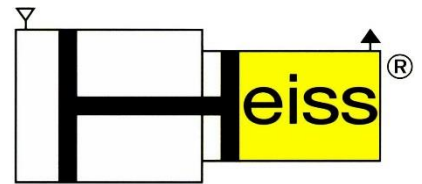


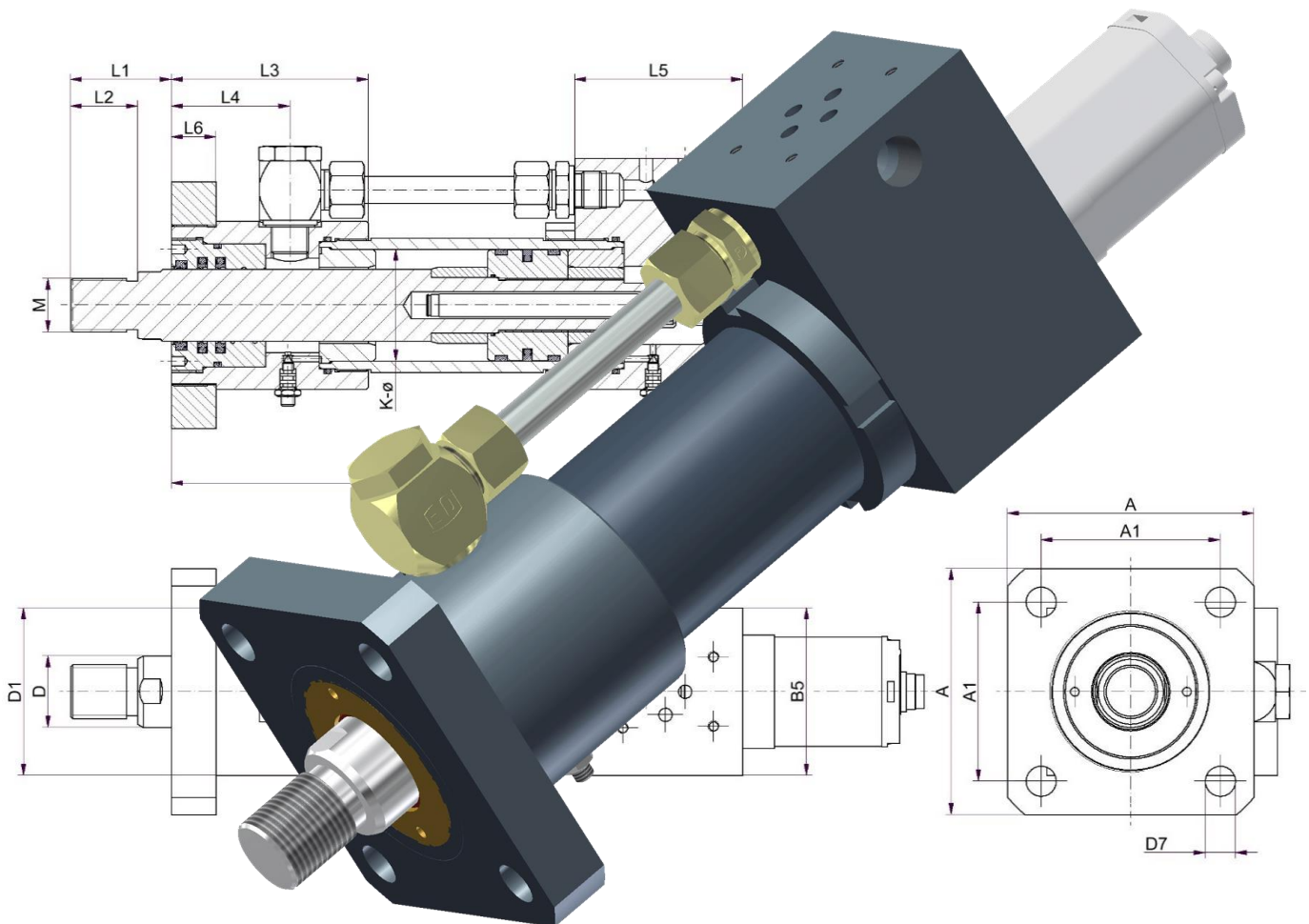
Standard Cylinder Series

SZ100, SZ160, SZ250

With position measuring system and valve plate connection



HYDRAULIK + PNEUMATIK GMBH



- Option for attachment of servo- or proportional valves
- Seals in servo-quality for stick-slip-less motion
- Maximum continuous duty temperature between -20 and +70°C by default
- Continuous and precise travel sensing as well as high repeat accuracy
- Contact free, wear free displacement encoding
- Choice of 9 different piston sizes between 32 and 200mm und 20 different attachments for pressures up to 250bar
- Available for use with water

Standard Cylinder Series

SZ100, SZ160, SZ250

with position measuring system and valve plate connection



General information cylinder:

The cylinders are manufactured for the below listed applications in threaded design with ground and hard-chrome plated cylinder rods.

