

*leaderdrive*<sup>®</sup>



Jiangsu Kaiserdrive  
Intelligent Technology Co., Ltd.

## Rotary Actuator



KDA202201

## ● Company Profile



As a subsidiary of Leader Harmonious Drive Systems Co., Ltd. and high-tech enterprise specialized in the R&D, production and sales of intelligent drive products, the Company mainly produces rotary actuator, CNC rotary table (the 4th and 5th axis) , integrated gear motor, EtherCAT servo drive, frameless torque motor, all of which are used for precision machine tool, laser processing device, electronics and semiconductor equipment, factory automation system, medical apparatus and instruments, robot, logistics automation system, solar photovoltaic system, LED equipment, detection device, printing machinery, precision measuring instrument and other fields.

With a strong focus on independent innovation, the Company has established a core R&D team consisting of more than 50 doctors, masters and experts in intelligent control field and it has also established closed cooperation relationship with many institutions, and colleges and universities such as Chinese Academy of Sciences, Tsinghua University, Southeast University and Nanjing University of Aeronautics and Astronautics. It has obtained several invention and patent authorizations for its core technique and passed CE and ETL certifications. With more than 100,000 set/year intelligent automatic production line, the Company has established a strict quality management system and passed ISO9001 system certification. The Company has exported its products to more than 20 countries and regions, such as Germany, UK, Italy, France, US, Japan, Korea and the products are well received by customers.

## KAH series rotary actuators



KAH rotary actuator

### Product Features

- High Precision:** the absolute positioning accuracy can be up to less than 10 arc-seconds (0.0028 degree).
- Large Torque:** small size but large torque, maximum output torque can reach 800 N·m.
- Hollow Hole:** internal threading hole with large diameter, easy for passing through cables air hoses, laser beams, etc.,
- Long Life:** accuracy still remains unchanged even used for over 20,000 hours.
- Backlash-free:** drive with no backlash.
- Integration:** integrate harmonic speed reducer, torque motor, electromagnetic brake, encoder, and other sensors in one.
- Quick Response:** great dynamic response performance, preferred choice for laser processing device, factory automation systems, etc.
- Low Vibration:** extremely low noise, ideal choice for semiconductor, medical imaging equipment, precision instruments and other applications.
- High Protection:** protection level up to IP67.
- Maintenance Free:** no need for regular maintenance, lubricant change, etc.

### Application Areas

The products are used for precision machine tool, laser processing device, electronics and semiconductor equipment, factory automation system, medical apparatus and instruments, robot, logistics automation system, solar photovoltaic system, LED equipment, detection device, printing machinery, precision measuring instrument and other fields.



## Order Number

KAH-25	C	M	3	N	E
①	②	③	④	⑤	⑥

### ① Model

KAH-14 KAH-17 KAH-20 KAH-25 KAH-32 KAH-40

### ② Reduction ratio of speed reducer

A: 1/51

B: 1/81

C: 1/101

D: 1/121 (not suitable for KAH-14)

E: 1/161 (not suitable for KAH-14 or KAH-17)

### ③ Voltage

M: 220VAC

N: 110VAC

L: 48VDC

### ④ Motor shaft encoder

K : Multi-turn hollow shaft absolute encoder, single-turn 19 bits / multi-turn 16 bits

3 : Multi-turn hollow shaft absolute encoder, single-turn 24 bits / multi-turn 16 bits

