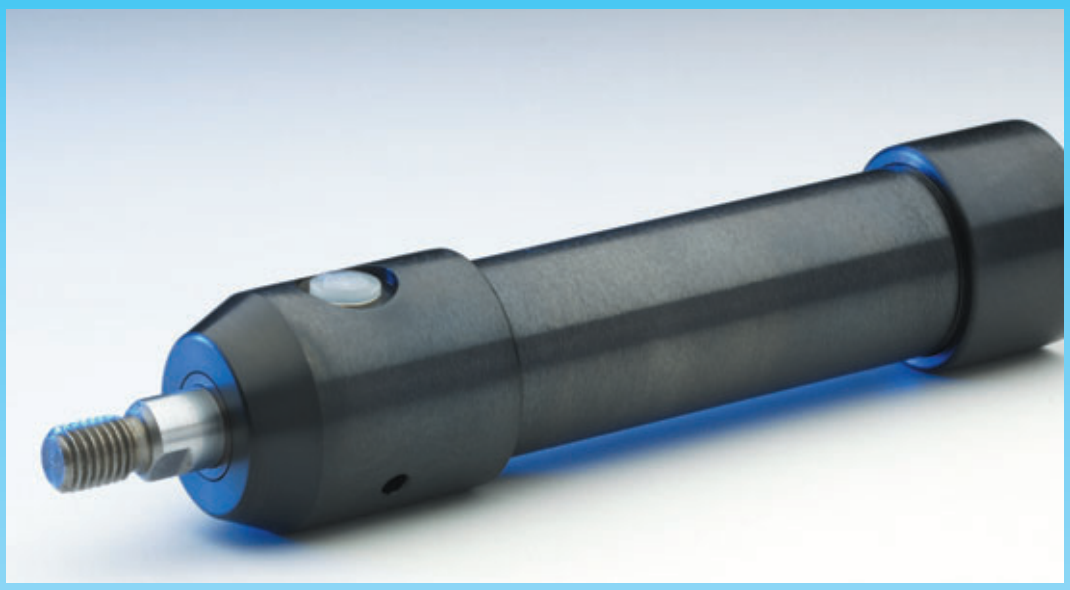
ZU series



100 bar universal cylinder

Piston Ø 10-100 mm
Lengths of stroke at your option (take account of the bend resistance, see page 35)
Standard lengths of stroke

- Round, compact design; black blued
- Piston rod hard chromium plated
- Particularly suited for installation into machines and appliances

Determine your 100 bar universal cylinder:

Ordering example: **ZU-Fv 32/140** NHR16 **D-H03** E11g G1/4" ES **As4**

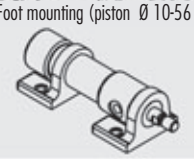
- Cylinder type
- ❶ Mounting type
- ❷ Piston Ø
- ❸ Length of stroke
  - Standard stroke series NHR
- ❹ Function type
- ❺ Seal type
- ❻ Options
  - End of piston rod
  - Connections
  - Vent screws
- ❼ Cover design (for front mounting type)

Special versions on request

❶ Mounting types

A Basic design

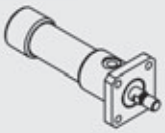
Hw Foot mounting (piston Ø 10-56 mm)



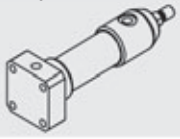
G Thread mounting

Gz Thread with centering

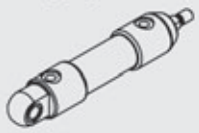
Fv Front flange



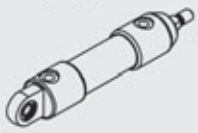
Fh Rear flange



Si Swivelling support

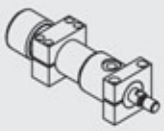


Sk Hinged support (piston Ø 20-100 mm)

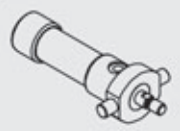


Special mounting types: (on request)

KH Clamping holder

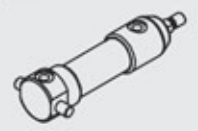


Sv Front support bolt



Sm Centered support bolt

S Rear support bolt



❷ Piston Ø

Piston Ø (mm)	**10**	**12.5**	**16**	**20**	**25**	**32**	**40**	**50**	56	**63**	70	**80**	90	**100**
Piston surface pushing (cm^2)	0.78	1.23	2.00	3.14	4.90	8.05	12.5	19.6	23.7	31.1	38.5	50.2	63.6	78.5
Piston surface pulling (cm^2)	0.56	0.95	1.50	2.36	3.73	6.04	9.42	14.7	18.8	23.1	30.1	37.7	51.0	58.9

❸ Length of stroke

Lengths of stroke at your option: We manufacture any length of stroke you desire.