Special purpose designs of almost any kind can be considered. Intermediate sizes or piston sizes up to 500mm diameter are possible.

Cylinders can be fitted with vent valves upon request. Please indicate the desired location for the vent when ordering. Please request our electronic product catalogue for CAD data or download it from www.heiss.de.

Technical specifications cylinder:

Operating pressure:

Depending on cylinder series chosen 100, 160 or 250bar. For higher operating pressures or hydraulic shocks 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 are possible 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. However, the max. permissible operating temperature of the position measuring system needs to be considered.

Piston travel speed:

Maximum 0,5 m/s. Please contact us for higher piston travel speeds.

Cylinder stroke:

The maximum permissible stroke is dependent on the permissible buckling stress. For dimensioning help please use the load/buckling diagram with the simplified calculation formulas.

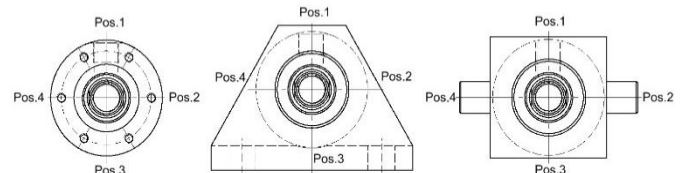
Position of connections:

The default position of the connections can be found in the overview of configurations. Should a different position be desired, please, indicate this when ordering.

Cylinders with dampers have the adjustment screw positioned across the port (Pos. 3) except with configuration 113, 113-1 and 113-2, here the adjustment screw is rotated by 90° away from the port when looking at the face of the piston rod end (Pos. 2).

Pos. 1 is the port position for all configurations. Should a different port or damper adjustment position be required please indicate this with the order.

Example in combination with various attachments:



For port position rotated by 90° in clockwise direction please indicate with order "hydraulic port in Pos. 2".

Tolerances:

Tolerances for stroke 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:

Swivel heads, rod clevis and rod end straight eyes as well as pivot brackets and pillow blocks for pivot pin attachments can be found in our main catalogue under Accessories.

Standard Cylinder Series

SZ100, SZ160, SZ250

with position measuring system and valve plate connection



General information on Transsonar displacement encoders

The Transsonar position encoder allows touch-free sensing, thus, wear-free sensing of the piston position of the hydraulic cylinder. Position sensing is absolute, no reference point needs to be used. The encoder is inverse-polarity protected and are protected against inductive voltage peaks.

Position encoders with analog or digital interfaces can be installed in the cylinder. If required we deliver cylinders prepared for installation of a position measuring system. When ordering please indicate what type of system will be installed. Upon dispatch the position encoder is installed. For installation of the position measuring system the cylinder needs to be fully retracted to avoid damage of the measuring stick.

Specifications:

Series	BTL7-A,G,E,C	BTL7-P	BTL7-S	BTL5-T
Interface	analog	digital	SSI	PROFIBUS-DP
Stroke	25...7620mm	25...7500mm	25...7620mm	25...4000mm
Output signal	A 0...10 and 10...0V G -10...10 and 10...-10V E 4...20 or 20...4mA C 0...20 or 20...0mA	Impulse Start / Stop	synchronuous- serial	PROFIBUS-DP
Operating voltage	24V oder 10-30V	10...30V	10...30V	20...28V
Current consumption 24V DC	≤ 15 mA	≤ 120mA	≤ 120mA	≤ 100mA
System resolution	≤ 0,33 mV / ≤ 0,66 μA	Depending on signal processing	1,2,5,10,20,40 or 100μm	Pos. step 5μm V step 0,1mm/S
Hysteresis	≤ 5 μm	≤ ±7 μm	≤ 7 μm	≤ 1 Digit
Repeat accuracy	System resolution min. 2 μm	typ. ±μm	≤ 11 μm	± 1 Digit
Operating temperature	-40°C...+85°C			
Degree of protection	IP 68 with cable output IP 67 with connector (when plugged in)			IP 67
Shock loading	150 g / 6 ms per IEC 60068-2-27			
Vibration	20 g, 10...2000 Hz per IEC 60068-2-6			
Pressure resistance	max. 600 bar			
Housing material	Anodized aluminum			
Flange / tube material	Stainless steel 1.3952 / 1.4571			
Housing dimensions Hex.wrench size 46mm	71mm long, plus cable or connector	57mm long plus cable or connector	57mm long plus cable or connector	incl. connector 182mm long
Connection with configuration: 111-2, 117, 118, 218, 119, 219, 125, 225	Permanently installed cable (5 m length by default)			With plug connector (connector to be ordered separately)
Connection all other configurations	With plug connector (connector to be oredred separately)			

