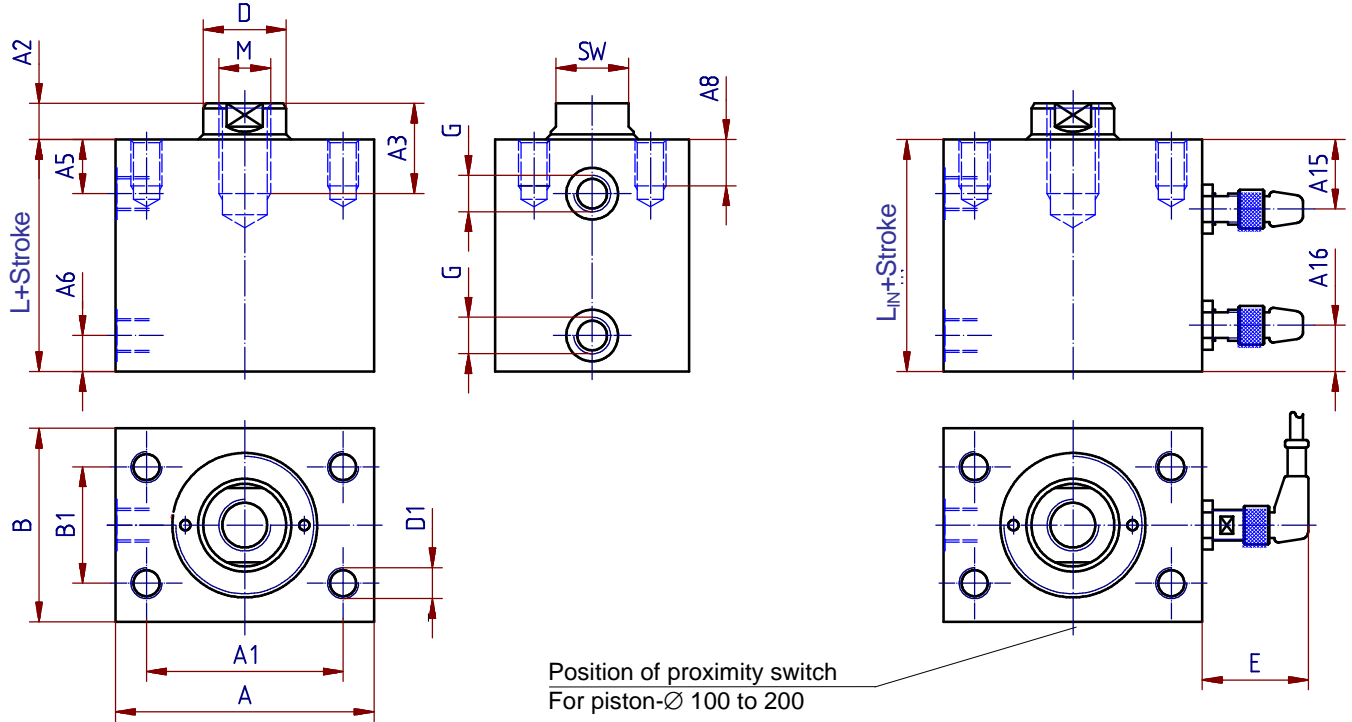
Hydraulic Block Cylinder HBZ 500

Configuration AG1



HBZ500 -.././.. -AG1.003

HBZ500 -.././.. -AG1.003.IN



- Only bolts of strength category 12.9 should be used for installation

Piston-ø	16	20	25	32	40	50	63	80	100	125	160	200
D rod ø	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A5	17	17	19	23	25	27	28	34	37	47	55	65
A6	11	11	11	11	11	12	15	18	22	25	35	40
A8	12	12	15	20	20	25	35	40	50	60	70	90
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
B1	22	22	30	35	40	45	65	80	108	130	160	220
D1	M6	M6	M8	M10	M10	M12	M16	M20	M24	M30	M36	M48
E	54	56	56	51	50	50	44	36	50	49	40	50
G	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G3/4"
SW	8	10	14	17	22	30	36	46	55	75	95	120

Design subject to change

Revision B * 12.03.13

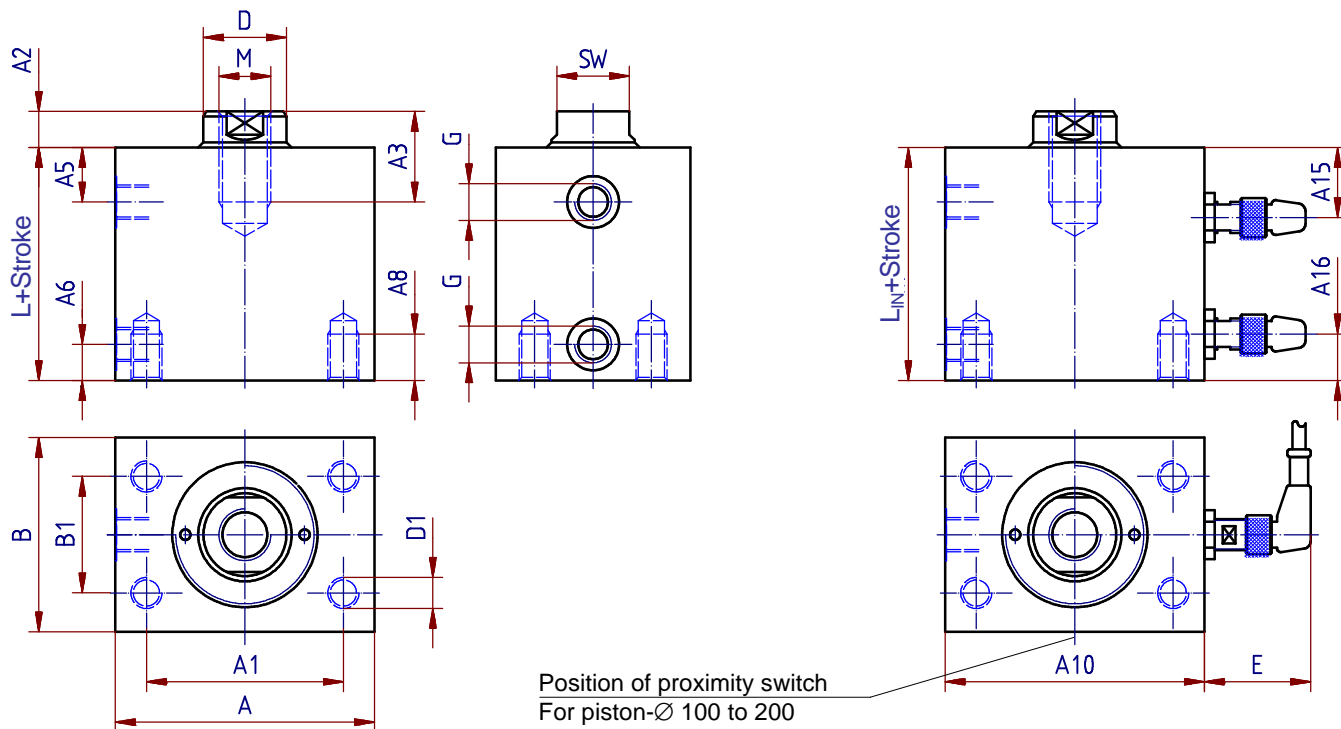
Hydraulic Block Cylinder HBZ 500

Configuration AG2



HBZ500 -.././.. -AG2.003

HBZ500 -.././.. -AG2.003.IN



- Only bolts of strength category 12.9 should be used for installation

Piston-ø	16	20	25	32	40	50	63	80	100	125	160	200
D rod ø	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A5	17	17	19	23	25	27	28	34	37	47	55	65
A6	11	11	11	11	11	12	15	18	22	25	35	40
A8	12	12	15	20	20	25	35	40	50	60	70	90
A10	75	75	65	75	85	100	125	160	200	230	300	380
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
B1	22	22	30	35	40	45	65	80	108	130	160	220
D1	M6	M6	M8	M10	M10	M12	M16	M20	M24	M30	M36	M48
E	46	49	56	51	50	50	44	36	50	49	40	50
G	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G3/4"
SW	8	10	14	17	22	30	36	46	55	75	95	120