Standard stroke versions NHR: With piston Ø 10-50 mm, a choice of 8 standard lengths of stroke for every piston Ø is available for short-time delivery.

● **Ordering example: ZU-Fv 25/90 NHR15 D-H03 As1**

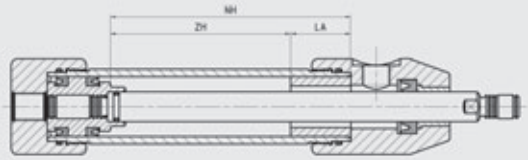
Piston Ø		**10**	**12.5**	**16**	**20**	**25**	**32**	**40**	**50**
Function	**NHR**	**Length of stroke**							
D	**11**	10	11	12	14	16	18	20	22
	12	20	22	25	28	32	36	40	45
	13	28	32	36	40	45	50	56	63
	14	40	44	50	56	64	72	80	90
	15	56	63	70	80	90	100	110	125
	16	80	90	100	110	125	140	160	180
	17	110	125	140	160	180	200	220	250
	18	160	180	200	220	250	280	320	360

Intermediate strokes aNHR:

By inserting a stroke-limiting bushing(LA) any intermediate stroke (ZH) can be realized from a longer standard stroke (NH).

The measures of length L1v and L1h always correspond with the normal stroke.

● **Ordering example: ZU-Fv 25/80 aNHR15 D-H03 As1**



❹ Function types

D | Double effect

pushing and pulling

E Single-effect

pushing

Ez Single-effect

pulling

Dbb Double-effect

with end position damping on both sides (piston Ø 20-56 mm)

Dbb Double-effect

with end position damping on both sides (piston Ø 63-100 mm)

Special function types: (on request)

Dd Double effect

with through piston rod

Dbv Double-effect

with end position damping at the front

Dbh Double-effect

with end position damping at the back

F Single-effect

pushing with spring return mechanism

Fz Single-effect

pulling with spring return mechanism

⑤ Seal types

Standard version: H00 for hydraulic fluid (mineral oil). Seal types for other pressure media on request.

Seal types	H00	H01	H03	H04	H06	H07	H11	H12
Piston seal, PTFE gliding ring (piston Ø 10-16 mm) Piston seal, grooved ring (piston Ø 20-100 mm)	●	●						
Piston seal, PTFE gliding ring (min. piston Ø 20 mm with driving band)			●	●	●	●	●	●
Rod seal, grooved ring	●	●	●	●				
Rod seal ,PTFE gliding ring					●	●	●	●
Dust seal		●		●		●		●
O-rings Nitril	●	●	●	●	●	●		
O-rings Viton							●	●
Piston speed								
max. 0.5 m/s	●	●	●	●				
max. 10 m/s					●	●	●	●
Temperature range								
-20/+100 °C	●	●	●	●	●	●		
-20/+200 °C							●	●

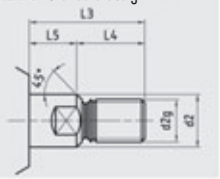
⑥ Options

End of piston rod:

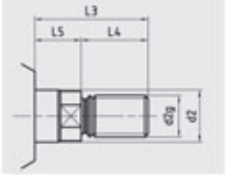
Standard version: E11

Additional versions as shown in the illustrations are manufactured based on the catalog if not otherwise specified by the customer.
Tailor-made versions available on request.