Upon request additional interfaces are available such as CANopen (BTL5-T), Ethernet (BTL6-V) or with 4 programmable switching points (BTL5-F). Optional, some interfaces are available with a configurable double output function (position and speed) as well as parameterization and adjustment of start and end points via USB interface.

Please request separate catalogues for detailed information on the respective Transsonar position encoders, the required connectors and the evaluation units.

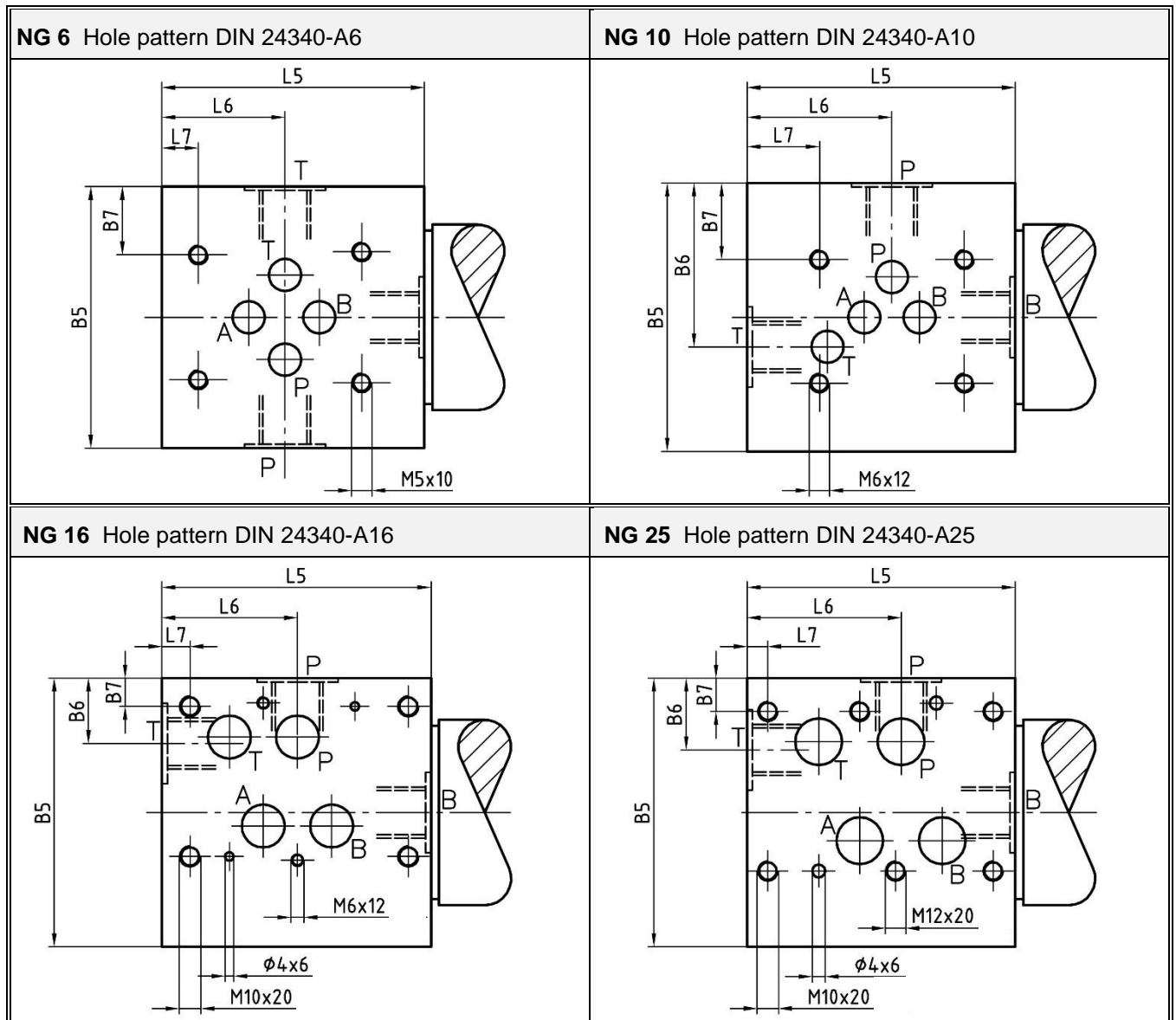
Standard Cylinder Series

SZ100, SZ160, SZ250

with position measuring system and valve plate connection



Connecting hole pattern for valve design



Piston-Ø	32	40	50	63	80	100	125	160	200
L5	55	65	75	100	110	90	125	130	155
L6	28,5	30,5	34,5	54	59	54	63	63	89
L7	7	9	13	27	32	27	13	13	12
B5	55	65	75	100	110	140	180	225	280
B6	-	-	-	61	66	81	58	80,5	94
B7	12	17	22	28,5	33,5	48,5	39,5	62	71
B,P,T	G3/8"	G3/8"	G3/8"	G1/2"	G1/2"	G1/2"	G3/4"	G3/4"	G1 1/4"
Valve size	NG6	NG6	NG6	NG10	NG10	NG10	NG16	NG16	NG25

Design subject to change

- Connecting plates are also available upon request for pilot controlled valves or rotated by 90° relative to the cylinder axis.
- The various piston sizes can be combined with other valve attachment sizes if required.

Standard Cylinder Series

SZ100, SZ160, SZ250

with position measuring system and valve plate connection



Dimensions:

	Piston-Ø	32	40	50	63	80	100	125	160	200	
SZ100 / SZ160	L	Not available with position encoder	121	139	169	184	194	252	330	375	
	L _{AK} (BTL7-P+S)		246	270	312	337	360	450	543	683	
	L _{AK} (BTL7-A,G,C,E)		303	327	369	394	417	507	600	740	
	L _{AK} (BTL5-T)		383	407	449	474	497	587	680	820	
	L _B (BTL7-P+S)		214	232	267	282	292	350	428	473	
	L _B (BTL7-A,G,C,E)		271	289	324	339	349	407	485	530	
	L _B (BTL5-T)		351	369	404	419	429	487	565	610	
	L ₂₁₈ (BTL7-P+S)		296	330	382	442	482	590	693	853	