Design subject to change

Revision A1 * 12.03.13

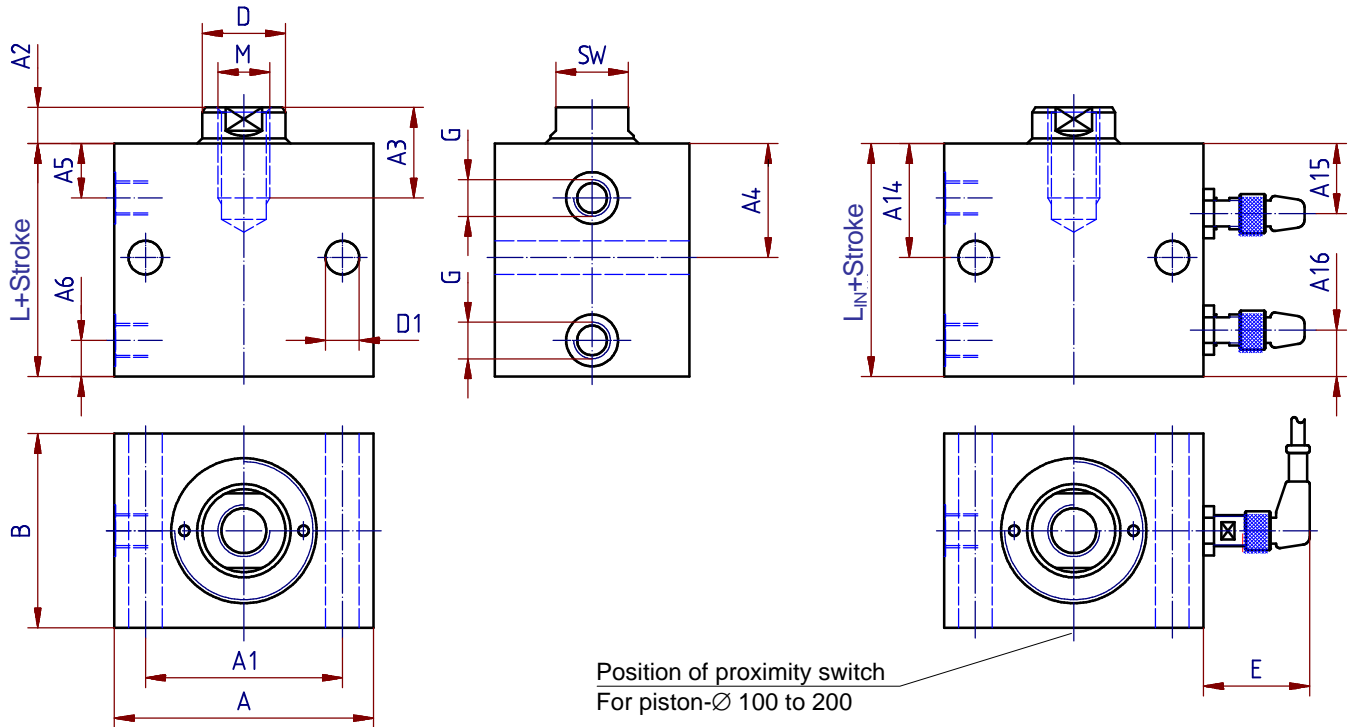
Hydraulic Block Cylinder HBZ 500

Configuration BD1



HBZ500 -.././.. -BD1.003

HBZ500 -.././.. -BD1.003.IN



- At higher pressures bracing of the cylinder is required.
- Only bolts of strength category 12.9 should be used for installation

Piston-ø	16	20	25	32	40	50	63	80	100	125	160	200
D rod ø	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A4	30	30	33	38	40	44	50	60	64	82	90	112
A5	17	17	19	23	25	27	28	34	37	47	55	65
A6	11	11	11	11	11	12	15	18	22	25	35	40
A14	40	41	44	47	49	58	59	60	64	82	90	112
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
D1	7	7	9	11	11	14	18	22	26	33	39	52
E	54	56	56	51	50	50	44	36	50	49	40	50
G	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G3/4"
SW	8	10	14	17	22	30	36	46	55	75	95	120