5 : Hollow shaft incremental encoder, 2500P/R

### ⑤ Motor shaft holding brake

N : without brake

A : with brake

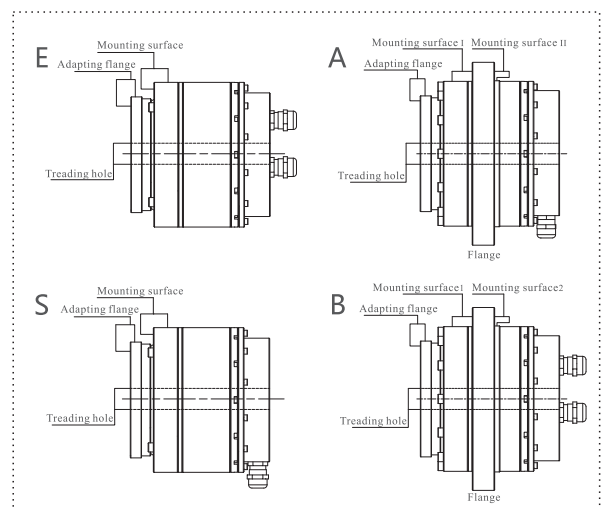
### ⑥ Structural form

E : without flange, cables are taken out from rear (standard)

S : without flange, cables are taken out from side

A : with flange, cables are taken out from rear

B : with flange, cables are taken out from side



Structural form

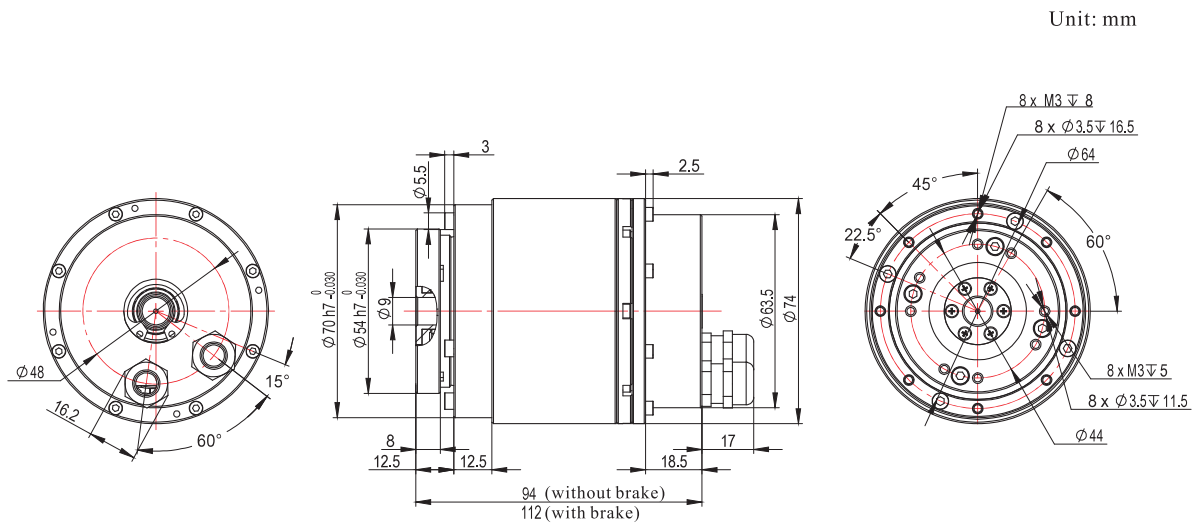
The specifications of KAH-14 and KAH-17 series actuators

