AFC Type

Right Angle Hollow Bore/ Right Angle Shaft

Model and Type Codes

Standard Model Lineup

P.816

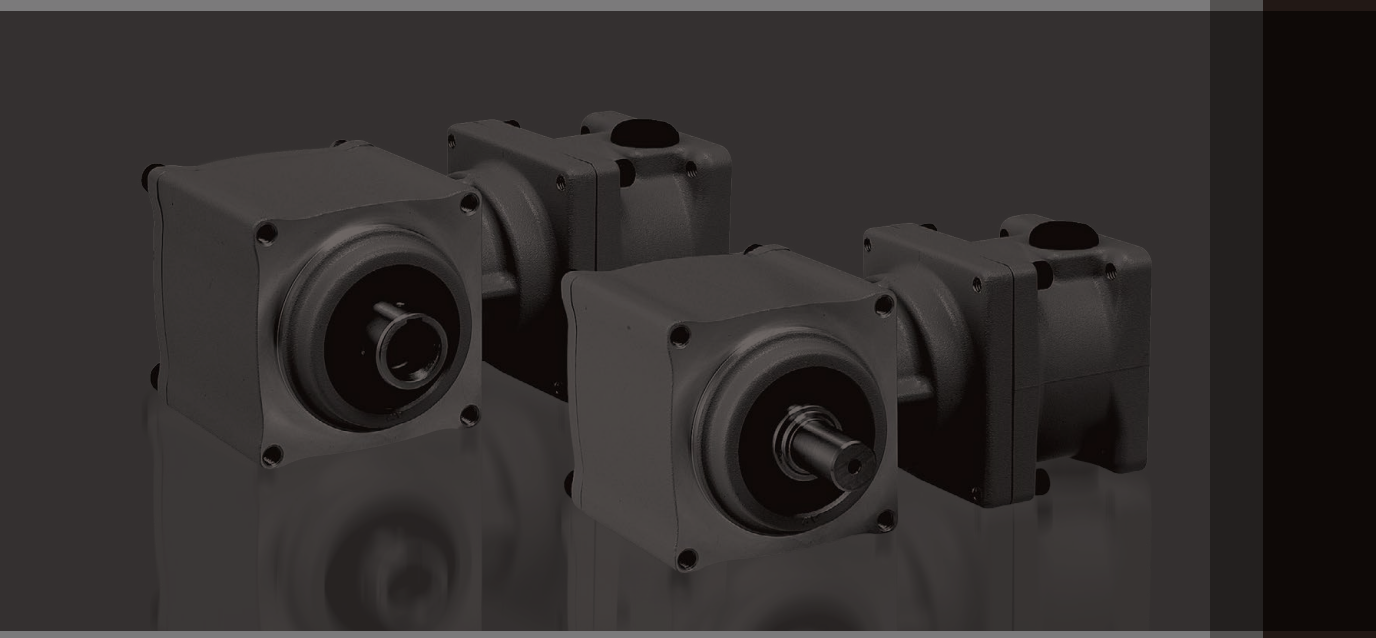
HIGH PRECISION GEARBOXES FOR SERVO MOTORS

1. Compact High Precision Gearboxes for Servo Motors

1-1. Performance Tables

1-2. Drawings

1-3. Low Temperature Startup Characteristics (No Load Running Torque (Input Shaft))



Model and Type Codes

AFC Type

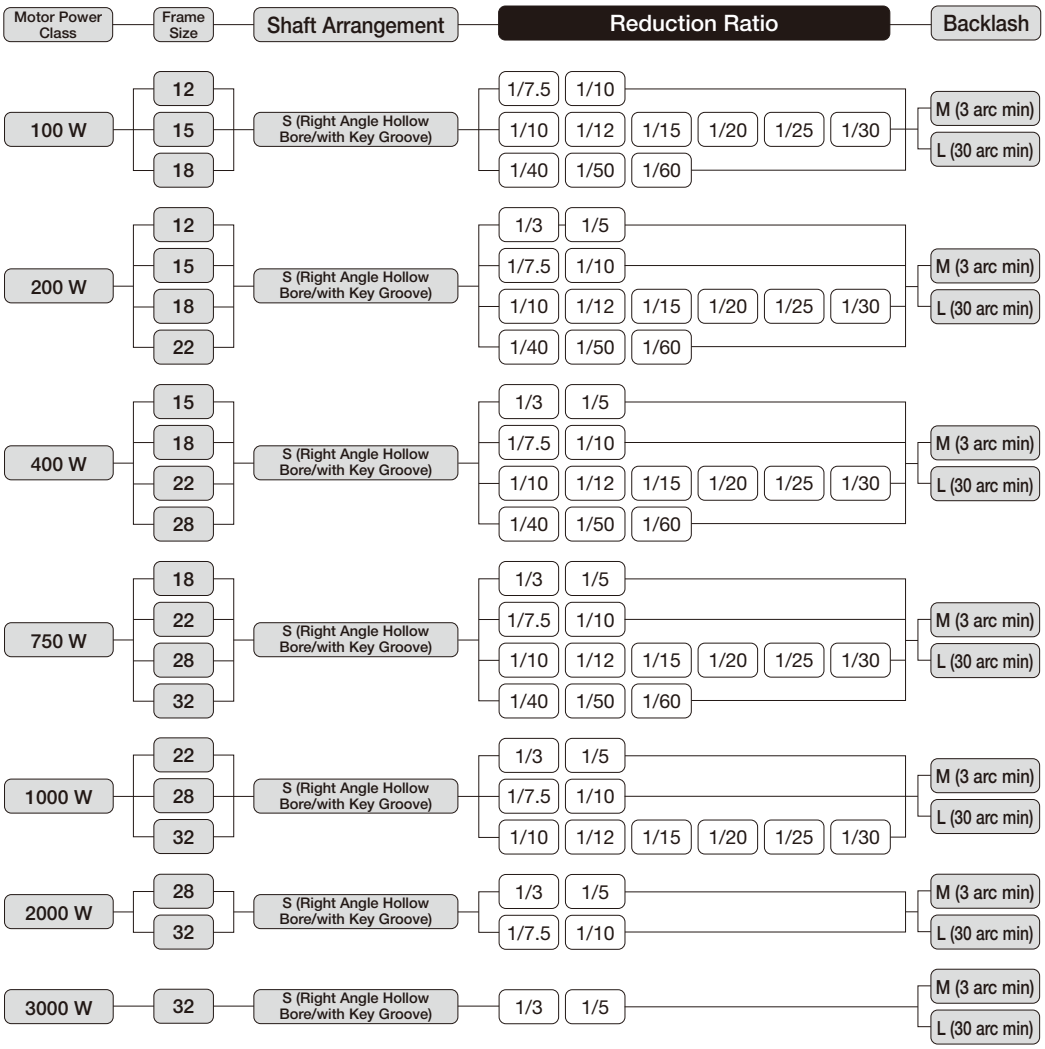
Mounting Type	Motor Type	Frame Size	Shaft Arrangement		Reduction Ratio	Backlash	Motor Power Class	Type	Option	Option Code
AFC	Z	18	S	–	7.5	M	400	S3		
AFC	Z	32	H	–	60	M	750	S4	X	B3
①	②	③	④		⑤	⑥	⑦	⑧	⑨	⑩

①Mounting Type	AFC : Right Angle Shaft (Compact Flange Mount)		
②Motor Type	Z : High Precision Gearboxes for Servo Motor (Z Type Gearbox)		
③Frame Size and Output Shaft Diameter	Output Shaft Diameter (Inner diameter is used for Right Angle Hollow Bore Type and outer diameter for Right Angle Shaft Type)		
④Shaft Arrangement	Right Angle Hollow Bore	Right Angle Shaft	
	S : Right Angle Hollow Bore (with Key Groove)	Output shaft on the left side when viewed from the input shaft side (with a key and shaft end tapped)  Nameplate	Output shaft on the left side when viewed from the input shaft side (without a key)  Nameplate
		L	H
⑤Reduction Ratio	3:1/3 7.5:1/7.5 60:1/60		
⑥Backlash	M : Backlash 3 arc min		
	L : Backlash 30 arc min		
⑦Motor Power Class	100 : 100 W Class		
	200 : 200 W Class		
	400 : 400 W Class		
	750 : 750 W Class		
	1000 : 1000 W Class		
	2000 : 2000 W Class		
	3000 : 3000 W Class		
⑧Flange Type for Servo Motor Mounting	S1/K13/K61, etc.		
⑨Option	Blank : Standard Specification		
	X : Special Specification Code		
⑩Option Code (Note 1)	Position Code of Wrench Hole for Input Shaft Joint Tightening For details, please refer to the list of option codes on page 949.		

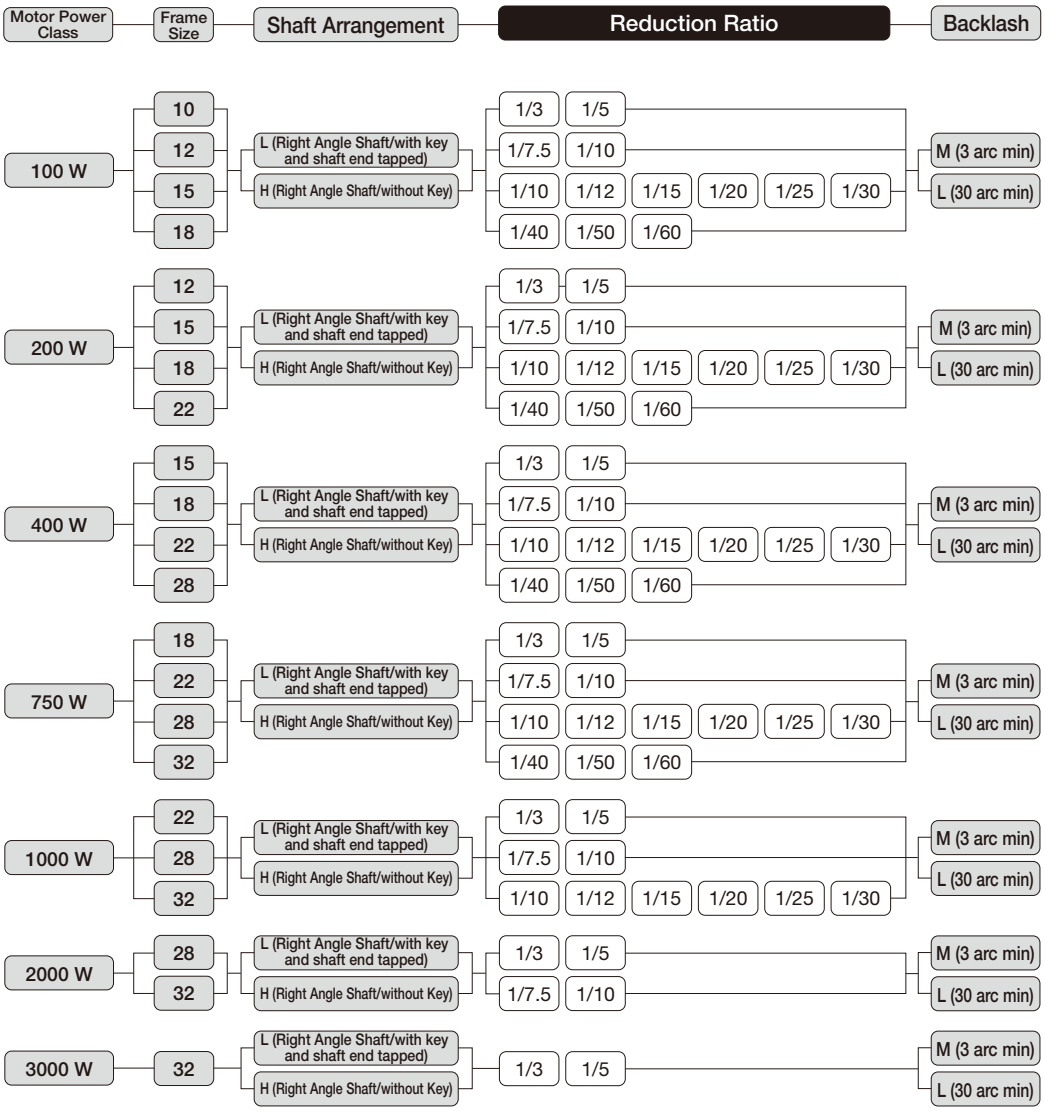
Note 1: The option code will not be shown in the nomenclature on the nameplate. But it will be shown in the Option code row of the nameplate.

Standard Model Lineup

AFC Type <Right Angle Hollow Bore>



AFC Type <Right Angle Shaft>



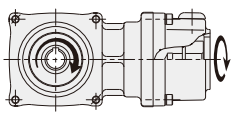
MEMO

1. Compact High Precision Gearboxes for Servo Motors

1-1. Performance Tables

AFC Type <Right Angle Hollow Bore Backlash 3 arc min/30 arc min Specifications> Performance Table by Reduction Ratio

[Notes]



- The instantaneous input speed is 7000 r/min. The rated input speed is 3000 r/min.
- Allowable output shaft O.H.L. is the value at the load point of the O.H.L. shown on page 945.
- For the continuous rated input torque, please refer to page 948. In addition, for the servo motor-based motor rated output torque, please refer to page 927.
- The key dimensions and tolerances for output shafts conform to JIS B 1301-1996 (plain form).
- The key for the output shaft is not supplied with right angle hollow bore types.
- The internal moment of inertia (input shaft equivalent) is the value for the gearbox alone, and does not include the motor's moment of inertia.
- The allowable average torque is the continuous allowable torque value.
- Adjust the gain so that the inertial load on the output shaft side does not vibrate during acceleration and deceleration.
- In the performance table, ▭ indicates that for a clockwise (CW) motor input, the output rotates clockwise (CW) as viewed from the output shaft under the conditions shown in the figure on the right. (The arrows indicate the rotational directions of the input and output shafts, and do not limit the actual direction of rotation.)
- M in the Precision column means backlash 3 arc min, and L means backlash 30 arc min.
- When the gearbox is used at low temperature, the no load running torque at a startup will increase. Please refer to page 842 for cold start characteristics.

