

## Description

- Strokes up to 200 mm
- Piston diameter: 16 -200 mm
- Cylinders of type 57 have an extremely small overall length and are particularly suitable for short strokes
- Block cylinders offer the possibility of the direct attachment of valves as well as the direct attachment of limit switches
- A wide choice of mounting types ensure the perfect adjustment to each specific application
- Several piston rod ends may be combined with each mounting type
- Special designs are available, e.g. attachment of additional elements
- An essential advantage in maintenance is the possibility of quick and simple replacement of the piston rod seal
- Cooling can be realized in an enhanced installation length

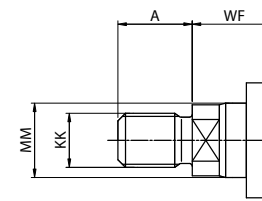
## Technical data

- Operating pressure: 400 bar (40 MPa)
- Test pressure: 500 bar (50 MPa)
- Hydraulic fluid temperature range: - 20 ... + 80 °C
- Viscosity range: (20 ... 80) 10<sup>-6</sup> m<sup>2</sup>/s
- Piston speed: ≤ 0.5 m/s  
(higher speeds on request)

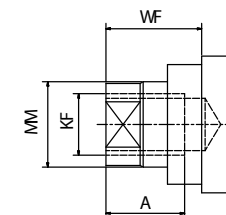
### Hydraulic fluids:

- Mineral oils, HFC, HFD liquids in combination with seals made of PTFE and fluoric elastomers
- HFA and HFB liquids on request

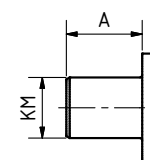
## Piston rod end



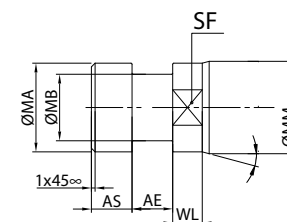
External thread, ref. no. 0  
External thread, ref. no. 4



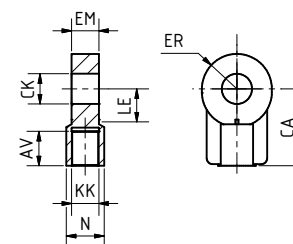
Inside thread, ref. no. 1



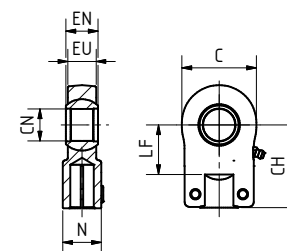
Cylindrical, ref. no. 2



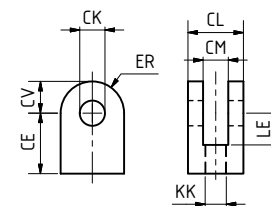
Clutch element, ref. no. 3



Plain rod eye, ref. no. 5

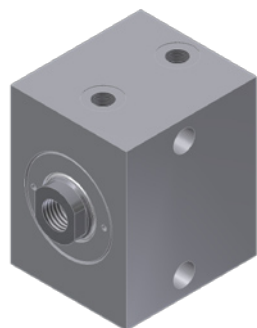


Swivel head, ref. no. 8

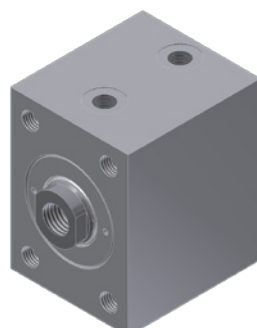


Clevis, ref. no. 9

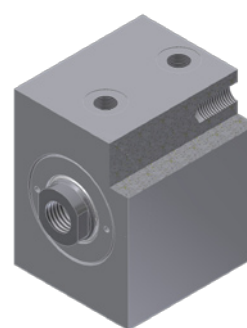
**Special design  
on request!**



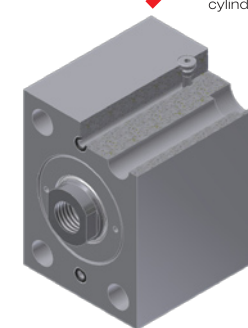
**Mounting type: 02**  
Description: Foot mounting  
ISO-des.: MS 2



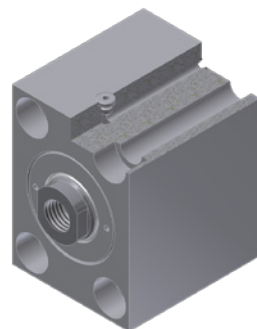
**Mounting type: 11**  
Description: Threaded holes head end  
ISO-des.: MX 5



