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Zero-back Drive

Robo Series

SENES TECHNOLOGY

The Future of New Generation Robot
Industrial Robot Series



SeneS Technology Co., Ltd.

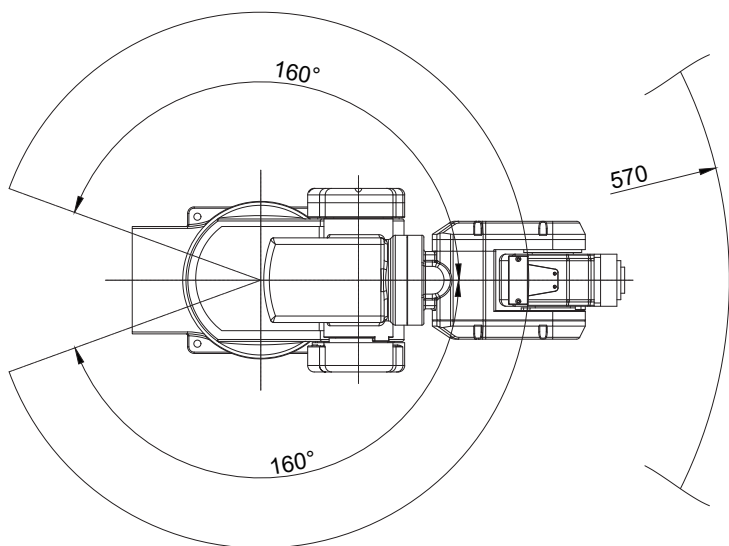
SENES ROBO SERIES

New generation robot
The future of high technology

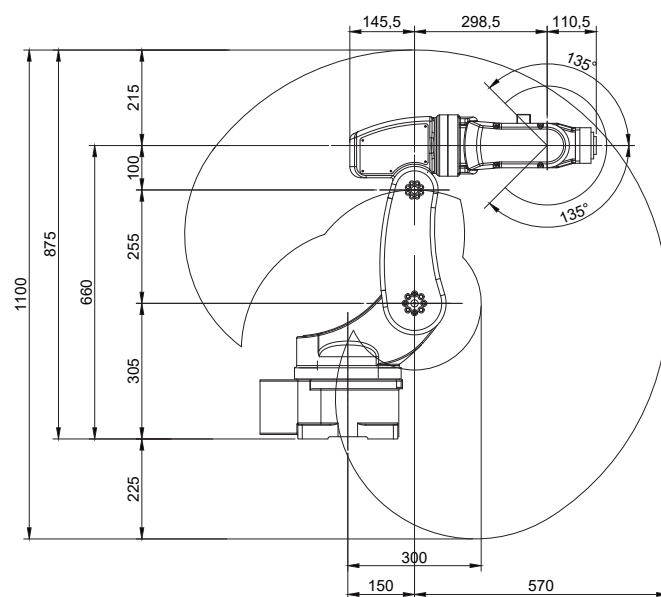


Product Overview

- Robo 003 - 3kg payload
- Robo 005 - 5kg payload
- Robo 010 - 10kg payload
- Robo 015 - 15kg payload



MODEL		ROBO 003
Max Payload(Kg)		3
Motion Range (°)	Arm rotation (JT 1)	±170
	Arm out-in (JT 2)	-80 ~ +135
	Arm up-down (JT 3)	+118 ~ -170
	Wrist swivel (JT 4)	± 270
	Wrist band (JT 5)	±145
	Wrist twist (JT 6)	±360
Max Speed (°/s)	Arm rotation (JT 1)	160
	Arm out-in (JT 2)	160
	Arm up-down (JT 3)	170
	Wrist swivel (JT 4)	340
	Wrist band (JT 5)	340
	Wrist twist (JT 6)	450
Moment (N.M)	Wrist swivel (JT 4)	7.2
	Wrist band (JT 5)	7.2
	Wrist twist (JT 6)	5.2
Moment of Inertia (Kg.M ²)	Wrist swivel (JT 4)	0.3
	Wrist band (JT 5)	0.3
	Wrist twist (JT 6)	0.3
Moment of Inertia(Kg.M ²)		0.05
Max Reach(mm)		540
Max Speed(mm/s)		3,100
Mass		26
Body Color		Ivory/Dark Navy
Installation		Floor
Environmental	Temperature(°C)	0~40
Condition	Humidity(%)	35~85 (No dew nor frost allowed)
Power Requirement(KVA)		1.5
Degree of Protection		Wrist IP 60 Base axis IP54
Machine Controller		SNS003Series



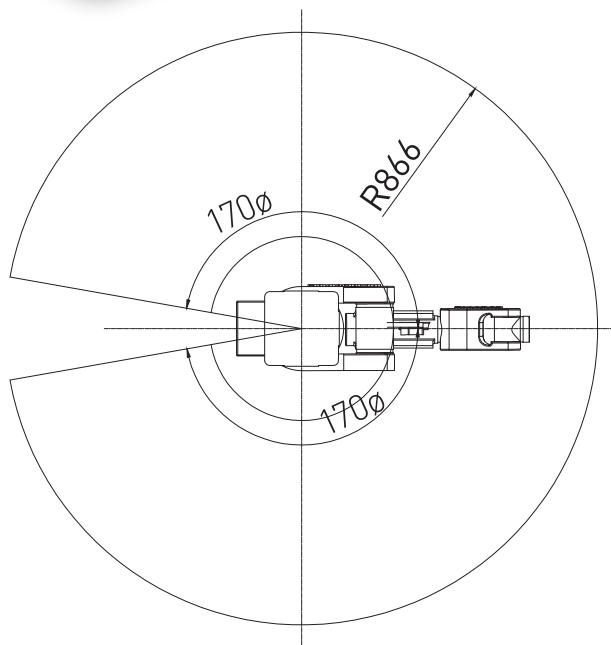
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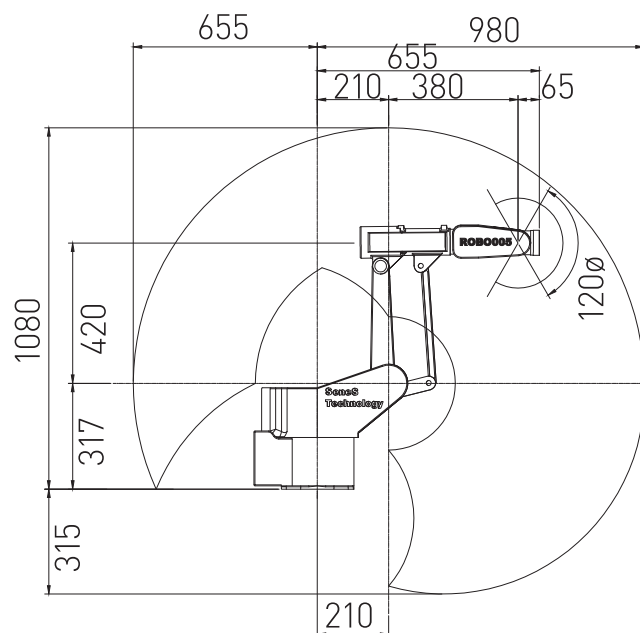


Product Overview

- Robo 003 - 3kg payload
- **Robo 005 - 5kg payload**
- Robo 010 - 10kg payload
- Robo 015 - 15kg payload



MODEL		ROBO 005
Max Payload(Kg)		5
Motion Range (°)	Arm rotation (JT 1)	±170
	Arm out-in (JT 2)	-80 ~ +135
	Arm up-down (JT 3)	+118 ~ -170
	Wrist swivel (JT 4)	±270
	Wrist band (JT 5)	±145
	Wrist twist (JT 6)	±360
Max Speed (°/s)	Arm rotation (JT 1)	160
	Arm out-in (JT 2)	160
	Arm up-down (JT 3)	170
	Wrist swivel (JT 4)	340
	Wrist band (JT 5)	340
	Wrist twist (JT 6)	450
Moment (N.M)	Wrist swivel (JT 4)	12.3
	Wrist band (JT 5)	12.3
	Wrist twist (JT 6)	7
Moment of Inertia (Kg.M ²)	Wrist swivel (JT 4)	0.4
	Wrist band (JT 5)	0.4
	Wrist twist (JT 6)	0.12
Moment of Inertia(Kg.M ²)		0.05
Max Reach(mm)		980
Max Speed(mm/s)		3,100
Mass		37
Body Color		Ivory/Dark Navy
Installation		Floor
Environmental	Temperature(°C)	0~40
Condition	Humidity(%)	35~85 (No dew nor frost allowed)
Power Requirement(KVA)		1.5
Degree of Protection		Wrist IP 60 Base axis IP54
Machine Controller		SNS005Series



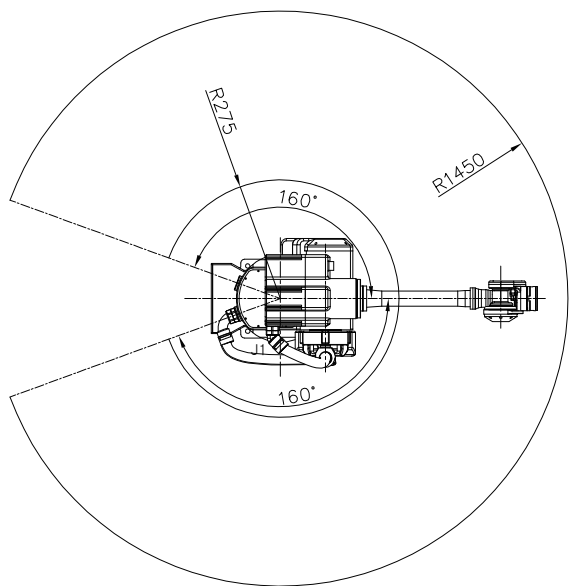
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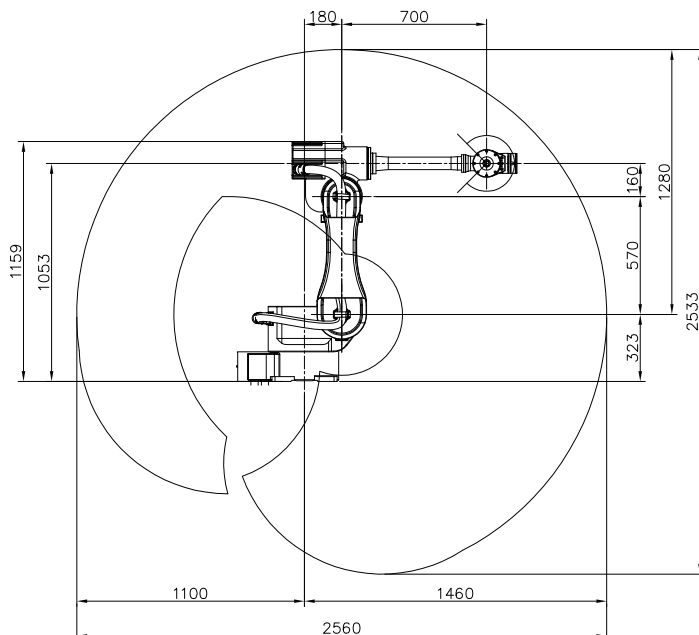


Product Overview

- Robo 003 - 3kg payload
- Robo 005 - 5kg payload
- **Robo 010 - 10kg payload**
- Robo 015 - 15kg payload



MODEL		ROBO 010
Max Payload(Kg)		10
Motion Range (°)	Arm rotation (JT 1)	±170
	Arm out-in (JT 2)	-90 ~ +145
	Arm up-down (JT 3)	+150 ~ -163
	Wrist swivel (JT 4)	± 270
	Wrist band (JT 5)	± 145
	Wrist twist (JT 6)	± 360
Max Speed (°/s)	Arm rotation (JT 1)	120
	Arm out-in (JT 2)	120
	Arm up-down (JT 3)	215
	Wrist swivel (JT 4)	365
	Wrist band (JT 5)	380
	Wrist twist (JT 6)	480
Moment (N.M)	Wrist swivel (JT 4)	13
	Wrist band (JT 5)	13
	Wrist twist (JT 6)	7.5
Moment of Inertia (Kg.M ²)	Wrist swivel (JT 4)	0.45
	Wrist band (JT 5)	0.45
	Wrist twist (JT 6)	0.14
Moment of Inertia(Kg.M ²)		0.1
Max Reach(mm)		1,450
Max Speed(mm/s)		4,100
Mass		110
Body Color		Ivory/Dark Navy
Installation		Floor
Environmental	Temperature(°C)	0~40
Condition	Humidity(%)	35~85 (No dew nor frost allowed)
Power Requirement(KVA)		2
Degree of Protection		Wrist IP 60 Base axis IP54
Machine Controller		SNS010Series