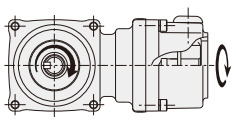
■ At an input speed of 3000 r/min

Mounting Type	Output Shaft Diameter	Shaft Arrangement	Nominal Reduction Ratio	Actual Reduction Ratio	Precision	Power Class	Allowable Average Torque (3000 r/min)	Allowable Peak Torque of Startup/ Stop	Allowable Output Shaft O.H.L.	Allowable Output Shaft Thrust Load	Internal Moment of Inertia (Input Shaft Equivalent)		Drawings
											Other than Flange Type K75	Flange Type K75	
							N·m	N·m	N	N	×10^{-4}kg·m^2		
AFCZ	12	S	1/3	1/3	M/L	200	2.37	4.6	500	200	0.288	—	P.820
AFCZ	15	S	1/3	1/3	M/L	400	3.80	10.4	785	314	0.378	—	P.821
AFCZ	18	S	1/3	1/3	M/L	750	7.23	19.4	980	392	1.236	—	P.823
AFCZ	22	S	1/3	1/3	M/L	1000	12.42	25.9	1050	420	5.700	—	P.825
AFCZ	28	S	1/3	1/3	M/L	2000	31.90	54.4	1200	480	7.190	11.11	P.827
AFCZ	32	S	1/3	1/3	M/L	3000	42.41	81.6	1370	548	9.449	12.95	P.829
AFCZ	12	S	1/5	1/5	M/L	200	3.21	7.7	650	250	0.263	—	P.820
AFCZ	15	S	1/5	1/5	M/L	400	6.62	17.3	980	377	0.333	—	P.821
AFCZ	18	S	1/5	1/5	M/L	750	10.43	32.4	1180	454	1.101	—	P.823
AFCZ	22	S	1/5	1/5	M/L	1000	22.99	43.1	1250	481	5.459	—	P.825
AFCZ	28	S	1/5	1/5	M/L	2000	37.93	90.7	1470	565	6.215	10.14	P.827
AFCZ	32	S	1/5	1/5	M/L	3000	53.96	136.0	1670	642	8.770	12.27	P.829
AFCZ	12	S	1/7.5	2/15	M/L	100	2.31	4.6	560	215	0.132	—	P.820
AFCZ	15	S	1/7.5	2/15	M/L	200	5.70	11.1	800	308	0.290	—	P.821
AFCZ	18	S	1/7.5	2/15	M/L	400	8.34	22.2	1120	431	0.391	—	P.822/ P.823
AFCZ	22	S	1/7.5	2/15	M/L	750	19.75	41.6	1370	527	1.311	—	P.824/ P.825
AFCZ	28	S	1/7.5	2/15	M/L	1000	33.07	64.7	1480	569	5.509	—	P.826
AFCZ	32	S	1/7.5	2/15	M/L	2000	51.70	116.6	1670	642	7.229	10.73	P.829
AFCZ	12	S	1/10	1/10	M/L	100	2.90	6.1	650	232	0.130	—	P.820
AFCZ	15	S	1/10	1/10	M/L	200	6.34	14.8	980	350	0.281	—	P.821
AFCZ	18	S	1/10	1/10	M/L	400	10.30	29.6	1250	446	0.379	—	P.822/ P.823
AFCZ	22	S	1/10	1/10	M/L	750	23.83	55.5	1550	554	1.229	—	P.824/ P.825
AFCZ	28	S	1/10	1/10	M/L	1000	33.65	73.9	1750	625	5.291	—	P.826
AFCZ	32	S	1/10	1/10	M/L	2000	62.17	155.5	1960	700	6.849	10.35	P.829

Mounting Type	Output Shaft Diameter	Shaft Arrangement	Nominal Reduction Ratio	Actual Reduction Ratio	Precision	Power Class	Allowable Average Torque (3000 r/min)	Allowable Peak Torque of Startup/ Stop	Allowable Output Shaft O.H.L.	Allowable Output Shaft Thrust Load	Internal Moment of Inertia (Input Shaft Equivalent)		Drawings
											Other than Flange Type K75	Flange Type K75	
							N·m	N·m	N	N	×10^{-4}kg·m^2		
AFCZ	15	S	1/10	1/10	M/L	100	3.76	6.4	980	350	0.136	—	P.821
AFCZ	18	S	1/10	1/10	M/L	200	6.42	16.4	1250	446	0.274	—	P.822
AFCZ	22	S	1/10	1/10	M/L	400	13.24	32.7	1550	554	0.359	—	P.824
AFCZ	28	S	1/10	1/10	M/L	750	20.86	63.0	1960	700	1.091	—	P.826
AFCZ	32	S	1/10	1/10	M/L	1000	45.98	86.3	2350	839	5.656	—	P.829
AFCZ	15	S	1/12	2/25	M/L	100	4.75	8.0	1020	364	0.133	—	P.821
AFCZ	18	S	1/12	2/25	M/L	200	8.03	20.5	1350	482	0.269	—	P.822
AFCZ	22	S	1/12	2/25	M	400	16.55	40.9	1640	586	0.347	—	P.824
AFCZ	22	S	1/12	19/235	L	400	16.55	40.9	1640	586	0.347	—	
AFCZ	28	S	1/12	2/25	M	750	26.08	78.8	2110	754	1.062	—	P.826
AFCZ	28	S	1/12	19/235	L	750	26.08	78.8	2110	754	1.062	—	
AFCZ	32	S	1/12	2/25	M	1000	57.48	107.8	2530	904	5.592	—	P.829
AFCZ	32	S	1/12	19/235	L	1000	57.48	107.8	2530	904	5.592	—	P.829
AFCZ	15	S	1/15	1/15	M/L	100	5.68	9.6	1060	379	0.132	—	P.821
AFCZ	18	S	1/15	1/15	M/L	200	9.63	24.6	1470	525	0.266	—	P.822
AFCZ	22	S	1/15	1/15	M/L	400	19.86	49.1	1720	614	0.339	—	P.824
AFCZ	28	S	1/15	1/15	M/L	750	31.29	94.6	2250	804	1.042	—	P.826
AFCZ	32	S	1/15	1/15	M/L	1000	68.97	129.4	2700	964	5.558	—	P.829
AFCZ	15	S	1/20	1/20	M/L	100	7.59	12.8	1180	421	0.130	—	P.821
AFCZ	18	S	1/20	1/20	M/L	200	12.84	32.7	1570	561	0.263	—	P.822
AFCZ	22	S	1/20	1/20	M/L	400	26.48	65.5	2010	718	0.330	—	P.824
AFCZ	28	S	1/20	1/20	M/L	750	41.72	126.1	2500	893	1.021	—	P.826
AFCZ	32	S	1/20	1/20	M/L	1000	91.96	172.5	3000	1071	5.514	—	P.829
AFCZ	15	S	1/25	1/25	M/L	100	9.44	16.0	1250	446	0.129	—	P.821
AFCZ	18	S	1/25	1/25	M/L	200	16.05	40.9	1670	596	0.260	—	P.822
AFCZ	22	S	1/25	1/25	M/L	400	33.10	81.8	2160	771	0.323	—	P.824
AFCZ	28	S	1/25	1/25	M/L	750	52.15	135.1	2740	979	1.008	—	P.826
AFCZ	32	S	1/25	1/25	M/L	1000	101.08	215.7	3280	1171	5.487	—	P.829
AFCZ	15	S	1/30	1/30	M/L	100	10.23	19.2	1330	475	0.128	—	P.821
AFCZ	18	S	1/30	1/30	M/L	200	17.74	49.1	1810	646	0.259	—	P.822
AFCZ	22	S	1/30	1/30	M/L	400	33.27	98.2	2300	821	0.319	—	P.824
AFCZ	28	S	1/30	1/30	M/L	750	60.37	162.1	2940	1050	0.999	—	P.826
AFCZ	32	S	1/30	1/30	M/L	1000	91.32	258.8	3520	1257	5.468	—	P.829
AFCZ	18	S	1/40	1/40	M/L	100	11.75	26.5	1650	550	0.128	—	P.822
AFCZ	22	S	1/40	1/40	M/L	200	25.21	56.1	2250	750	0.277	—	P.824
AFCZ	28	S	1/40	1/40	M/L	400	41.20	115.3	2900	967	0.369	—	P.826
AFCZ	32	S	1/40	1/40	M/L	750	95.32	227.5	3480	1160	1.220	—	P.828
AFCZ	18	S	1/50	1/50	M/L	100	14.72	33.2	1750	583	0.128	—	P.822
AFCZ	22	S	1/50	1/50	M/L	200	31.55	70.2	2480	827	0.275	—	P.824
AFCZ	28	S	1/50	1/50	M/L	400	63.89	144.1	3150	1050	0.366	—	P.826
AFCZ	32	S	1/50	1/50	M/L	750	101.08	237	3630	1210	1.209	—	P.828
AFCZ	18	S	1/60	1/60	M/L	100	17.62	39.8	1850	617	0.127	—	P.822
AFCZ	22	S	1/60	1/60	M/L	200	33.27	84.2	2700	900	0.274	—	P.824
AFCZ	28	S	1/60	1/60	M/L	400	61.10	144.1	3380	1127	0.364	—	P.826
AFCZ	32	S	1/60	1/60	M/L	750	118.90	284.4	3780	1260	1.204	—	P.828

AFC Type <Right Angle Shaft Backlash 3 arc min/30 arc min Specifications> Performance Table by Reduction Ratio

[Notes]



- The instantaneous input speed is 7000 r/min. The rated input speed is 3000 r/min.
- Allowable output shaft O.H.L. is the value at the load point of the O.H.L. shown on page 945.
- For the continuous rated input torque, please refer to page 948. In addition, for the servo motor-based motor rated output torque, please refer to page 929.
- The key dimensions and tolerances for output shafts conform to JIS B 1301-1996 (plain form).
- The key for the output shaft is not supplied with the H shaft (without a key) of right angle shaft types.
- The internal moment of inertia (input shaft equivalent) is the value for the gearbox alone, and does not include the motor's moment of inertia.
- The allowable average torque is the continuous allowable torque value.
- Adjust the gain so that the inertial load on the output shaft side does not vibrate during acceleration and deceleration.
- In the performance table, ▭ indicates that for a clockwise (CW) motor input, the output rotates clockwise (CW) as viewed from the output shaft under the conditions shown in the figure on the right. (The arrows indicate the rotational directions of the input and output shafts, and do not limit the actual direction of rotation.)
- M in the Precision column means backlash 3 arc min, and L means backlash 30 arc min.
- When the gearbox is used at low temperature, the no load running torque at a startup will increase. Please refer to page 842 for cold start characteristics.

■ At an input speed of 3000 r/min

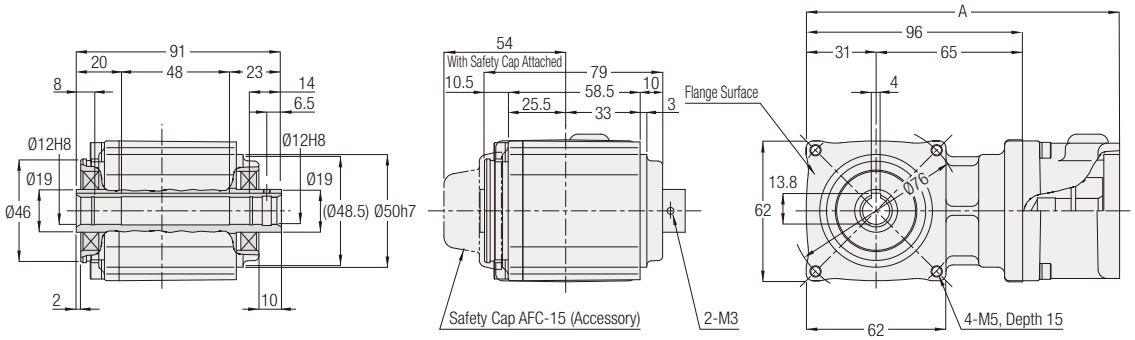
Mounting Type	Output Shaft Diameter	Shaft Arrangement	Nominal Reduction Ratio	Actual Reduction Ratio	Precision	Power Class	Allowable Average Torque (3000 r/min)	Allowable Peak Torque of Startup/ Stop	Allowable Output Shaft O.H.L.	Allowable Output Shaft Thrust Load	Internal Moment of Inertia (Input Shaft Equivalent)		Drawings
											Other than Flange Type K75	Flange Type K75	
							N·m	N·m	N	N	$\times 10^{-4}$kg·m^2		
AFCZ	10	L/H	1/3	1/3	M/L	100	1.49	2.0	395	158	0.138	—	P.830
AFCZ	12	L/H	1/3	1/3	M/L	200	2.37	4.6	500	200	0.288	—	P.831
AFCZ	15	L/H	1/3	1/3	M/L	400	3.80	10.4	785	314	0.378	—	P.833
AFCZ	18	L/H	1/3	1/3	M/L	750	7.23	19.4	980	392	1.236	—	P.835
AFCZ	22	L/H	1/3	1/3	M/L	1000	12.42	25.9	1050	420	5.700	—	P.837
AFCZ	28	L/H	1/3	1/3	M/L	2000	31.90	54.4	1200	480	7.190	11.11	P.839
AFCZ	32	L/H	1/3	1/3	M/L	3000	42.41	81.6	1370	548	9.449	12.95	P.841
AFCZ	10	L/H	1/5	1/5	M/L	100	2.34	3.3	490	188.5	0.132	—	P.830
AFCZ	12	L/H	1/5	1/5	M/L	200	3.21	7.7	650	250	0.263	—	P.831
AFCZ	15	L/H	1/5	1/5	M/L	400	6.62	17.3	980	377	0.333	—	P.833
AFCZ	18	L/H	1/5	1/5	M/L	750	10.43	32.4	1180	454	1.101	—	P.835
AFCZ	22	L/H	1/5	1/5	M/L	1000	22.99	43.1	1250	481	5.459	—	P.837
AFCZ	28	L/H	1/5	1/5	M/L	2000	37.93	90.7	1470	565	6.215	10.14	P.839
AFCZ	32	L/H	1/5	1/5	M/L	3000	53.96	136.0	1670	642	8.770	12.27	P.841
AFCZ	12	L/H	1/7.5	2/15	M/L	100	2.31	4.6	560	215	0.132	—	P.816
AFCZ	15	L/H	1/7.5	2/15	M/L	200	5.70	11.1	800	308	0.290	—	P.833
AFCZ	18	L/H	1/7.5	2/15	M/L	400	8.34	22.2	1120	431	0.391	—	P.834/ P.835
AFCZ	22	L/H	1/7.5	2/15	M/L	750	19.75	41.6	1370	527	1.311	—	P.836/ P.837
AFCZ	28	L/H	1/7.5	2/15	M/L	1000	33.07	64.7	1480	569	5.509	—	P.839
AFCZ	32	L/H	1/7.5	2/15	M/L	2000	51.70	116.6	1670	642	7.229	10.73	P.841
AFCZ	12	L/H	1/10	1/10	M/L	100	2.90	6.1	650	232	0.130	—	P.820
AFCZ	15	L/H	1/10	1/10	M/L	200	6.34	14.8	980	350	0.281	—	P.833
AFCZ	18	L/H	1/10	1/10	M/L	400	10.30	29.6	1250	446	0.379	—	P.834/ P.835
AFCZ	22	L/H	1/10	1/10	M/L	750	23.83	55.5	1550	554	1.229	—	P.836/ P.837
AFCZ	28	L/H	1/10	1/10	M/L	1000	33.65	73.9	1750	625	5.291	—	P.839
AFCZ	32	L/H	1/10	1/10	M/L	2000	62.17	155.5	1960	700	6.849	10.35	P.841