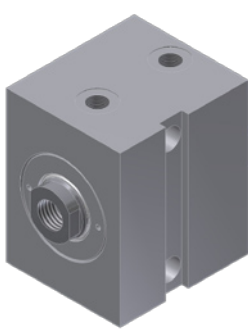
**Mounting type: 12**  
Description: Threaded holes cap end  
ISO-des.: MX 6



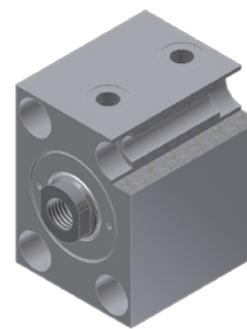
**Mounting type: 13**  
Description: Rectangular flange head end  
ISO-des.: --



**Mounting type: 14**  
Description: Rectangular flange cap end  
ISO-des.: --

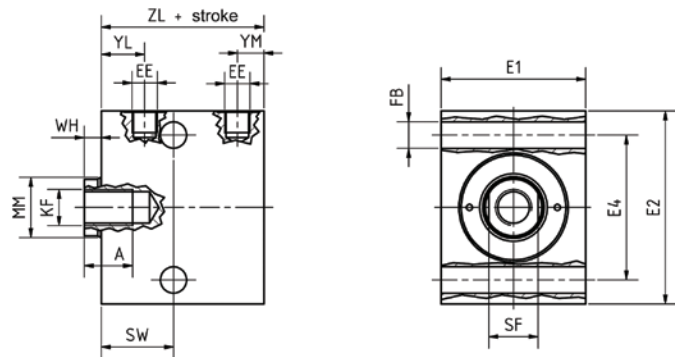


**Mounting type: 22**  
Description: Foot mounting with fit-in key  
ISO-des.: MS 2

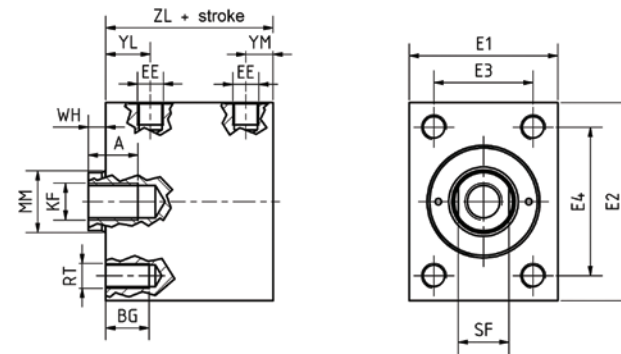


**Mounting type: 43**  
Description: Longitudinal bores, sinks on both sides  
ISO-des.: --

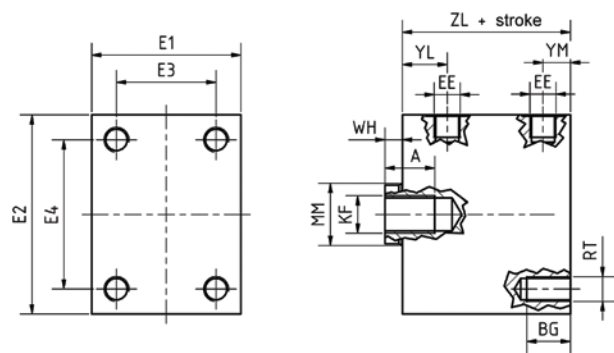
Mounting types



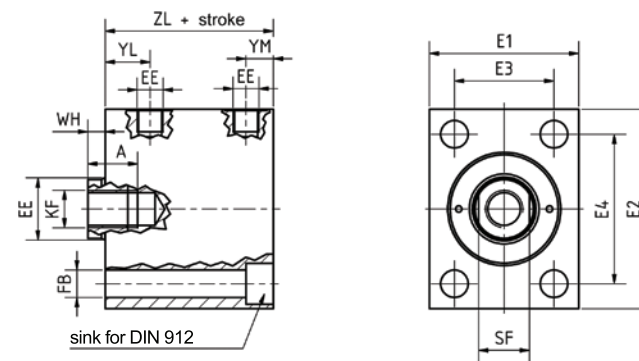
Mounting type 02: Foot mounting; ISO-des.: --