Design subject to change

Revision B * 12.03.13

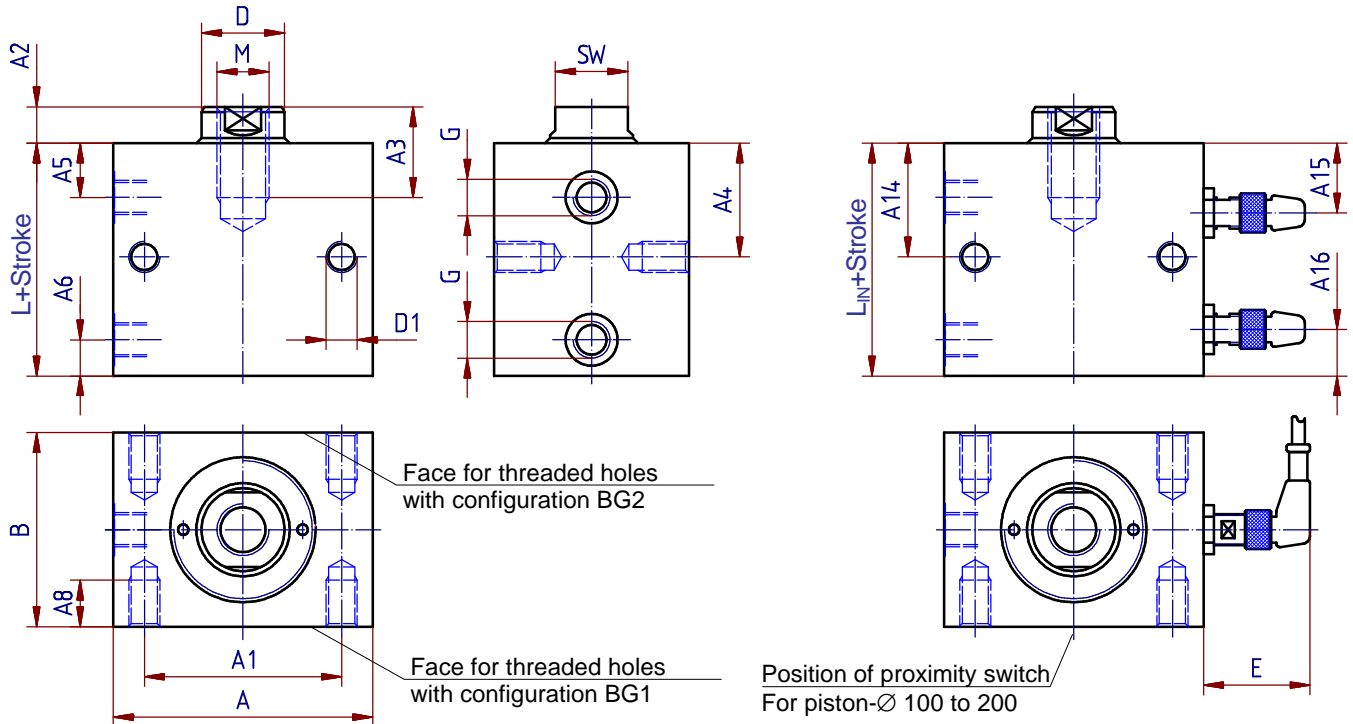
Hydraulic Block Cylinder HBZ 500

Configuration BG1 and BG2



HBZ500 -../... -BG...003

HBZ500 -../... -BG...003.IN



- At higher pressures bracing of the cylinder is required.
- Only bolts of strength category 12.9 should be used for installation.

Piston-ø	16	20	25	32	40	50	63	80	100	125	160	200
D rod ø	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A4	30	30	33	38	40	44	50	60	64	82	90	112
A5	17	17	19	23	25	27	28	34	37	47	55	65
A6	11	11	11	11	11	12	15	18	22	25	35	40
A8	12	12	15	20	20	25	35	40	50	60	70	90
A14	40	41	44	47	49	58	59	60	64	82	90	112
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
D1	M6	M6	M8	M10	M10	M12	M16	M20	M24	M30	M36	M48
E	54	56	56	51	50	50	44	36	50	49	40	50
G	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G3/4"
SW	8	10	14	17	22	30	36	46	55	75	95	120

Design subject to change

Revision B * 12.03.13

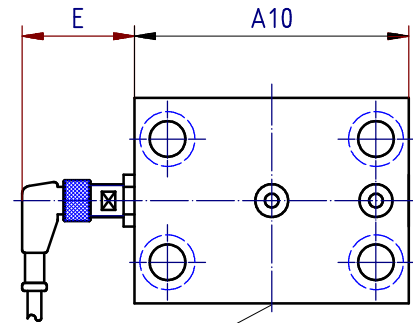
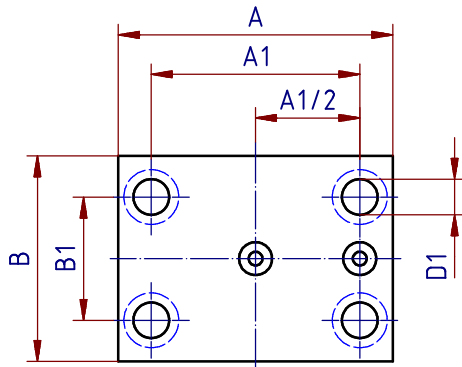
Hydraulic Block Cylinder HBZ 500

Configuration CD1

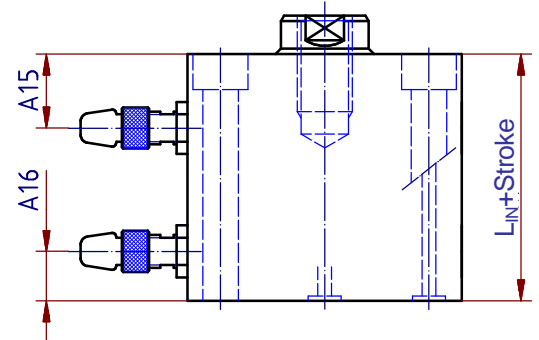
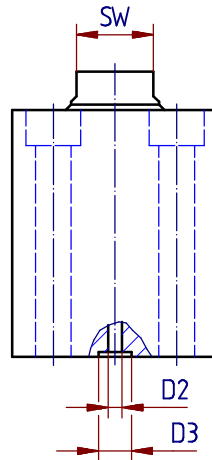
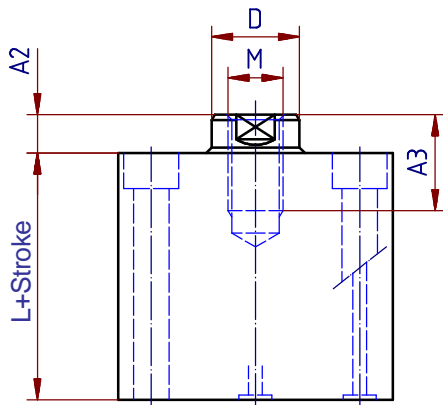


HBZ500 -.././.. -CD1.003

HBZ500 -.././.. -CD1.003.IN



Position of proximity switch
For piston- \varnothing 100 to 200



- Counterbores for cylinder head bolts DIN 912
- Only bolts of strength category 12.9 should be used for installation.

Piston- \varnothing	16	20	25	32	40	50	63	80	100	125	160	200
D rod \varnothing	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A10	75	75	65	75	85	100	125	160	200	230	300	380
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
B1	22	22	30	35	40	45	65	80	108	130	160	220
D1	7	7	9	11	11	14	18	22	26	33	39	52
D2	5	5	5	5	5	5	11	11	11	11	11	18
D3	10	10	10	10	10	10	18	18	18	18	18	26
E	46	49	56	51	50	50	44	36	50	49	40	50
SW	8	10	14	17	22	30	36	46	55	75	95	120
O-Ring	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	14x2	14x2	14x2	14x2	14x2	22x2