	L ₂₁₈ (BTL7-A,G,C,E)		353	387	439	499	539	647	750	910	
	L ₂₁₈ (BTL5-T)		433	467	519	579	619	727	830	990	
	L ₂₁₉ (BTL7-P+S)		328	367	426	447	487	610	723	883	
	L ₂₁₉ (BTL7-A,G,C,E)		385	424	483	504	544	667	780	940	
	L ₂₁₉ (BTL5-T)		465	504	563	584	624	747	860	1020	
	L ₂₂₅ (BTL7-P+S)		315	355	412	494	512	620	733	898	
	L ₂₂₅ (BTL7-A,G,C,E)		372	412	469	551	569	677	790	955	
	L ₂₂₅ (BTL5-T)		452	492	549	631	649	757	870	1035	
	Excess length 004			40	50	40	40	50	80	100	120
	Excess lgth 005/006			20	25	20	20	25	40	50	60
	L16			13	16	16	25	35	50	55	75
	H4			16,5	15	21	20,5	18,5	35,5	35	53
SZ250	L	130	138	155	195	215	207	272	330	375	
	L _{AK} (BTL7-P+S)	251	264	288	345	378	383	511	598	683	
	L _{AK} (BTL7-A,G,C,E)	308	321	345	402	435	440	568	655	740	
	L _{AK} (BTL5-T)	388	401	425	482	515	520	648	735	820	
	L _B (BTL7-P+S)	223	231	248	293	313	305	370	428	473	
	L _B (BTL7-A,G,C,E)	280	288	305	350	370	362	427	485	530	
	L _B (BTL5-T)	360	368	385	430	450	442	507	565	610	
	L ₂₁₈ (BTL7-P+S)	301	322	358	420	483	508	651	768	903	
	L ₂₁₈ (BTL7-A,G,C,E)	358	379	415	477	540	565	708	825	960	
	L ₂₁₈ (BTL5-T)	438	459	495	557	620	645	788	905	1040	
	L ₂₁₉ (BTL7-P+S)	333	359	402	475	488	513	671	798	958	
	L ₂₁₉ (BTL7-A,G,C,E)	390	416	459	532	545	570	728	855	1015	
	L ₂₁₉ (BTL5-T)	470	496	539	612	625	650	808	935	1095	
	L ₂₂₅ (BTL7-P+S)	320	347	388	452	535	538	681	783	983	
	L ₂₂₅ (BTL7-A,G,C,E)	377	404	445	509	592	595	738	840	1040	
	L ₂₂₅ (BTL5-T)	457	484	525	589	672	675	818	920	1120	
	Excess length 004	40	40	50	50	60	70	80	100	120	
	Excess lgth 005/006	20	20	25	25	30	35	40	50	60	
	L16	13	16	19	25	30	35	50	60	75	
	H4	13,5	13,5	13,5	18,5	18	16	33	32,5	48	
	L5	55	65	75	100	110	90	125	130	155	
	B5	55	65	75	100	110	140	180	225	280	
	H5	27,5	32,5	37,5	50	55	70	90	112,5	140	
	H6	80	92	103	135	150	175	235	280	360	
	K	G1/4"	G1/4"	G1/4"	G3/8"	G3/8"	G3/8"	G3/8"	G3/8"	G3/8"	
	Valve size	NG6	NG6	NG6	NG10	NG10	NG10	NG16	NG16	NG25	