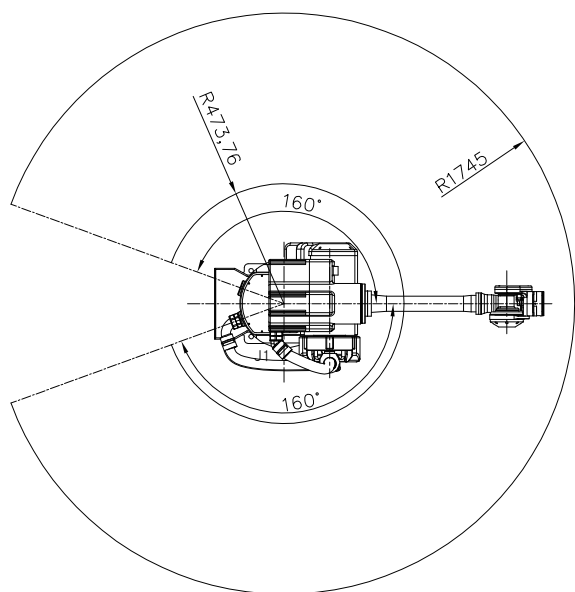
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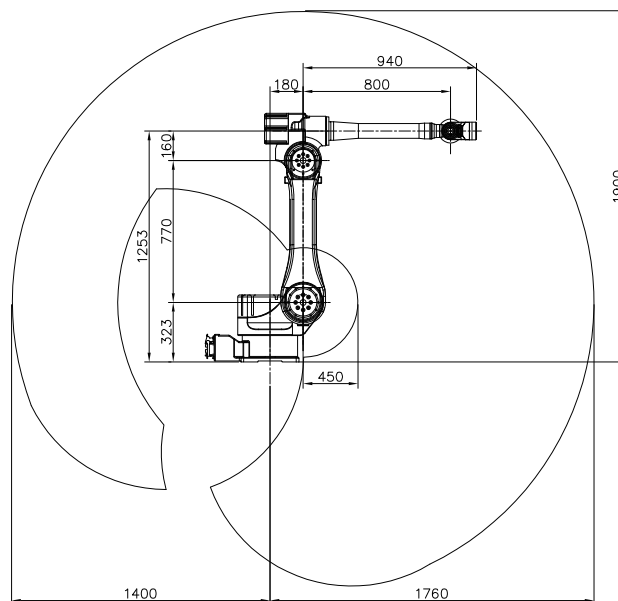


Product Overview

- Robo 003 - 3kg payload
- Robo 005 - 5kg payload
- Robo 010 - 10kg payload
- Robo 015 - 15kg payload

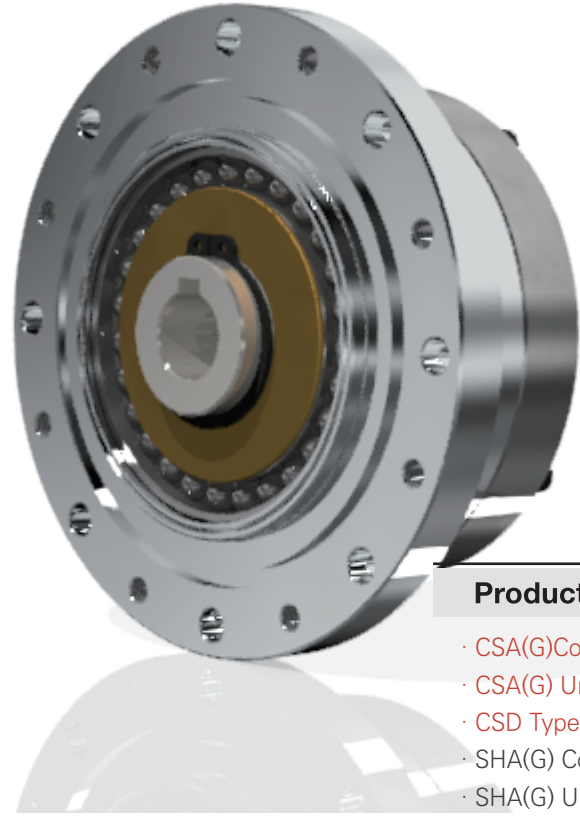


MODEL		ROBO 015
Max Payload(Kg)		15
Motion Range (°)	Arm rotation (JT 1)	±170
	Arm out-in (JT 2)	-90 ~ +155
	Arm up-down (JT 3)	+150 ~ -163
	Wrist swivel (JT 4)	±270
	Wrist band (JT 5)	±145
	Wrist twist (JT 6)	±360
Max Speed (°/s)	Arm rotation (JT 1)	120
	Arm out-in (JT 2)	120
	Arm up-down (JT 3)	215
	Wrist swivel (JT 4)	365
	Wrist band (JT 5)	380
	Wrist twist (JT 6)	480
Moment (N.M)	Wrist swivel (JT 4)	13
	Wrist band (JT 5)	13
	Wrist twist (JT 6)	7.5
Moment of Inertia (Kg.M ²)	Wrist swivel (JT 4)	0.45
	Wrist band (JT 5)	0.45
	Wrist twist (JT 6)	0.14
Moment of Inertia(Kg.M ²)		0.2
Max Reach(mm)		1,745
Max Speed(mm/s)		4,600
Mass		175
Body Color		Ivory/Dark Navy
Installation		Floor
Environmental	Temperature(°C)	0~40
Condition	Humidity(%)	35~85 (No dew nor frost allowed)
Power Requirement(KVA)		3
Degree of Protection		Wrist IP 60 Base axis IP54
Machine Controller		SNS015Series



ZERO BACK DRIVE

High Power & Extreme Precision



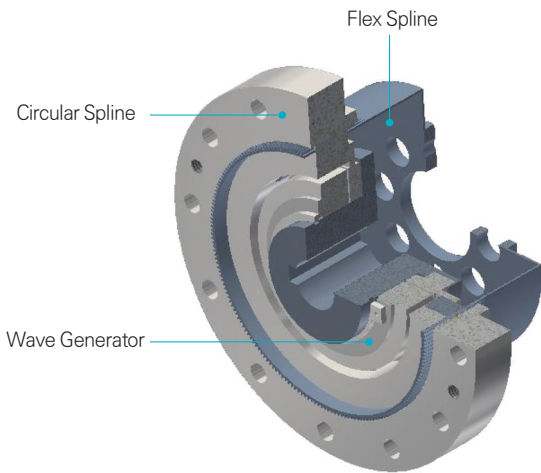
Product Overview

- CSA(G)Component Type
- CSA(G) Unit Type
- CSD Type
- SHA(G) Component Type
- SHA(G) Unit Type

Metal's elastic dynamics applied Zero Back Drive.

Consists of just 3 of parts as Wave generator, Flex spline & Circular Spline

금속의 굴곡과 탄성 역학을 응용한 제로백 드라이브는 웨이브 제너레이터, 플렉스 스플라인 그리고 써큘러 스플라인, 3개의 기본 부품으로 구성됩니다.



Structure of CSA component type
/CSA컴포넌트 타입의 구조

CS 시리즈의 특징

- 컴팩트, 심플한 디자인
- 고토크 용량
- 고강성
- 우수한 위치 결정도와 회전정도
- 입출력 축이 동축상
- 폭넓은 감속비
- 소형화

Feature of CS Series

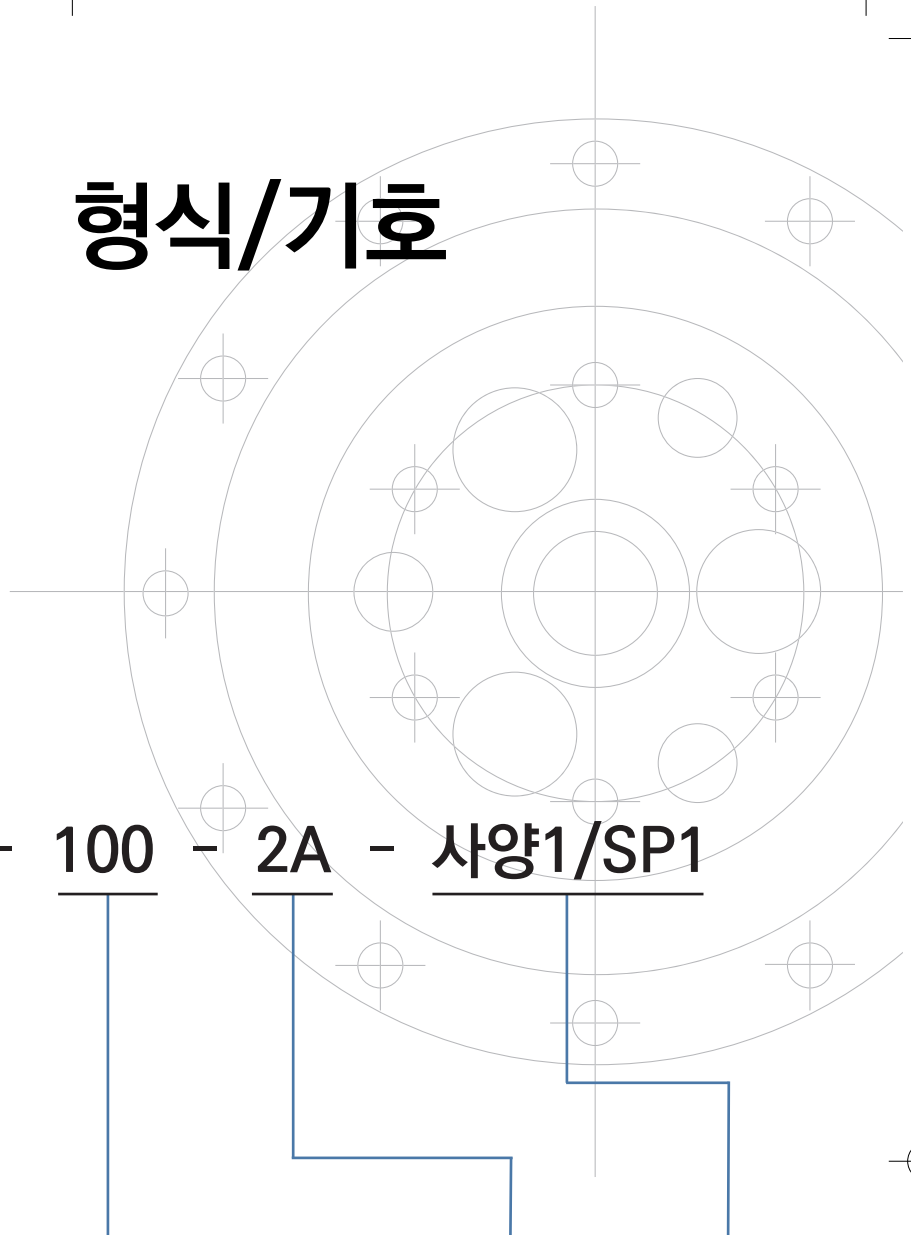
- Compact and Simple design
- High Torque
- High Stiffness
- Excellence Positioning and Accuracies
- Coaxial Input and Output



