

## HSS Series

**Square output flange**  
**Straight type gearbox, Standard / Premium / Advanced**



## HAS Series

**Square output flange**  
**Right-angle type gearbox, Standard / Premium / Advanced**

- Best-in-class backlash
- High output torque
- Low noise level
- High efficiency
- Maintenance free
- Balanced motor pinion
- Gear ratios available from 3:1 up to 200:1
- No need to replace lubrication to expand the lifespan

		HSS						
Stage	Gear ratio	045	060	090	115	142	180	220
1A	3-10	○	○	○	○	○	○	-
2B	15-100	⊗	○	○	○	○	○	-
2A	15-100	○	○	○	○	○	○	-
1M/2M	3-100	⊗	⊗	⊗	⊗	⊗	⊗	-

		HAS				
Stage	Gear ratio	045	060	090	115	142
1A	3-10	○	○	○	○	-
	14, 20	⊗	○	○	○	-
2B	15, 20	⊗	⊗	⊗	⊗	-
	25-100	⊗	○	○	○	-
	120-200	⊗	⊗	○	○	-
2A	15, 20	○	⊗	⊗	⊗	-
	25-100	○	○	○	○	-
	120-200	⊗	○	○	○	-
1M/2M	3-200	⊗	⊗	⊗	⊗	-

○ : Standard, △: Custom made, ⊗ : Contact sales person.