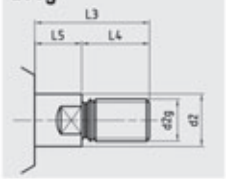
E11 Standard design



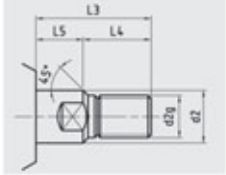
E10



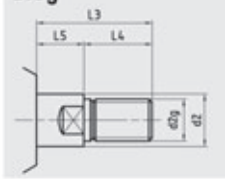
E11g



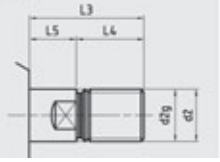
E15



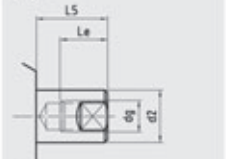
E15g



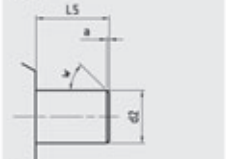
E16



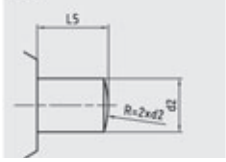
E22



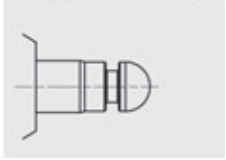
E31



E32



E-spez (acc. to your drawing)



Connections:

are manufactured based on the catalog if not otherwise specified by the customer. The position of the connections can be customized. Larger and other (metric) connections are available on request.

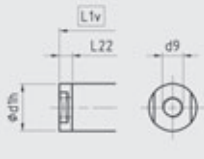
Vent screws (ES):

are attached to order and in accordance with the position specified by the customer.

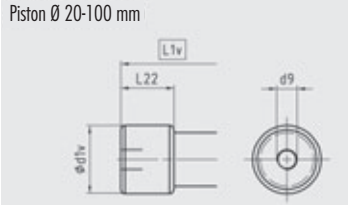
⑦ Cover design (for mounting / fastening on the cylinder head)

As1 Cover with axial connection (standard version)

Piston Ø 10-16 mm

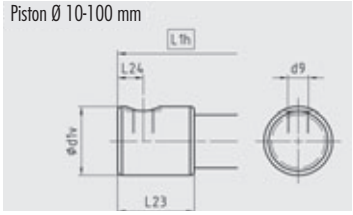


Piston Ø 20-100 mm



As4 Cover with lateral connection (to order)

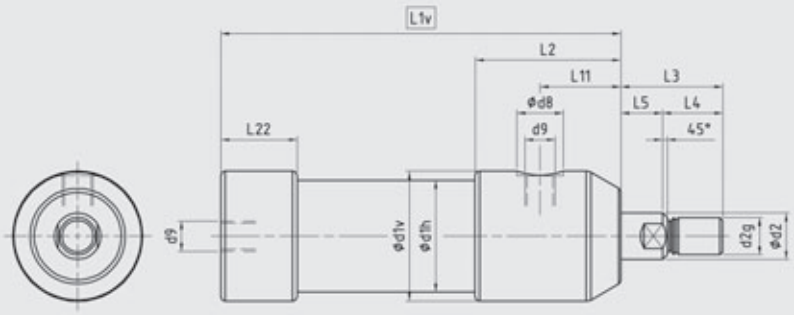
Piston Ø 10-100 mm



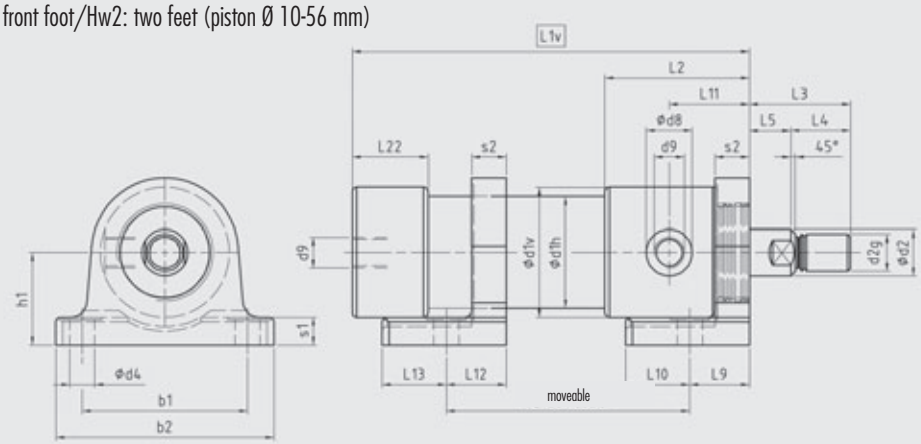
Piston Ø	10	12.5	16	20	25	32	40	50	56	63	70	80	90	100
L22	6	6	6	25	26	31	33	38	39	43	46	52	55	60
L23	16	16	16	36	37	40	48	51	52	54	57	67	70	71
L24	8	8	8	12	12	12	15	15	16	16	16	19	19	19