SZB-CSA-XX-XXX-2UH 조립도

ZERO BACK DRIVE

형식/기호



SZB - CSA - 25 - 100 - 2A - 사양1/SP1

제로백 드라이브
/Zero Back Drive

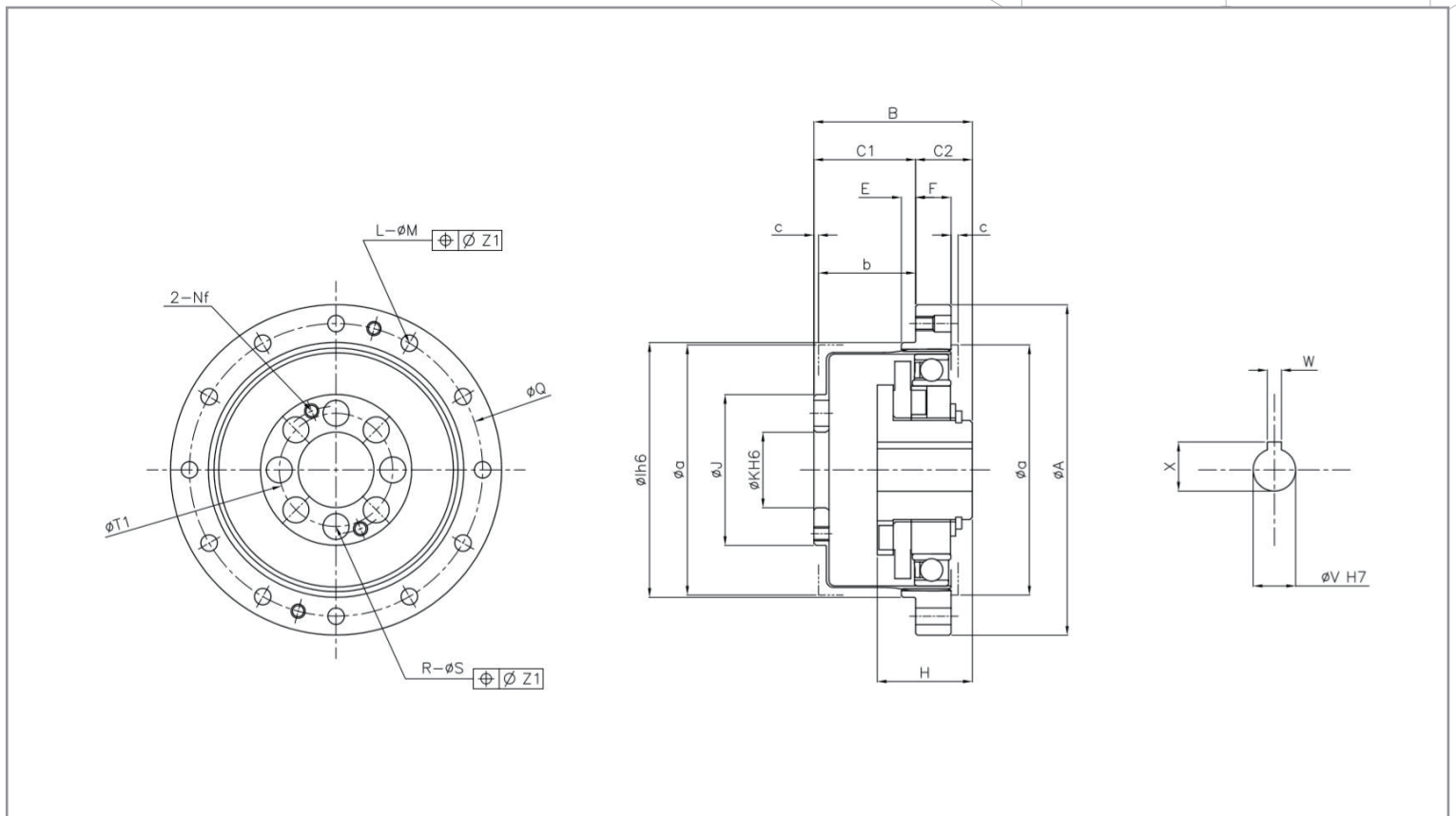
기호명/Model name	형번/Model No	감속비/Reduction ratio					형식/Model	특수사양/Special Specification
CSA CSAG	14	50	80	100	-	-	2A : Component 2UH : Unit	Non Record: Standard
	17	50	80	100	120	-		
	20	50	80	100	120	160		
	25	50	80	100	120	160		
	32	50	80	100	120	160		
	40	50	80	100	120	160		
	45	50	80	100	120	160		
CSD	14	50	-	100	-	-	2A : Component	Non Record: Standard
	17	50	-	100	-	-		
	20	50	-	100	-	160		
	25	50	-	100	-	160		
	32	50	-	100	-	160		
	40	50	-	100	-	160		

주1/Reduce ration: Input=wave generation, Fix=circular spline, output=flex spline

ZERO BACK DRIVE

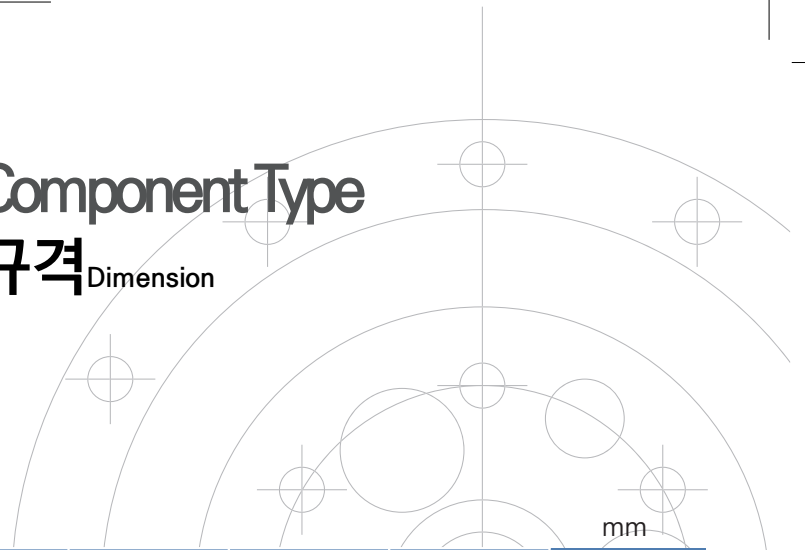
Component Type
외형도 Drawing

SZB-CSA-XX-XXX-2A



ZERO BACK DRIVE

Component Type 규격 Dimension



기호 Symbol		형번 Model	14	17	20	25	32	40	45
ØAh6			50	60	70	85	110	135	155
B	CSAG		29 ⁰ _{-0.4}	33 ⁰ _{-0.4}	34 ⁰ _{-0.4}	37 ⁰ _{-0.5}	44 ⁰ _{-0.6}	53 ⁰ _{-0.6}	59 ⁰ _{-0.6}
	CSA		29 ⁰ _{-0.8}	33 ⁰ _{-0.9}	34 ⁰ ₋₁	37 ⁰ ₋₁	44 ⁰ _{-1.1}	53 ⁰ _{-1.1}	59 ⁰ _{-1.2}
C1			18 ^{+0.4} ₀	20 ^{+0.5} ₀	22 ^{+0.6} ₀	24 ^{+0.6} ₀	28 ^{+0.6} ₀	34 ^{+0.6} ₀	38 ^{+0.6} ₀
C2			11	12.5	12	13	16	19	20.5
E			2	2.5	3	3	3	4	4
F			6	6.5	7.5	10	14	17	19
H	CSAG		18.5	20.7	21.5	21.6	23.6	29.7	30.5
	CSA		17.6	19.5	20.1	20.2	22	27.5	27.9
Ølh6			38	48	54	67	90	110	124
J			23	27.2	32	40	52	64	72
ØKH6			11	10	16	20	26	32	36
L	CSAG		8	16	16	16	16	16	16
	CSA		6	12	12	12	12	12	12
M			3.5	3.4	3.5	4.5	5.5	6.6	9
Nf			M3	M3	M3	M4	M5	M6	M6
Q(PCD)			44	54	62	75	100	120	140
R			6	6	8	8	8	8	8
ØS			4.5	5.5	5.5	6.6	9	11	13.5
T1(PCD)			17	19	24	30	40	50	54
ØV	표준(H7)		6	8	9	11	14	14	19
	최대치수		8	10	13	15	15	20	20
W			-	-	3	4	5	5	6
X			-	-	10 ^{+0.1} ₀	13 ^{+0.1} ₀	17 ^{+0.1} ₀	16 ^{+0.1} ₀	22 ^{+0.1} ₀
a			38	45	53	66	86	106	119
b			17.1	19	20.5	3	26.8	33	36.5
c			1	1	1.5	1.5	1.5	22	2
f			M3*4	M3*6	-	-	-	-	-
Weight(Kg)			0.09	0.15	0.28	0.42	0.42	1.7	2.3

ZERO BACK DRIVE

Component Type 테크니컬 데이터 Technical Data

-CSA Component Type

모델 Model No.	감속비 /Reduction Ratio	기동/정지시의 정격 토크 Nm /Rated torque at input 2000r/min		기동/정지시의 정격 토크 Nm /Permissible peak torque at start/stop		평균 부하 토크의 최대 허용치 Nm /Permissible max value of ave. load torque		순간 허용 최대 토크 Nm /Instantaneous permissible max torque		허용 최고 입력 회전 속도r/min /Permissible max input rotational speed(r/min)	허용 최고 평균 회전 속도r/min Permissible average input rotational speed(r/min)	관성 모멘트 /Inertia moment I/1000Kgm ²
		Nm	kgfm	Nm	kgfm	Nm	kgfm	Nm	kgfm	그리스윤활	그리스윤활	
14	50	5	0.47	15	2	6	1	30	3	8,500	3,500	0.045
	80	7.8	0.8	23	2.4	11	1.1	47	4.8			
	100	7.8	0.8	28	2.9	11	1.1	54	5.5			
17	50	16	1.6	34	3.5	26	2.6	70	7.1	7,300	3,500	0.098
	80	22	2.2	43	4.4	27	2.7	87	8.9			
	100	24	2.4	54	5.5	39	4	108	11			
	120	24	2.4	54	5.5	39	4	86	8.8			
20	50	25	2.5	56	5.7	34	3.5	98	10	6,500	3,500	0.241
	80	34	3.5	74	7.5	47	4.8	127	13			
	100	40	4.1	82	8.4	49	5	191	20			
	120	40	4.1	82	8.4	49	5	191	20			
	160	40	4.1	92	9.4	49	5	147	15			
25	50	39	4	98	10	55	5.6	186	19	5,600	3,500	0.516
	80	63	6.4	137	14	87	8.9	255	26			
	100	67	6.8	157	16	108	11	284	29			
	120	67	6.8	157	16	108	11	284	29			
	160	67	6.8	176	18	108	11	314	32			
32	50	76	7.6	216	22	108	11	382	39	4,800	3,500	2.02
	80	118	12	304	31	167	17	568	58			
	100	137	14	333	34	216	22	647	66			
	120	137	14	353	36	216	22	686	70			
	160	137	14	372	38	216	22	686	70			
40	50	137	14	402	41	196	20	686	70	4,000	3,000	5.62
	80	206	21	519	53	284	29	980	100			
	100	265	27	568	58	372	38	1080	110			
	120	294	30	617	63	451	46	1180	120			
	160	294	30	647	66	451	46	1180	120			
45	50	176	18	500	51	265	27	950	97	3,800	3,000	10.85
	80	313	32	706	72	390	40	1270	130			
	100	353	36	755	77	500	51	1570	160			
	120	402	41	823	84	620	63	1760	180			
	160	402	41	882	90	630	64	1910	195			