Series			KAH-14			KAH-17			
Model KAH-			14A	14B	14C	17A	17B	17C	17D
Reduction ratio			1:51	1:81	1:101	1:51	1:81	1:101	1:121
	Max. torque	N·m	23	29	34	42	53	66	66
	Rated torque	N·m	8.6	13.5	13.5	32	33	49	49
Power Supply 220VAC	Max. rotation speed	RPM	125	79	63	102	64	52	43
	Rated rotation speed	RPM	59	37	30	59	37	30	25
	Max. current	Arms	2.0	1.6	1.5	2.6	2.1	2.0	1.8
	Rated current	Arms	0.8	0.8	0.6	2.0	1.2	1.6	1.3
	Torque constant	N·m/Arms	11.3	18.0	22.5	16.0	26.8	31.6	37.3
	Phase resistance	Ohms	4.031			1.995			
	Phase inductance	mH	4.752			3.663			
	EMF constant	Vrms/kRPM	19.22			27.28			
Power Supply 110VAC	Max. rotation speed	RPM	125	79	63	102	64	52	43
	Rated rotation speed	RPM	58	37	30	59	37	30	25
	Max. current	Arms	3.9	3.2	3.0	5.3	4.2	4.0	3.5
	Rated current	Arms	1.5	1.5	1.2	4.0	2.5	3.1	2.6
	Torque constant	N·m/Arms	5.7	9.0	11.3	8.1	13.4	15.8	18.8
	Phase resistance	Ohms	1.051			0.523			
	Phase inductance	mH	1.306			0.846			
	EMF constant	Vrms/kRPM	9.81			13.39			
Power Supply 48VDC	Max. rotation speed	RPM	108	68	55	79	50	40	33
	Rated rotation speed	RPM	59	37	30	59	37	30	25
	Max. current	Arms	7.8	6.2	5.9	9.5	7.6	7.6	6.3
	Rated current	Arms	2.9	2.8	2.3	7.3	4.7	5.6	4.7
	Torque constant	N·m/Arms	2.9	4.8	5.8	4.4	7.0	8.8	10.5
	Phase resistance	Ohms	0.282			0.183			
	Phase inductance	mH	0.341			0.252			
	EMF constant	Vrms/kRPM	5.63			7.61			
Absolute Encoder	Encoder type		Hollow shaft absolute multi-turn encoder, single turn 19bits or 24bits, multi-turn 16bits						
	Encoder resolution(1 rotation of motor)		2 <sup>19</sup> ( 524,288 ) or 2 <sup>24</sup> ( 16,777,216 )						
	Motor multiple rotation counter		2 <sup>16</sup> ( 65,536 )						
Incremental Encoder	Encoder resolution		Wire-saving hollow shaft incremental encoder, 10000 pulse/rev (when multiplied by 4)						
	Output shaft resolution	pulse/rev	510000	810000	1010000	510000	810000	1010000	1210000
Uni-directional positioning accuracy	Arc sec		40	30	30	40	30	30	30
			The positioning accuracy of customized products can be up to less than 10 arc-seconds.						
Repeat positioning accuracy	Arc sec		8	7	7	8	7	7	7
Overturning stiffness	× 10 <sup>-4</sup> N·m/rad		7.05	9.8		22.08	25.8		
Torsional stiffness	× 10 <sup>-4</sup> N·m/rad		0.46	0.6		1.07	1.3		
Inertia moment	without brake	kg·m <sup>2</sup>	0.09	0.19	0.28	0.15	0.41	0.51	1.16
	with brake	kg·m <sup>2</sup>	0.11	0.22	0.31	0.17	0.45	0.56	1.28
Mass	without brake	kg	1.6			1.8			
	with brake	kg	1.8			2.0			
Motor poles			16						
Motor insulation			Insulation class: F(155 °C)						
			Insulation resistance: 200MΩ or more (DC500V)						
			Dielectric strength: AC1500V (1 minute)						
Ingress Protection			Totally enclosed self-cooled type (IP65 default,IP67 special customized)						