Mounting type 11: Threaded holes head end; ISO-des.: MX 5

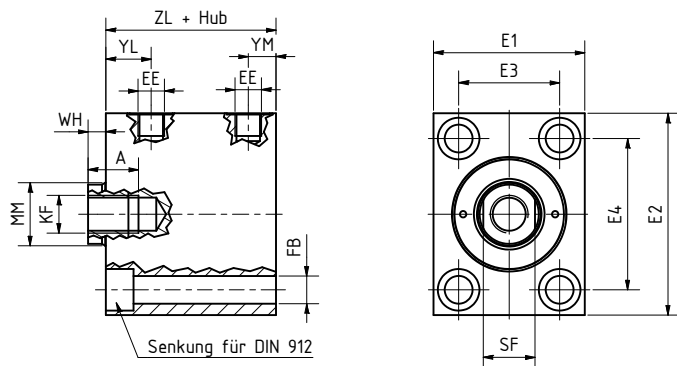


Mounting type 12: Threaded holes cap end; ISO-des.: MX 6

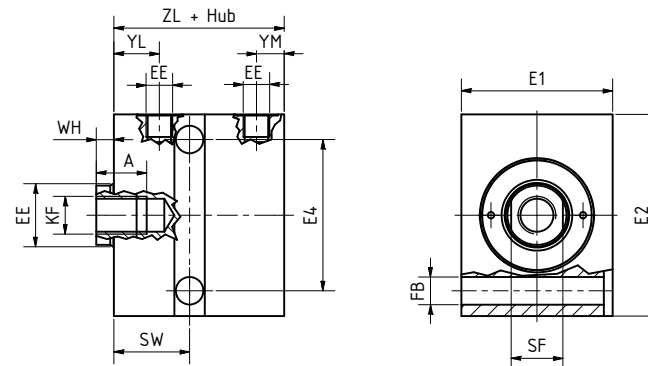


Mounting type 13: Rectangular flange head end; ISO-des.: --

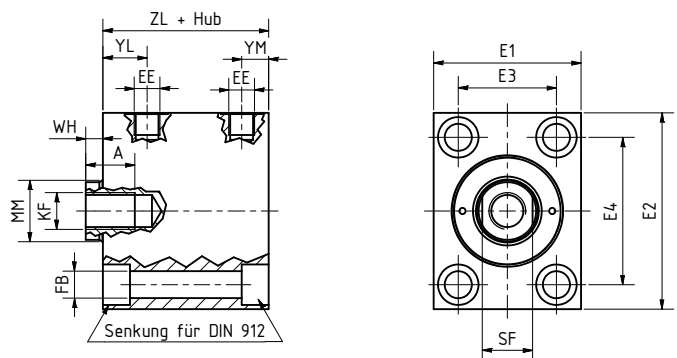
Mounting types



Mounting type 14: Rectangular flange cap end; ISO-des.: --

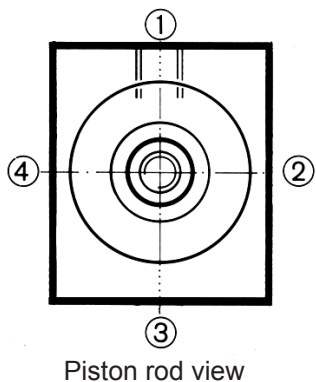


Mounting type 22: Foot mounting with fit-in key; ISO-des.: MS 2



Mounting type 43: Longitudinal bores, sinks on both sides; ISO-des.: --

Position of connections



Connections: Standard position of connections is side 1 for all mounting types. Connections in different positions are available on request.

Piston rod dim.

Piston Ø	Rod end	Tol.	16	25	32	40	50	63	80	100	125	160	200
Piston rod Ø MM			10	16	20	25	32	40	50	63	80	100	125
A (l <sub>9</sub> )			12	15	15	25	30	40	40	60	70	80	100
KF (d <sub>8</sub> )			M6	M10	M12	M16	M20	M27	M30	M42	M48	M56	M72
SF (sw)			8	13	17	22	27	36	41	50	70	85	100