ZERO BACK DRIVE

Component Type 테크니컬 데이터 Technical Data

-CSAG Component Type

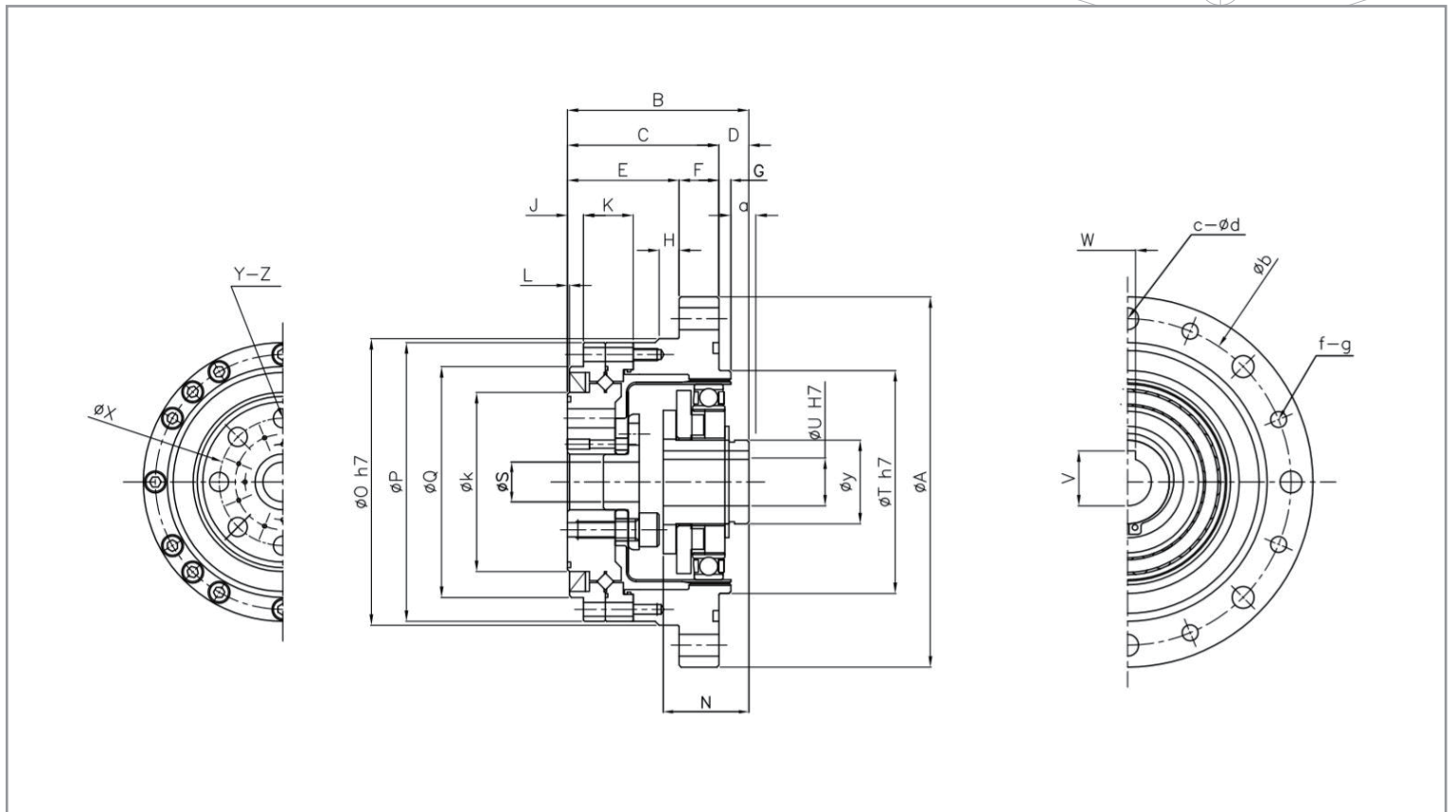
모델 Model No.	감속비 /Reduction Ratio	기동/정지시의 정격 토크 Nm /Rated torque at input 2000r/min		기동/정지시의 정격 토크 Nm /Permissible peak torque at start/stop		평균 부하 토크의 최대 허용치 Nm /Permissible max value of ave. load torque		순간 허용 최대 토크 Nm /Instantaneous permissible max torque		허용 최고 입력 회전 속도r/min /Permissible max input rotational speed(r/min)	허용 최고 평균 회전 속도r/min Permissible average input rotational speed(r/min)	관성 모멘트 /Inertia moment I/1000Kgm ²
		Nm	kgfm	Nm	kgfm	Nm	kgfm	Nm	kgfm	그리스유힬	그리스유힬	
14	50	6	0.61	19.6	2	7.7	0.8	39.1	4	8,500	3,500	0.045
	80	8.5	0.87	25.5	2.6	11.9	1.2	49.3	5			
	100	8.5	0.87	30.6	3.12	11.9	1.2	49.3	5			
17	50	18	1.8	37	3.8	29	2.9	77	7.9	7,300	3,500	0.098
	80	25	2.5	48	4.9	30	3	96	9.8			
	100	26	2.7	60	6.1	43	4.4	122	12.4			
	120	26	2.7	60	6.1	43	4.4	122	12.4			
20	50	28	2.9	62	6.3	37	4	108	11	6,500	3,500	0.241
	80	37	3.8	82	8.3	52	5	140	14			
	100	44	4.5	91	9.3	54	6	162	17			
	120	44	4.5	96	9.8	54	6	162	17			
	160	44	4.5	96	9.8	54	6	162	17			
25	50	43	4.4	108	11	61	6	206	21	5,600	3,500	0.516
	80	70	7.1	151	15.4	96	10	282	28.8			
	100	74	7.5	173	17.7	119	12	314	32			
	120	74	7.5	184	18.8	119	12	336	34.3			
	160	74	7.5	195	19.9	119	12	347	35.4			
32	50	84	9	239	24	119	12	422	43	4,800	3,500	2.02
	80	130	13	336	34	184	19	627	64			
	100	151	15	368	38	239	24	715	7			
	120	151	15	390	40	239	24	158	77			
	160	151	15	411	42	239	24	158	77			
40	50	151	15	445	45	217	22	158	77	4,000	3,000	5.62
	80	228	23	574	59	314	32	1080	110			
	100	293	30	627	64	411	42	1190	121			
	120	325	33	682	70	498	51	1301	133			
	160	325	33	715	73	498	51	1301	133			
45	50	195	20	553	56	293	30	1050	107	3,800	3,000	10.85
	80	346	35	780	80	431	44	1403	143			
	100	390	40	835	85	553	56	1735	144			
	120	445	45	910	93	684	70	1945	198			
	160	445	45	975	99	696	71	2111	215			

ZERO BACK DRIVE

Unit Type
외형도 Drawing

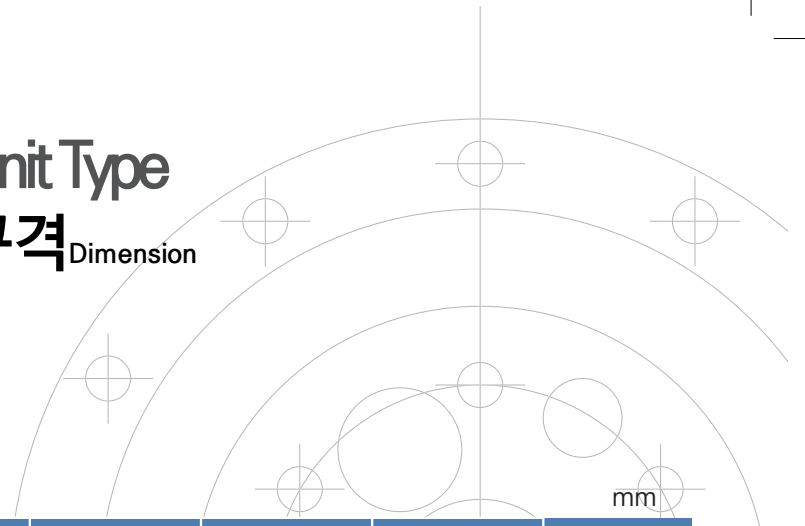


SZB-CSA-XX-XXX-2UH



ZERO BACK DRIVE

Unit Type
규격 Dimension



기호 Symbol		형번 Model	14	17	20	25	32	40	45
ØA			73	79	70	85	110	135	155
B			41 ⁰ _{-0.9}	45 ⁰ _{-0.9}	45.5 ⁰ ₋₁	52 ⁰ ₋₁	62 ⁰ _{-1.1}	72.5 ⁰ _{-1.1}	79.5 ⁰ _{-1.2}
C			34	37	38	46	57	66.5	74
D	CSAG		7 ⁰ _{-0.4}	8 ⁰ _{-0.4}	7.5 ⁰ _{-0.5}	6 ⁰ _{-0.5}	5 ⁰ _{-0.6}	6 ⁰ _{-0.6}	5.5 ⁰ _{-0.6}
	CSA		7 ⁰ _{-0.8}	8 ⁰ _{-0.9}	7.5 ⁰ ₋₁	6 ⁰ ₋₁	5 ⁰ _{-1.1}	6 ⁰ _{-1.1}	5.5 ⁰ _{-1.2}
E			27	29	28	36	45	50.5	58
F			7	8	10	10	12	16	16
G			2	2	3	3	3	4	4
H			3.5	4	5	5	5	5	6
L	CSAG		0.5	0.5	0.5	0.5	1	1.5	1
	CSA		0.5	1.1	1.1	1.1	1.2	1.6	1.6
N	CSAG		18.5	20.7	21.5	21.6	23.6	29.7	30.5
	CSA		17.6	19.5	20.1	20.2	22	27.5	27.9
ØO h7			56	63	72	86	113	127	148
ØP	CSAG		56	62	70	85	112	123	147
	CSA		55	62	70	85	112	123	147
ØQ			42.5	49.5	58	73	96	109	127
ØS			8	7	10	15	20	24	25
ØT h7			38	48	56	67	90	110	124
ØU H7			6	8	12	14	14	14	19
V			-	-	13.8 ^{+0.1} ₀	16.3 ^{+0.1} ₀	16.3 ^{+0.1} ₀	16.3 ^{+0.1} ₀	21.8 ^{+0.1} ₀
W Js9			-	-	4	5	5	5	6
ØX			23	27	32	42	55	68	82
Y			6	6	8	8	8	8	8
Z			M4X8	M5X10	M6X9	M8X12	M10X15	M12X18	M14X21
a			1	1	1.5	1.5	1.5	2	2
Øb			65	71	82	96	125	144	164
C	CSAG		8	8	8	10	12	10	12
	CSA		6	6	6	8	12	8	12
Ød			4.5	4.5	5.5	5.5	6.6	9	9
F	CSAG		8	8	8	10	12	10	12
	CSA		6	6	6	8	12	8	12
g			M4	M4	M5	M5	M6	M8	M8
Øy			14	18	21	26	26	32	32
Weight(kg)			0.52	0.68	0.98	1.5	3.2	5	7

ZERO BACK DRIVE

Unit Type 테크니컬 데이터 Technical Data

-CSA Unit Type

모델 Model No.	감속비 /Reduction Ratio	기동/정지시의 정격 토크 Nm /Rated torque at input 2000r/min		기동/정지시의 정격 토크 Nm /Permissible peak torque at start/stop		평균 부하 토크의 최대 허용치 Nm /Permissible max value of ave. load torque		순간 허용 최대 토크 Nm /Instantaneous permissible max torque		허용 최고 입력 회전 속도r/min /Permissible max input rotational speed(r/min)	허용 최고 평균 회전 속도r/min Permissible average input rotational speed(r/min)	관성 모멘트 /Inertia moment /1000Kgm ²
		Nm	kgfm	Nm	kgfm	Nm	kgfm	Nm	kgfm	그리스윤활	그리스윤활	
14	50	5	0.47	15	2	6	1	30	3	8,500	3,500	0.045
	80	7.8	0.8	23	2.4	11	1.1	47	4.8			
	100	7.8	0.8	28	2.9	11	1.1	54	5.5			
17	50	16	1.6	34	3.5	26	2.6	70	7.1	7,300	3,500	0.098
	80	22	2.2	43	4.4	27	2.7	87	8.9			
	100	24	2.4	54	5.5	39	4	108	11			
	120	24	2.4	54	5.5	39	4	86	8.8			
20	50	25	2.5	56	5.7	34	3.5	98	10	6,500	3,500	0.241
	80	34	3.5	74	7.5	47	4.8	127	13			
	100	40	4.1	82	8.4	49	5	191	20			
	120	40	4.1	82	8.4	49	5	191	20			
	160	40	4.1	92	9.4	49	5	147	15			
25	50	39	4	98	10	55	5.6	186	19	5,600	3,500	0.516
	80	63	6.4	137	14	87	8.9	255	26			
	100	67	6.8	157	16	108	11	284	29			
	120	67	6.8	157	16	108	11	284	29			
	160	67	6.8	176	18	108	11	314	32			
32	50	76	7.6	216	22	108	11	382	39	4,800	3,500	2.02
	80	118	12	304	31	167	17	568	58			
	100	137	14	333	34	216	22	647	66			
	120	137	14	353	36	216	22	686	70			
	160	137	14	372	38	216	22	686	70			
40	50	137	14	402	41	196	20	686	70	4,000	3,000	5.62
	80	206	21	519	53	284	29	980	100			
	100	265	27	568	58	372	38	1080	110			
	120	294	30	617	63	451	46	1180	120			
	160	294	30	647	66	451	46	1180	120			
45	50	176	18	500	51	265	27	950	97	3,800	3,000	10.85
	80	313	32	706	72	390	40	1270	130			
	100	353	36	755	77	500	51	1570	160			
	120	402	41	823	84	620	63	1760	180			
	160	402	41	882	90	630	64	1910	195			