Please note that all additional dimensions are listed on the standard catalogue pages of the respective cylinder series and configuration.

Design subject to change

Standard Cylinder Series

SZ100, SZ160, SZ250

with position measuring system and valve plate connection



Overview of configurations :

Front view	Side view	Configuration	Description
		110	BASIC ATTACHMENT Clamping possible on cylinder tube
		111	THREAD ATTACHMENT With male thread on cylinder head
		111-1	THREAD ATTACHMENT Centering shoulder and threaded holes on the face of the cylinder head
		111-2	THREAD ATTACHMENT Centering shoulder and threaded holes on the face of the cylinder bottom
		112	FLANGE ATTACHMENT On front of cylinder head with 4 bolt holes
		112-1	FLANGE ATTACHMENT On back of cylinder head with 4 bolt holes
		113	FOOT ATTACHMENT Tangential foot screwed onto cylinder tube

Standard Cylinder Series

SZ100, SZ160, SZ250
with position measuring system and valve plate connection



Overview of configurations:

Front view	Side view	Configuration	Description
		113-1	FOOT ATTACHMENT Angled foot screwed onto cylinder head
		113-2	FOOT ATTACHMENT Angled foot screwed onto cylinder head and angled foot shiftable along cylinder tube
		114	PIVOT PIN ATTACHMENT At front end of cylinder head
		114-1	PIVOT PIN ATTACHMENT At back end of cylinder head
		115	PIVOT PIN ATTACHMENT On cylinder tube, position adjustable
		116	PIVOT PIN ATTACHMENT At cylinder bottom (pivot pins removable)
		117	FLANGE ATTACHMENT At cylinder bottom with 4 bolt holes

Standard Cylinder Series

SZ100, SZ160, SZ250
with position measuring system and valve plate connection



Overview of configurations:

Front view	Side view	Configuration	Description
<p>View A:</p>		118	<p>PIVOT EYE ATTACHMENT</p> <p>With bronze bushing at cylinder bottom</p>
<p>View A:</p>		218	<p>PIVOT EYE ATTACHMENT</p> <p>With bronze bushings both ends</p>
<p>View A:</p>		119	<p>PIVOT EYE ATTACHMENT</p> <p>With ball and socket joint at cylinder bottom</p>
<p>View A:</p>		219	<p>PIVOT EYE ATTACHMENT</p> <p>With ball and socket joints both ends</p>
<p>View A:</p>		125	<p>CLEVIS ATTACHMENT</p> <p>Clevis bracket at cylinder bottom</p>
<p>View A:</p>		225	<p>CLEVIS ATTACHMENT</p> <p>Both ends (clevis bracket at cylinder bottom and rod clevis at rod end)</p>

- **Additional attachment combinations and cylinder sizes possible upon request.**
- **More compact measurement systems allow shorter installation dimensions of cylinders in combination with most interfaces. Please contact us if required.**