Design subject to change

Revision B * 12.03.13

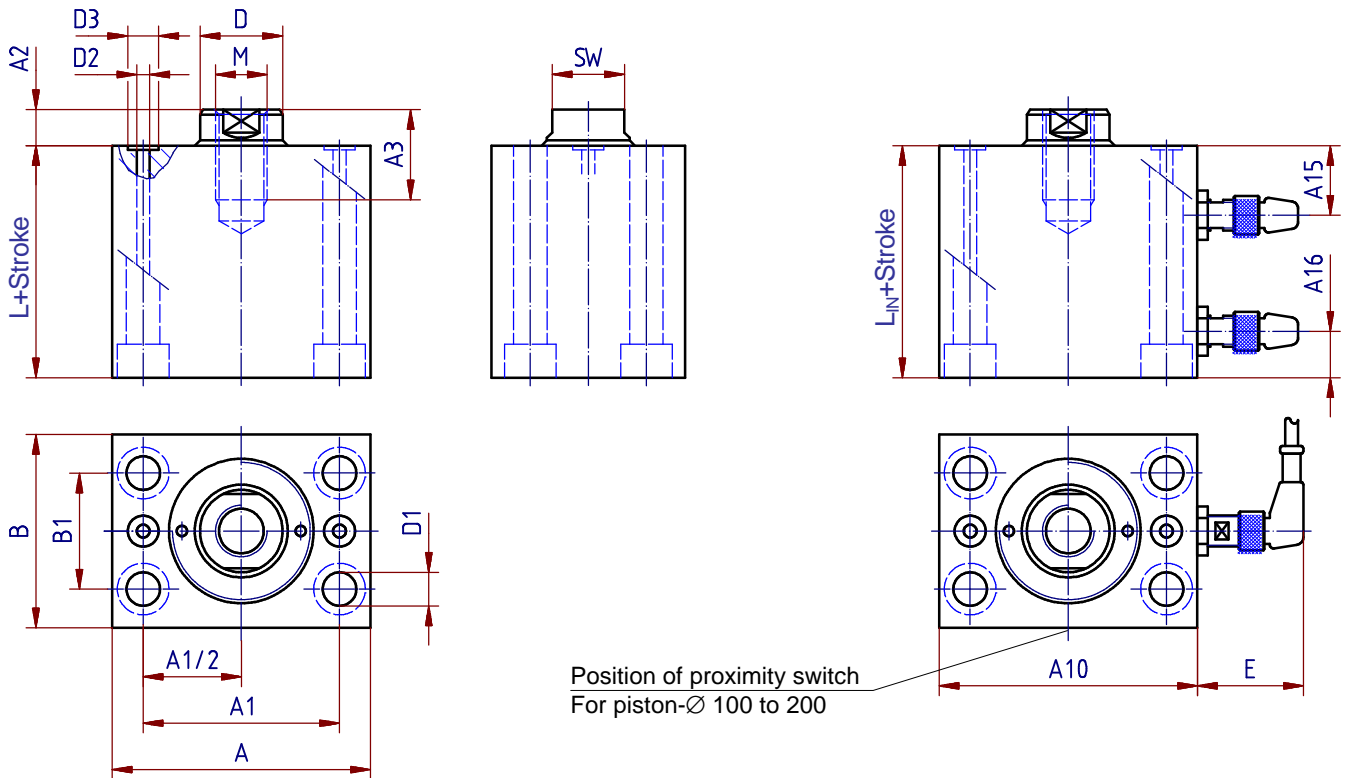
Hydraulic Block Cylinder HBZ 500

Configuration CD2



HBZ500 -.././.. -CD2.003

HBZ500 -.././.. -CD2.003.IN



- Counterbores for cylinder head bolts DIN 912 except piston-Ø 16 and 20
- Only bolts of strength category 12.9 should be used for installation.

Piston-Ø	16	20	25	32	40	50	63	80	100	125	160	200
D rod ø	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A10	75	75	65	75	85	100	125	160	200	230	300	380
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
B1	22	22	30	35	40	45	65	80	108	130	160	220
D1	7	7	9	11	11	14	18	22	26	33	39	52
D2	5	5	5	5	5	5	11	11	11	11	11	18
D3	10	10	10	10	10	10	18	18	18	18	18	26
E	46	49	56	51	50	50	44	36	50	49	40	50
SW	8	10	14	17	22	30	36	46	55	75	95	120
O-Ring	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	14x2	14x2	14x2	14x2	14x2	22x2

Design subject to change

Revision B * 12.03.13

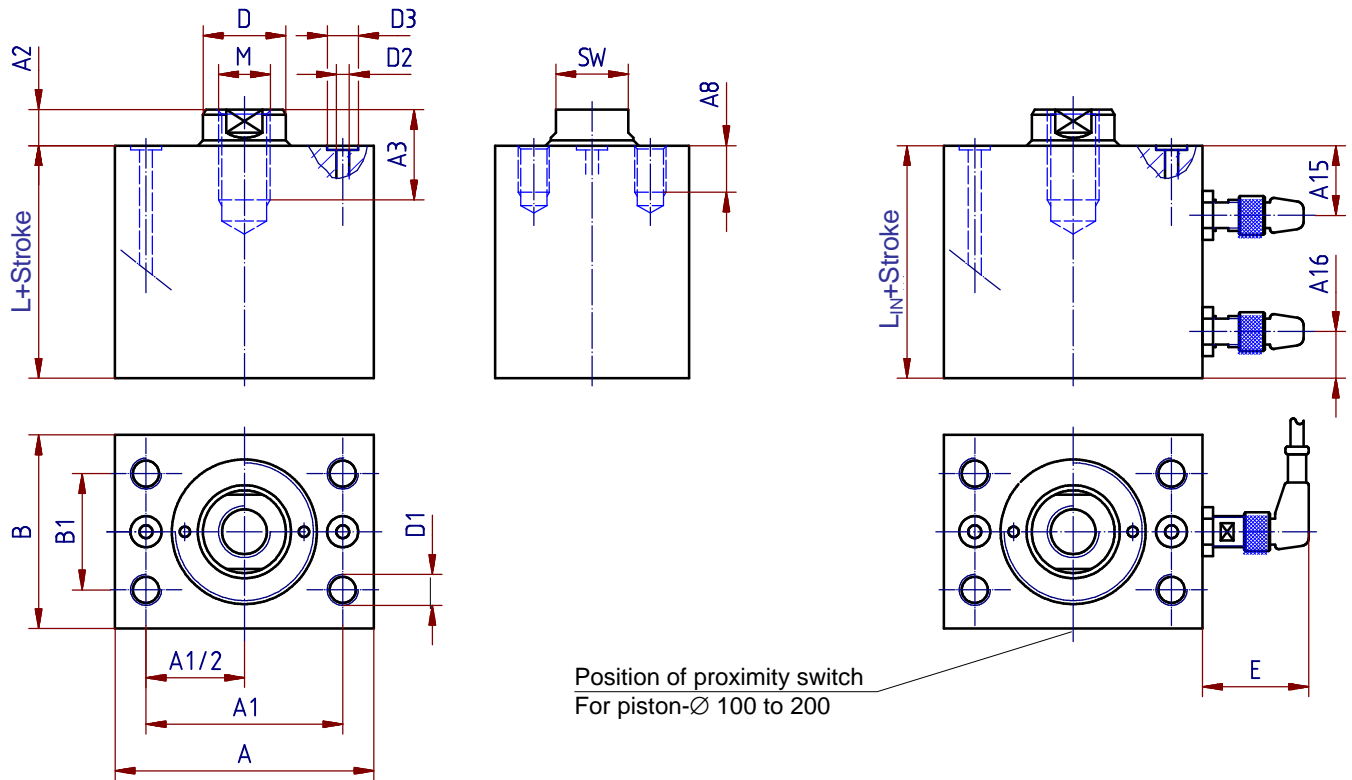
Hydraulic Block Cylinder HBZ 500

Configuration CG1



HBZ500 -.././.. -CG1.003

HBZ500 -.././.. -CG1.003.IN



- Only bolts of strength category 12.9 should be used for installation.