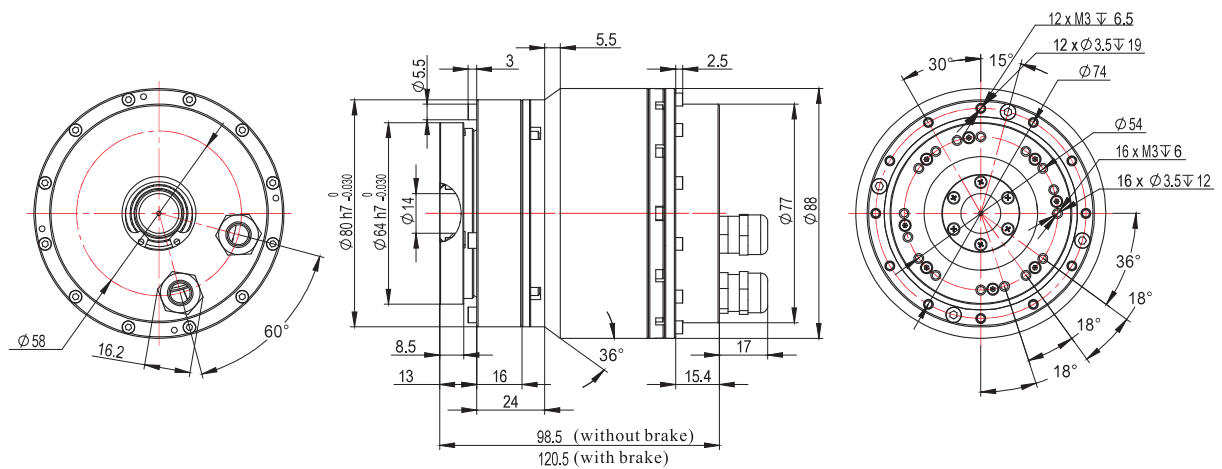


## Outline Drawings

### KAH-14



### KAH-17



The specifications of KAH-20 and KAH-25 series actuators

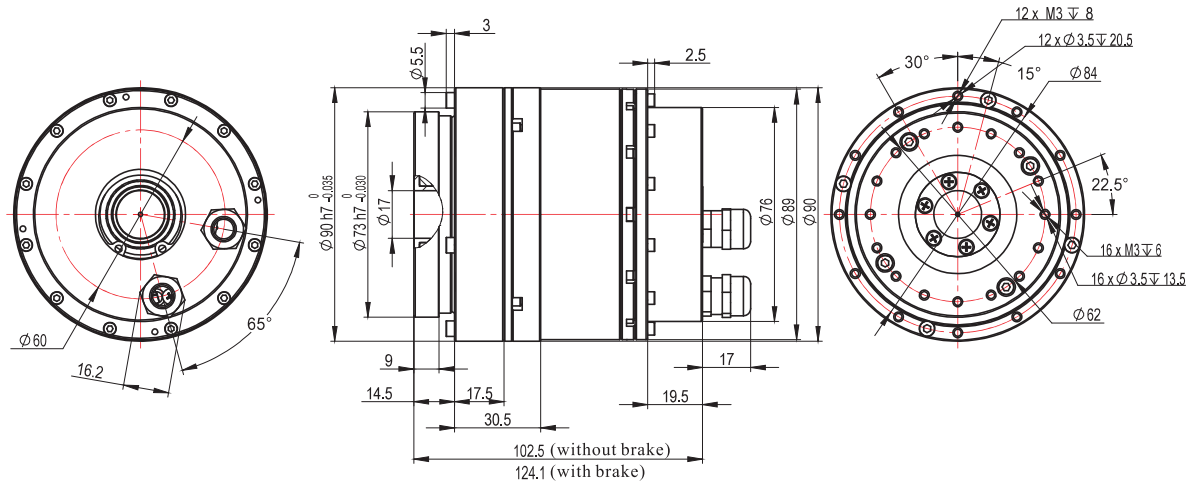
Series		KAH-20					KAH-25					
Model KAH-		20A	20B	20C	20D	20E	25A	25B	25C	25D	25E	
Reduction ratio		1:51	1:81	1:101	1:121	1:161	1:51	1:81	1:101	1:121	1:161	
Max. torque	N·m	69	91	102	108	113	121	169	194	207	217	
Rated torque	N·m	42	58	61	61	61	69	107	133	133	133	
Power Supply 220VAC	Max. rotation speed	RPM	102	64	52	43	32	108	64	52	43	31
	Rated rotation speed	RPM	59	37	30	25	19	49	37	30	25	19
	Max. current	Arms	4.3	3.6	3.2	2.9	2.2	6.5	5.7	5.2	4.7	3.7
	Rated current	Arms	2.6	2.3	1.9	1.6	1.2	3.7	3.6	3.6	3.0	2.3
	Torque constant	N·m/Arms	15.9	25.3	31.6	37.4	50.4	18.9	29.7	37.2	44.3	59.1
	Phase resistance	Ohms	1.992					1.284				
	Phase inductance	mH	3.661					2.956				
	EMF constant	Vrms/kRPM	27.26					31.53				
Power Supply 110VAC	Max. rotation speed	RPM	102	64	52	43	32	108	64	52	43	32
	Rated rotation speed	RPM	59	37	30	25	19	49	37	30	25	19
	Max. current	Arms	8.7	7.2	6.5	5.7	4.5	12.9	11.4	10.5	9.3	7.3
	Rated current	Arms	5.3	4.6	3.9	3.3	2.4	7.3	7.2	7.2	6.0	4.5
	Torque constant	N·m/Arms	8.0	12.7	15.8	18.7	25.2	9.4	14.9	18.6	22.2	29.6
	Phase resistance	Ohms	0.524					0.417				
	Phase inductance	mH	0.843					0.776				
	EMF constant	Vrms/kRPM	13.65					15.75				
Power Supply 48VDC	Max. rotation speed	RPM	79	50	40	33	25	75	47	38	31	24
	Rated rotation speed	RPM	59	37	30	25	19	39	25	20	17	12
	Max. current	Arms	15.6	13.0	11.7	10.3	8.1	24.2	21.3	19.4	17.5	13.8
	Rated current	Arms	9.5	8.3	7.0	5.8	4.4	13.7	13.5	13.4	11.2	8.4