ZERO BACK DRIVE

Unit Type 테크니컬 데이터 Technical Data

-CSAG Unit Type

모델 Model No.	감속비 /Reduction Ratio	기동/정지시의 정격 토크 Nm /Rated torque at input 2000r/min		기동/정지시의 정격 토크 Nm /Permissible peak torque at start/stop		평균 부하 토크의 최대 허용치 Nm /Permissible max value of ave. load torque		순간 허용 최대 토크 Nm /Instantaneous permissible max torque		허용 최고 입력 회전 속도r/min /Permissible max input rotational speed(r/min)	허용 최고 평균 회전 속도r/min Permissible average input rotational speed(r/min)	관성 모멘트 /Inertia moment I/1000Kgm ²
		Nm	kgfm	Nm	kgfm	Nm	kgfm	Nm	kgfm	그리스윤활	그리스윤활	
14	50	6	0.61	19.6	2	7.7	0.8	39.1	4	8,500	3,500	0.045
	80	8.5	0.87	25.5	2.6	11.9	1.2	49.3	5			
	100	8.5	0.87	30.6	3.12	11.9	1.2	49.3	5			
17	50	18	1.8	37	3.8	29	2.9	77	7.9	7,300	3,500	0.098
	80	25	2.5	48	4.9	30	3	96	9.8			
	100	26	2.7	60	6.1	43	4.4	122	12.4			
	120	26	2.7	60	6.1	43	4.4	122	12.4			
20	50	28	2.9	62	6.3	37	4	108	11	6,500	3,500	0.241
	80	37	3.8	82	8.3	52	5	140	14			
	100	44	4.5	91	9.3	54	6	162	17			
	120	44	4.5	96	9.8	54	6	162	17			
	160	44	4.5	96	9.8	54	6	162	17			
25	50	43	4.4	108	11	61	6	206	21	5,600	3,500	0.516
	80	70	7.1	151	15.4	96	10	282	28.8			
	100	74	7.5	173	17.7	119	12	314	32			
	120	74	7.5	184	18.8	119	12	336	34.3			
	160	74	7.5	195	19.9	119	12	347	35.4			
32	50	84	9	239	24	119	12	422	43	4,800	3,500	2.02
	80	130	13	336	34	184	19	627	64			
	100	151	15	368	38	239	24	715	7			
	120	151	15	390	40	239	24	158	77			
	160	151	15	411	42	239	24	158	77			
40	50	151	15	445	45	217	22	158	77	4,000	3,000	5.62
	80	228	23	574	59	314	32	1080	110			
	100	293	30	627	64	411	42	1190	121			
	120	325	33	682	70	498	51	1301	133			
	160	325	33	715	73	498	51	1301	133			
45	50	195	20	553	56	293	30	1050	107	3,800	3,000	10.85
	80	346	35	780	80	431	44	1403	143			
	100	390	40	835	85	553	56	1735	144			
	120	445	45	910	93	684	70	1945	198			
	160	445	45	975	99	696	71	2111	215			

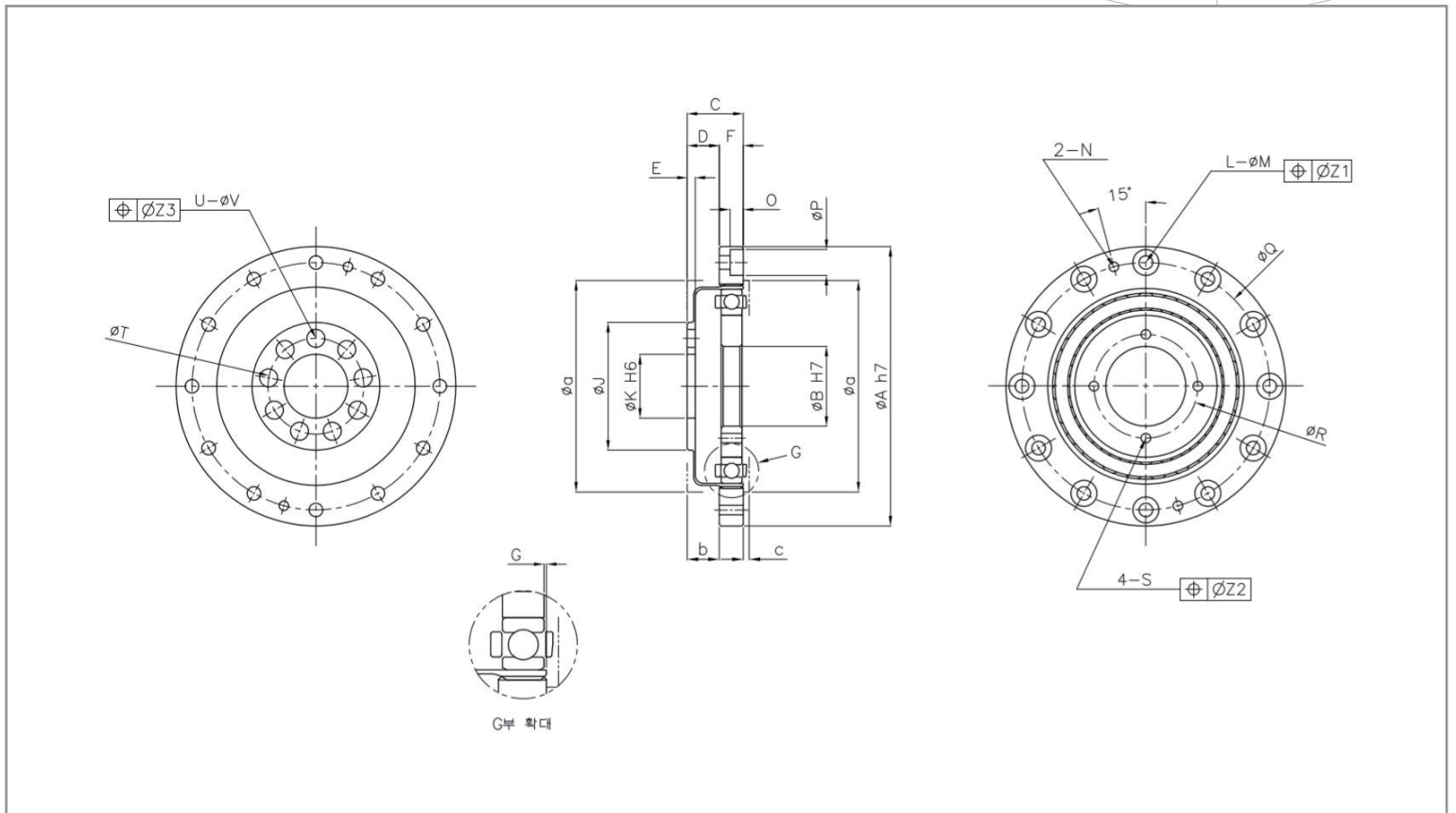
ZERO BACK DRIVE

CSD Component Type

외형도 Drawing



SZB-CSD-XX-XXX-2A



ZERO BACK DRIVE

CSD Component Type

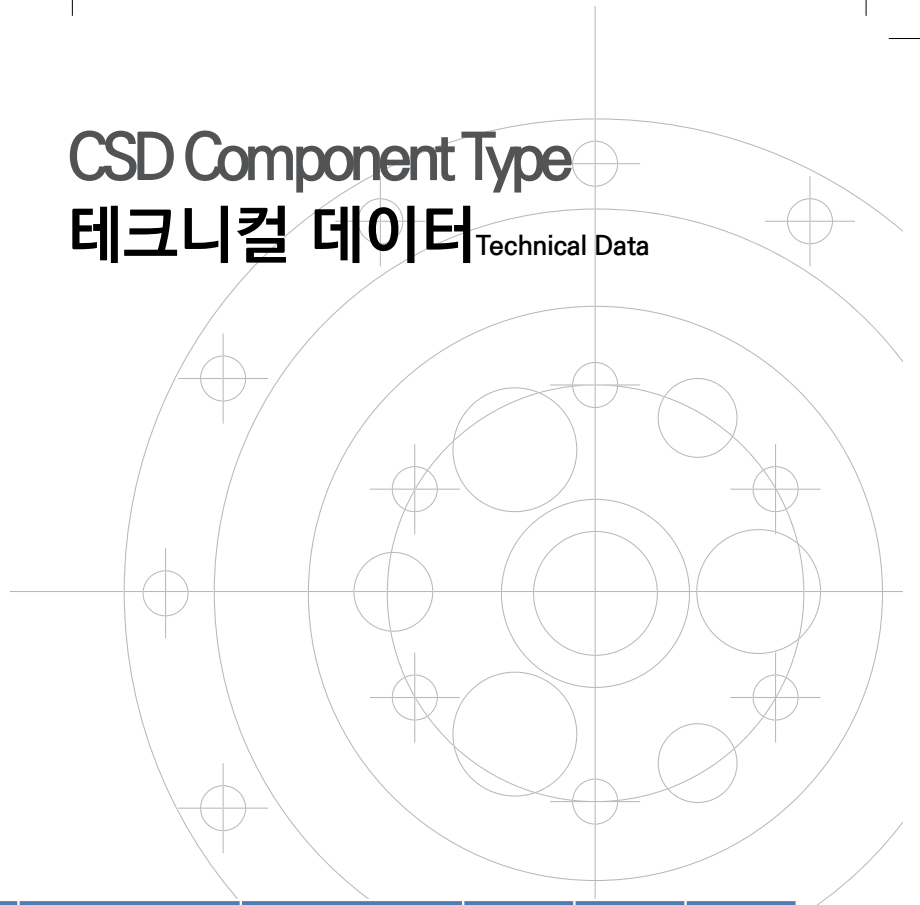
규격 Dimension

mm

기호 Symbol	형번 Model	14	17	20	25	32	40
ØAh7		50 ⁰ _{-0.025}	60 ⁰ _{-0.030}	70 ⁰ _{-0.030}	85 ⁰ _{-0.035}	110 ⁰ _{-0.035}	135 ⁰ _{-0.040}
ØBH7		11 ^{+0.018} ₀	15 ^{+0.018} ₀	20 ^{+0.021} ₀	24 ^{+0.021} ₀	32 ^{+0.025} ₀	40 ^{+0.025} ₀
C		11	12.5	14	17	22	27
D		6.5 ^{+0.2} ₀	7.5 ^{+0.2} ₀	8 ^{+0.3} ₀	10 ^{+0.3} ₀	13 ^{+0.3} ₀	16 ^{+0.3} ₀
E		1.4	1.7	2	2	2.5	3
F		4.5	5	6	7	9	11
G		0.3 ^{+0.2} ₀	0.3 ^{+0.2} ₀	0.3 ^{+0.2} ₀	0.4 ^{+0.2} ₀	0.5 ^{+0.2} ₀	0.6 ^{+0.2} ₀
H		4 ⁰ _{-0.1}	5 ⁰ _{-0.1}	5.2 ⁰ _{-0.1}	6.3 ⁰ _{-0.1}	8.6 ⁰ _{-0.1}	10.3 ⁰ _{-0.1}
ØJ		23	27.2	32	40	52	64
ØK H6		11 ^{+0.011} ₀	11 ^{+0.011} ₀	16 ^{+0.011} ₀	20 ^{+0.013} ₀	30 ^{+0.013} ₀	32 ^{+0.016} ₀
L		6	8	12	12	12	12
M		3.4	3.4	3.4	3.4	4.5	5.5
N		M3	M3	M3	M3	M4	M5
P		-	-	6.5	6.5	8	9.5
ØQ		44	54	62	75	100	120
ØR		17	21	26	30	40	50
ØS		M3	M3	M3	M3	M4	M5
ØT1		17	19.5	24	30	41	48
U		9	8	9	9	11	10
ØV		3.4	4.5	4.5	5.5	6.6	9
a		38	45	53	66	86	106
b		6.5	7.5	8	10	13	16
c		1	1	1.5	1.5	2	2.5
Weight(kg)		0.06	0.1	0.13	0.24	0.51	0.92

ZERO BACK DRIVE

CSD Component Type 테크니컬 데이터 Technical Data



모델 Model No.	감속비 /Reduction Ratio	기동/정지시의 정격 토크 Nm /Rated torque at input 2000r/min		기동/정지시의 정격 토크 Nm /Permissible peak torque at start/stop		평균 부하 토크의 최대 허용치 Nm /Permissible max value of ave. load torque		순간 허용 최대 토크 Nm /Instantaneous permissible max torque		허용 최고 입력 회전 속도r/min /Permissible max input rotational speed(r/min)	허용 최고 평균 회전 속도r/min /Permissible average input rotational speed(r/min)	관성 모멘트 /Inertia moment I/1000Kgm ²
		Nm	kgfm	Nm	kgfm	Nm	kgfm	Nm	kgfm	그리스유탈	그리스유탈	
14	50	3.15	0.32	10.2	1	4	0.42	20.4	2	8,500	3,500	0.045
	100	4.5	0.47	16.2	1.6	6.5	0.67	26.4	2.7			
17	50	9.4	0.94	19.6	2	15.3	1.6	40.8	4.2	7,300	3,500	0.098
	100	13.6	1.4	31.5	3.2	23	2.4	46.8	4.8			
20	50	14.5	1.5	33.2	3.4	20.4	2	58.7	6	6,500	3,500	0.241
	100	23.8	2.5	48.5	4.9	28.9	3	64.6	6.6			
	160	23.8	2.5	54.4	5.5	28.9	6	64.6	6.6			
25	50	23	2.4	58.7	6	32.3	3.3	108	11	5,600	3,500	0.516
	100	40	4.1	93.5	9.4	63.8	6.5	129.2	12.8			
	160	40	4.1	104.6	11	63.8	6.5	129.2	12.8			
32	50	45	4.6	128.4	12.8	63.8	6.5	224.4	23	4,800	3,500	2.02
	100	81.6	8.5	198	20.4	128.4	12.8	305.2	31.5			
	160	81.6	8.5	221.9	23	128.4	12.8	305.2	31.5			
40	50	81.6	8.5	238.9	24.7	116.5	12	408	41.7	4,000	3,000	5.62
	100	157.3	16.2	338.3	34.9	221	23	590	60.4			
	160	175.1	17.9	385	39	268.6	27.2	590	60.4			