Piston-ø	16	20	25	32	40	50	63	80	100	125	160	200
D rod ø	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A8	12	12	15	20	20	25	35	40	50	60	70	90
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
B1	22	22	30	35	40	45	65	80	108	130	160	220
D1	M6	M6	M8	M10	M10	M12	M16	M20	M24	M30	M36	M48
D2	5	5	5	5	5	5	11	11	11	11	11	18
D3	10	10	10	10	10	10	18	18	18	18	18	26
E	54	56	56	51	50	50	44	36	50	49	40	50
SW	8	10	14	17	22	30	36	46	55	75	95	120
O-Ring	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	14x2	14x2	14x2	14x2	14x2	22x2

Design subject to change

Revision B * 12.03.13

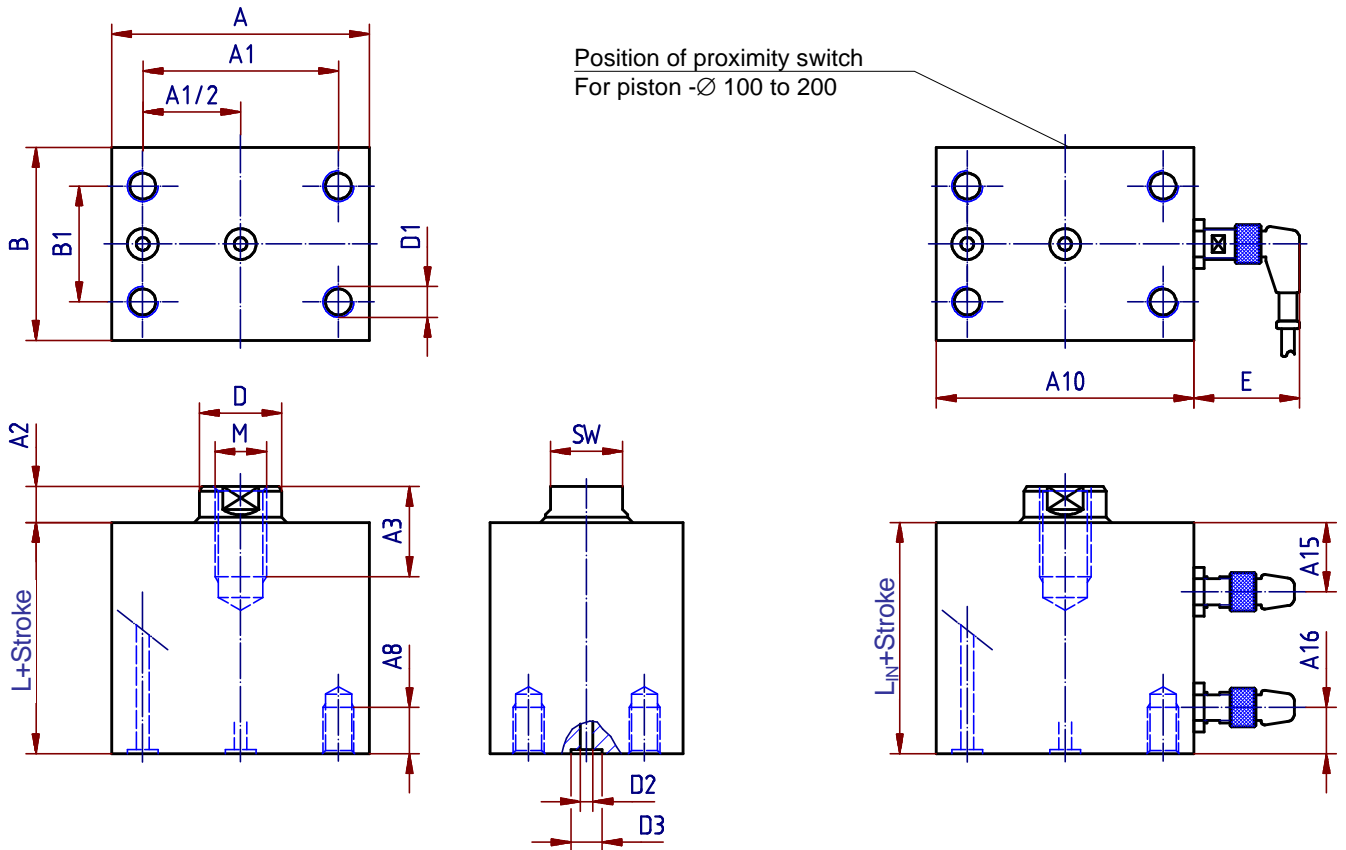
Hydraulic Block Cylinder HBZ 500

Configuration CG2



HBZ500 -.././.. -CG2.003

HBZ500 -.././.. -CG2.003.IN



Only bolts of strength category 12.9 should be used for installation.

Piston- \varnothing	16	20	25	32	40	50	63	80	100	125	160	200
D rod \varnothing	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A8	12	12	15	20	20	25	35	40	50	60	70	90
A10	75	75	65	75	85	100	125	160	200	230	300	380
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
B1	22	22	30	35	40	45	65	80	108	130	160	220
D1	M6	M6	M8	M10	M10	M12	M16	M20	M24	M30	M36	M48
D2	5	5	5	5	5	5	11	11	11	11	11	18
D3	10	10	10	10	10	10	18	18	18	18	18	26
E	46	49	56	51	50	50	44	36	50	49	40	50
SW	8	10	14	17	22	30	36	46	55	75	95	120
O-Ring	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	14x2	14x2	14x2	14x2	14x2	22x2

Design subject to change

Revision B * 12.03.13

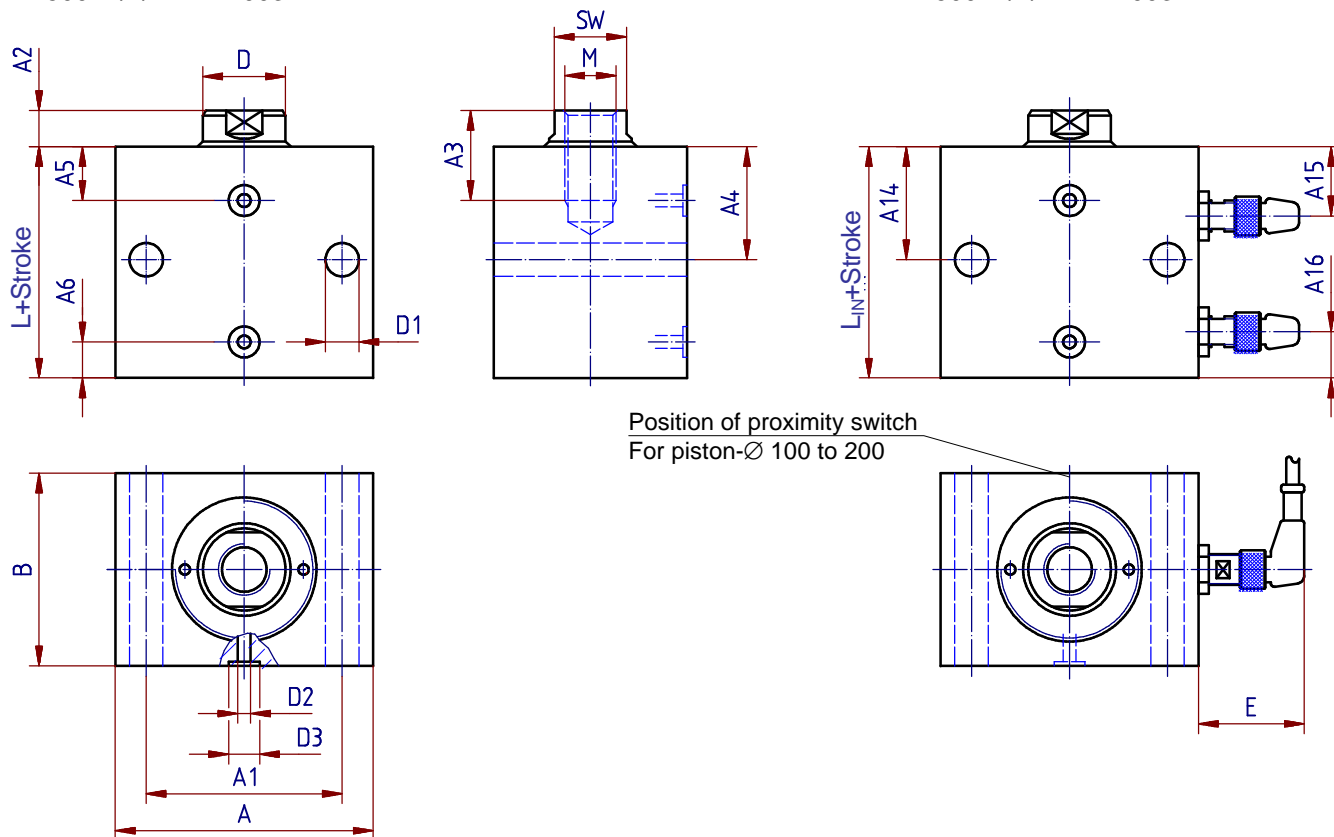
Hydraulic Block Cylinder HBZ 500

Configuration DD1



HBZ500 -.././.. -DD1.003

HBZ500 -.././.. -DD1.003.IN



- At higher pressures bracing of cylinder is required.
- Only bolts of strength category 12.9 should be used for installation.