	Torque constant	N·m/Arms	4.4	7.0	8.8	10.5	14.0	5.0	7.9	9.9	11.9	15.8
	Phase resistance	Ohms	0.185					0.126				
	Phase inductance	mH	0.257					0.208				
	EMF constant	Vrms/kRPM	7.59					8.3				
Absolute Encoder	Encoder type	Hollow shaft absolute multi-turn encoder, single turn 19bits or 24bits, multi-turn 16bits										
	Encoder resolution(1 rotation of motor)	$2^{19}$ ( 524,288 ) or $2^{24}$ ( 16,777,216 )										
	Motor multiple rotation counter	$2^{16}$ ( 65,536 )										
Incremental Encoder	Encoder resolution	Wire-saving hollow shaft incremental encoder, 10000 pulse/rev (when multiplied by 4)										
	Output shaft resolution	pulse/rev	510000	810000	1010000	1210000	1610000	510000	810000	1010000	1210000	1610000
Uni-directional positioning accuracy	Arc sec	40	30	30	30	30	40	30	30	30	30	
Repeat positioning accuracy	Arc sec	8	7	7	7	7	8	7	7	7	7	
Overturning stiffness	$\times 10^4 \text{ N}\cdot\text{m}/\text{rad}$	23.5	27.3				34.7	42.8				
Torsional stiffness	$\times 10^4 \text{ N}\cdot\text{m}/\text{rad}$	1.8	2.3				3.4	4.6				
Inertia moment	without brake	$\text{kg}\cdot\text{m}^2$	0.19	0.57	0.86	1.23	2.18	0.49	1.24	1.93	2.85	5.01
	with brake	$\text{kg}\cdot\text{m}^2$	0.22	0.63	0.95	1.35	2.35	0.58	1.51	2.31	3.31	5.97
Mass	without brake	kg	2.2				3.2					
	with brake	kg	2.5				3.6					
Motor poles		16										
Motor insulation		Insulation class: F(155 °C)										
		Insulation resistance: 200M $\Omega$ or more (DC500V)										
		Dielectric strength: AC1500V (1 minute)										
Ingress Protection		Totally enclosed self-cooled type (IP65 default, IP67 special customized)										