Dimension drawings/Dimensions

A Basic design



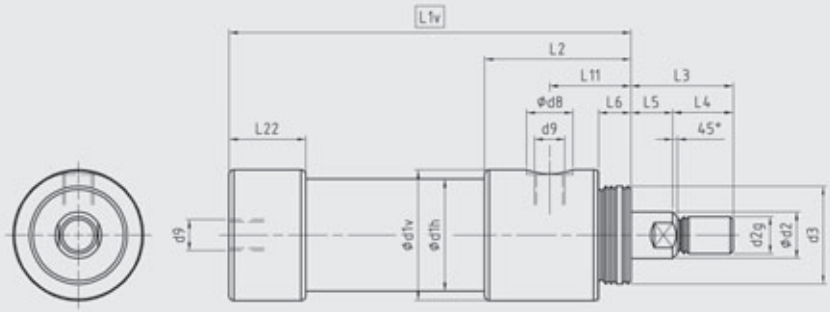
Hw/Hw2 Hw: front foot/Hw2: two feet (piston Ø 10-56 mm)



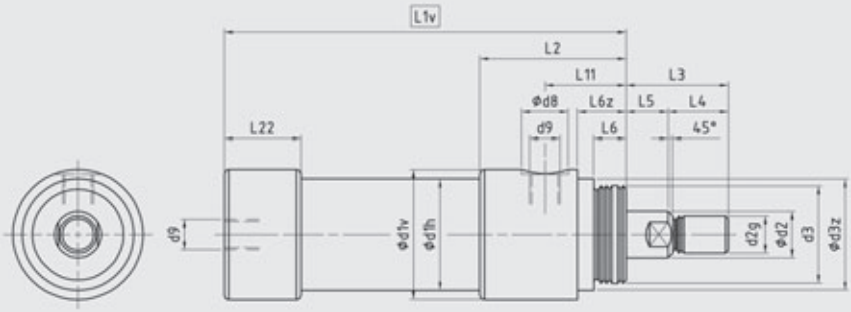
Piston Ø		**10**	**12.5**	**16**	**20**	**25**	**32**	**40**	**50**	56	**63**	70	**80**	90	**100**
d1v		24	24	28	32	36	45	56	68	78	85	90	105	116	130
d1h		16	18	22	25	30	38	48	60	68	75	80	90	105	115
d2-f7		6	6	8	10	12	16	20	25	25	32	32	40	40	50
d2g		M5	M5	M6	M8	M10	M14	M16	M20	M20	M24	M24	M33	M33	M42
d4		4.5	4.5	4.5	5.5	7	9	11	13	13	-	-	-	-	-
d8		15	15	15	16	16	16	20	20	20	20	20	26	26	26
d9		G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/4"	G 1/4"	G 1/4"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 3/8"
b1		30	30	34	40	45	56	72	100	100	-	-	-	-	-
b2		42	42	46	50	60	72	95	125	125	-	-	-	-	-
h1±0.1		18	18	20	22	25	32	40	50	50	-	-	-	-	-
s1		6	6	6	8	8	10	12	15	15	-	-	-	-	-
s2		8	8	8	9	9	11	14	16	16	20	20	25	25	35
L2		35	35	40	46	48	52	63	70	75	82	91	96	114	125
L3		15	15	17	23	27	37	44	52	52	55	55	70	70	80
L4		10	10	12	14	16	22	26	32	32	35	35	45	45	55
L5		5	5	5	9	11	15	18	20	20	20	20	25	25	25
L9		16	16	16	18	20	22	26	30	30	-	-	-	-	-
L10		19	19	20	20	22	24	28	35	35	-	-	-	-	-
L11		18	18	22.5	24.5	25.5	28.5	35	40	44.5	48	55	55	69	78
L12		16	16	16	18	20	22	26	30	30	-	-	-	-	-
L13		19	19	20	20	22	24	28	35	35	-	-	-	-	-
L22		6	6	6	25	26	31	33	38	39	43	46	52	55	60
Function type		**Measures of length L1v and measures of length L1h** (with cover design As4)													
D	L1v = Stroke +	52.5	55.5	62	66	73	82	93	104	112	119	125	133	148	166
	L1h = Stroke +	62.5	65.5	72	77	84	91	108	117	125	130	136	148	163	177
E/Ez	L1v = Stroke +	52.5	55.5	54	58	63	70	80	90	97	104	110	118	133	154
	L1h = Stroke +	62.5	65.5	64	69	74	79	95	103	110	115	121	133	148	165
Dbb	L1v = Stroke +	-	-	-	100	113	130	147	165	169	-	-	-	-	-
	L1h = Stroke +	-	-	-	111	124	139	162	178	182	182	188	211	226	248
		Minimum measures of length L1v and L1h													
	L1v =	-	-	-	72	75	84	97	109	115	126	138	149	170	186
	L1h =	-	-	-	83	86	93	112	122	128	137	149	164	185	197