HSS / HAS

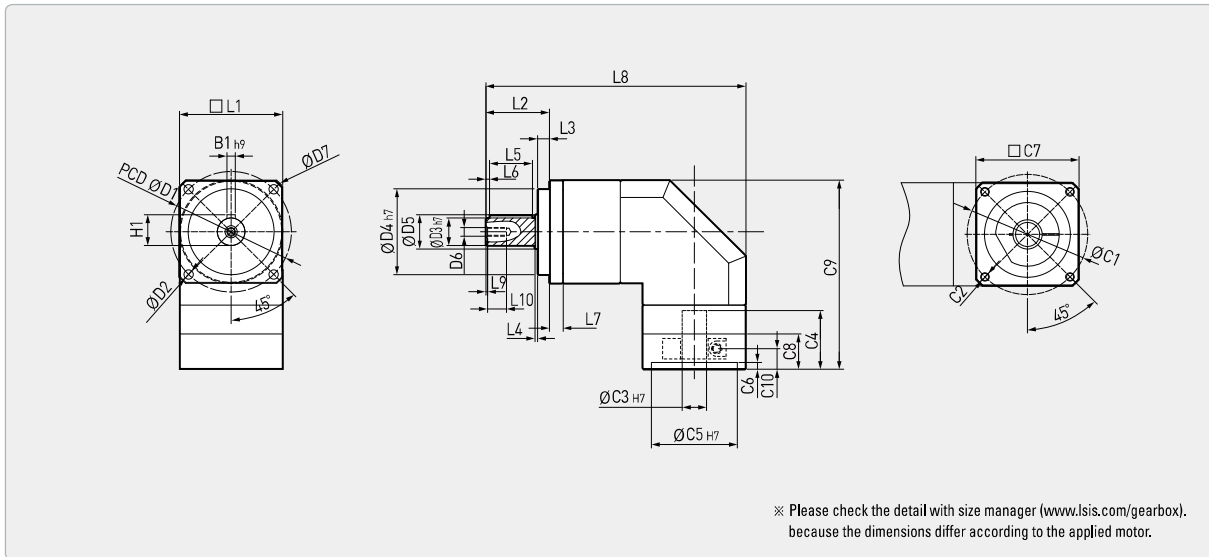


Division	Stage	Gear ratio	045	060	090	115	142	
<b>Nominal Output Torque (Nm)</b>	1	3	20	57	148	272	484	
		4	18	51	143	295	549	
		5	19	54	160	332	634	
		6	18	50	151	311	592	
		7	17	48	145	305	562	
		8	16	44	132	279	527	
		9	14	42	123	254	483	
		10	14	42	121	262	500	
		14	-	44	145	305	562	
		15	14	-	-	-	-	
	20	14	22	71	147	275		
	2	25	19	54	160	332	634	
		30	18	50	151	311	592	
		35	17	48	145	305	562	
		40	16	44	132	279	527	
		45	14	42	123	254	483	
		50	19	54	160	332	634	
		60	18	50	151	311	592	
		70	17	48	145	305	562	
		80	16	44	132	279	527	
90		14	42	123	254	483		
100	14	42	121	262	500			
120	-	-	151	311	592			
140	-	-	145	305	562			
160	-	-	132	279	527			
180	-	-	123	254	483			
200	-	-	121	262	500			
<b>Emergency Stop Torque (Nm)</b>	1,2	3-200	3 times nominal output torque					
<b>Nominal Input Speed (rpm)</b>	1,2	3-200	5,000	5,000	4,000	4,000	3,000	
<b>Max. Input Speed (rpm)</b>	1,2	3-200	10,000	10,000	8,000	8,000	6,000	
<b>Torsional Rigidity (Nm/Arcmin)</b>	1,2	3-200	3	7	14	26	55	
<b>Max. Radial Load (N)</b>	1,2	3-200	750	1,280	3,200	6,800	9,300	
<b>Max. Axial Load (N)</b>	1,2	3-200	390	690	1,600	3,400	4,500	
<b>Backlash (Arcmin)</b>	<b>S</b>	1	3-20	≤8	≤8	≤8	≤8	≤8
		2	25-200	≤11	≤11	≤11	≤11	≤11
	<b>P</b>	1	3-20	≤6	≤6	≤6	≤6	≤6
		2	25-200	≤9	≤9	≤9	≤9	≤9
	<b>A</b>	1	3-20	★	≤4	≤4	≤4	≤4
		2	25-200	★	≤7	≤7	≤7	≤7
<b>Service Life (Hrs)</b>	1,2	3-200	20,000 (10,000 under continuous operation)					
<b>Efficiency (%)</b>	1	3-20	≥95					
	2	25-100	≥92					
<b>Weight (kg)</b>	1A	3-20	≤0.9	≤1.5	≤6.0	≤12.0	≤24.0	
	2A	25-200	≤1.2	≤2.0	≤7.5	≤13.5	≤26.0	
	2B	25-200	-	≤1.9	≤7.3	≤12.8	≤25.0	
<b>Operating Temp (°C)</b>	1,2	3-200	-10 - 90					
<b>Lubrication</b>	1,2	3-200	Grease (VIGO Grease RE #0)					
<b>Degree of Gearbox Protection</b>	1,2	3-200	IP65					
<b>Noise (dB)</b>	1,2	3-200	≤58	≤60	≤63	≤66	≤69	
<b>Inertia (kgcm<sup>2</sup>)</b>	1A	3-10	0.09	0.36	2.27	6.88	23.50	
		14, 20	-	0.08	1.89	6.23	21.75	
	2B	15, 20	-	-	-	-	-	
		25-100	-	0.09	0.36	2.27	6.88	
		120-200	-	-	0.32	1.89	6.23	
	2A	15, 20	0.09	-	-	-	-	
		25-100	0.09	0.36	2.27	6.88	23.50	
		120-200	-	-	1.89	6.23	21.75	

Please contact LSIS sales person for ★ gear ratio. (1) Considering safety factors, nominal output torque is calculated. (2) Max. output torque is equivalent to 60% of the emergency stop torque.

# Single Stage

## Drawing of Planetary Gearbox



Dimension	HAS0451A	HAS0601A	HAS0901A	HAS1151A	HAS1421A
<b>D1</b>	50	70	100	130	165
<b>D2</b>	3.5	5.5	6.8	8.7	11
<b>D3 h7</b>	13	16	22	32	40
<b>D4 h7</b>	35	50	80	110	130
<b>D5</b>	15	20	30	39.5	60
<b>D6</b>	M4 X 0.7P	M5 X 0.8P	M8 X 1.25P	M12 X 1.75P	M16 X 2.0P
<b>D7</b>	58	80	116	152	185
<b>L1</b>	45	60	90	115	142
<b>L2</b>	26.5	37	48	64	97
<b>L3</b>	5.5	7	10	12	15
<b>L4</b>	1	1.5	1.5	2	3
<b>L5</b>	15	25	32	40	65
<b>L6</b>	2	2	3	5	5
<b>L7</b>	6.5	8	11	12	19
<b>L8</b>	114	151.2	203	270	333
<b>L9</b>	1.5	1.5	1.5	2	2
<b>L10</b>	9.5	10.5	13.5	18	34
<b>* C1</b>	46	70	90	145	200
<b>* C2</b>	M4 X 0.7P	M5 X 0.8P	M6 X 1.0P	M8 X 1.25P	M12 X 1.75P
<b>* C3 h7</b>	8	14	19	24	35
<b>* C4</b>	26.5	34	43.1	62	82
<b>* C5 h7</b>	30	50	70	110	114.3
<b>* C6</b>	4	4	6	7	7
<b>* C7</b>	45	60	90	132	180
<b>* C8</b>	17	20.5	23.5	42	47
<b>* C9</b>	83	110	152	200	240
<b>* C10</b>	10	12	13.4	28	29.5
<b>B1 h9</b>	5	5	6	10	12
<b>H1</b>	15	18	24.5	35	43

(1) C(C1-C10) is dimension for input shaft parts. Dimensions differ by motor types and makers. Find CAD file for exact dimensions of gearbox in [www.lsis.com/gearbox](http://www.lsis.com/gearbox).