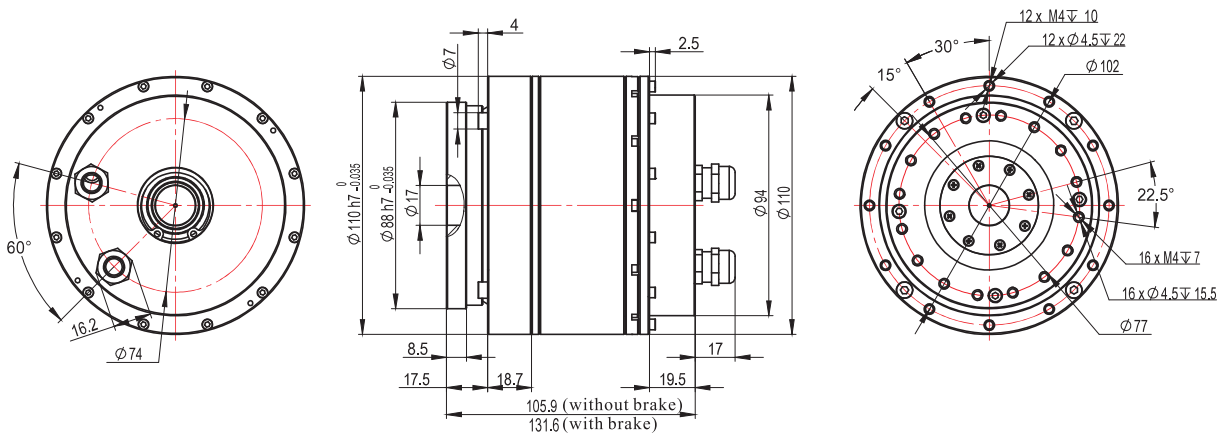
## Outline Drawings

### KAH-20

Unit: mm



### KAH-25



The specifications of KAH-32 and KAH-40 series actuators

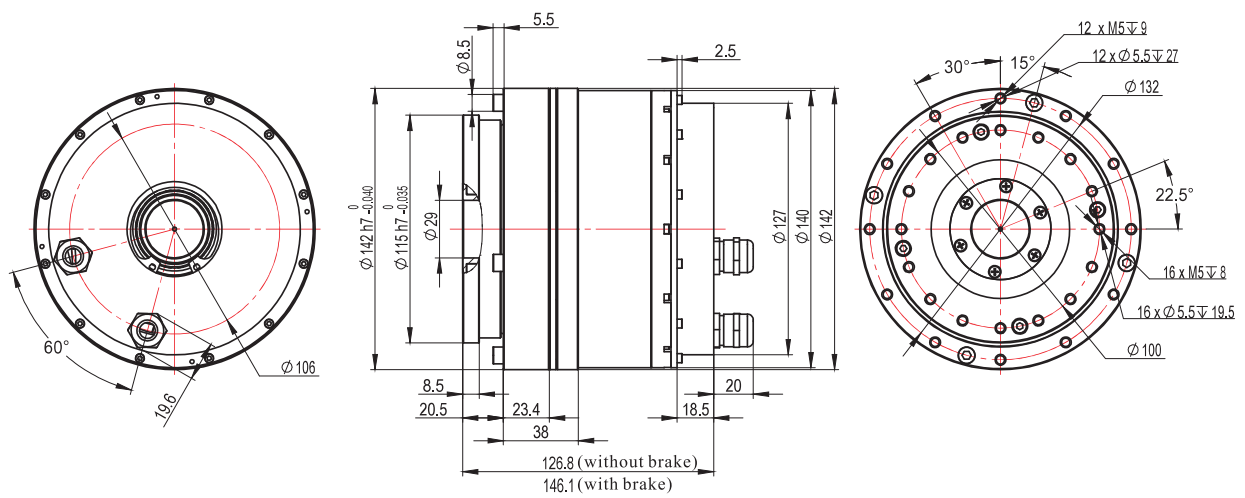
Series		KAH-32					KAH-40					
Model KAH-		32A	32B	32C	32D	32E	40A	40B	40C	40D	40E	
Reduction ratio		1:51	1:81	1:101	1:121	1:161	1:51	1:81	1:101	1:121	1:161	
Max. torque	N·m	267	376	411	436	459	497	641	702	762	800	
Rated torque	N·m	133	206	267	267	267	242	351	460	557	557	
Power Supply 220VAC	Max. rotation speed	RPM	106	67	54	45	33	84	53	43	36	26
	Rated rotation speed	RPM	49	30	25	21	15	39	25	20	17	12
	Max. current	Arms	11.6	5.8	5.1	4.5	3.6	20.9	17.0	14.9	13.5	10.6
	Rated current	Arms	5.8	3.2	3.3	2.8	2.1	10.2	9.3	9.8	9.9	7.4
	Torque constant	N·m/Arms	23.0	64.8	80.9	96.7	129.0	23.8	37.8	47.1	56.5	75.2
	Phase resistance	Ohms	1.239					1.107				
	Phase inductance	mH	3.517					3.436				
	EMF constant	Vrms/kRPM	38.32					43.24				
Power Supply 110VAC	Max. rotation speed	RPM	105	67	54	45	34	84	53	43	36	26
	Rated rotation speed	RPM	49	30	25	21	16	39	25	20	17	12
	Max. current	Arms	23.2	11.6	10.2	9.0	7.1	41.7	33.9	29.8	27.0	21.3
	Rated current	Arms	11.6	6.4	6.6	5.5	4.1	20.3	18.6	19.5	19.7	14.8
	Torque constant	N·m/Arms	11.5	32.4	40.5	48.4	64.5	11.9	18.9	23.6	28.2	37.6
	Phase resistance	Ohms	0.354					0.272				
	Phase inductance	mH	0.708					0.615				
	EMF constant	Vrms/kRPM	19.32					21.58				
Power Supply 48VDC	Max. rotation speed	RPM	53	33	27	22	17	49	31	25	21	16
	Rated rotation speed	RPM	39	25	20	17	12	30	19	15	12	10
	Max. current	Arms	37.7	33.4	29.3	25.9	20.5	73.3	59.5	52.3	47.4	37.4
	Rated current	Arms	18.8	18.3	19.1	15.9	11.9	35.7	32.6	34.3	34.6	26.2