Mounting Type	Output Shaft Diameter	Shaft Arrangement	Nominal Reduction Ratio	Actual Reduction Ratio	Precision	Power Class	Allowable Average Torque (3000 r/min)	Allowable Peak Torque of Startup/ Stop	Allowable Output Shaft O.H.L.	Allowable Output Shaft Thrust Load	Internal Moment of Inertia (Input Shaft Equivalent)		Drawings
											Other than Flange Type K75	Flange Type K75	
							N·m	N·m	N	N	$\times 10^{-4}$kg·m^2		
AFCZ	15	L/H	1/10	1/10	M/L	100	3.76	6.4	980	350	0.136	—	P.832
AFCZ	18	L/H	1/10	1/10	M/L	200	6.42	16.4	1250	446	0.274	—	P.834
AFCZ	22	L/H	1/10	1/10	M/L	400	13.24	32.7	1550	554	0.359	—	P.836
AFCZ	28	L/H	1/10	1/10	M/L	750	20.86	63.0	1960	700	1.091	—	P.838
AFCZ	32	L/H	1/10	1/10	M/L	1000	45.98	86.3	2350	839	5.656	—	P.840/ P.841
AFCZ	15	L/H	1/12	2/25	M/L	100	4.75	8.0	1020	364	0.133	—	P.832
AFCZ	18	L/H	1/12	2/25	M/L	200	8.03	20.5	1350	482	0.269	—	P.834
AFCZ	22	L/H	1/12	2/25	M	400	16.55	40.9	1640	586	0.347	—	P.836
AFCZ	22	L/H	1/12	19/235	L	400	16.55	40.9	1640	586	0.347	—	
AFCZ	28	L/H	1/12	2/25	M	750	26.08	78.8	2110	754	1.062	—	P.838
AFCZ	28	L/H	1/12	19/235	L	750	26.08	78.8	2110	754	1.062	—	
AFCZ	32	L/H	1/12	2/25	M	1000	57.48	107.8	2530	904	5.592	—	P.840/ P.841
AFCZ	32	L/H	1/12	19/235	L	1000	57.48	107.8	2530	904	5.592	—	P.840/ P.841
AFCZ	15	L/H	1/15	1/15	M/L	100	5.68	9.6	1060	379	0.132	—	P.832
AFCZ	18	L/H	1/15	1/15	M/L	200	9.63	24.6	1470	525	0.266	—	P.834
AFCZ	22	L/H	1/15	1/15	M/L	400	19.86	49.1	1720	614	0.339	—	P.836
AFCZ	28	L/H	1/15	1/15	M/L	750	31.29	94.6	2250	804	1.042	—	P.838
AFCZ	32	L/H	1/15	1/15	M/L	1000	68.97	129.4	2700	964	5.558	—	P.840/ P.841
AFCZ	15	L/H	1/20	1/20	M/L	100	7.59	12.8	1180	421	0.130	—	P.832
AFCZ	18	L/H	1/20	1/20	M/L	200	12.84	32.7	1570	561	0.263	—	P.834
AFCZ	22	L/H	1/20	1/20	M/L	400	26.48	65.5	2010	718	0.330	—	P.836
AFCZ	28	L/H	1/20	1/20	M/L	750	41.72	126.1	2500	893	1.021	—	P.838
AFCZ	32	L/H	1/20	1/20	M/L	1000	91.96	172.5	3000	1071	5.514	—	P.840/ P.841
AFCZ	15	L/H	1/25	1/25	M/L	100	9.44	16.0	1250	446	0.129	—	P.832
AFCZ	18	L/H	1/25	1/25	M/L	200	16.05	40.9	1670	596	0.260	—	P.834
AFCZ	22	L/H	1/25	1/25	M/L	400	33.10	81.8	2160	771	0.323	—	P.836
AFCZ	28	L/H	1/25	1/25	M/L	750	52.15	135.1	2740	979	1.008	—	P.838
AFCZ	32	L/H	1/25	1/25	M/L	1000	101.08	215.7	3280	1171	5.487	—	P.840/ P.841
AFCZ	15	L/H	1/30	1/30	M/L	100	10.23	19.2	1330	475	0.128	—	P.832
AFCZ	18	L/H	1/30	1/30	M/L	200	17.74	49.1	1810	646	0.259	—	P.834
AFCZ	22	L/H	1/30	1/30	M/L	400	33.27	98.2	2300	821	0.319	—	P.836
AFCZ	28	L/H	1/30	1/30	M/L	750	60.37	162.1	2940	1050	0.999	—	P.838
AFCZ	32	L/H	1/30	1/30	M/L	1000	91.32	258.8	3520	1257	5.468	—	P.840/ P.841
AFCZ	18	L/H	1/40	1/40	M/L	100	11.75	26.5	1650	550	0.128	—	P.834
AFCZ	22	L/H	1/40	1/40	M/L	200	25.21	56.1	2250	750	0.277	—	P.836
AFCZ	28	L/H	1/40	1/40	M/L	400	41.20	115.3	2900	967	0.369	—	P.838
AFCZ	32	L/H	1/40	1/40	M/L	750	95.32	227.5	3480	1160	1.220	—	P.840
AFCZ	18	L/H	1/50	1/50	M/L	100	14.72	33.2	1750	583	0.128	—	P.834
AFCZ	22	L/H	1/50	1/50	M/L	200	31.55	70.2	2480	827	0.275	—	P.836
AFCZ	28	L/H	1/50	1/50	M/L	400	63.89	144.1	3150	1050	0.366	—	P.838
AFCZ	32	L/H	1/50	1/50	M/L	750	101.08	237.0	3630	1210	1.209	—	P.840
AFCZ	18	L/H	1/60	1/60	M/L	100	17.62	39.8	1850	617	0.127	—	P.834
AFCZ	22	L/H	1/60	1/60	M/L	200	33.27	84.2	2700	900	0.274	—	P.836
AFCZ	28	L/H	1/60	1/60	M/L	400	61.10	144.1	3380	1127	0.364	—	P.838
AFCZ	32	L/H	1/60	1/60	M/L	750	118.90	284.4	3780	1260	1.204	—	P.840

1-2. Drawings

AFC Type Right Angle Hollow Bore — Shaft Diameter 12 — Backlash 3 arc min/30 arc min

<Figure 1>

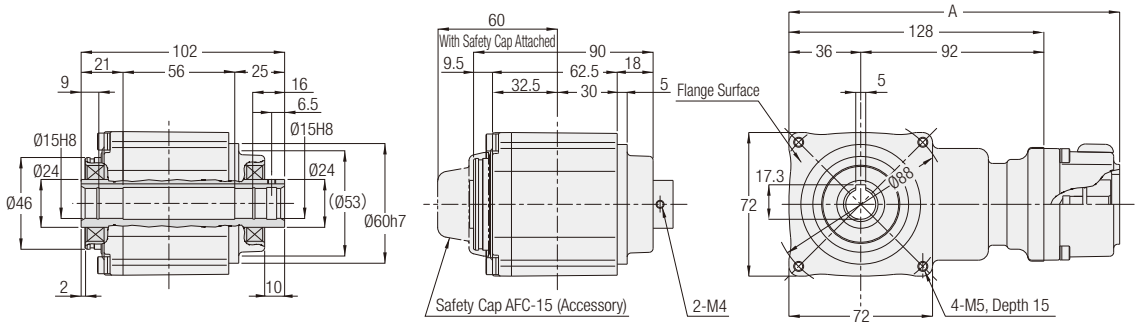


Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
100 W	AFCZ12S-✱✱✱□100△	7.5, 10	1	S1/S3	1.5	134
100 W	AFCZ12S-✱✱✱□100△	7.5, 10	1	S6	1.5	133
200 W	AFCZ12S-✱✱✱□200△	3, 5	1	S1/S2/S3	1.5	139
200 W	AFCZ12S-✱✱✱□200△	3, 5	1	S6	1.5	135
200 W	AFCZ12S-✱✱✱□200△	3, 5	1	S7	1.5	138

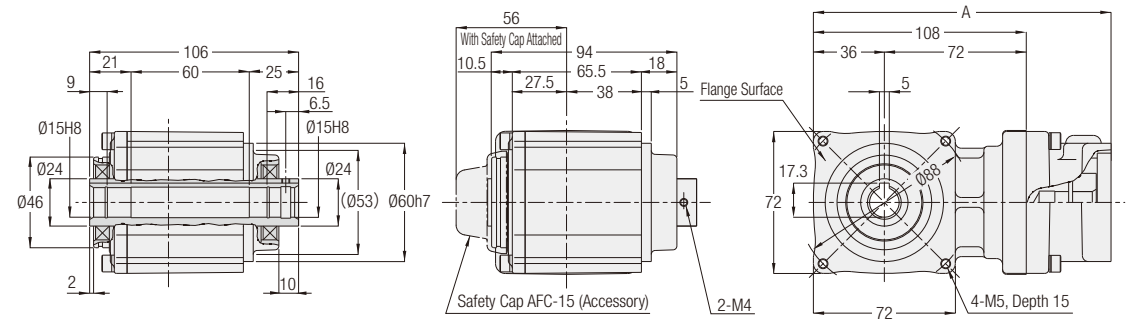
Note: A reduction ratio will be indicated as ✱✱✱ in the nomenclature. In addition, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: Please refer to page 816 for the performance table.

AFC Type Right Angle Hollow Bore | Shaft Diameter **15** Backlash 3 arc min/30 arc min

<Figure 1>



<Figure 2>

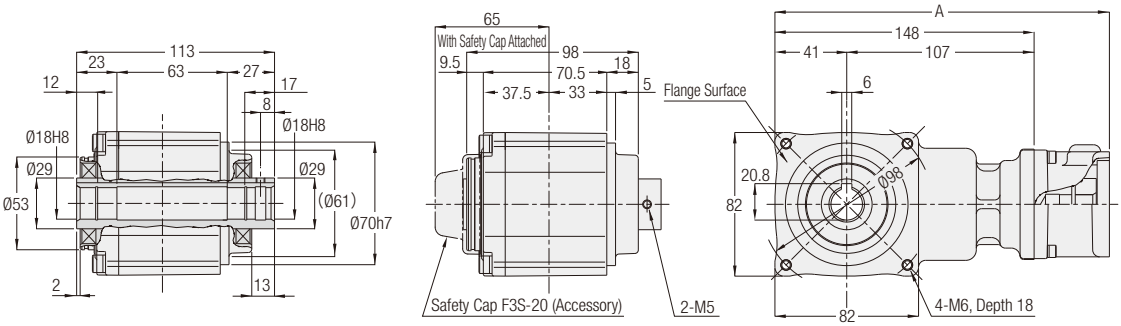


Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
100 W	AFCZ15S-***□100△	10, 12, 15, 20, 25, 30	1	S1/S3	1.9	166
100 W	AFCZ15S-***□100△	10, 12, 15, 20, 25, 30	1	S6	1.9	165
200 W	AFCZ15S-***□200△	7.5, 10	2	S1/S2/S3	2.5	151
200 W	AFCZ15S-***□200△	7.5, 10	2	S6	2.5	147
200 W	AFCZ15S-***□200△	7.5, 10	2	S7	2.5	150
400 W	AFCZ15S-***□400△	3,5	2	S1/S3	2.5	151
400 W	AFCZ15S-***□400△	3,5	2	S6	2.5	147
400 W	AFCZ15S-***□400△	3,5	2	S7	2.5	150

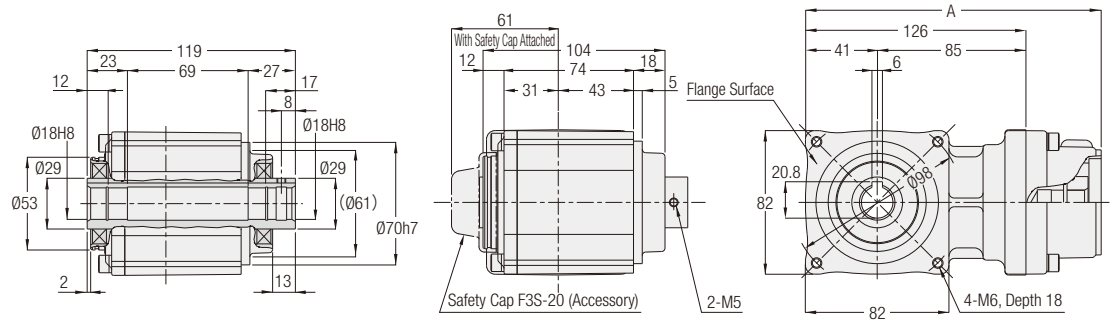
Note: A reduction ratio will be indicated as *** in the nomenclature. In addition, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: Please refer to page 816 for the performance table.