ZERO BACK DRIVE

CS Series 테크니컬 데이터 Technical Data

- Backlash

형번 Model 감속비 Ratio	14	17	20	25	32	40	45
50	2	2	2	2	2	2	2
80	2	2	2	2	2	2	2
100	2	2	2	2	2	2	2
120	-	-	2	2	2	2	2
160	-	-	-	2	2	2	2

Arc min

- Start Torque

형번 Model 감속비 Ratio	14	17	20	25	32	40	45
50	4.1	6.3	8.2	15	32.5	57.5	78.7
80	3	4.1	5.1	9.6	18.7	36.2	51
100	2.6	3.6	4.6	7.5	18.7	32.5	45
120	-	-	4.1	7.8	16.2	30	41.2
160	-	-	-	6.8	15	26.2	36.2

cNm

- Increase Start Torque

형번 Model 감속비 Ratio	14	17	20	25	32	40	45
50	1.8	3.3	5.2	9.9	20	36	52
80	1.8	3.3	5.3	10	21	36	53
100	2	3.6	5.6	11	22	40	56
120	-	-	6.1	12	24	43	61
160	-	-	-	14	29	51	70

Nm

ZERO BACK DRIVE

High Power & Extreme Precision



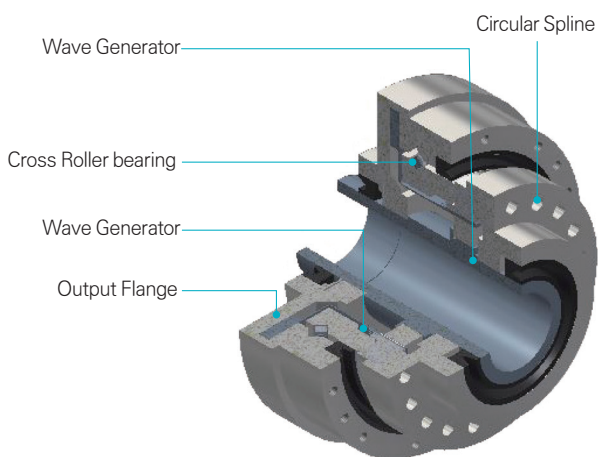
Product Overview

- CSA(G) Component Type
- CSA(G) Unit Type
- CSD Type
- SHA(G) Component Type
- SHA(G) Unit Type

Metal's elastic dynamics applied Zero Back Drive.

Consists of just 3 of parts as Wave generator, Flex spline & Circular Spline

금속의 굴곡과 탄성 역학을 응용한 제로백 드라이브는 웨이브 제너레이터, 플렉스 스플라인 그리고 써큘러 스플라인, 3개의 기본 부품으로 구성됩니다.



Structure of SHA Unit type
/SHA유닛 타입의 구조

SH 시리즈의 특징

- 컴팩트, 심플한 디자인
- 고토크 용량
- 고강성
- 우수한 위치 결정도와 회전정도
- 입출력 축이 동축상
- 폭넓은 감속비
- 소형화

Feature of SH Series

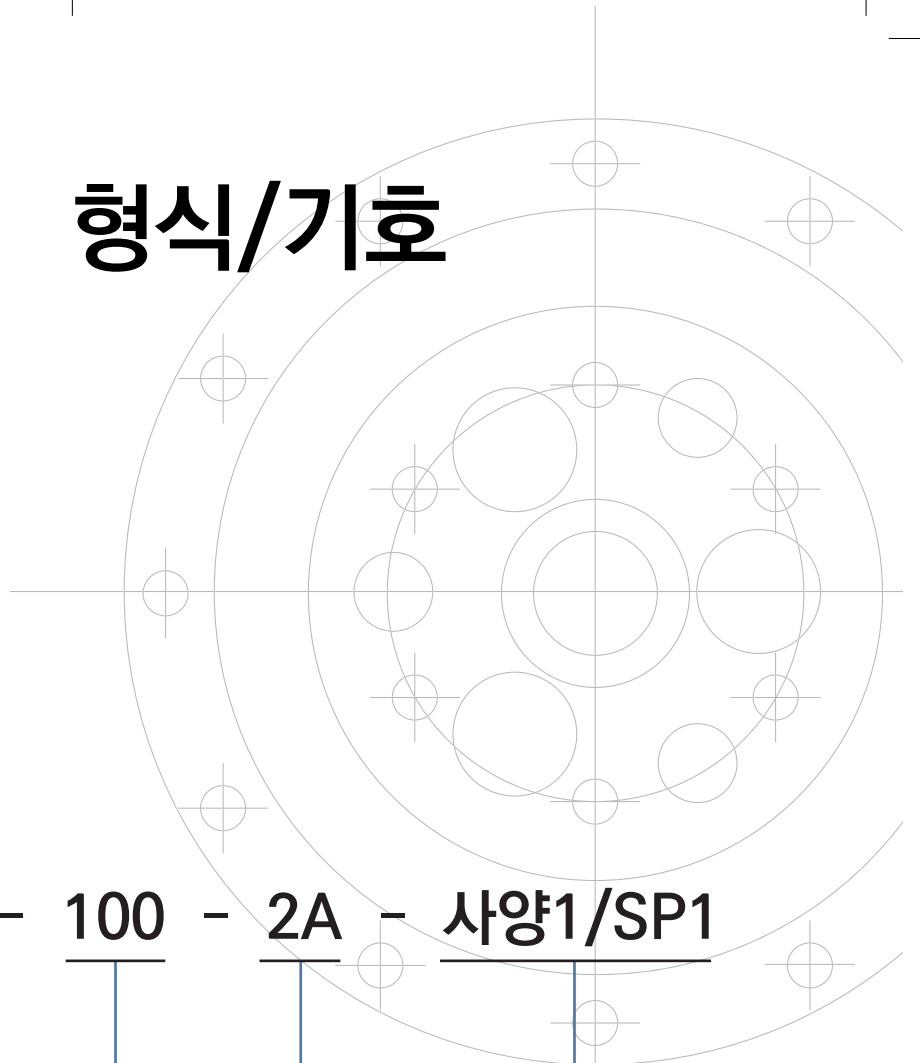
- Compact and Simple Design
- High Torque
- High Stiffness
- Excellence Positioning and Accuracies
- Coaxial Input and Output



SZB-SHA-XX-XXX-2UH 조립도

ZERO BACK DRIVE

형식/기호



SZB - SHA - 25 - 100 - 2A - 사양1/SP1

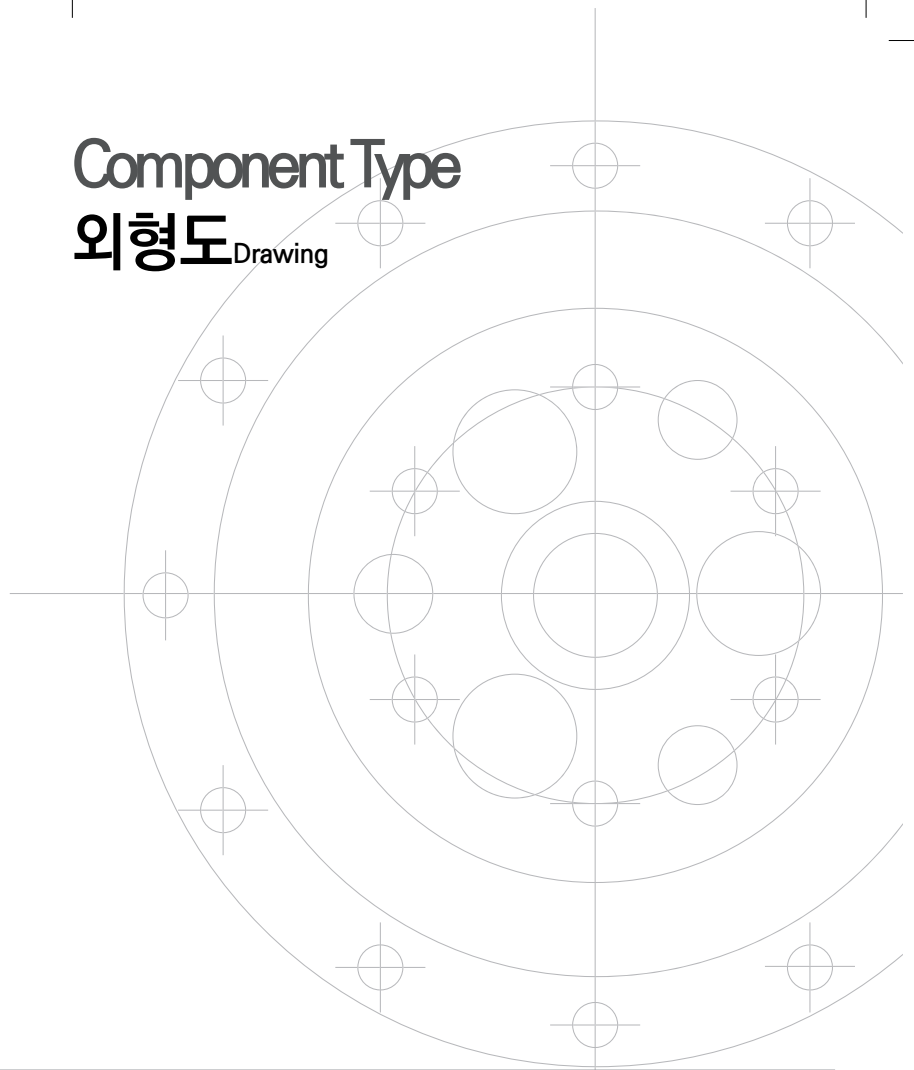
제로백 드라이브
/Zero Back Drive

기호명/Model name	형번/Model No	감속비/Reduction ratio					형식/Model	특수사양/Special Specification
SHA SHAG	14	50	80	100	-	-	2A : Component 2UH : Unit	Non Record: Standard
	17	50	80	100	120	-		
	20	50	80	100	120	160		
	25	50	80	100	120	160		
	32	50	80	100	120	160		
	40	50	80	100	120	160		
	45	50	80	100	120	160		

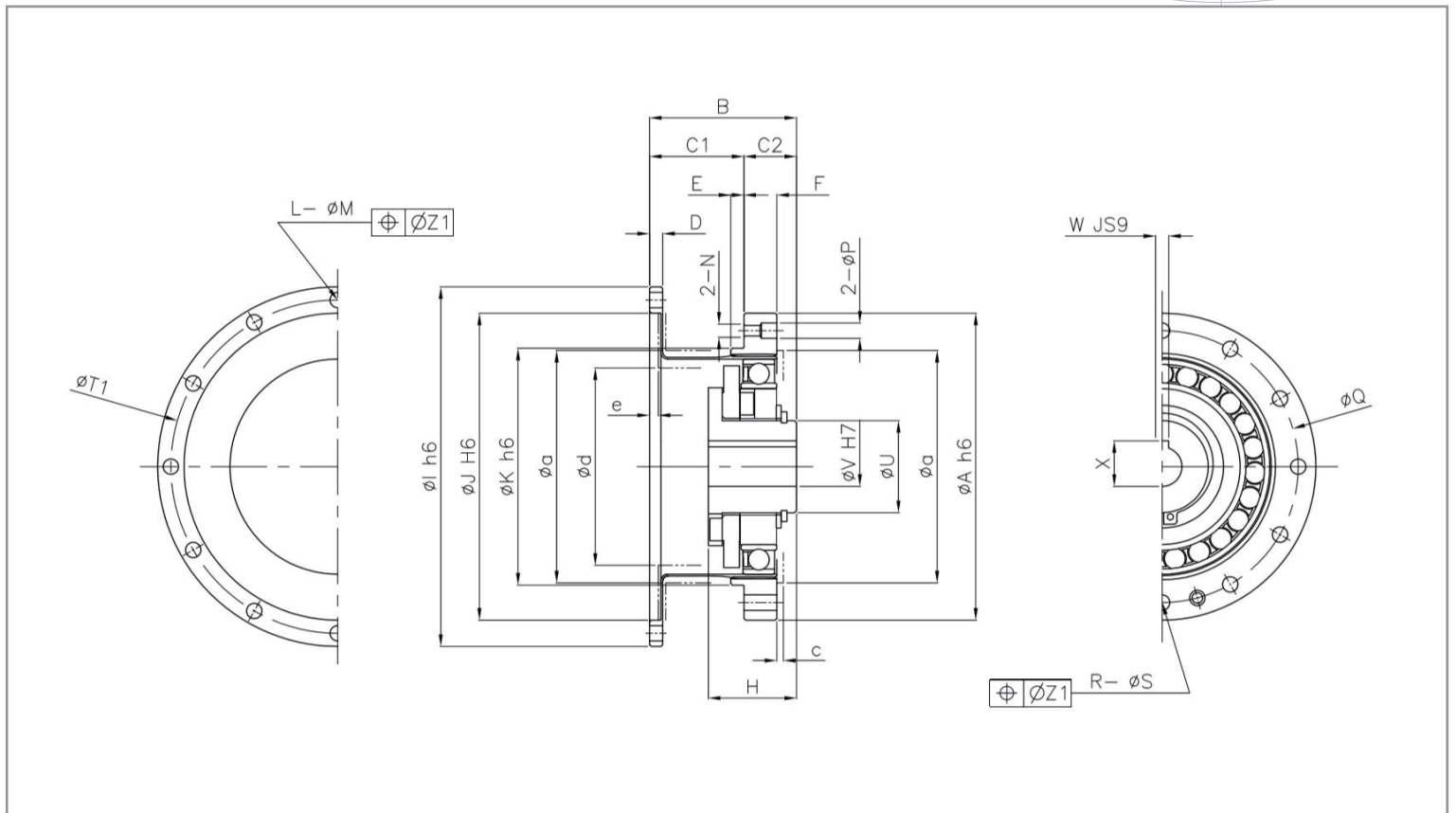
주1/Reduce ratio: Input=wave generation, Fix=circular spline, output=flex spline