	Torque constant	N·m/Arms	7.1	11.3	14.0	16.8	22.4	6.8	10.8	13.4	16.1	21.3
	Phase resistance	Ohms	0.129					0.107				
	Phase inductance	mH	0.253					0.228				
	EMF constant	Vrms/kRPM	11.74					11.48				
Absolute Encoder	Encoder type		Hollow shaft absolute multi-turn encoder, single turn 19bits or 24bits, multi-turn 16bits									
	Encoder resolution(1 rotation of motor)		$2^{19}$ ( 524,288 ) or $2^{24}$ ( 16,777,216 )									
	Motor multiple rotation counter		$2^{16}$ ( 65,536 )									
Incremental Encoder	Encoder resolution		Wire-saving hollow shaft incremental encoder, 10000 pulse/rev (when multiplied by 4)									
	Output shaft resolution	pulse/rev	510000	810000	1010000	1210000	1610000	510000	810000	1010000	1210000	1610000
	Uni-directional positioning accuracy	Arc sec	40	30	30	30	30	40	30	30	30	30
		The positioning accuracy of customized products can be up to less than 10 arc-seconds.										
Repeat positioning accuracy	Arc sec	8	7	7	7	7	8	7	7	7	7	
Overturning stiffness	$\times 10^4$ N·m/rad	87.5	113.6				149.5	187.4				
Torsional stiffness	$\times 10^4$ N·m/rad	7.6	9.9				14	18.6				
Inertia moment	without brake	kg·m <sup>2</sup>	1.72	4.34	6.76	9.98	17.54	3.91	9.86	15.36	22.68	39.86
	with brake	kg·m <sup>2</sup>	2.03	5.29	8.09	11.59	20.90	4.62	12.03	18.39	26.35	47.50
Mass	without brake	kg	6.3				9.1					
	with brake	kg	6.8				9.7					
Motor poles		16										
Motor insulation		Insulation class: F(155 °C)										
		Insulation resistance: 200MΩ or more (DC500V)										
		Dielectric strength: AC1500V (1 minute)										
Ingress Protection		Totally enclosed self-cooled type (IP65 default,IP67 special customized)										