Kolben-Ø	16	20	25	32	40	50	63	80	100	125	160	200
D Kst ø	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A4	30	30	33	38	40	44	50	60	64	82	90	112
A5	17	17	19	23	25	27	28	34	37	47	55	65
A6	11	11	11	11	11	12	15	18	22	25	35	40
A14	40	41	44	47	49	58	59	60	64	82	90	112
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
D1	7	7	9	11	11	14	18	22	26	33	39	52
D2	5	5	5	5	5	5	11	11	11	11	11	18
D3	10	10	10	10	10	10	18	18	18	18	18	26
E	54	56	56	51	50	50	44	36	50	49	40	50
SW	8	10	14	17	22	30	36	46	55	75	95	120
O-Ring	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	14x2	14x2	14x2	14x2	14x2	22x2

Design subject to change

Revision B * 12.03 13

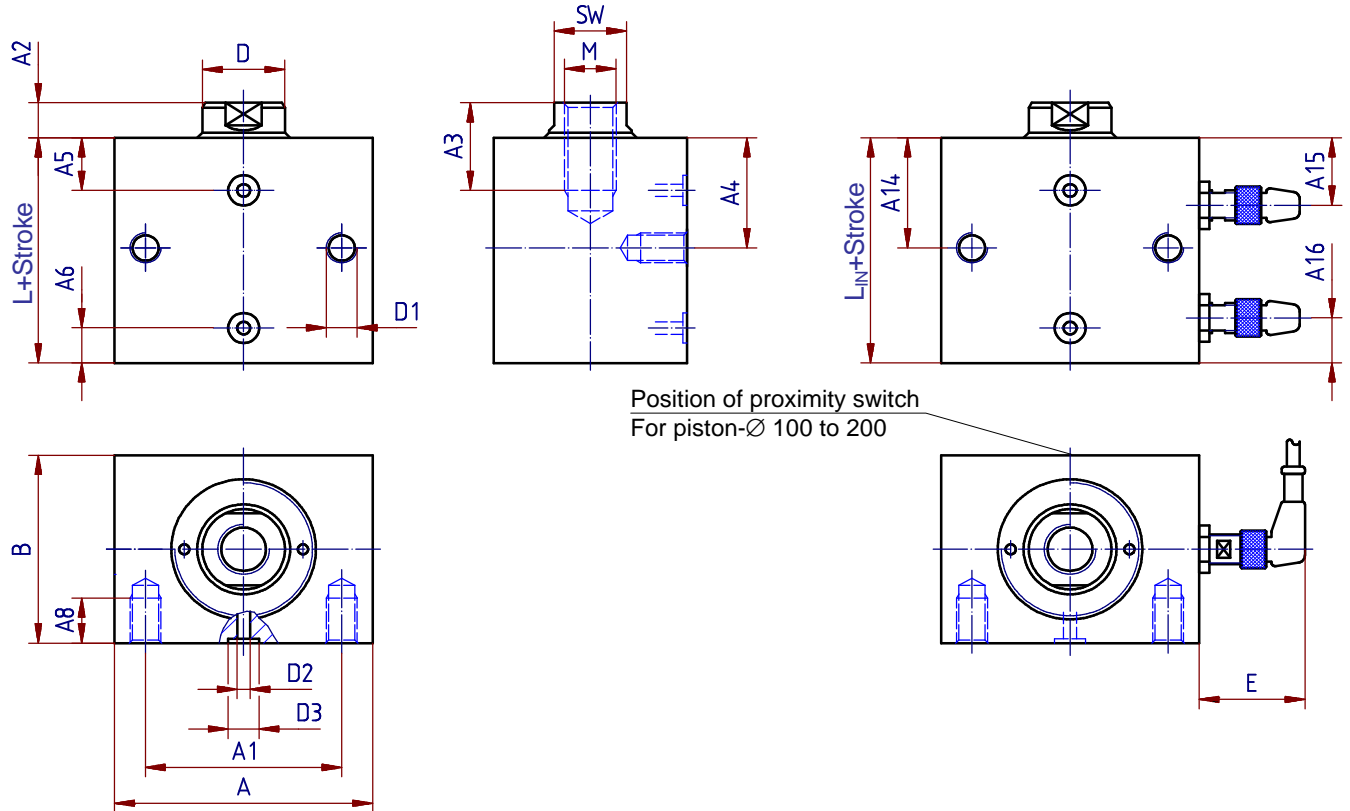
Hydraulic Block Cylinder HBZ 500

Configuration DG1



HBZ500 -../... -DG1.003

HBZ500 -../... -DG1.003.IN



- At higher pressures bracing of cylinder is required.
- Only bolts of strength category 12.9 should be used for installation.

Piston-ø	16	20	25	32	40	50	63	80	100	125	160	200
D rod ø	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	40	45	44	50	54	65	72	85	90	110	130	160
L _{IN}	64	68	66	70	75	89	94	105	111	133	153	183
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A4	30	30	33	38	40	44	50	60	64	82	90	112
A5	17	17	19	23	25	27	28	34	37	47	55	65
A6	11	11	11	11	11	12	15	18	22	25	35	40
A8	12	12	15	20	20	25	35	40	50	60	70	90
A14	40	41	44	47	49	58	59	60	64	82	90	112
A15	28	28	28	25	34	38	37	41	42	51	61	71
A16	14	13	13	14	15	18	20	23	27	31	41	46
B	35	35	45	55	63	75	95	120	150	180	230	300
D1	M6	M6	M8	M10	M10	M12	M16	M20	M24	M30	M36	M48
D2	5	5	5	5	5	5	11	11	11	11	11	18
D3	10	10	10	10	10	10	18	18	18	18	18	26
E	54	56	56	51	50	50	44	36	50	49	40	50
SW	8	10	14	17	22	30	36	46	55	75	95	120
O-Ring	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	7x1,5	14x2	14x2	14x2	14x2	14x2	22x2