ZERO BACK DRIVE

Component Type
외형도 Drawing



SZB-SHA-XX-XXX-2A



ZERO BACK DRIVE

Component Type 규격 Dimension

기호 Symbol		형번 Model	14	17	20	25	32	40	45
ØA h6			50	60	70	85	110	135	155
B	SHAG		28.5 ⁰ _{-0.4}	32.5 ⁰ _{-0.4}	33.5 ⁰ _{-0.4}	37 ⁰ _{-0.5}	44 ⁰ _{-0.6}	53 ⁰ _{-0.6}	58.5 ⁰ _{-0.6}
	SHA		28.5 ⁰ _{-0.8}	32.5 ⁰ _{-0.9}	33.5 ⁰ ₋₁	37 ⁰ ₋₁	44 ⁰ _{-1.1}	53 ⁰ _{-1.1}	58.5 ⁰ _{-1.2}
C1			17.5 ^{+0.4} ₀	20 ^{+0.5} ₀	21.5 ^{+0.6} ₀	24 ^{+0.6} ₀	28 ^{+0.6} ₀	34 ^{+0.6} ₀	38 ^{+0.6} ₀
C2			11	12.5	12	13	16	19	20.5
E			2	2.5	3	3	3	4	4
F			6	6.5	7.5	10	14	17	19
H	SHAG		18.5	20.7	21.5	21.6	23.6	29.7	30.5
	SHA		17.6	19.5	20.1	20.2	22	27.5	27.9
ØI h6			60	72	82	104	134	164	190
ØJ h6			48	60	70	88	114	140	158
ØK h6			38	48	54	67	90	110	124
L			8	12	12	12	12	12	18
ØM			3.5	3.4	3.5	4.5	5.5	6.6	6.6
N			M3	M3	M3	M4	M5	M6	M8
ØP			-	-	3.5	4.5	5.5	6.6	9
ØQ			44	54	62	75	100	120	140
R	SHAG		8	16	16	16	16	16	16
	SHA		6	12	12	12	12	12	12
ØS			3.5	3.5	3.5	4.5	5.5	6.6	9
ØT1			54	66	76	96	124	152	180
ØU			14	18	21	26	26	32	32
ØV	표준(H7)		6	8	9	11	14	14	19
	최대치수		8	10	13	15	15	20	20
W Js9			-	-	3	4	5	5	6
X			-	-	10.4 ^{+0.1} ₀	12.8 ^{+0.1} ₀	16.6 ^{+0.1} ₀	16.3 ^{+0.1} ₀	21.8 ^{+0.1} ₀
Øa			38	45	53	66	86	106	119
c			1	1	1.5	1.5	1.5	2	2
Ød			31	38	45	56	73	90	101
e			1.7	2.1	2	2	2	2	2.3
Weight(kg)			0.11	0.18	0.31	0.48	0.97	1.87	

ZERO BACK DRIVE

Component Type 테크니컬 데이터 Technical Data

-SHA Component Type

모델 Model No.	감속비 /Reduction Ratio	기동/정지시의 정격 토크 Nm /Rated torque at input 2000r/min		기동/정지시의 정격 토크 Nm /Permissible peak torque at start/stop		평균 부하 토크의 최대 허용치 Nm /Permissible max value of ave. load torque		순간 허용 최대 토크 Nm /Instantaneous permissible max torque		허용 최고 입력 회전 속도r/min /Permissible max input rotational speed(r/min)	허용 최고 평균 회전 속도r/min Permissible average input rotational speed(r/min)	관성 모멘트 /Inertia moment I/1000Kgm ²
		Nm	kgfm	Nm	kgfm	Nm	kgfm	Nm	kgfm	그리스유힬	그리스유힬	
14	50	5	0.47	15	2	6	1	30	3	8,500	3,500	0.045
	80	7.8	0.8	23	2.4	11	1.1	47	4.8			
	100	7.8	0.8	28	2.9	11	1.1	54	5.5			
17	50	16	1.6	34	3.5	26	2.6	70	7.1	7,300	3,500	0.098
	80	22	2.2	43	4.4	27	2.7	87	8.9			
	100	24	2.4	54	5.5	39	4	108	11			
	120	24	2.4	54	5.5	39	4	86	8.8			
20	50	25	2.5	56	5.7	34	3.5	98	10	6,500	3,500	0.241
	80	34	3.5	74	7.5	47	4.8	127	13			
	100	40	4.1	82	8.4	49	5	191	20			
	120	40	4.1	82	8.4	49	5	191	20			
	160	40	4.1	92	9.4	49	5	147	15			
25	50	39	4	98	10	55	5.6	186	19	5,600	3,500	0.516
	80	63	6.4	137	14	87	8.9	255	26			
	100	67	6.8	157	16	108	11	284	29			
	120	67	6.8	157	16	108	11	284	29			
	160	67	6.8	176	18	108	11	314	32			
32	50	76	7.6	216	22	108	11	382	39	4,800	3,500	2.02
	80	118	12	304	31	167	17	568	58			
	100	137	14	333	34	216	22	647	66			
	120	137	14	353	36	216	22	686	70			
	160	137	14	372	38	216	22	686	70			
40	50	137	14	402	41	196	20	686	70	4,000	3,000	5.62
	80	206	21	519	53	284	29	980	100			
	100	265	27	568	58	372	38	1080	110			
	120	294	30	617	63	451	46	1180	120			
	160	294	30	647	66	451	46	1180	120			
45	50	176	18	500	51	265	27	950	97	3,800	3,000	10.85
	80	313	32	706	72	390	40	1270	130			
	100	353	36	755	77	500	51	1570	160			
	120	402	41	823	84	620	63	1760	180			
	160	402	41	882	90	630	64	1910	195			

ZERO BACK DRIVE

Component Type 테크니컬 데이터 Technical Data

-SHAG Component Type

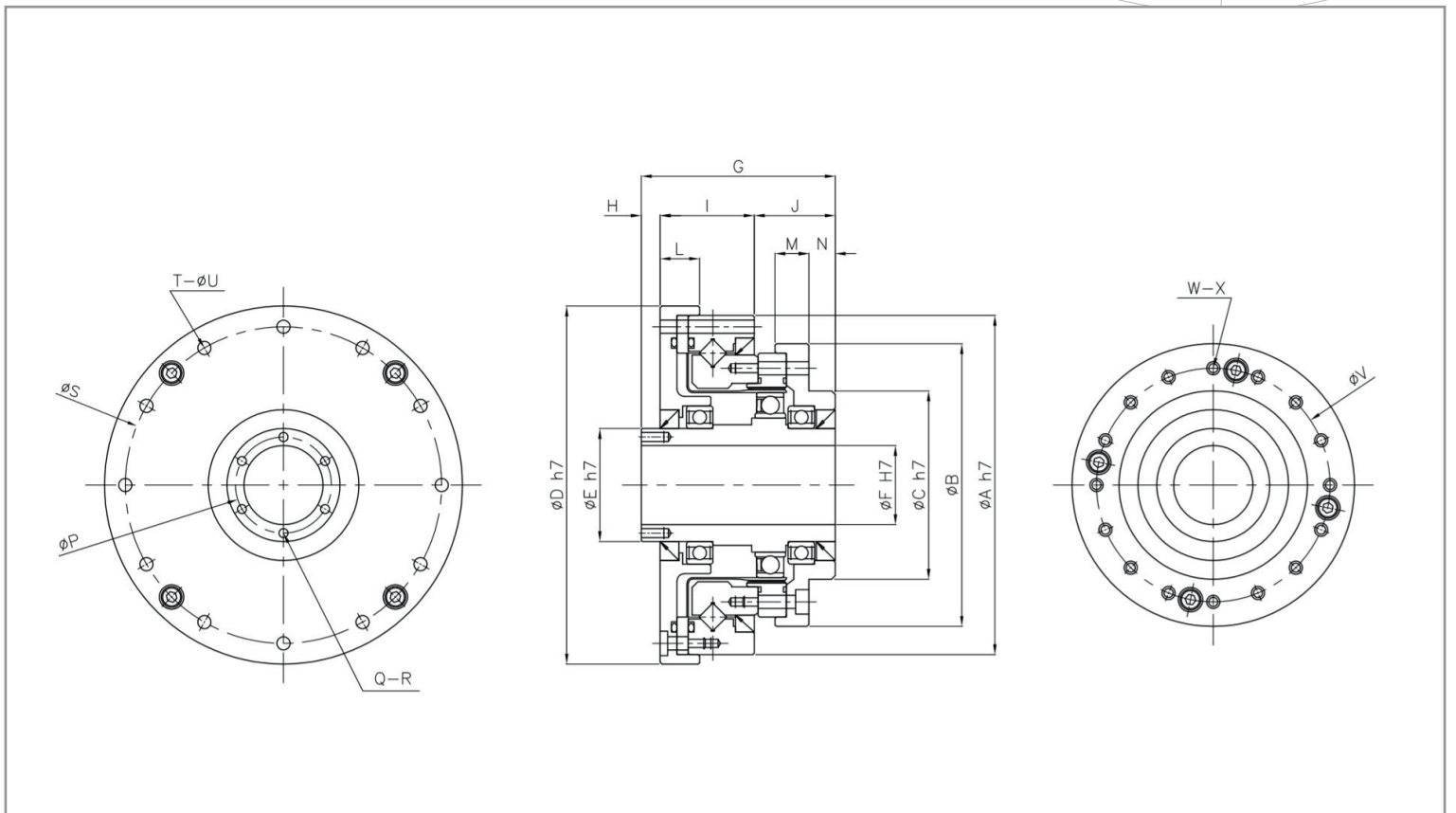
모델 Model No.	감속비 /Reduction Ratio	기동/정지시의 정격 토크 Nm /Rated torque at input 2000r/min		기동/정지시의 정격 토크 Nm /Permissible peak torque at start/stop		평균 부하 토크의 최대 허용치 Nm /Permissible max value of ave. load torque		순간 허용 최대 토크 Nm /Instantaneous permissible max torque		허용 최고 입력 회전 속도/r/min /Permissible max input rotational speed(r/min)	허용 최고 평균 회전 속도/r/min Permissible average input rotational speed(r/min)	관성 모멘트 /Inertia moment I/1000Kgm ²
		Nm	kgfm	Nm	kgfm	Nm	kgfm	Nm	kgfm	그리스윤활	그리스윤활	
14	50	6	0.61	19.6	2	7.7	0.8	39.1	4	8,500	3,500	0.045
	80	8.5	0.87	25.5	2.6	11.9	1.2	49.3	5			
	100	8.5	0.87	30.6	3.12	11.9	1.2	49.3	5			
17	50	18	1.8	37	3.8	29	2.9	77	7.9	7,300	3,500	0.098
	80	25	2.5	48	4.9	30	3	96	9.8			
	100	26	2.7	60	6.1	43	4.4	122	12.4			
	120	26	2.7	60	6.1	43	4.4	122	12.4			
20	50	28	2.9	62	6.3	37	4	108	11	6,500	3,500	0.241
	80	37	3.8	82	8.3	52	5	140	14			
	100	44	4.5	91	9.3	54	6	162	17			
	120	44	4.5	96	9.8	54	6	162	17			
	160	44	4.5	96	9.8	54	6	162	17			
25	50	43	4.4	108	11	61	6	206	21	5,600	3,500	0.516
	80	70	7.1	151	15.4	96	10	282	28.8			
	100	74	7.5	173	17.7	119	12	314	32			
	120	74	7.5	184	18.8	119	12	336	34.3			
	160	74	7.5	195	19.9	119	12	347	35.4			
32	50	84	9	239	24	119	12	422	43	4,800	3,500	2.02
	80	130	13	336	34	184	19	627	64			
	100	151	15	368	38	239	24	715	7			
	120	151	15	390	40	239	24	158	77			
	160	151	15	411	42	239	24	158	77			
40	50	151	15	445	45	217	22	158	77	4,000	3,000	5.62
	80	228	23	574	59	314	32	1080	110			
	100	293	30	627	64	411	42	1190	121			
	120	325	33	682	70	498	51	1301	133			
	160	325	33	715	73	498	51	1301	133			
45	50	195	20	553	56	293	30	1050	107	3,800	3,000	10.85
	80	346	35	780	80	431	44	1403	143			
	100	390	40	835	85	553	56	1735	144			
	120	445	45	910	93	684	70	1945	198			
	160	445	45	975	99	696	71	2111	215			