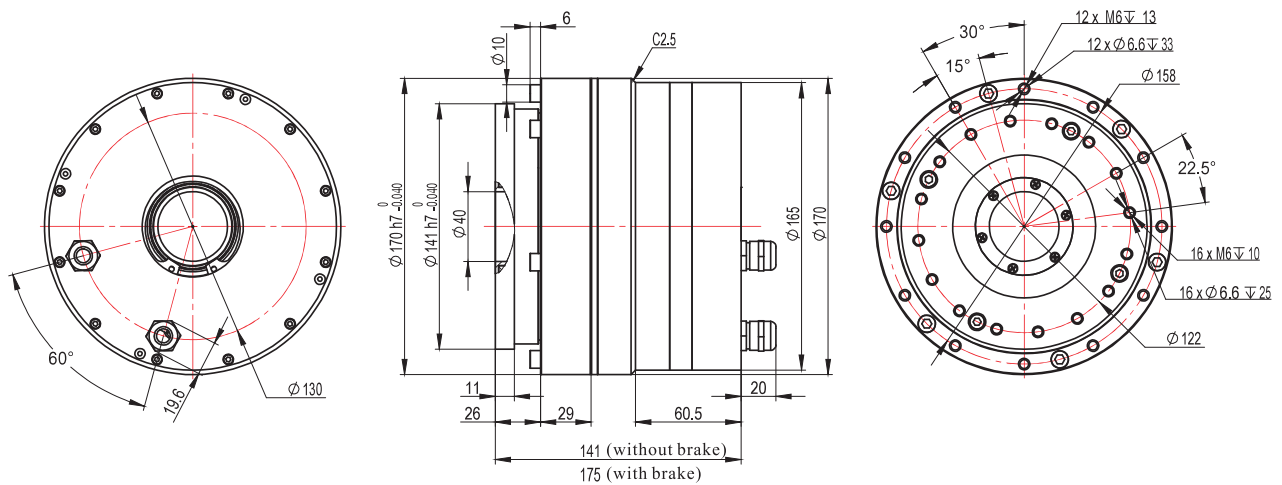
# Outline Drawings

## KAH-32

Unit: mm

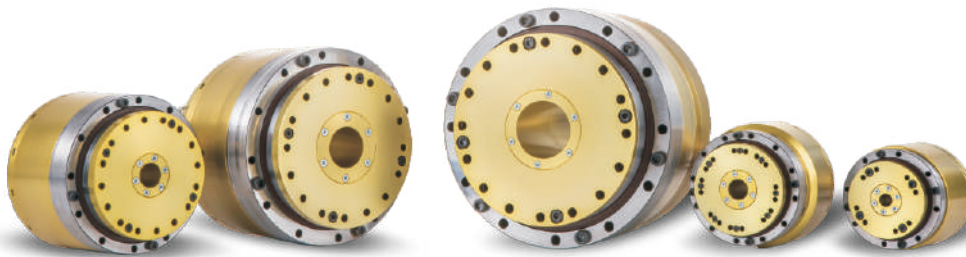


## KAH-40



The bending moment, radial force and axial force						
Model: KAH-	14	17	20	25	32	40
Allowable average bending moment Mb (N·m)	41	72	140	243	460	600
Maximum momentary bending moment Mb (N·m)	80	140	280	480	900	1200
Allowable average radial force Ft (N)	270	400	650	900	1350	2000
Maximum momentary radial force Ft (N)	490	700	1150	1600	2300	3500
Allowable average axial force Fa (N)	270	400	650	900	1350	2000
Maximum momentary axial force Fa (N)	490	700	1150	1600	2300	3500

The design life (positioning accuracy remains unchanged)						
Model: KAH-	14	17	20	25	32	40
Design life (Reduction ratio 1/51)	15000 hours					
Design life (All reduction ratio, excluding 1/51)	20000 hours					



**Jiangsu Kaiserdrive Intelligent Technology Co., Ltd.**

E-mail : [sales@kaiserdrive.com](mailto:sales@kaiserdrive.com)

Add : NO.68 YaoFeng West Road, Wuzhong District, Suzhou, China

Zip code : 215101

Tel : 0512-65563897

Fax : 0512-65563897

<http://www.kaiserdrive.com>



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*leaderdrive*<sup>®</sup>

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District , Suzhou , China

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