AFC Type Right Angle Hollow Bore Shaft Diameter 18 Backlash 3 arc min/30 arc min

<Figure 1>



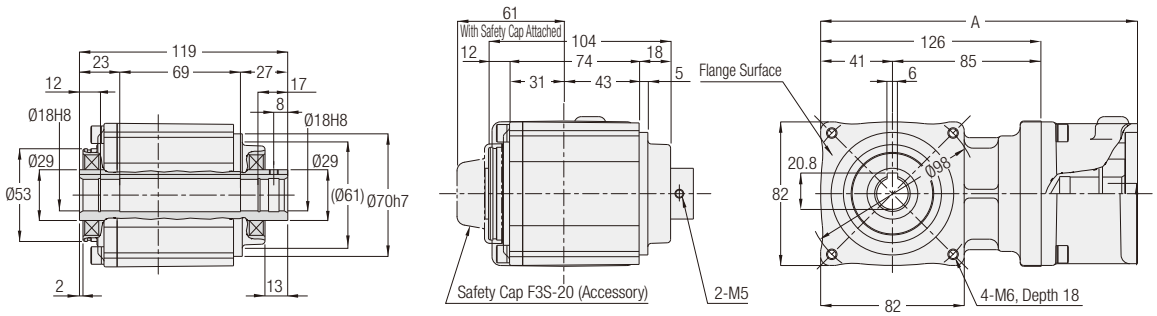
<Figure 2>



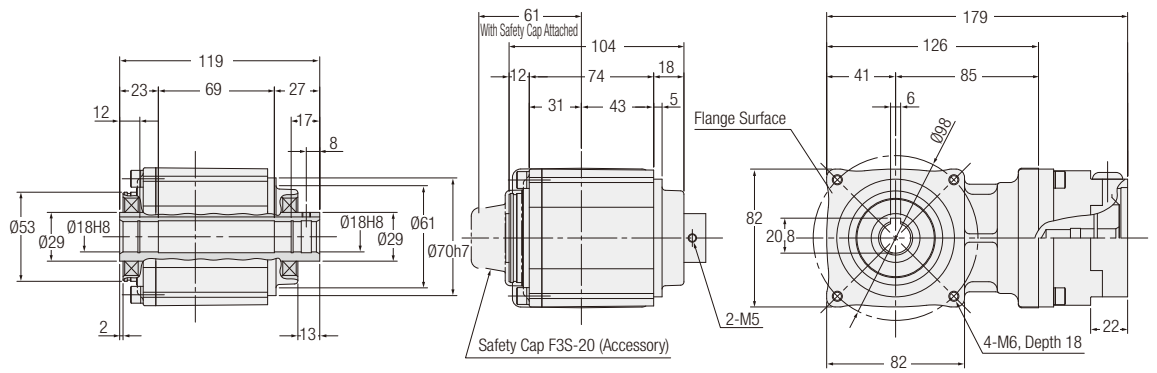
Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
100 W	AFCZ18S-***□100△	40, 50, 60	1	S1/S3	2.7	186
100 W	AFCZ18S-***□100△	40, 50, 60	1	S6	2.7	185
200 W	AFCZ18S-***□200△	10, 12, 15, 20, 25, 30	1	S1/S2/S3	2.7	191
200 W	AFCZ18S-***□200△	10, 12, 15, 20, 25, 30	1	S6	2.7	187
200 W	AFCZ18S-***□200△	10, 12, 15, 20, 25, 30	1	S7	2.7	190
400 W	AFCZ18S-***□400△	7.5, 10	2	S1/S3	3.2	169
400 W	AFCZ18S-***□400△	7.5, 10	2	S7	3.2	168

Note: A reduction ratio will be indicated as *** in the nomenclature. In addition, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: Please refer to page 816 for the performance table.

<Figure 3>



<Figure 4>

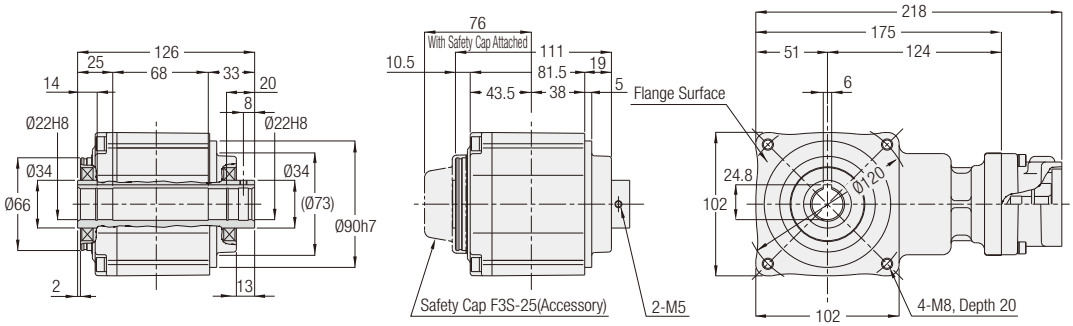


Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
400 W	AFCZ18S-✻✻✻□400△	7.5, 10	3	S6	3.2	165
750 W	AFCZ18S-✻✻✻□750△	3, 5	3	S1/S2/S3/S4/S9	3.2	181
750 W	AFCZ18S-✻✻✻□750△	3, 5	4	SA	3.2	—

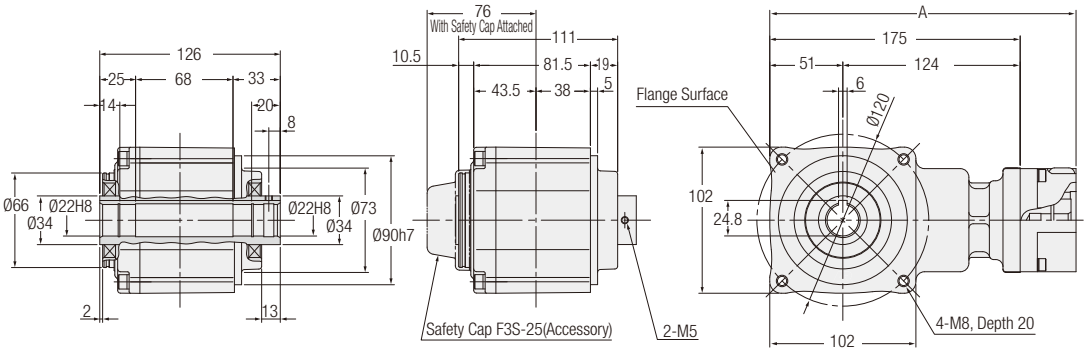
Note: A reduction ratio will be indicated as ✻✻✻ in the nomenclature. In addition, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: Please refer to page 816 for the performance table.

AFC Type Right Angle Hollow Bore — Shaft Diameter 22 — Backlash 3 arc min/30 arc min

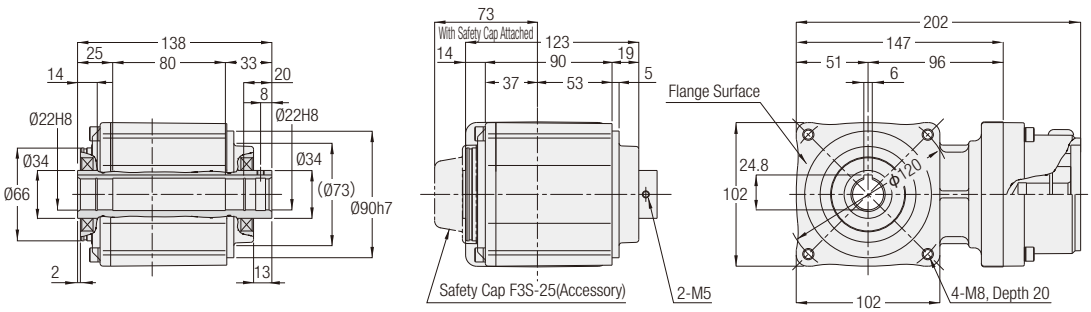
<Figure 1>



<Figure 2>



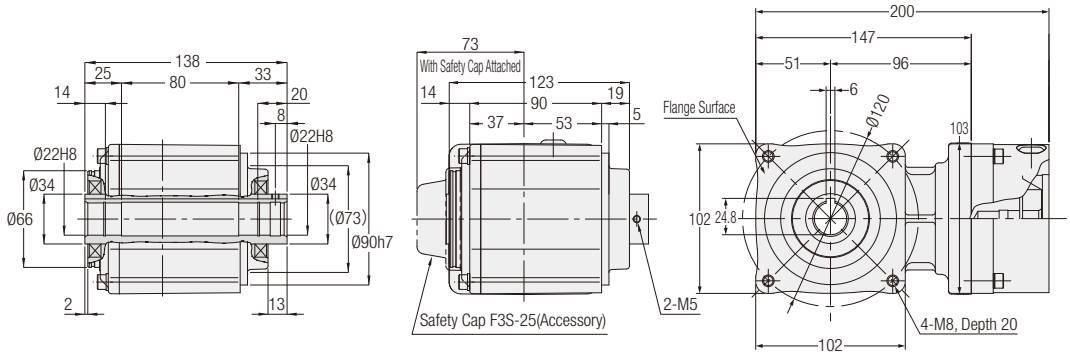
<Figure 3>



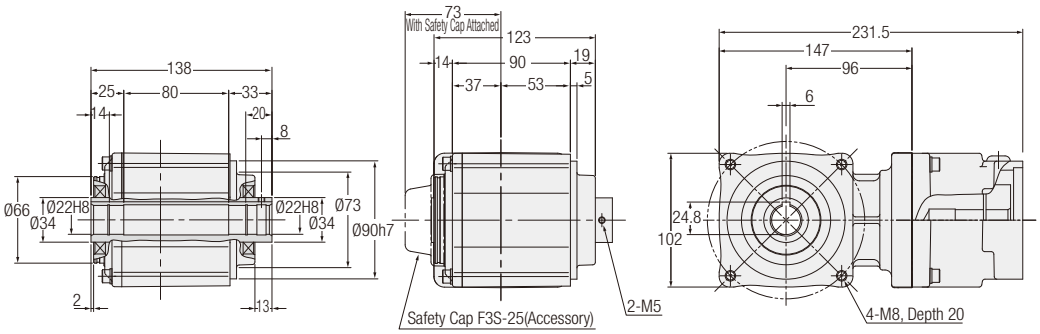
Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
200 W	AFCZ22S-✱✱✱□200△	40, 50, 60	1	S1/S2/S3	4.3	—
200 W	AFCZ22S-✱✱✱□200△	40, 50, 60	2	S6	4.3	214
200 W	AFCZ22S-✱✱✱□200△	40, 50, 60	2	S7	4.3	217
400 W	AFCZ22S-✱✱✱□400△	10, 12, 15, 20, 25, 30	1	S1/S3	4.3	—
400 W	AFCZ22S-✱✱✱□400△	10, 12, 15, 20, 25, 30	2	S6	4.3	214
400 W	AFCZ22S-✱✱✱□400△	10, 12, 15, 20, 25, 30	2	S7	4.3	217
750 W	AFCZ22S-✱✱✱□750△	7.5, 10	3	S1/S2/S3/S4/S9	5.4	—

Note: A reduction ratio will be indicated as ✱✱✱ in the nomenclature. In addition, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: Please refer to page 816 for the performance table.

<Figure 4>



<Figure 5>



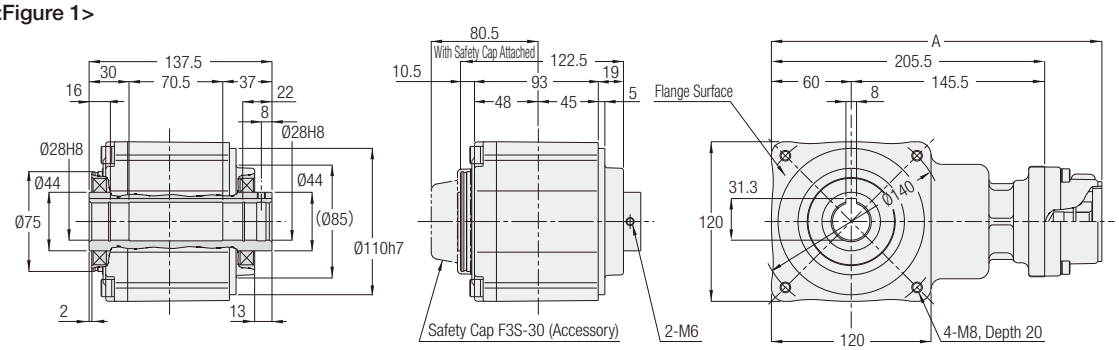
Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
750 W	AFCZ22S-***□750△	7.5, 10	4	SA	5.4	200
1000 W	AFCZ22S-***□1000△	3, 5	4	K13/K22/K23/K61	6.2	231.5
1000 W	AFCZ22S-***□1000△	3, 5	5	KC9	6.2	—

Note: A reduction ratio will be indicated as *** in the nomenclature. In addition, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: Please refer to page 816 for the performance table.

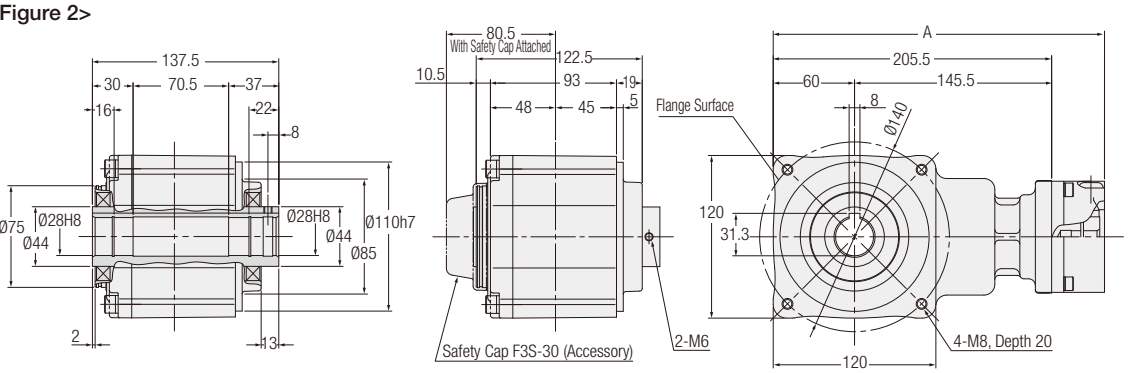
AFC Type Right Angle Hollow Bore — Shaft Diameter 28 — Backlash 3 arc min/30 arc min

The values in parentheses ( ) are the indications for flange type K75.