ZERO BACK DRIVE

Unit t Type
외형도 Drawing

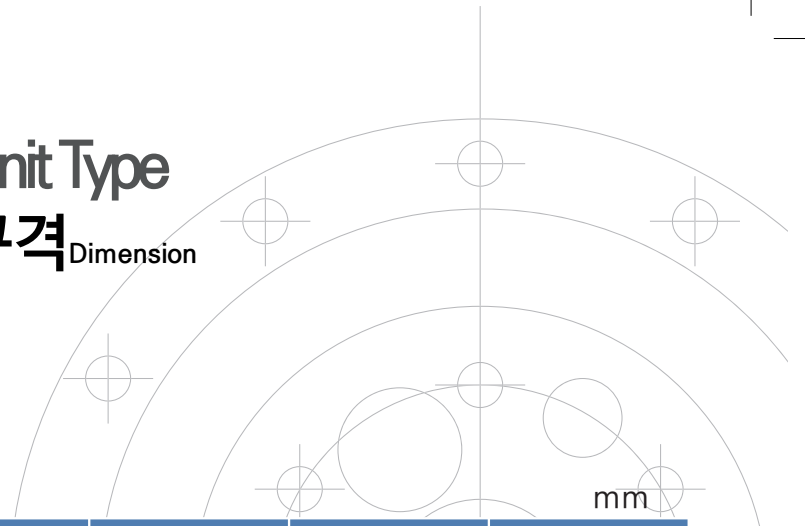


SZB-SHA-XX-XXX-2UH



ZERO BACK DRIVE

Unit Type
규격 Dimension



기호 Symbol	형번 Model	14	17	20	25	32	40
∅Ah7		70	80	90	11	142	170
∅B		54	64	75	90	115	140
∅C h7		36	45	50	60	85	100
∅D h7		74	84	95	115	147	175
∅E h7		20	25	30	38	45	59
∅F h7		14	19	21	29	36	46
G		52.5	56.5	51.5	55.5	65.5	79
H		12	12	5	6	7	8
I		20.5	23	25	26	32	38
J		20	21.5	21.5	23.5	26.5	33
L		9	10	10.5	10.5	12	14
M		8	8.5	9	8.5	9.5	13
N		7.5	8.5	7	6	5	7
∅P		2.5	2.5	25.5	33.5	40.5	52
Q		3	3	6	6	6	6
R		M3	M3	M3X6	M3X6	M4X8	M4X8
∅S		64	74	84	102	132	158
T		8	12	12	12	12	12
∅U		3.5	3.5	3.5	4.5	5.5	6.6
∅V		44	54	62	77	10	122
W		-	112등배중 8	20등배중 16	16	16	16
X		M3X5	M3X6	M3X6	M4X7	M5X8	M6X10
		∅3.5X11.5	∅3.5X12	∅3.5X13.5	∅4.5X15.5	∅5.5X20.5	∅6.5X25
Weight(kg)		0.71	1	1.38	2.1	4.5	7.7

ZERO BACK DRIVE

Unit Type 테크니컬 데이터 Technical Data

-SHA Unit Type

모델 Model No.	감속비 /Reduction Ratio	기동/정지시의 정격 토크 Nm /Rated torque at input 2000r/min		기동/정지시의 정격 토크 Nm /Permissible peak torque at start/stop		평균 부하 토크의 최대 허용치 Nm /Permissible max value of ave. load torque		순간 허용 최대 토크 Nm /Instantaneous permissible max torque		허용 최고 입력 회전 속도/r/min /Permissible max input rotational speed(r/min)	허용 최고 평균 회전 속도/r/min Permissible average input rotational speed(r/min)	관성 모멘트 /Inertia moment I/1000Kgm ²
		Nm	kgfm	Nm	kgfm	Nm	kgfm	Nm	kgfm	그리스윤활	그리스윤활	
14	50	5	0.47	15	2	6	1	30	3	8,500	3,500	0.045
	80	7.8	0.8	23	2.4	11	1.1	47	4.8			
	100	7.8	0.8	28	2.9	11	1.1	54	5.5			
17	50	16	1.6	34	3.5	26	2.6	70	7.1	7,300	3,500	0.098
	80	22	2.2	43	4.4	27	2.7	87	8.9			
	100	24	2.4	54	5.5	39	4	108	11			
	120	24	2.4	54	5.5	39	4	86	8.8			
20	50	25	2.5	56	5.7	34	3.5	98	10	6,500	3,500	0.241
	80	34	3.5	74	7.5	47	4.8	127	13			
	100	40	4.1	82	8.4	49	5	191	20			
	120	40	4.1	82	8.4	49	5	191	20			
	160	40	4.1	92	9.4	49	5	147	15			
25	50	39	4	98	10	55	5.6	186	19	5,600	3,500	0.516
	80	63	6.4	137	14	87	8.9	255	26			
	100	67	6.8	157	16	108	11	284	29			
	120	67	6.8	157	16	108	11	284	29			
	160	67	6.8	176	18	108	11	314	32			
32	50	76	7.6	216	22	108	11	382	39	4,800	3,500	2.02
	80	118	12	304	31	167	17	568	58			
	100	137	14	333	34	216	22	647	66			
	120	137	14	353	36	216	22	686	70			
	160	137	14	372	38	216	22	686	70			
40	50	137	14	402	41	196	20	686	70	4,000	3,000	5.62
	80	206	21	519	53	284	29	980	100			
	100	265	27	568	58	372	38	1080	110			
	120	294	30	617	63	451	46	1180	120			
	160	294	30	647	66	451	46	1180	120			
45	50	176	18	500	51	265	27	950	97	3,800	3,000	10.85
	80	313	32	706	72	390	40	1270	130			
	100	353	36	755	77	500	51	1570	160			
	120	402	41	823	84	620	63	1760	180			
	160	402	41	882	90	630	64	1910	195			

ZERO BACK DRIVE

Unit Type 테크니컬 데이터 Technical Data

-SHAG Unit Type

모델 Model No.	감속비 /Reduction Ratio	기동/정지시의 정격 토크 Nm /Rated torque at input 2000r/min		기동/정지시의 정격 토크 Nm /Permissible peak torque at start/stop		평균 부하 토크의 최대 허용치 Nm /Permissible max value of ave. load torque		순간 허용 최대 토크 Nm /Instantaneous permissible max torque		허용 최고 입력 회전 속도r/min /Permissible max input rotational speed(r/min)	허용 최고 평균 회전 속도r/min Permissible average input rotational speed(r/min)	관성 모멘트 /Inertia moment I/1000Kgm ²
		Nm	kgfm	Nm	kgfm	Nm	kgfm	Nm	kgfm	그리스윤활	그리스윤활	
14	50	6	0.61	19.6	2	7.7	0.8	39.1	4	8,500	3,500	0.045
	80	8.5	0.87	25.5	2.6	11.9	1.2	49.3	5			
	100	8.5	0.87	30.6	3.12	11.9	1.2	49.3	5			
17	50	18	1.8	37	3.8	29	2.9	77	7.9	7,300	3,500	0.098
	80	25	2.5	48	4.9	30	3	96	9.8			
	100	26	2.7	60	6.1	43	4.4	122	12.4			
	120	26	2.7	60	6.1	43	4.4	122	12.4			
20	50	28	2.9	62	6.3	37	4	108	11	6,500	3,500	0.241
	80	37	3.8	82	8.3	52	5	140	14			
	100	44	4.5	91	9.3	54	6	162	17			
	120	44	4.5	96	9.8	54	6	162	17			
	160	44	4.5	96	9.8	54	6	162	17			
25	50	43	4.4	108	11	61	6	206	21	5,600	3,500	0.516
	80	70	7.1	151	15.4	96	10	282	28.8			
	100	74	7.5	173	17.7	119	12	314	32			
	120	74	7.5	184	18.8	119	12	336	34.3			
	160	74	7.5	195	19.9	119	12	347	35.4			
32	50	84	9	239	24	119	12	422	43	4,800	3,500	2.02
	80	130	13	336	34	184	19	627	64			
	100	151	15	368	38	239	24	715	77			
	120	151	15	390	40	239	24	158	77			
	160	151	15	411	42	239	24	158	77			
40	50	151	15	445	45	217	22	158	77	4,000	3,000	5.62
	80	228	23	574	59	314	32	1080	110			
	100	293	30	627	64	411	42	1190	121			
	120	325	33	682	70	498	51	1301	133			
	160	325	33	715	73	498	51	1301	133			
45	50	195	20	553	56	293	30	1050	107	3,800	3,000	10.85
	80	346	35	780	80	431	44	1403	143			
	100	390	40	835	85	553	56	1735	144			
	120	445	45	910	93	684	70	1945	198			
	160	445	45	975	99	696	71	2111	215			

ZERO BACK DRIVE

SH Series 테크니컬 데이터 Technical Data

- Backlash

형번 Model 감속비 Ratio	14	17	20	25	32	40	45
50	2	2	2	2	2	2	2
80	2	2	2	2	2	2	2
100	2	2	2	2	2	2	2
120	-	-	2	2	2	2	2
160	-	-	-	2	2	2	2

Arc min

- Start Torque

형번 Model 감속비 Ratio	14	17	20	25	32	40	45
50	9	27	36	56	85	136	165
80	8	25	33	50	74	117	138
100	2.7	24	32	49	72	112	131
120	-	-	31	48	68	110	126
160	-	-	-	47	67	105	122

cNm

- Increase Start Torque

형번 Model 감속비 Ratio	14	17	20	25	32	40	45
50	5.3	16	22	34	51	82	99
80	7.2	24	31	48	70	112	133
100	8.2	29	38	59	86	134	158
120	-	-	45	69	97	158	182
160	-	-	-	90	128	201	233

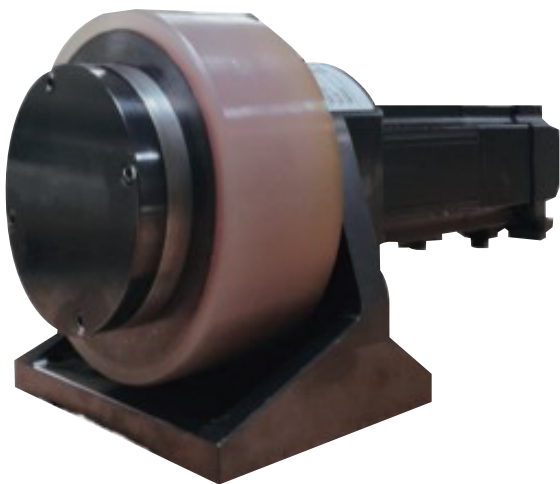
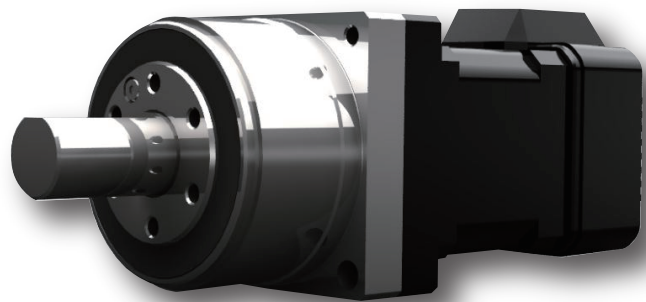
Nm

The Other
하모닉 이외 제작 가능한 제품

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CSA-mini Type은 최소 형번을 사용하여
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AGV Wheel

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- 감속비 20:1

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