(2) In XX<sub>YY</sub>, YY means fit tolerance (KS B 0401).

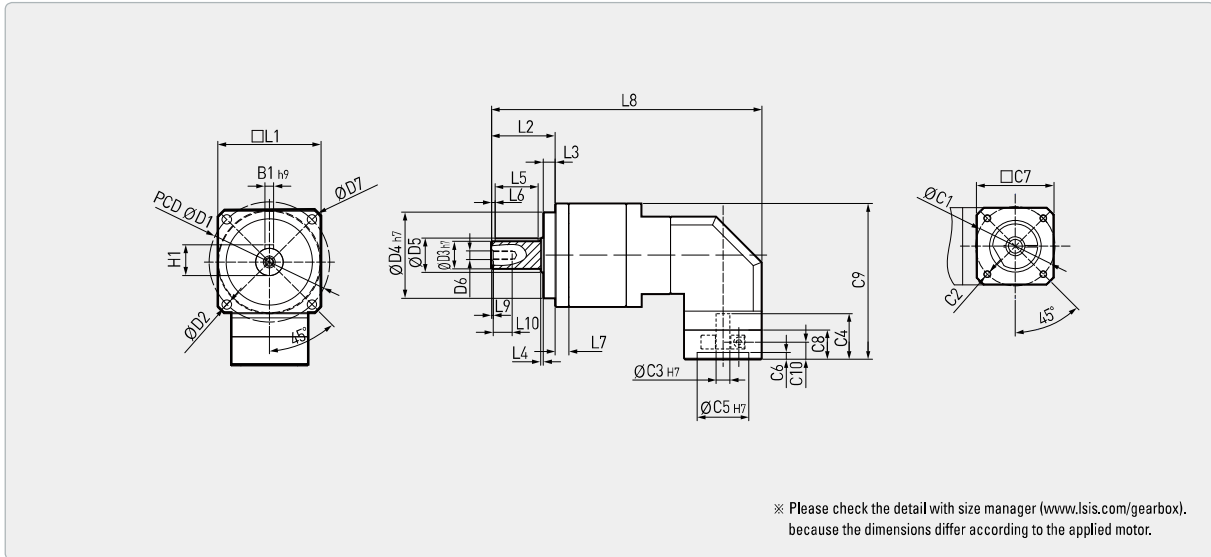
(3) ( ) is M Type-made to order.



HAS Series

## Double Stage B Type

### Drawing of Planetary Gearbox



Dimension	HAS0602B	HAS0902B	HAS1152B	HAS1422B
<b>D1</b>	70	100	130	165
<b>D2</b>	5.5	6.8	8.7	11
<b>D3 h7</b>	16	22	32	40
<b>D4 h7</b>	50	80	110	130
<b>D5</b>	20	30	39.5	60
<b>D6</b>	M5 X 0.8P	M8 X 1.25P	M12 X 1.75P	M16 X 2.0P
<b>D7</b>	80	116	152	185
<b>L1</b>	60	90	115	142
<b>L2</b>	37	48	64	97
<b>L3</b>	7	10	12	15
<b>L4</b>	1.5	1.5	2	3
<b>L5</b>	25	32	40	65
<b>L6</b>	2	3	5	5
<b>L7</b>	8	11	12	19
<b>L8</b>	157	205.7	275.5	367.5
<b>L9</b>	1.5	1.5	2	2
<b>L10</b>	10.5	13.5	18	34
<b>* C1</b>	46	70	90	145
<b>* C2</b>	M4 X 0.7P	M5 X 0.8P	M6 X 1.0P	M8 X 1.25P
<b>* C3 h7</b>	8	14	19	24
<b>* C4</b>	26.5	34	43.1	62
<b>* C5 h7</b>	30	50	70	110
<b>* C6</b>	4	4	6	7
<b>* C7</b>	45	60	90	132
<b>* C8</b>	17	20.5	23.5	42
<b>* C9</b>	90.5	125	164.5	213.5
<b>* C10</b>	10	12	13.4	28
<b>B1 h9</b>	5	6	10	12
<b>H1</b>	18	24.5	35	43