Rod end = piston rod ends which correspond to dimensions

Cylinder dimensions

Piston Ø	Mt.	Tol.	16	25	32	40	50	63	80	100	125	160	200											
Piston rod Ø MM			10	16	20	25	32	40	50	63	80	100	125											
Annulus area A <sub>1</sub> (cm <sup>2</sup> )			2.01	4.91	8.04	12.6	19.6	31.2	50.3	78.5	122.66	201	314											
Annulus area A <sub>2</sub> (cm <sup>2</sup> )			1.23	2.90	4.90	7.66	11.6	18.6	30.6	47.4	72.42	122.5	191.34											
Pushing force (kN / 100 bar)			2.01	4.98	8.04	12.6	19.6	31.2	50.3	78.5	126.7	201	314											
Pulling force (kN / 100 bar)			1.23	2.90	4.90	7.66	11.6	18.6	30.6	47.4	72.4	122.5	191.3											
BG	11, 12		12	16	20	20	24	32	35	50	50	55	80											
E1 (b <sub>1</sub> )	all		35	45	55	63	75	95	120	150	180	230	300											
E2 (b <sub>2</sub> )	all		60	65	75	85	100	125	160	200	230	300	380											
E3 (b <sub>3</sub> )	all	js13	22	30	35	40	45	65	80	108	130	160	220											
E4 (b <sub>4</sub> )	all	js13	40	50	55	63	76	95	120	158	180	230	300											
E5 (b <sub>5</sub> )	22	H11	8	10	12	12	15	20	24	28	35	42	55											
EE (d <sub>3</sub> )	all		G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2	G3/4											
FB (d <sub>16</sub> )	02,13,14,43		6.6	9	11	11	14	18	22	27	33	39	52											
PA (t <sub>1</sub> )	22	+0.1	2	2	3	3	5	5	7	7	7	9	9											
RT	11, 12		M6	M8	M10	M10	M12	M16	M20	M24	M30	M36	M48											
SW (l <sub>3</sub> )	02, 22		30	33	38	40	44	50	60	64	82	90	112											
WH (l <sub>1</sub> )	all	±1	6	7	10	10	10	14	14	15	16	22	28											
YL (l <sub>4</sub> )	all	±0.5	18	19	24	26	28	28	36	35	42	57	70											
YM (l <sub>5</sub> )	all	±0.5	12	14	14	14	16	20	22	25	28	32	39											
ZL (L <sub>0</sub> )	all	+1	40	44	50	54	65	72	85	90	110	128	160											
standard stroke	all		16	50	20	50	25	50	25	50	25	50	30	63	32	80	40	100	40	100	40	100	40	100
ZL + standard stroke	all		56	90	64	94	75	100	79	104	90	115	102	135	117	165	130	190	150	210	168	228	200	260

Mt. = mounting types which correspond to dimensions

Weight

Weight (kg) m = m <sub>0</sub> + (m <sub>h</sub> / 10 x stroke)																									
Weight m <sub>0</sub> at stroke = 0		0.54	0.81	1.62	1.84	3.15	6.5	10.6	15.4	29	69	234													
Weight m <sub>h</sub> / 10 mm stroke		0.14	0.19	0.22	0.33	0.45	0.6	1.17	2.16	2.5	4.17	7.8													
Weight (kg) at standard stroke		0.8	1.2	1.2	1.8	2.2	2.7	2.7	3.5	4.3	5.4	8.3	10.3	14.3	19.6	24	37	39	54	85.6	110.7	265	312		

# Datasheet Type 57 · Hydraulic block cylinder



## Ordering Code Standard Cylinders / Standard Cylinders DIN/ISO

Classification / order number

TYP	KST	KSTH	KSTV	BEA	BAA	DAE	-DKO-	MM	HUB	KDI	KSDI	EE	-EEV-	EEH-	DAEV	DAEH-	ELV	ELH-	S	SZA	-SVO	SHI	
Example	51	0	0	8	02	2	1	050	022	0350	5	0	0	1	1	2	0	0	0	N	0	3	3

Abbr.	Characteristics	Types of cylinders									
TYP	Type of cylinder	41	44	46	47	48	51	53	55	57	

KST	Piston rod	41	44	46	47	48	51	53	55	57
0	single	X	X	X	X	X	X	X	X	X
1	on both sides (double rod cylinder)	X					X		X	
2	on both sides, small rear rod						X		X	
3	on both sides, large rear rod						X		X	
4	on both sides, medium rear rod						X		X	

KSTH	Piston rod end, rear	41	44	46	47	48	51	53	55	57
0	external thread	X	X	X	X	X	X		X	
1	internal thread	X					X		X	
2	cylindrical	X								
4	external thread ISO 4395						X		X	
5	plain rod eye	X								
8	swivel head (Type 51, 55: DIN 24555)	X					X		X	