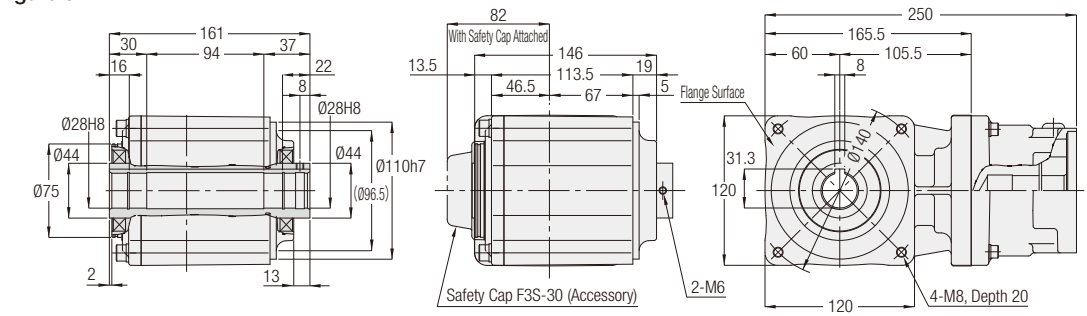
<Figure 1>



<Figure 2>



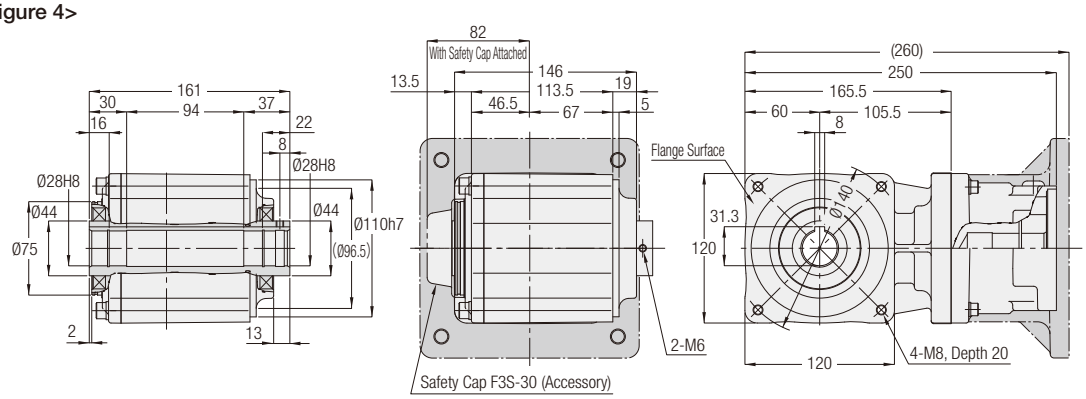
<Figure 3>



Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
400 W	AFCZ28S-***□400△	40, 50, 60	1	S1/S3	6.6	248.5
400 W	AFCZ28S-***□400△	40, 50, 60	2	S6	6.6	244.5
400 W	AFCZ28S-***□400△	40, 50, 60	2	S7	6.6	247.5
750 W	AFCZ28S-***□750△	10, 12, 15, 20, 25, 30	1	S1/S2/S3/S4/S9	6.6	260.5
750 W	AFCZ28S-***□750△	10, 12, 15, 20, 25, 30	1	SA	6.6	258.5
1000 W	AFCZ28S-***□1000△	7.5, 10	3	K13/K22/K23/K61/KC9	8.8	—

Note: A reduction ratio will be indicated as *** in the nomenclature. In addition, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: The drawings shown in the dark color are outline drawings of flange type K75.
Note: Please refer to page 816 for the performance table.

<Figure 4>



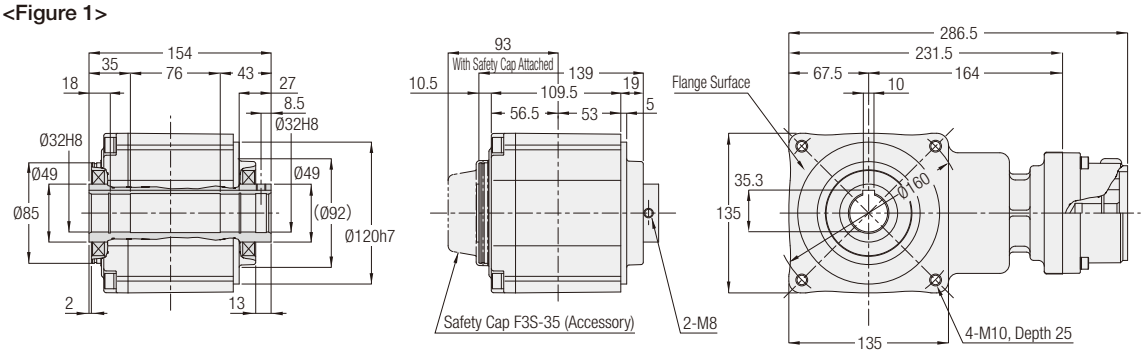
Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)
2000 W	AFCZ28S-***□2000△	3, 5	4	K13/K21/K22/K23/K31/K32/K33/ K41	8.8
2000 W	AFCZ28S-***□2000△	3, 5	4	K75	9.8

Note: A reduction ratio will be indicated as *** in the nomenclature. In addition, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: The drawings shown in the dark color are outline drawings of flange type K75.
Note: Please refer to page 816 for the performance table.

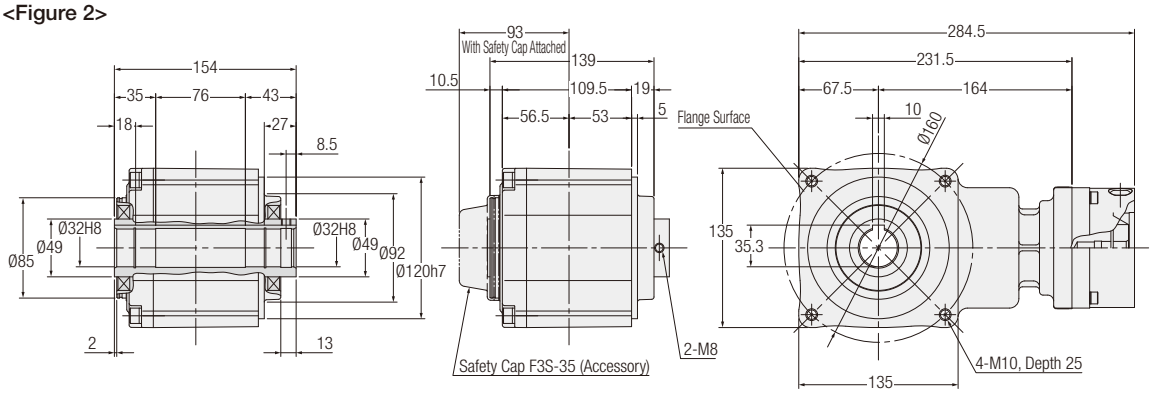
AFC Type Right Angle Hollow Bore — Shaft Diameter 32 — Backlash 3 arc min/30 arc min

The values in parentheses ( ) are the indications for flange type K75.

<Figure 1>



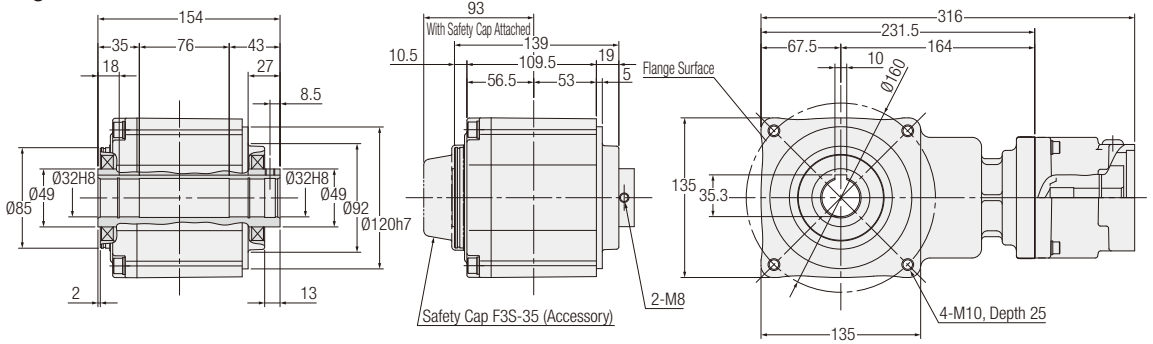
<Figure 2>



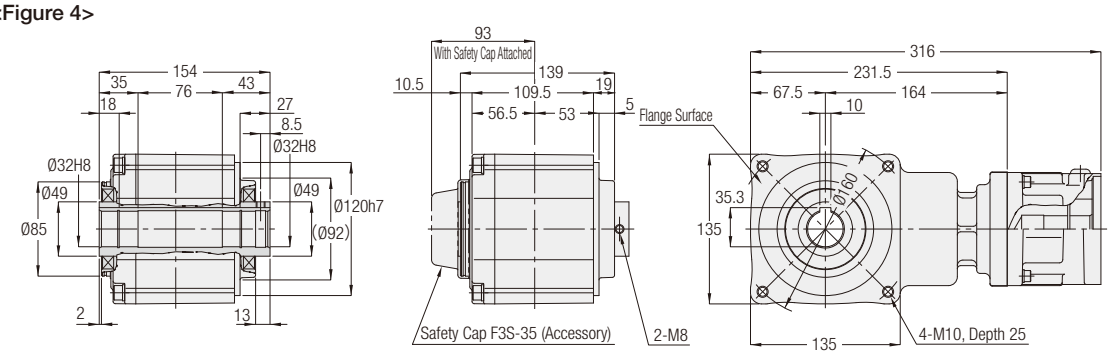
Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)
750 W	AFCZ32S-✻✻✻□750△	40, 50, 60	1	S1/S2/S3/S4/S9	10
750 W	AFCZ32S-✻✻✻□750△	40, 50, 60	2	SA	10

Note: A reduction ratio will be indicated as ✻✻✻ in the nomenclature. In addition, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: The drawings shown in the dark color are outline drawings of flange type K75.
Note: Please refer to page 816 for the performance table.

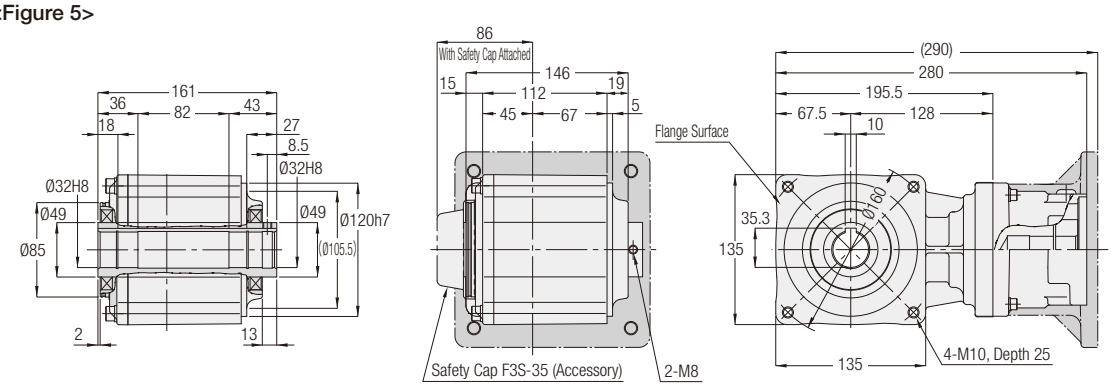
<Figure 3>



<Figure 4>



<Figure 5>

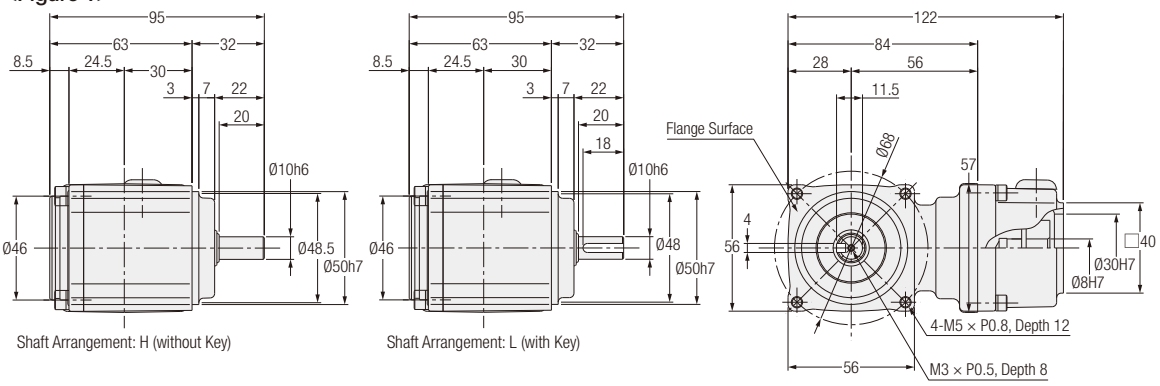


Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)
1000 W	AFCZ32S-✱✱✱□1000△	10, 12, 15, 20, 25, 30	3	KC9	10.5
1000 W	AFCZ32S-✱✱✱□1000△	10, 12, 15, 20, 25, 30	4	K13/K22/K23/K61	10.5
2000 W	AFCZ32S-✱✱✱□2000△	7.5, 10	5	K13/K21/K22/K23/K31/K32/K33/K41	11
2000 W	AFCZ32S-✱✱✱□2000△	7.5, 10	5	K75	9.8
3000 W	AFCZ32S-✱✱✱□3000△	3, 5	5	K13/K21/K22/K23/K32/K33/K34/K52	11
3000 W	AFCZ32S-✱✱✱□3000△	3, 5	5	K75/KBC	12

Note: A reduction ratio will be indicated as ✱✱✱ in the nomenclature. In addition, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: The drawings shown in the dark color are outline drawings of flange type K75.
Note: Please refer to page 816 for the performance table.