Dimension drawings/Dimensions

G Thread fastening



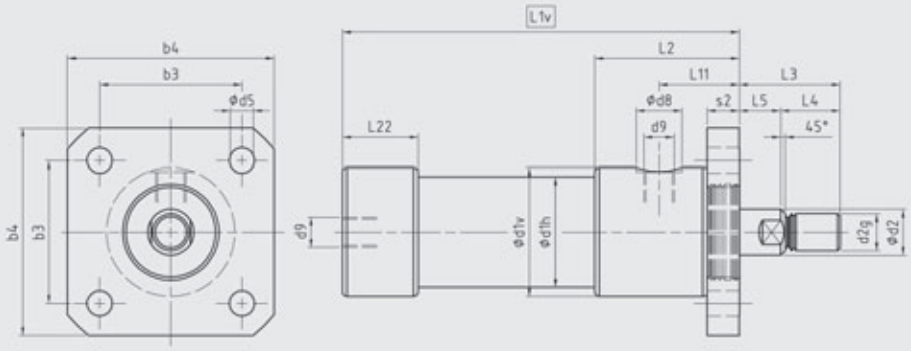
Gz Thread fastening with centering



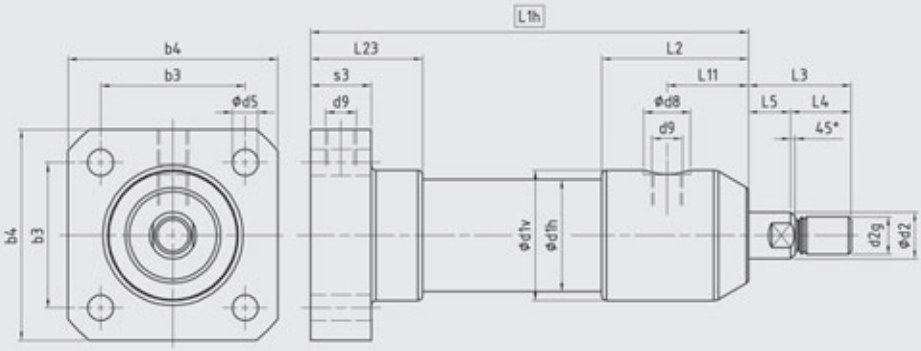
Piston Ø		**10**	**12.5**	**16**	**20**	**25**	**32**	**40**	**50**	56	**63**	70	**80**	90	**100**
	d1v	24	24	28	32	36	45	56	68	78	85	90	105	116	130
	d1h	16	18	22	25	30	38	48	60	68	75	80	90	105	115
	d2-f7	6	6	8	10	12	16	20	25	25	32	32	40	40	50
	d2g	M5	M5	M6	M8	M10	M14	M16	M20	M20	M24	M24	M33	M33	M42
	d3	M16x1	M16x1	M20x1	G ½"	G ¾"	G 1"	G 1 ¼"	G 1 ½"	G 1 ½"	G 2"	G 2"	G 2 ½"	G 2 ½"	G 3"
	d3z-h7	20	20	24	25	28	40	48	60	60	75	75	90	90	115
	d8	15	15	15	16	16	16	20	20	20	20	20	26	26	26
	d9	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/4"	G 1/4"	G 1/4"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 3/8"
	L2	35	35	40	46	48	52	63	70	75	82	91	96	114	125
	L3	15	15	17	23	27	37	44	52	52	55	55	70	70	80
	L4	10	10	12	14	16	22	26	32	32	35	35	45	45	55
	L5	5	5	5	9	11	15	18	20	20	20	20	25	25	25
	L6	8	8	8	9	9	11	14	16	16	20	20	25	25	35
	L6z	11	11	12	13	13.5	16	21	23	23	30	30	35	35	49
	L11	18	18	22.5	24.5	25.5	28.5	35	40	44.5	48	55	55	69	78
	L22	6	6	6	25	26	31	33	38	39	43	46	52	55	60
Function type		**Measures of length L1v and measures of length L1h** (with cover design As4)													
D	L1v = Stroke +	52.5	55.5	62	66	73	82	93	104	112	119	125	133	148	166
	L1h = Stroke +	62.5	65.5	72	77	84	91	108	117	125	130	136	148	163	177
E/Ez	L1v = Stroke +	52.5	55.5	54	58	63	70	80	90	97	104	110	118	133	154
	L1h = Stroke +	62.5	65.5	64	69	74	79	95	103	110	115	121	133	148	165
Dbb	L1v = Stroke +	-	-	-	100	113	130	147	165	169	182	188	211	226	248
	L1h = Stroke +	-	-	-	111	124	139	162	178	182	182	188	211	226	248
		Minimum measures of length L1v und L1h													
	L1v =	-	-	-	72	75	84	97	109	115	126	138	149	170	186
	L1h =	-	-	-	83	86	93	112	122	128	137	149	164	185	197