KSTV	Piston rod end, front	41	44	46	47	48	51	53	55	57
0	external thread	X	X	X	X	X	X	X	X	X
1	internal thread	X	X	X	X	X	X	X	X	X
2	cylindrical	X	X	X	X	X	X	X	X	X
3	coupling	X	X	X	X	X	X	X	X	X
4	external thread ISO 4395	X	X	X	X	X	X	X	X	X
5	plain rod eye	X	X	X	X	X	X	X	X	X
8	swivel head (Type 51, 55: DIN 24555)	X	X	X	X	X	X	X	X	X
9	clevis	X	X	X	X	X	X	X	X	X

BEA	Mounting type	ISO-des.	41	44	46	47	48	51	53	55	57
00	basic form		X		X	X	X	X	X	X	
01	threaded flange head end		X								
	threaded holes head end	MX5						X	X	X	
02	foot mounting	MS2	X	X	X	X	X	X	X	X	X
03	flange head end	MF3	X	X	X	X	X				
04	flange cap end	MF4	X	X	X	X	X				
05	rod eye	MP3	X	X	X	X	X	X	X	X	
06	trunnion	MT4	X		X	X	X	X	X	X	
08	rod end bearing	MP5	X		X	X	X	X	X	X	
11	threaded holes head end	MX5									X
	tie rods elongated head end	MX3						X	X	X	
12	threaded holes cap end										X
	tie rods elongated cap end	MX2						X	X	X	
13	rectangular flange head end <sup>1),3)</sup>	MF1/ME5			X	X	X	X	X	X	X
14	rectangular flange cap end <sup>2),3)</sup>	MF2/ME6			X	X	X	X	X	X	X
15	clevis mounting	MP1						X	X	X	
16	trunnion on the head	MT1						X	X	X	
19	tie rods elongated both ends	MX1						X	X	X	
22	foot mounting with fit-in key	MS2						X	X	X	X
23	rectangular flange head end (wide)							X	X	X	
26	trunnion on the bottom	MT2						X	X	X	
33	flange on cylinder		X		X	X	X				
43	longitudinal bores, sinks on both sides										X

BAA	Type of construction	41	44	46	47	48	51	53	55	57
2	double-acting	X	X	X	X	X	X	X	X	X
3+4	single-acting (3=pushing; 4=pulling)	X	X	X	X	X	X	X	X	X
5+6	single-acting with spring (5=pushing; 6=pulling)	X		X	X	X	X	X	X	X

Abbr.	Characteristics	Types of cylinders									
DAE	Cushioning	41	44	46	47	48	51	53	55	57	
0	without cushioning	X	X	X	X	X	X	X	X	X	
1	cushioning in the front	X	X	X	X	X	X	X	X		
2	cushioning in the head	X	X	X	X	X	X	X	X		
3	cushioning on both sides	X	X	X	X	X	X	X	X		

DKO	Piston diameter	41	44	46	47	48	51	53	55	57
	see measuring index									

MM	Piston rod diameter	41	44	46	47	48	51	53	55	57
	see measuring index									

HUB	Stroke	41	44	46	47	48	51	53	55	57
	consider buckling									

KDI	Piston seal	41	44	46	47	48	51	53	55	57
0	NBR lip seals / PUR lip seals	X <sub>s</sub>	X	X	X	X	X	X	X	X
2	PUR lip seal / Viton®	X	X							
3	piston ring / casting	X <sub>s</sub>								
5*	sleeve ring/o-ring; tefl./NBR	X <sub>(S)</sub>	X	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X	X <sub>s</sub>	X <sub>s</sub>
6	sleeve ring/o-ring;tefl./Viton®	X	X	X	X	X	X	X	X	X
7	compact seal / NBR	X		X	X	X	X	X <sub>s</sub>	X	

KSDI	Piston rod seal	41	44	46	47	48	51	53	55	57
0	NBR lip seals / PUR lip seals	X <sub>s</sub>		X	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>
1	PUR lip seal, u-seal				X	X	X	X	X	X <sub>s</sub>
2	lip seal / Viton®	X			X	X	X	X	X	X
3	chevron ring NBR		X <sub>s</sub>	X <sub>s</sub>						
4	chevron ring Viton®		X	X						
5	stepseal/o-ring; tefl./NBR				X	X	X	X	X	
6	stepseal/o-ring;tefl./Viton®				X	X	X	X	X	
9	PUR lip seal, u-seal+scraper Viton®				X	X	X	X	X	X

EE	Hydraulic connections	41	44	46	47	48	51	53	55	57
0	pipe thread (DIN/ISO 228)	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>
1	metrical ISO thread	X		X	X	X	X	X	X	
2	UNF thread	X		X	X	X	X	X	X	
3	flange connection			X	X	X	X	X	X	