Design subject to change

Revision B * 12.03.13

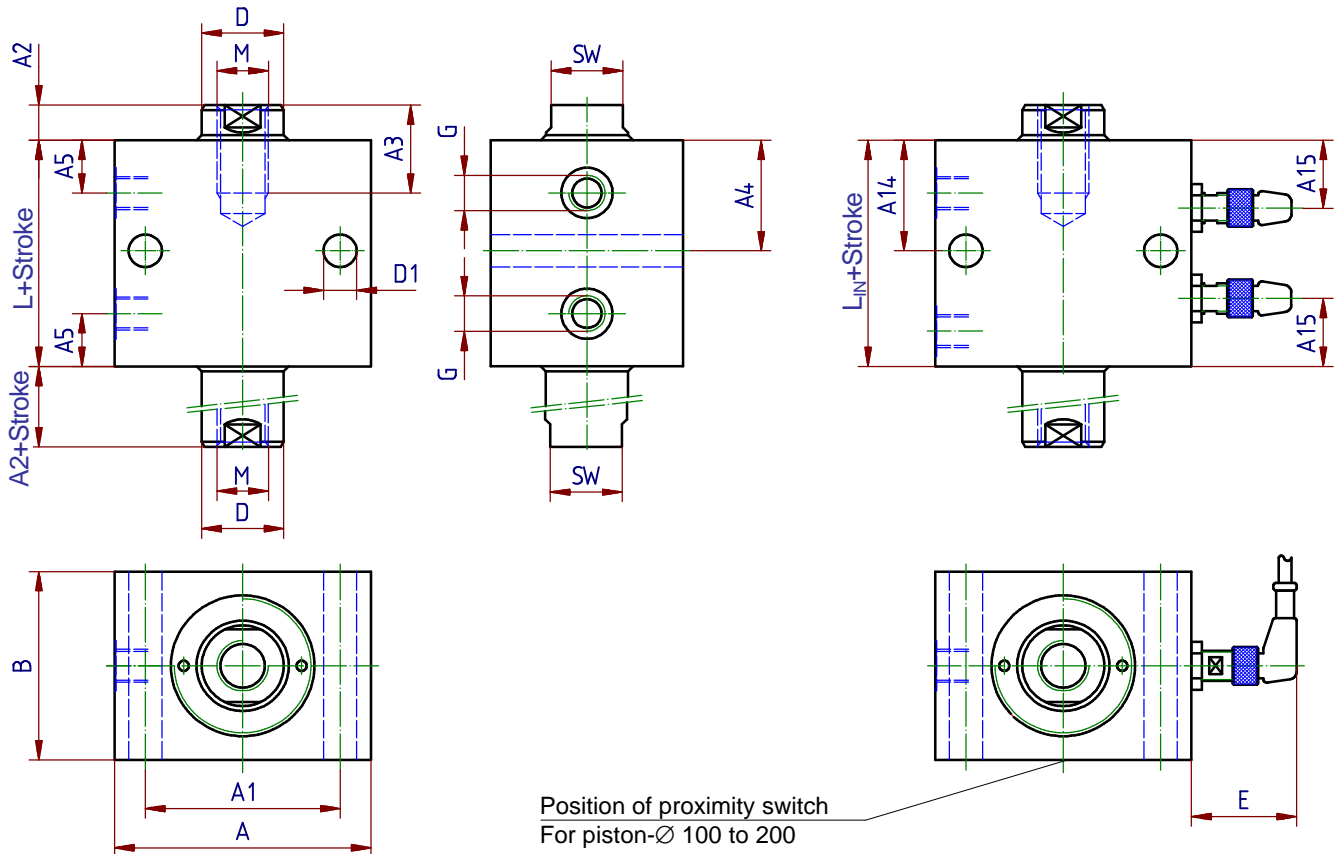
Hydraulic Block Cylinder HBZ 500

Configuration BD1-120 (can be combined with all configurations)



HBZ500 -.././.. -BD1-120.003

HBZ500 -.././.. -BD1.-120003.IN



- At higher pressures bracing of cylinder is required.
- Only bolts of strength category 12.9 should be used for installation.
- With end-of-stroke damper the additional length „L⁺“ has to be considered with the respective functional mode.

Piston-Ø	16	20	25	32	40	50	63	80	100	125	160	200
D rod ø	10	12	16	20	25	32	40	50	60	80	100	125
M	M6	M8	M10	M12	M16	M20	M24x2	M30x2	M42x3	M52x3	M56x4	M64x4
L	53	55	54	58	72	85	88	102	104	130	150	185
L _{IN}	78	83	79	82	96	110	111	123	126	153	173	208
Nominal stroke	16	16	20	25	25	25	30	30	40	40	40	40
A	60	60	65	75	85	100	125	160	200	230	300	380
A1	40	40	50	55	63	76	95	120	158	180	230	300
A2	6	7	7	10	10	10	14	14	15	16	22	28
A3	15	15	20	25	30	35	40	40	55	60	70	85
A4	30	30	33	38	40	44	50	60	64	82	90	112
A5	17	17	19	23	25	27	28	34	37	47	55	65
A14	40	41	44	47	49	58	59	60	64	82	90	112
A15	28	28	28	25	34	38	37	41	42	51	61	71
B	35	35	45	55	63	75	95	120	150	180	230	300
D1	7	7	9	11	11	14	18	22	26	33	39	52
E	54	56	56	51	50	50	44	36	50	49	40	50
G	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G3/4"
SW	8	10	14	17	22	30	36	46	55	75	95	120
L ⁺ 004	12	16	24	26	30	30	36	40	50	70	90	110
L ⁺ 005/006	6	8	12	13	15	15	18	20	25	35	45	55

Design subject to change

Revision B * 12.03.13

Hydraulic Block Cylinder HBZ 500



Piston force diagram

Formulas for calculation

- of piston force on piston side: (pushing)

$$F = \frac{p \cdot D^2 \cdot p}{40000}$$

F ... piston force [kN]

- of piston force on rod side: (pulling)

$$F = \frac{p \cdot (D^2 - d^2) \cdot p}{40000}$$

p ... operating pressure [bar]

D ... piston- \varnothing [mm]