Dimension drawings/Dimensions

Fv Front flange



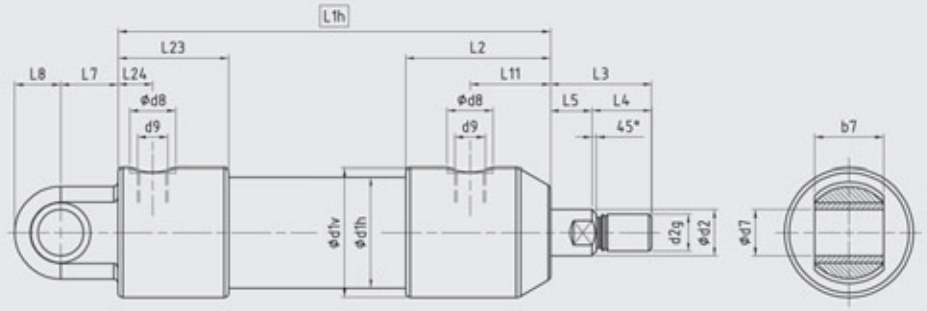
Fh Rear flange



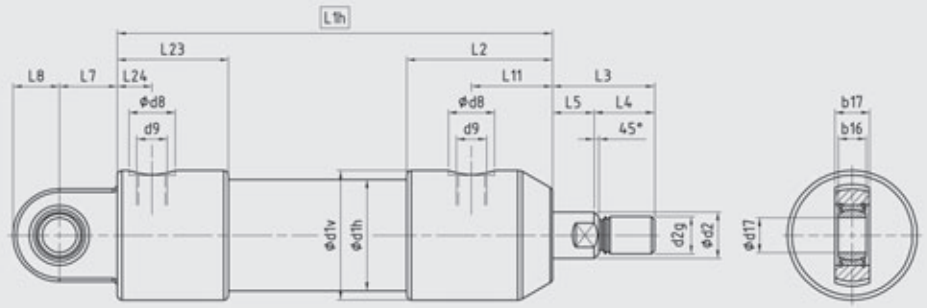
Piston Ø		**10**	**12.5**	**16**	**20**	**25**	**32**	**40**	**50**	56	**63**	70	**80**	90	**100**
	d1v	24	24	28	32	36	45	56	68	78	85	90	105	116	130
	d1h	16	18	22	25	30	38	48	60	68	75	80	90	105	115
	d2-f7	6	6	8	10	12	16	20	25	25	32	32	40	40	50
	d2g	M5	M5	M6	M8	M10	M14	M16	M20	M20	M24	M24	M33	M33	M42
	d5	5.5	5.5	6	7	7	9	11	13	13	13	13	17	17	17
	d8	15	15	15	16	16	16	20	20	20	20	20	26	26	26
	d9	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/4"	G 1/4"	G 1/4"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 3/8"
	b3	25	25	28	36	36	48	62	70	70	80	80	100	100	115
	b4	35	35	40	50	50	65	90	100	100	110	110	130	130	150
	s2	8	8	8	9	9	11	14	16	16	20	20	25	25	35
	s3	16	16	16	20	20	20	26	26	26	26	26	32	32	32
	L2	35	35	40	46	48	52	63	70	75	82	91	96	114	125
	L3	15	15	17	23	27	37	44	52	52	55	55	70	70	80
	L4	10	10	12	14	16	22	26	32	32	35	35	45	45	55
	L5	5	5	5	9	11	15	18	20	20	20	20	25	25	25
	L11	18	18	22.5	24.5	25.5	28.5	35	40	44.5	48	55	55	69	78
	L22	6	6	6	25	26	31	33	38	39	43	46	52	55	60
	L23	16	16	16	36	37	40	48	51	52	54	57	67	70	71
Function type		**Measures of length L1v and measures of length L1h** (with cover design As4)													
D	L1v = Stroke +	52.5	55.5	62	66	73	82	93	104	112	119	125	133	148	166
	L1h = Stroke +	62.5	65.5	72	77	84	91	108	117	125	130	136	148	163	177
E/Ez	L1v = Stroke +	52.5	55.5	54	58	63	70	80	90	97	104	110	118	133	154
	L1h = Stroke +	62.5	65.5	64	69	74	79	95	103	110	115	121	133	148	165
Dbb	L1v = Stroke +	-	-	-	100	113	130	147	165	169	182	188	211	226	248
	L1h = Stroke +	-	-	-	111	124	139	162	178	182	182	188	211	226	248
		Minimum measures of length L1v und L1h													
	L1v =	-	-	-	72	75	84	97	109	115	126	138	149	170	186
	L1h =	-	-	-	83	86	93	112	122	128	137	149	164	185	197