AFC Type Right Angle Shaft | Shaft Diameter 10 | Backlash 3 arc min/30 arc min

<Figure 1>



Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)
100 W	AFCZ10#-***□100△	3, 5	1	S1/S3/S6	1.5

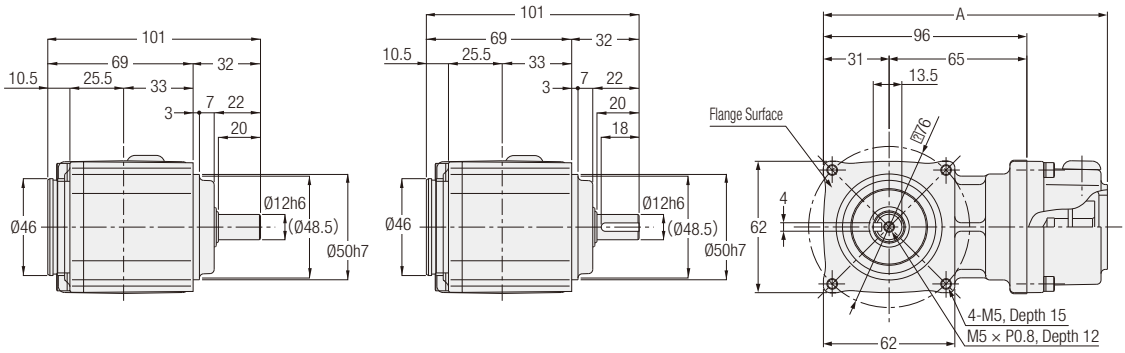
Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ***, backlash will be indicated as □, and a flange type will be indicated as △.

Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.

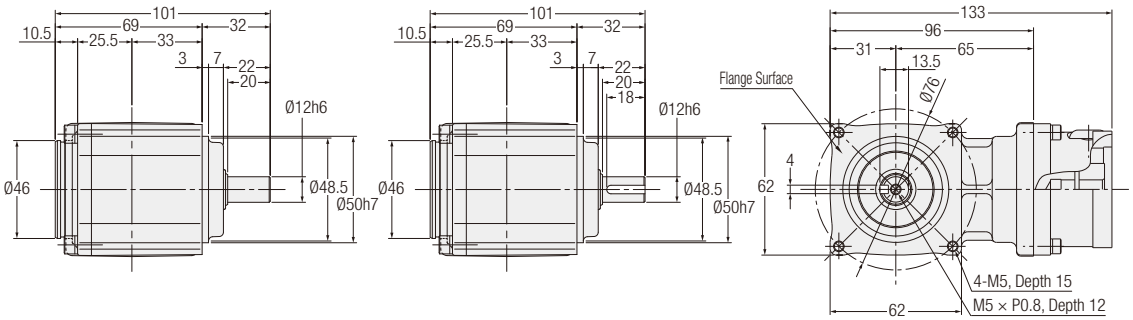
Note: Please refer to page 818 for the performance table.

AFC Type Right Angle Shaft | Shaft Diameter 12 | Backlash 3 arc min/30 arc min

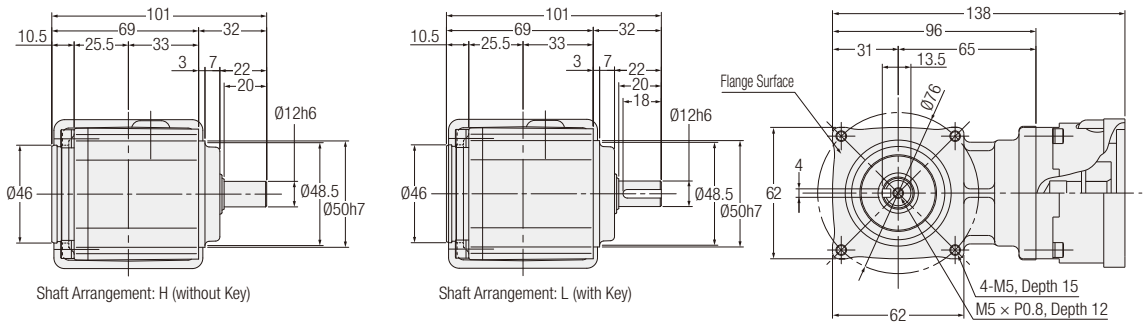
<Figure 1>



<Figure 2>



<Figure 3>



Shaft Arrangement: H (without Key)

Shaft Arrangement: L (with Key)

Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
100 W	AFCZ12#-***□100△	7.5, 10	1	S1/S3	1.5	134
100 W	AFCZ12#-***□100△	7.5, 10	2	S6	1.5	—
200 W	AFCZ12#-***□200△	5	1	S1/S2/S3	1.5	139
200 W	AFCZ12#-***□200△	5	1	S6	1.5	135
200 W	AFCZ12#-***□200△	5	3	S7	1.5	—

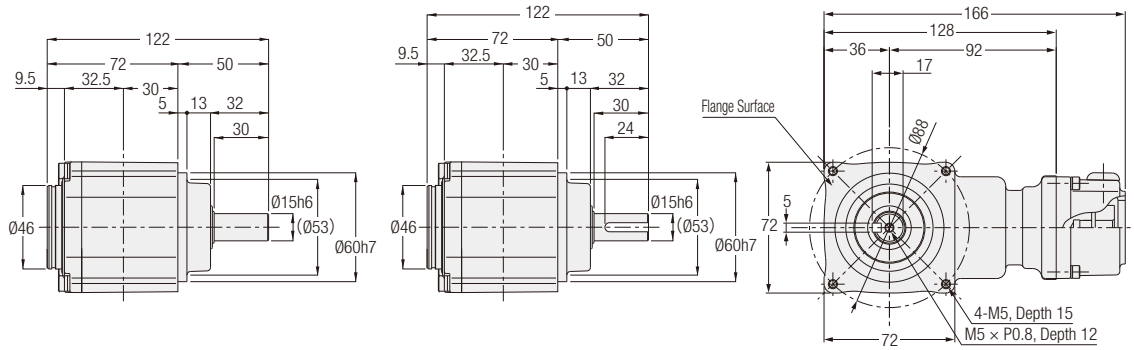
Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ***, backlash will be indicated as □, and a flange type will be indicated as △.

Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.

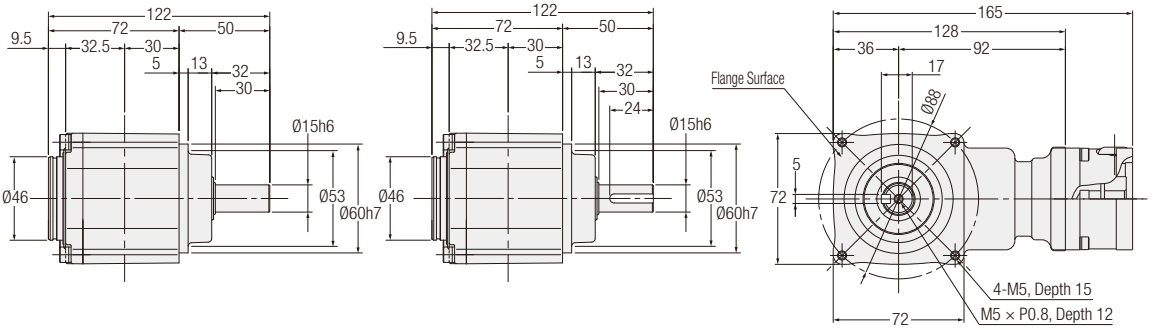
Note: Please refer to page 818 for the performance table.

AFC Type Right Angle Shaft Shaft Diameter 15 Backlash 3 arc min/30 arc min

<Figure 1>



<Figure 2>



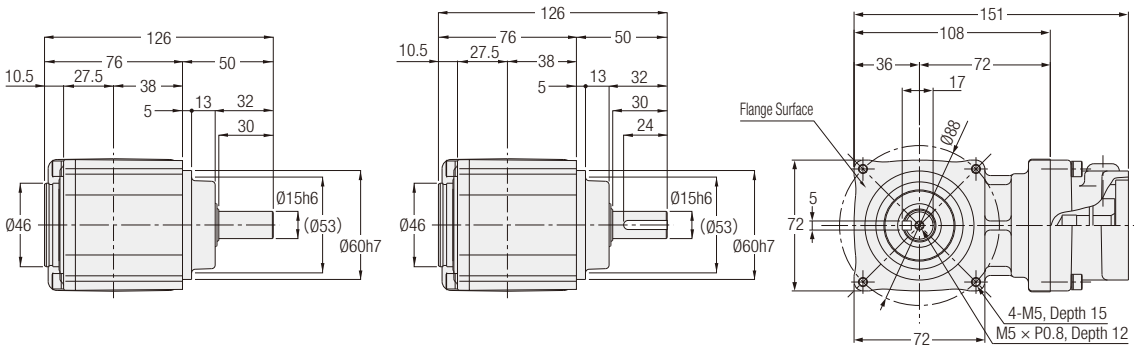
Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)
100 W	AFCZ15#-✱✱✱□100△	10, 12, 15, 20, 25, 30	1	S1/S3	2.0
100 W	AFCZ15#-✱✱✱□100△	10, 12, 15, 20, 25, 30	2	S6	2.0

Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ✱✱✱, backlash will be indicated as □, and a flange type will be indicated as △.

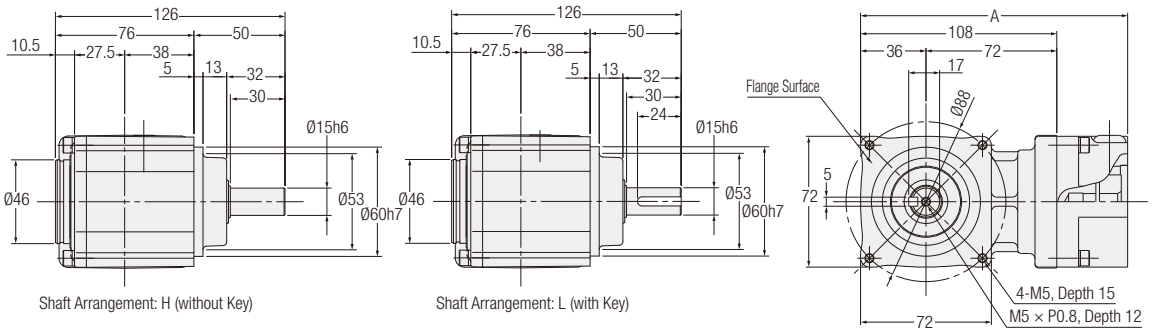
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.

Note: Please refer to page 818 for the performance table.

<Figure 3>



<Figure 4>

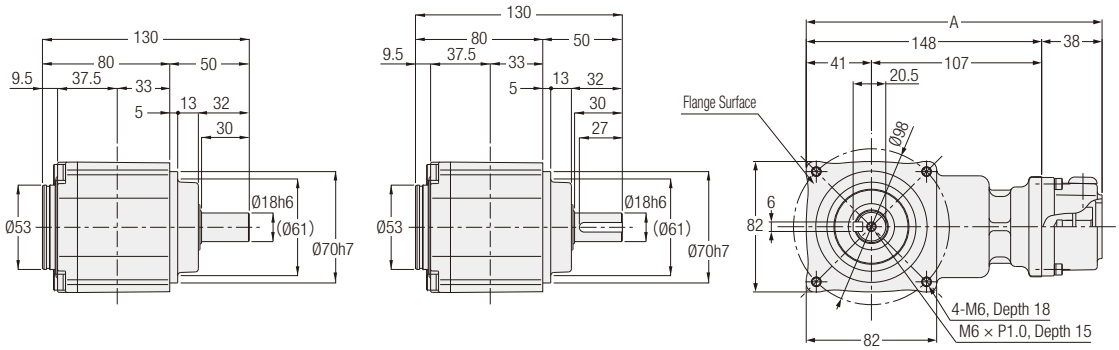


Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
200 W	AFCZ15#-***□200△	7.5, 10	3	S1/S2/S3	2.6	—
200 W	AFCZ15#-***□200△	7.5, 10	4	S6	2.6	147
200 W	AFCZ15#-***□200△	7.5, 10	4	S7	2.6	150
400 W	AFCZ15#-***□400△	3, 5	3	S1/S3	2.6	—
400 W	AFCZ15#-***□400△	3, 5	4	S6	2.6	147
400 W	AFCZ15#-***□400△	3, 5	4	S7	2.6	150

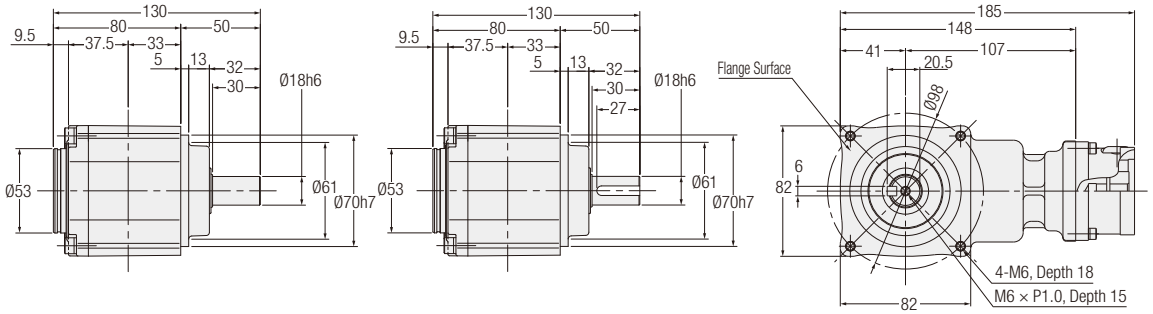
Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ***, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: Please refer to page 818 for the performance table.