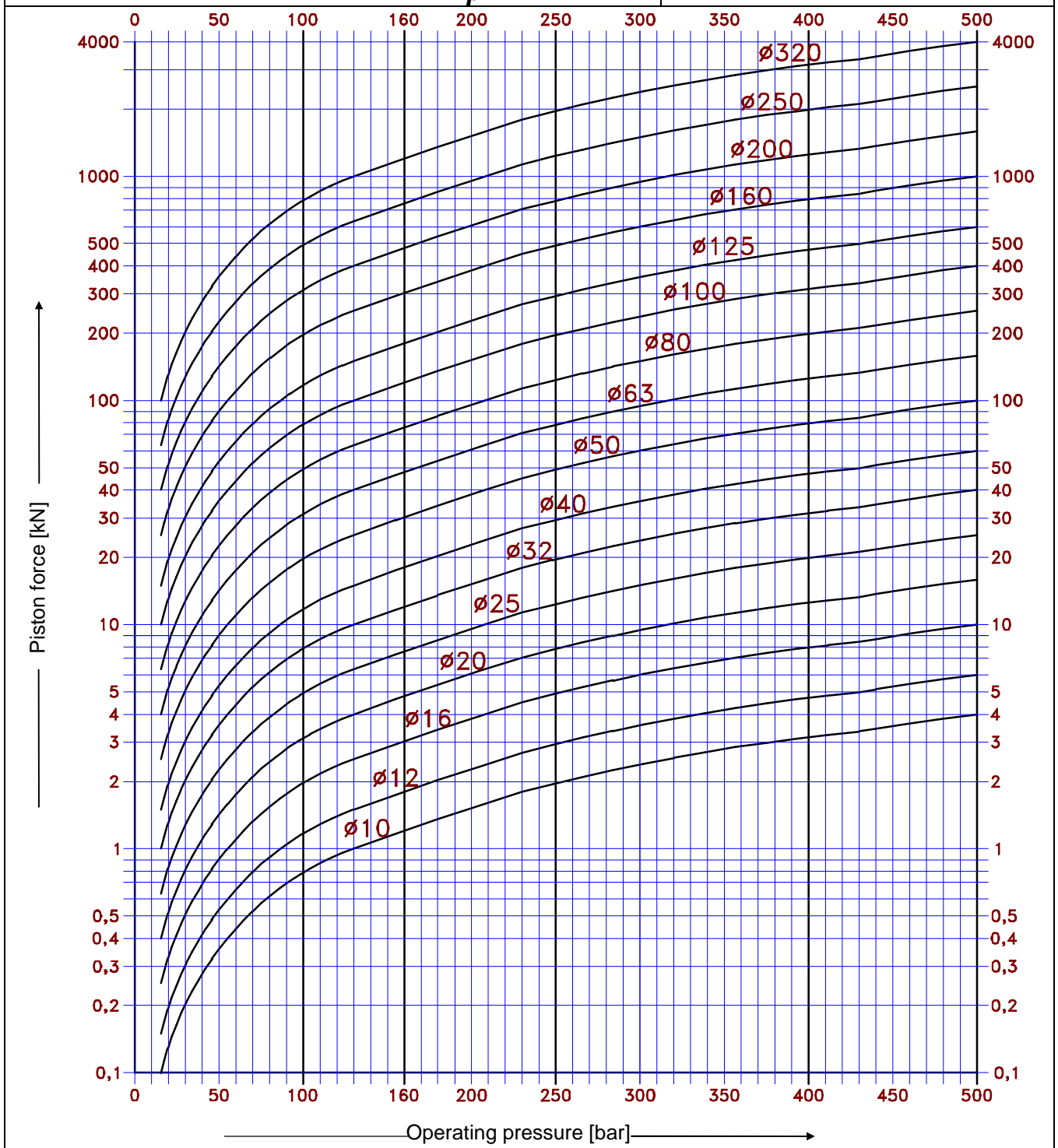
d ... rod- \varnothing [mm].

- of the required piston - \varnothing :

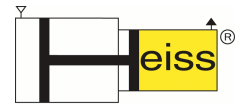
$$D_{\text{erf}} = \sqrt{\frac{F \cdot 40000}{p \cdot p}}$$

- of required operating pressure:

$$p_{\text{erf}} = \frac{F \cdot 40000}{p \cdot D^2}$$



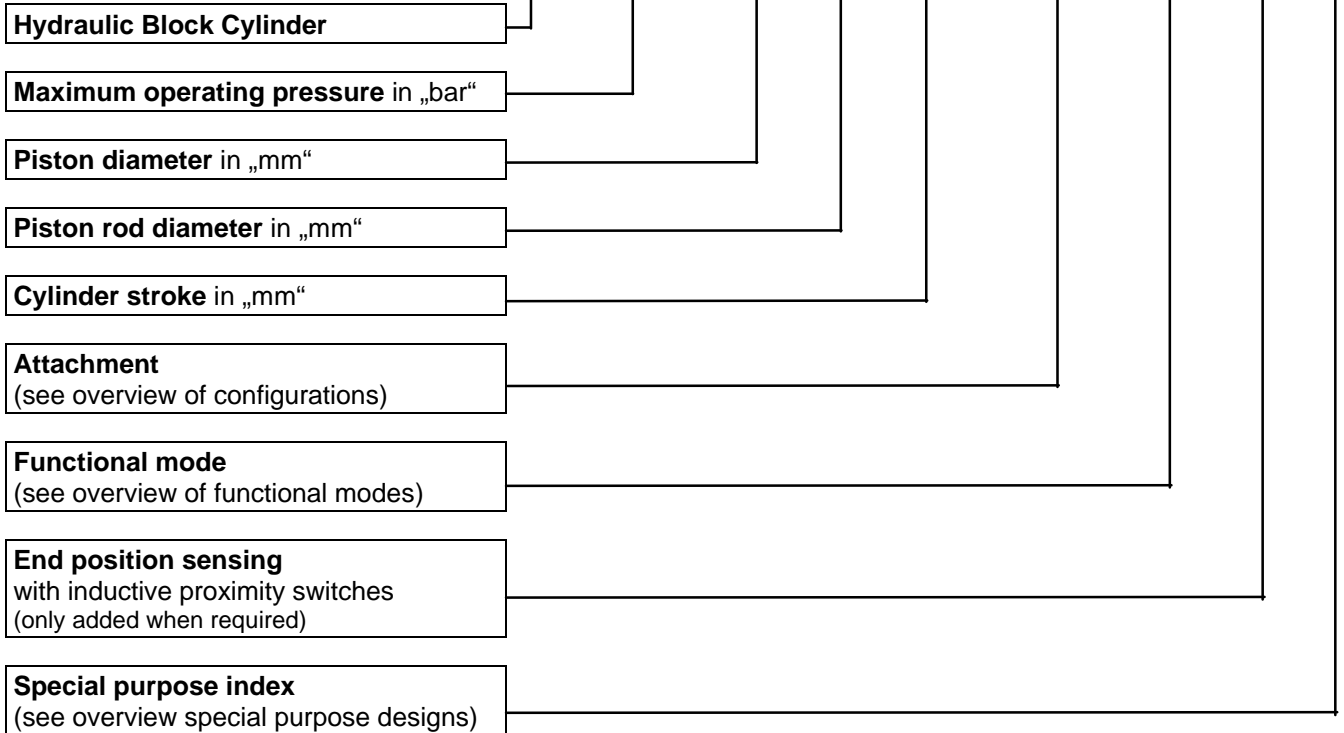
Hydraulic Block Cylinder HBZ 500



Type designation:

Description:

HBZ 500 - 50 / 32 / 25 - AD1 . 003 . IN . X



Examples for ordering:

HBZ 500 - 32 / 20 / 25 - BD2 . 003 . X1

Hydraulic-Block Cylinder for operating pressure of 500 bar
 Piston diameter: 32 mm
 Piston rod diameter: 20 mm
 Cylinder stroke: 25 mm
 Radial trough holes
 Double acting
 With threaded pin installed

HBZ 500 - 63 / 40 / 60 - DG1 - 120 . 003 . IN . X6

Hydraulic Block Cylinder for operating pressure of 500 bar
 Piston diameter: 63 mm
 Piston rod diameter: 40 mm
 Cylinder stroke: 60 mm
 Radial threaded blind holes with O-ring seals
 Nondifferential cylinder
 Double acting
 With inductive proximity switches
 With heat resistant seals

HBZ 500 - 100 / 60 / 80 - AG2 . 004 . X2 . X3

a2 = 50

a1 = 75

M = M 50x2

Hydraulic Block Cylinder for operating pressure of 500 bar
 Piston diameter: 100 mm
 Piston rod diameter: 60 mm
 Cylinder stroke: 80 mm
 Axial threaded blind holes on bottom side
 Double acting with end-of-stroke damper on both sides
 Piston rod with male thread M50x2; 50mm long, piston rod excess end 75mm
 Piston seals statically

Design subject to change

Revision B * 12.03.13