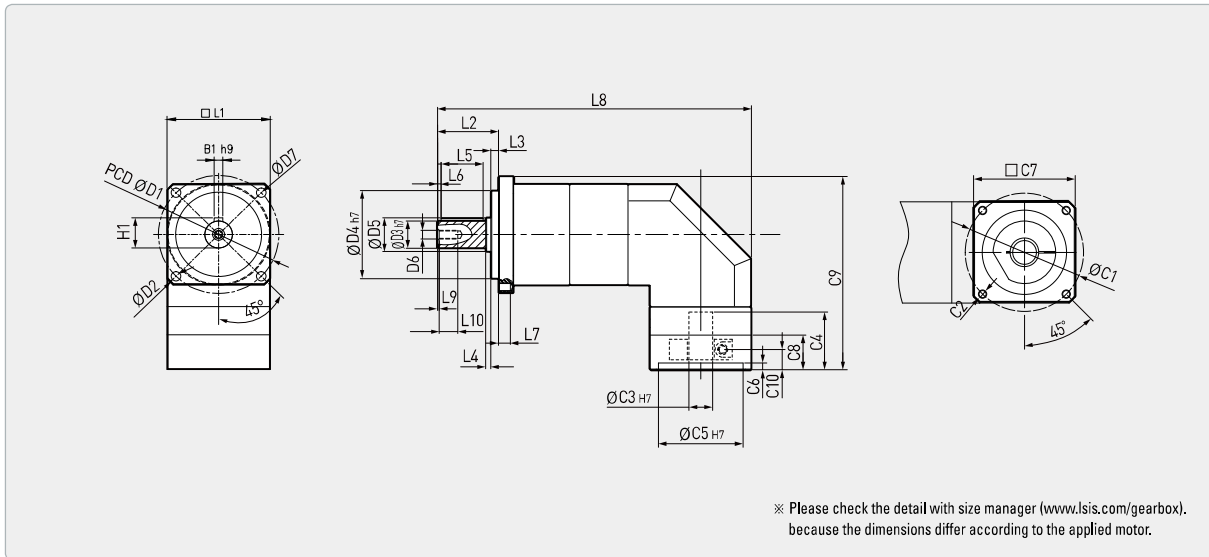
(1) C(C1-C10) is dimension for input shaft parts. Dimensions differ by motor types and makers. Find CAD file for exact dimensions of gearbox in [www.lsis.com/gearbox](http://www.lsis.com/gearbox).

(2) In XXYY, YY means fit tolerance (KS B 0401).

(3) ( ) is M Type-made to order.

# Double Stage A Type

## Drawing of Planetary Gearbox



Dimension	HAS0452A	HAS0602A	HAS0902A	HAS1152A	HAS1422A
<b>D1</b>	50	70	100	130	165
<b>D2</b>	3.5	5.5	6.8	8.7	11
<b>D3 h7</b>	13	16	22	32	40
<b>D4 h7</b>	35	50	80	110	130
<b>D5</b>	15	20	30	39.5	60
<b>D6</b>	M4 X 0.7P	M5 X 0.8P	M8 X 1.25P	M12 X 1.75P	M16 X 2.0P
<b>D7</b>	58	80	116	152	185
<b>L1</b>	45	60	90	115	142
<b>L2</b>	26.5	37	48	64	97
<b>L3</b>	5.5	7	10	12	15
<b>L4</b>	1	1.5	1.5	2	3
<b>L5</b>	15	25	32	40	65
<b>L6</b>	2	2	3	5	5
<b>L7</b>	6.5	8	11	12	19
<b>L8</b>	143	185.7	247	295.5	392.5
<b>L9</b>	1.5	1.5	1.5	2	2
<b>L10</b>	9.5	10.5	13.5	18	34
<b>* C1</b>	46	70	90	145	200
<b>* C2</b>	M4 X 0.7P	M5 X 0.8P	M6 X 1.0P	M8 X 1.25P	M12 X 1.75P
<b>* C3 H7</b>	8	14	19	24	35
<b>* C4</b>	26.5	34	43.1	62	82
<b>* C5 H7</b>	30	50	70	110	114.3
<b>* C6</b>	4	4	6	7	7
<b>* C7</b>	45	60	90	132	180
<b>* C8</b>	17	20.5	23.5	42	47
<b>* C9</b>	83	110	152	194.4	232
<b>* C10</b>	10	12	13.4	28	29.5
<b>B1 h9</b>	5	5	6	10	12
<b>H1</b>	15	18	24.5	35	43

(1) C(C1-C10) is dimension for input shaft parts. Dimensions differ by motor types and makers. Find CAD file for exact dimensions of gearbox in [www.lsis.com/gearbox](http://www.lsis.com/gearbox).

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