EEV	Hydr. connection, front position	41	44	46	47	48	51	53	55	57
1	0 degrees (at top)	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X
2	45 / 60 degrees (clockwise)			X	X	X				
2 / 3	90 degrees (clockwise)			3	3	3	2	2	2	X
4	135 degrees (clockwise)			X	X	X				
3 / 5	180 degrees (clockwise)			5	5	5	3	3	3	
6	225 degrees (clockwise)			X	X	X				
4 / 7	270 degrees (clockwise)			7	7	7	4	4	4	
8	315 degrees (clockwise)			X	X	X				

<sup>1)</sup> MF 1 for 44, 46, 47, 48; ME 5 for 51, 53, 55  
<sup>2)</sup> MF 2 for 44, 46, 47, 48; ME 6 for 51, 53, 55  
<sup>3)</sup> mounting type 13 (14) for type 57: longitudinal bores, sinks on rear (front)  
 \* type 41: standard for piston diameter = 12, 15, 20  
 s = standard design  
 (S) = standard design, not for all forms of construction  
 RC = rear center

Abbr.	Characteristics	Types of cylinders									
EEH	Hydr. Connection, rear position	41	44	46	47	48	51	53	55	57	
RC	0 degrees (at top)	RC		X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X <sub>s</sub>	X	
	2 45 / 60 degrees (clockwise)			X	X	X					
2 / 3	90 degrees (clockwise)			3	3	3	2	2	2	X	
4	135 degrees (clockwise)			X	X	X					
3 / 5	180 degrees (clockwise)			5	5	5	3	3	3		
6	225 degrees (clockwise)			X	X	X					
4 / 7	270 degrees (clockwise)			7	7	7	4	4	4		
8	315 degrees (clockwise)			X	X	X					

DAEV	Cushioning, front position	41	44	46	47	48	51	53	55	57
0	without cushioning	X		X	X	X	X	X	X	
1	0 degrees (at top)			X	X	X	X	X	X	
2	45 / 60 degrees (clockwise)	X		X	X	X				
2 / 3	90 degrees (clockwise)	X <sub>s</sub>		3 <sub>s</sub>	3 <sub>s</sub>	3 <sub>s</sub>	2 <sub>(S)</sub>	2 <sub>(S)</sub>	2 <sub>(S)</sub>	
4	135 degrees (clockwise)			X	X	X				
3 / 5	180 degrees (clockwise)	X		5	5	5	3	3 <sub>s</sub>	3	
6	225 degrees (clockwise)			X	X	X				
4 / 7	270 degrees (clockwise)	X		7	7	7	4	4	4	
8	315 degrees (clockwise)			X	X	X				

DAEH	Cushioning, rear position	41	44	46	47	48	51	53	55	57
0	without cushioning	X		X	X	X	X	X	X	
1	0 degrees (at top)			X	X	X	X	X	X	
2	45 / 60 degrees (clockwise)	X		X	X	X				
2 / 3	90 degrees (CW: 51/55; Br. 02->S)	X <sub>s</sub>		3 <sub>s</sub>	3 <sub>s</sub>	3 <sub>s</sub>	2 <sub>(S)</sub>	2 <sub>(S)</sub>	2 <sub>(S)</sub>	
4	135 degrees (clockwise)			X	X	X				
3 / 5	180 degrees (clockwise)	X		5	5	5	3 <sub>s</sub>	3 <sub>s</sub>	3 <sub>s</sub>	
6	225 degrees (clockwise)			X	X	X				
4 / 7	270 degrees (clockwise)	X		7	7	7	4	4	4	
8	315 degrees (clockwise)			X	X	X				

ELV	Air bleed, front position	41	44	46	47	48	51	53	55	57
0	without air bleed	X	X							X
1 - 8	see cushioning position	X	X	X	X	X	X	X	X	X

ELH	Air bleed, rear position	41	44	46	47	48	51	53	55	57
0	without air bleed	X	X							X
1 - 8	see cushioning position	X	X	X	X	X	X	X	X	X

S	Position detection	41	44	46	47	48	51	53	55	57
Z	attached proximity switches								X	
N	built-in proximity switches	X	X	X	X	X	X	X	X	X

SZA	Number of switches	41	44	46	47	48	51	53	55	57
1 - 9	for S = Z								X	
1 - 2	for S = N	X	X	X	X	X	X	X	X	X

SVO	Switch, front position	41	44	46	47	48	51	53	55	57
0	without switch	X	X							