AFC Type Right Angle Shaft Shaft Diameter 18 Backlash 3 arc min/30 arc min

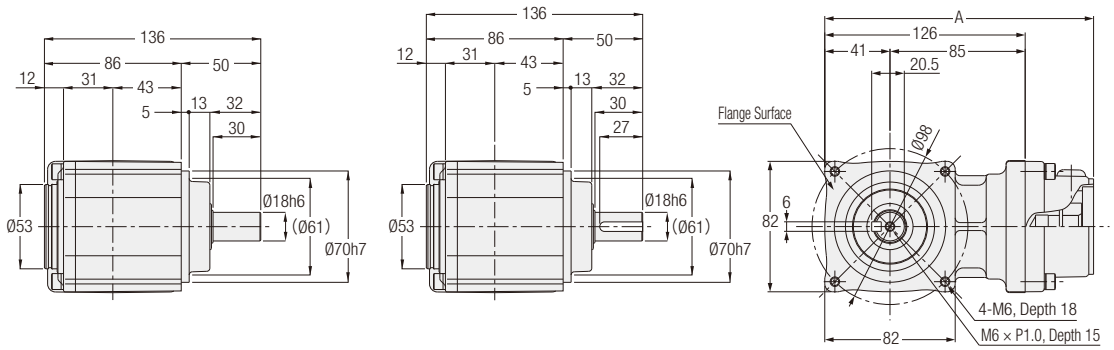
<Figure 1>



<Figure 2>



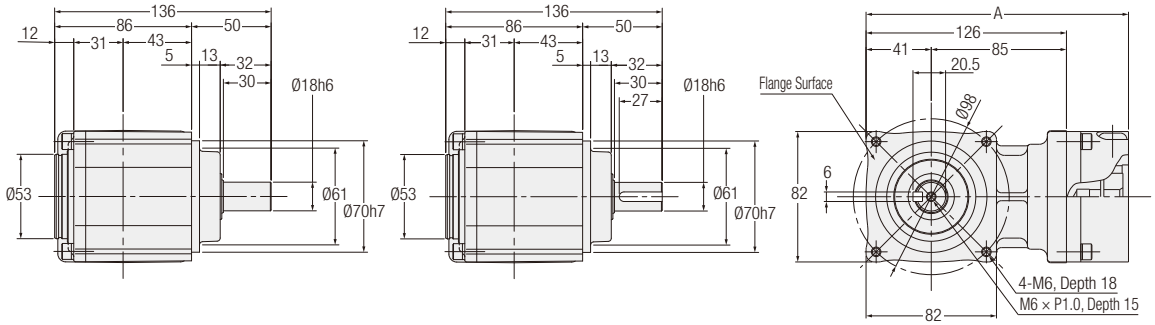
<Figure 3>



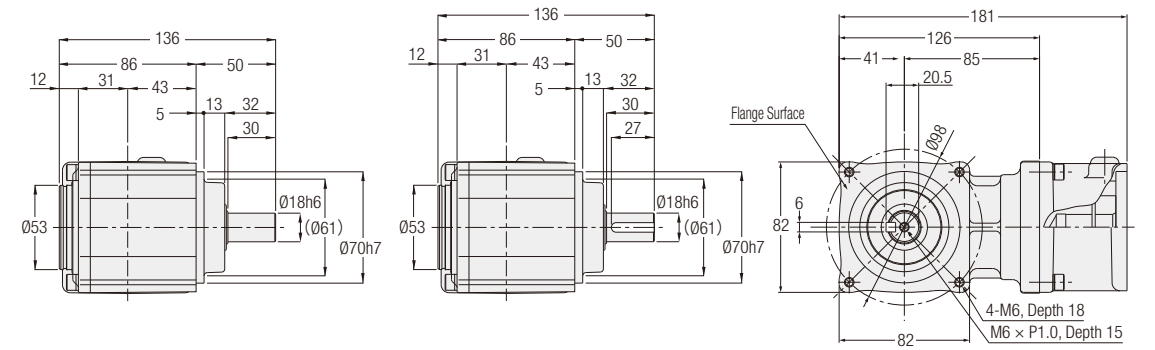
Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
100 W	AFCZ18#-***□100△	40, 50, 60	1	S1/S3	2.8	186
100 W	AFCZ18#-***□100△	40, 50, 60	2	S6	2.8	—
200 W	AFCZ18#-***□200△	10, 12, 15, 20, 25, 30	1	S1/S2/S3	2.8	191
200 W	AFCZ18#-***□200△	10, 12, 15, 20, 25, 30	1	S6	2.8	187
200 W	AFCZ18#-***□200△	10, 12, 15, 20, 25, 30	1	S7	2.8	190
400 W	AFCZ18#-***□400△	7.5, 10	3	S1/S3	3.3	169
400 W	AFCZ18#-***□400△	7.5, 10	3	S7	3.3	168

Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ***, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: Please refer to page 818 for the performance table.

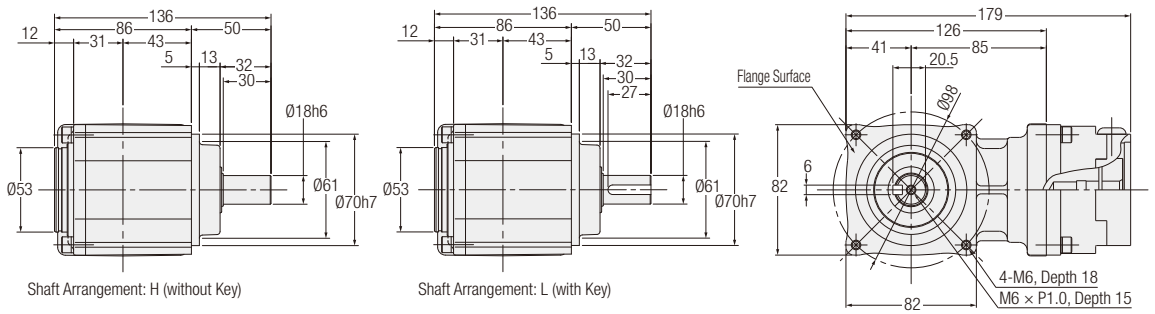
<Figure 4>



<Figure 5>



<Figure 6>



Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
400 W	AFCZ18#-***□400△	7.5, 10	4	S6	3.3	165
750 W	AFCZ18#-***□750△	3, 5	5	S1/S2/S3/S4/S9	3.3	—
750 W	AFCZ18#-***□750△	3, 5	6	SA	3.3	—

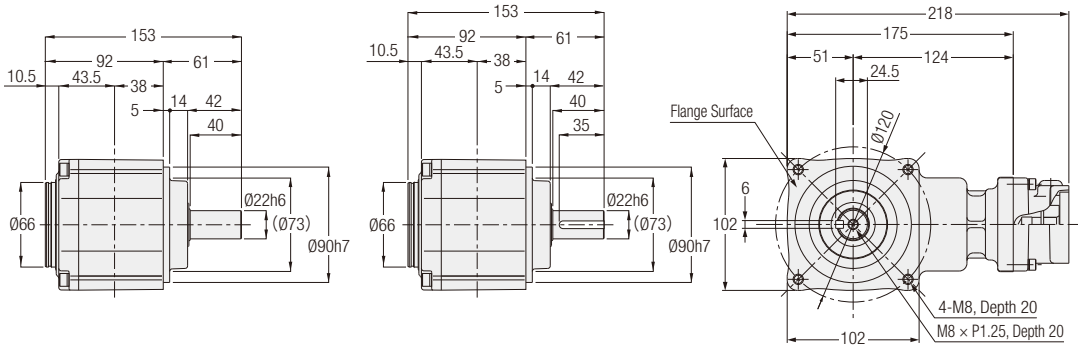
Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ***, backlash will be indicated as □, and a flange type will be indicated as △.

Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.

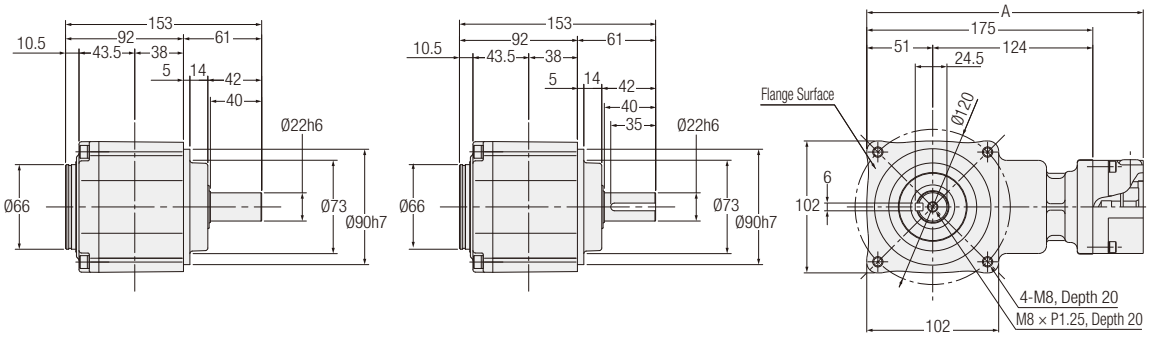
Note: Please refer to page 818 for the performance table.

AFC Type Right Angle Shaft | Shaft Diameter 22 | Backlash 3 arc min/30 arc min

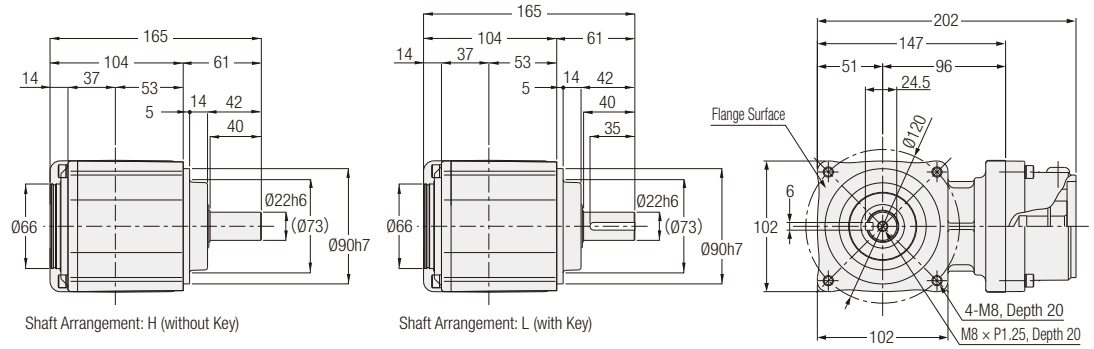
<Figure 1>



<Figure 2>



<Figure 3>



Shaft Arrangement: H (without Key)

Shaft Arrangement: L (with Key)

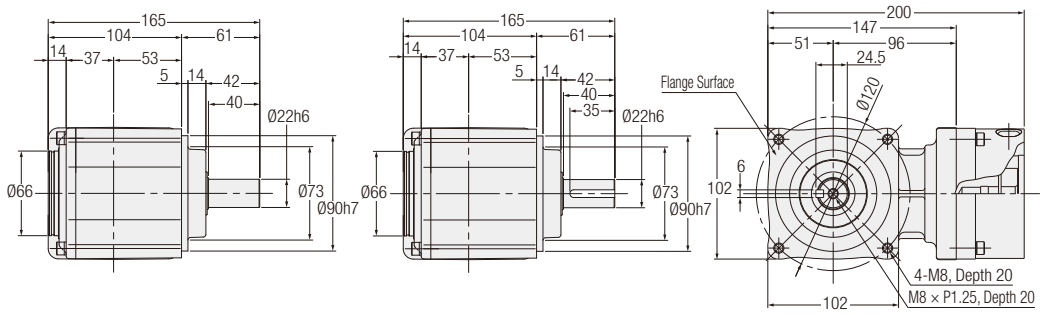
Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
200 W	AFCZ22#-***□200△	40, 50, 60	1	S1/S2/S3	4.6	—
200 W	AFCZ22#-***□200△	40, 50, 60	2	S6	4.6	214
200 W	AFCZ22#-***□200△	40, 50, 60	2	S7	4.6	217
400 W	AFCZ22#-***□400△	10, 12, 15, 20, 25, 30	1	S1/S3	4.6	—
400 W	AFCZ22#-***□400△	10, 12, 15, 20, 25, 30	2	S6	4.6	214
400 W	AFCZ22#-***□400△	10, 12, 15, 20, 25, 30	2	S7	4.6	217
750 W	AFCZ22#-***□750△	7.5, 10	3	S1/S2/S3/S4/S9	5.7	—

Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ***, backlash will be indicated as □, and a flange type will be indicated as △.

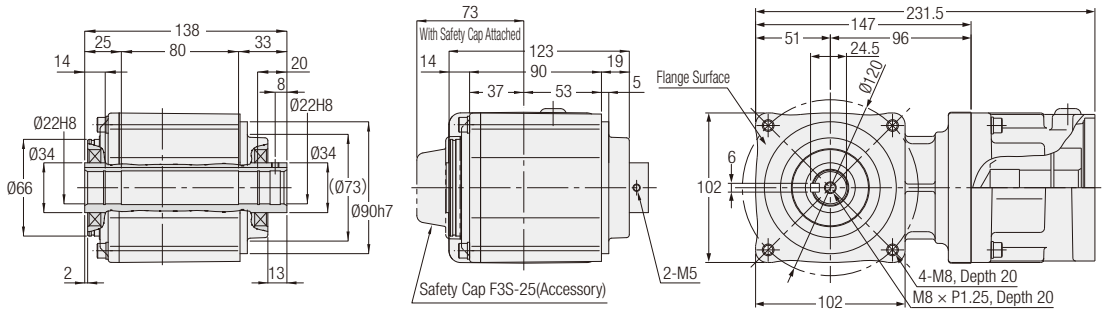
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.

Note: Please refer to page 818 for the performance table.