Dimension drawings/Dimensions

Si Swivelling support with gunmetal bush



Sk Hinged support with steel/steel swing bearing (piston Ø 20-100 mm)



Piston Ø		**10**	**12.5**	**16**	**20**	**25**	**32**	**40**	**50**	56	**63**	70	**80**	90	**100**
	d1v	24	24	28	32	36	45	56	68	78	85	90	105	116	130
	d1h	16	18	22	25	30	38	48	60	68	75	80	90	105	115
	d2-f7	6	6	8	10	12	16	20	25	25	32	32	40	40	50
	d2g	M5	M5	M6	M8	M10	M14	M16	M20	M20	M24	M24	M33	M33	M42
	d7-H7	7	7	8	10	12	16	20	25	25	32	32	40	40	50
	d8	15	15	15	16	16	16	20	20	20	20	20	26	26	26
	d9	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/4"	G 1/4"	G 1/4"	G 1/4"	G 1/4"	G 3/8"	G 3/8"	G 3/8"
	d17-H7	-	-	-	8	10	12	15	20	20	25	25	35	35	40
	b7	10	10	12	15	20	25	30	40	40	50	50	60	60	80
	b16	-	-	-	8	9	10	12	16	16	20	20	25	25	28
	b17	-	-	-	10	11	13	15	18	18	22	22	29	29	33
	L2	35	35	40	46	48	52	63	70	75	82	91	96	114	125
	L3	15	15	17	23	27	37	44	52	52	55	55	70	70	80
	L4	10	10	12	14	16	22	26	32	32	35	35	45	45	55
	L5	5	5	5	9	11	15	18	20	20	20	20	25	25	25
	L7	10	10	12	14	17	20	25	30	30	40	40	50	50	60
	L8	9	9	10	12	15	18	20	26	26	35	35	42	42	53
	L11	18	18	22.5	24.5	25.5	28.5	35	40	44.5	48	55	55	69	78
	L23	16	16	16	36	37	40	48	51	52	54	57	67	70	71
	L24	8	8	8	12	12	12	15	15	16	16	16	19	19	19
Function type		**Measures of length L1h**													
D	L1h = Stroke +	62.5	65.5	72	77	84	91	108	117	125	130	136	148	163	177
E/Ez	L1h = Stroke +	62.5	65.5	64	69	74	79	95	103	110	115	121	133	148	165
Dbb	L1h = Stroke +	-	-	-	111	124	139	162	178	182	182	188	211	226	248
		Minimum measures of length L1h													
	L1h =	-	-	-	83	86	93	112	122	128	137	149	164	185	197