Standard Cylinder Series

SZ100, SZ160, SZ250

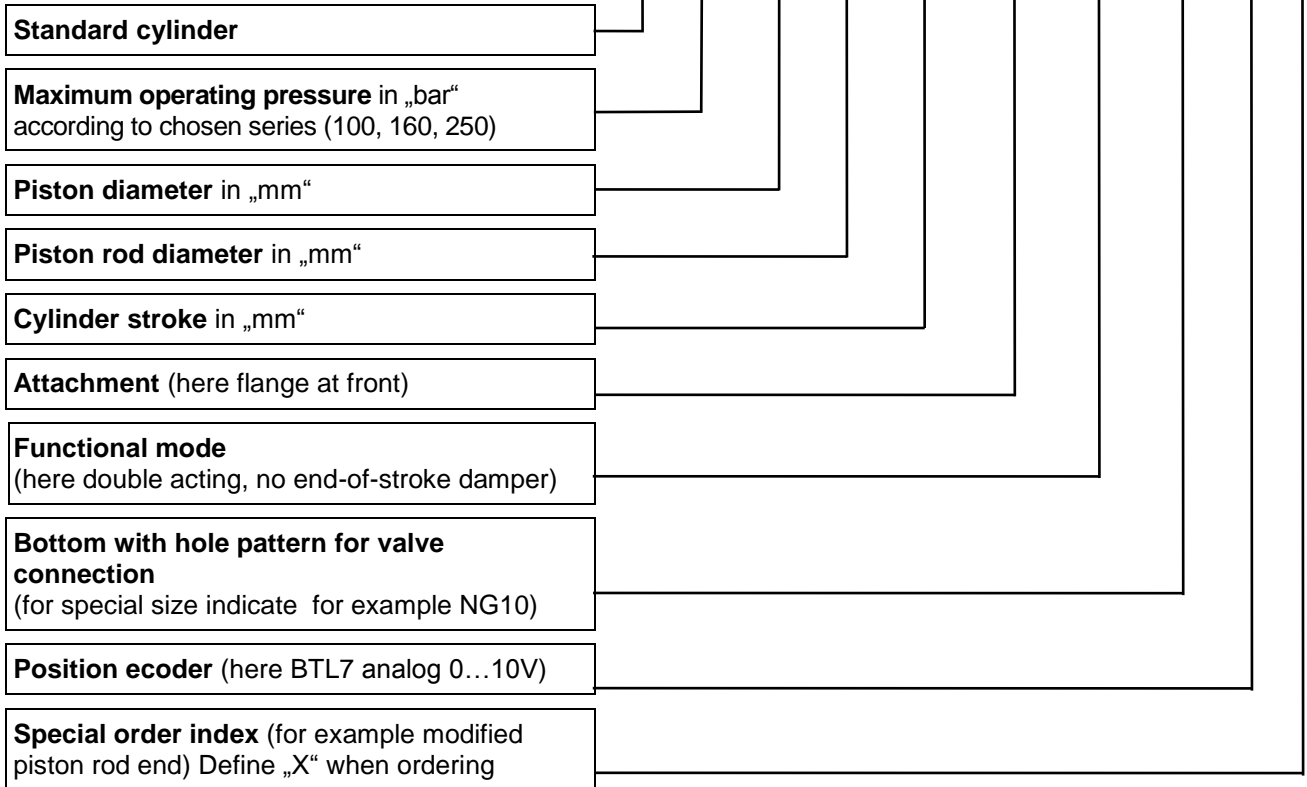
with position measuring system and valve plate connection



Type designation

Bezeichnung:

SZ 250 - 50 / 32 / 200 - 112 . 003 . NG - A . X



Examples for ordering:

SZ 250-32/20/80-117.003.NG-E

Standard cylinder for operating pressure of 250 bar
 Piston diameter: 32 mm
 Piston rod diameter: 20 mm
 Cylinder stroke: 80 mm
 Flange attachment on bottom
 Double acting
 NG hole pattern according to norm (here NG6)
 Position measuring system with current output 4-20mA

SZ 100-63/32/400-113.004.NG-S

Standard cylinder for operating pressure of 100 bar
 Piston diameter: 63 mm
 Piston rod diameter: 32 mm
 Cylinder stroke: 400 mm
 Foot attachment on the side
 Double acting with end-of-stroke damper both sides
 NG hole pattern according to norm (here NG10)
 Position measuring system with SSI-interface

SZ 160-50/25/100-112.003.NG10-T.X

Standard cylinder for operating pressure of max. 160 bar
 Piston diameter 50 mm
 Piston rod diameter 25 mm
 Cylinder stroke 100 mm
 Flange attachment at front with four bolt holes
 Functional mode double acting
 NG hole pattern not conform to norm in size NG10
 Position measuring system with Profibus DP-interface
 Special order index defined in plain text

Design subject to change Revision D * 14.11.2018