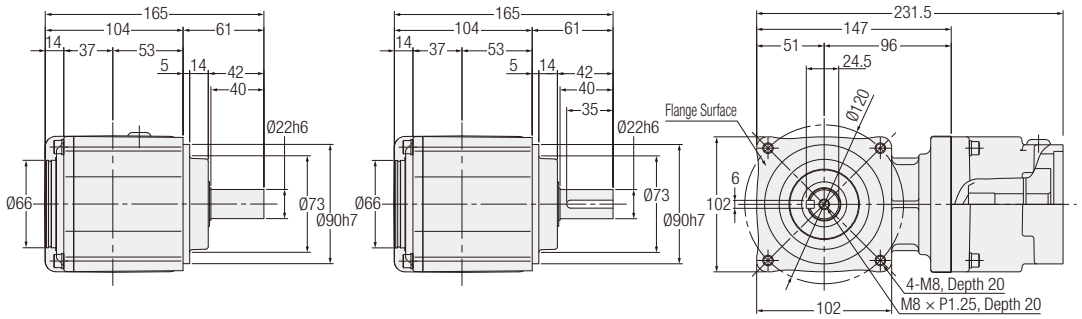
<Figure 4>



<Figure 5>



<Figure 6>



Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)
750 W	AFCZ22#-***□750△	7.5, 10	4	SA	5.7
1000 W	AFCZ22#-***□1000△	3, 5	5	K13/K22/K23/K61	6.5
1000 W	AFCZ22#-***□1000△	3, 5	6	KC9	6.5

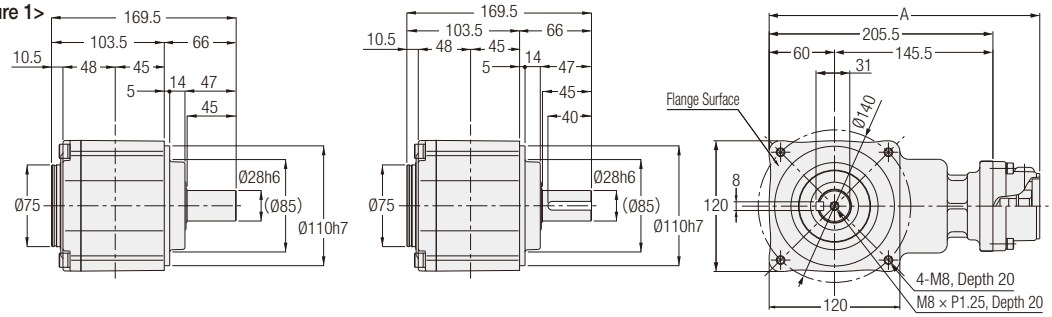
Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ***, backlash will be indicated as □, and a flange type will be indicated as △.

Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.

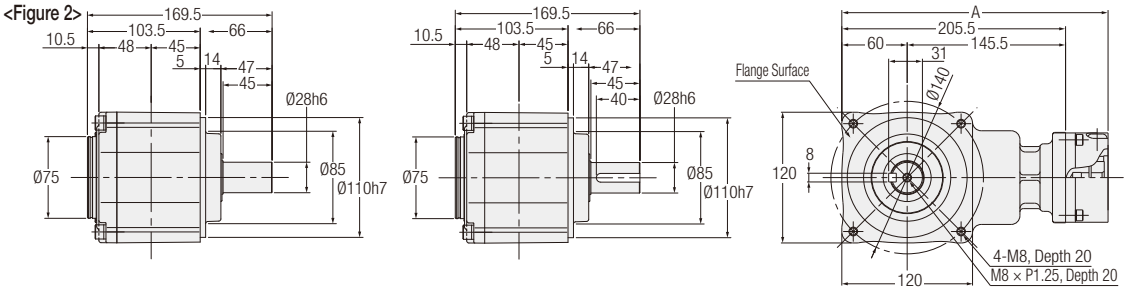
Note: Please refer to page 818 for the performance table.

AFC Type Right Angle Shaft Shaft Diameter 28 Backlash 3 arc min/30 arc min

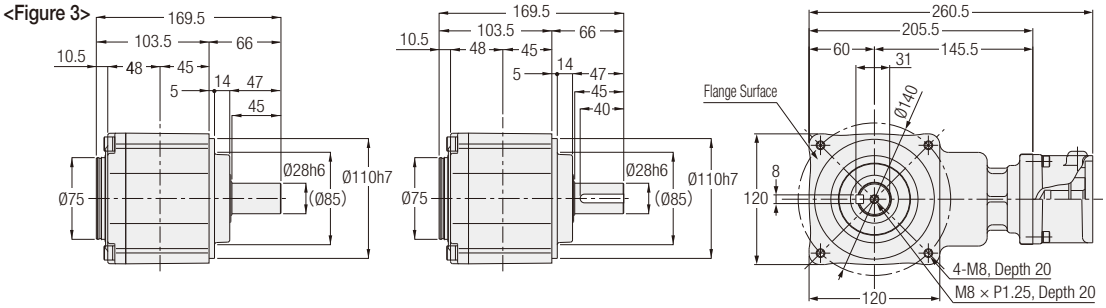
<Figure 1>



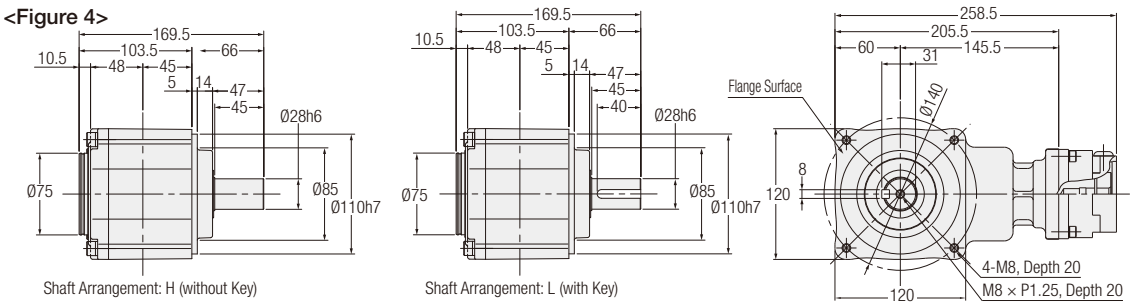
<Figure 2>



<Figure 3>



<Figure 4>



Shaft Arrangement: H (without Key)

Shaft Arrangement: L (with Key)

Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)	A
400 W	AFCZ28#-***□400△	40, 50, 60	1	S1/S3	7.2	248.5
400 W	AFCZ28#-***□400△	40, 50, 60	2	S6	7.2	244.5
400 W	AFCZ28#-***□400△	40, 50, 60	1	S7	7.2	247.5
750 W	AFCZ28#-***□750△	10, 12, 15, 20, 25, 30	3	S1/S2/S3/S4/S9	7.2	—
750 W	AFCZ28#-***□750△	10, 12, 15, 20, 25, 30	4	SA	7.2	—

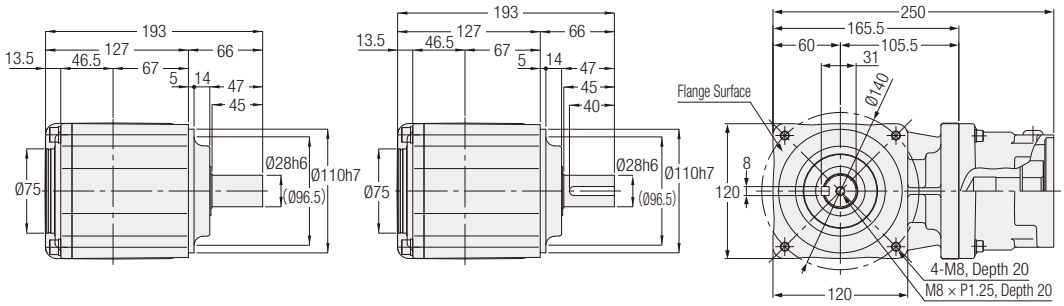
Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ***, backlash will be indicated as □, and a flange type will be indicated as △.

Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.

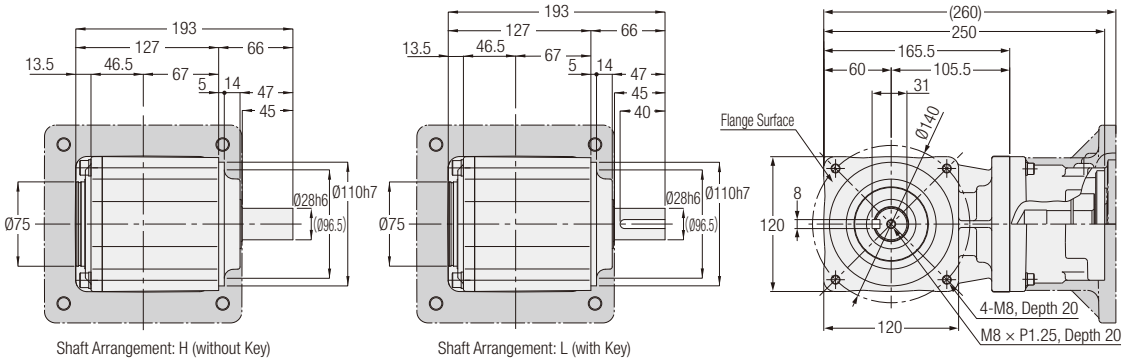
Note: Please refer to page 818 for the performance table.

The values in parentheses ( ) are the indications for flange type K75.

<Figure 5>



<Figure 6>



Shaft Arrangement: H (without Key)

Shaft Arrangement: L (with Key)

Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)
1000 W	AFCZ28#-***□1000△	7.5, 10	5	K13/K22/K23/K61/KC9	9.5
2000 W	AFCZ28#-***□2000△	3, 5	6	K13/K21/K22/K23/K31/K32/K33/ K41	9.5
2000 W	AFCZ28#-***□2000△	3, 5	6	K75	10.5

Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ***, backlash will be indicated as □, and a flange type will be indicated as △.

Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.

Note: The drawings shown in the dark color are outline drawings of flange type K75.

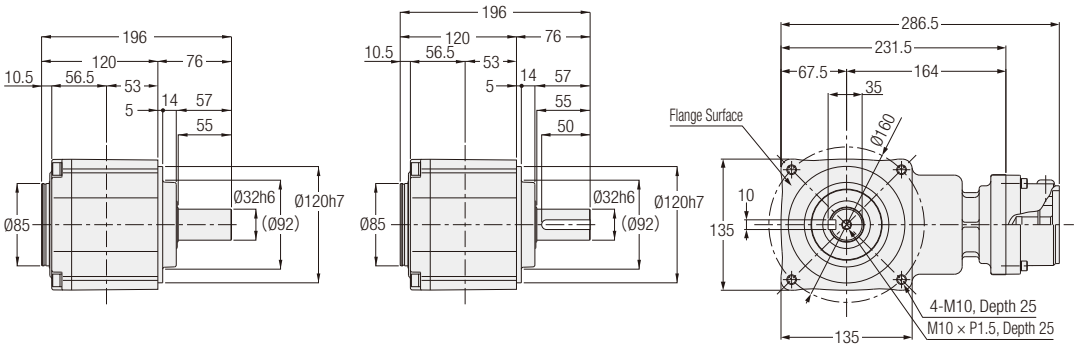
Note: Please refer to page 818 for the performance table.

AFC Type Right Angle Shaft

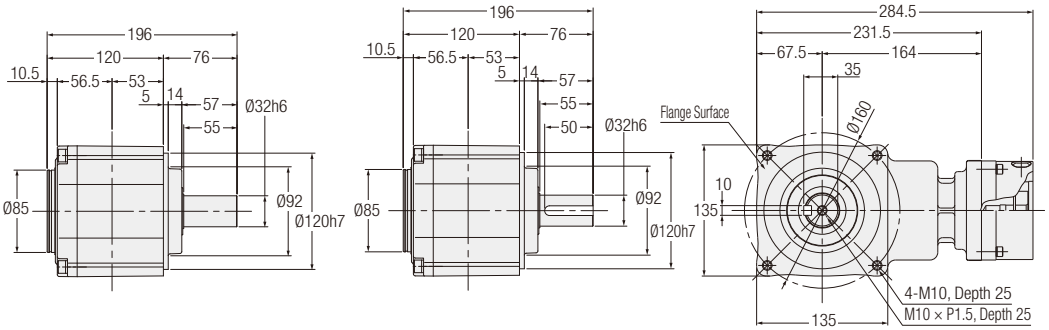
Shaft Diameter 32 Backlash 3 arc min/30 arc min

The values in parentheses ( ) are the indications for flange type K75.

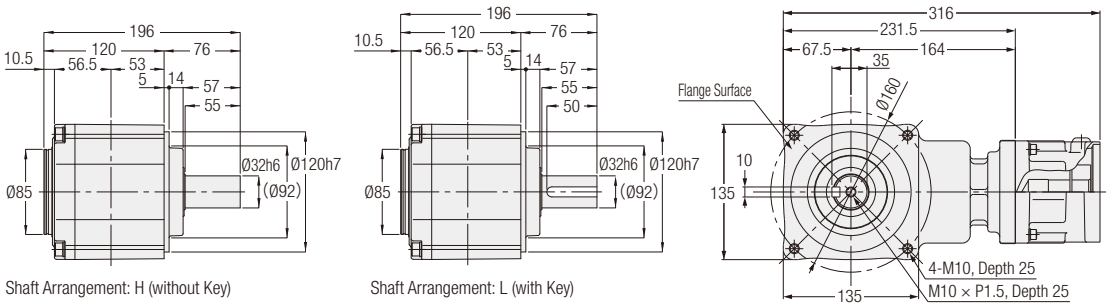
<Figure 1>



<Figure 2>



<Figure 3>



Shaft Arrangement: H (without Key)

Shaft Arrangement: L (with Key)

Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)
750 W	AFCZ32#-***□750△	40, 50, 60	1	S1/S2/S3/S4/S9	11
750 W	AFCZ32#-***□750△	40, 50, 60	2	SA	11
1000 W	AFCZ32#-***□1000△	10, 12, 15, 20, 25, 30	3	K13/K22/K23/K61	11.5

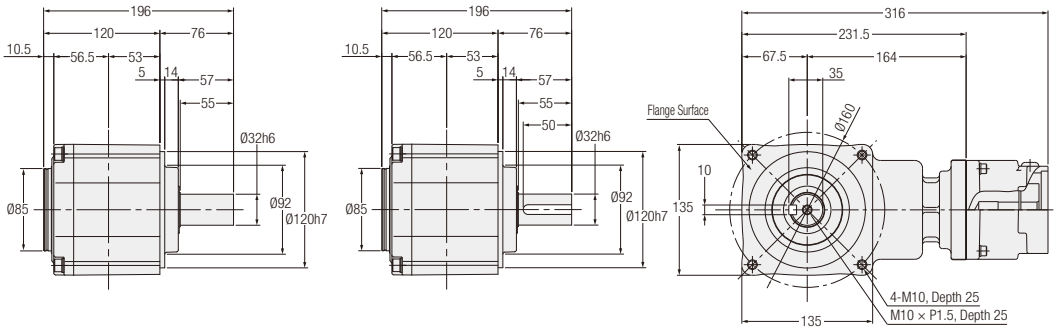
Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ***, backlash will be indicated as □, and a flange type will be indicated as △.

Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.

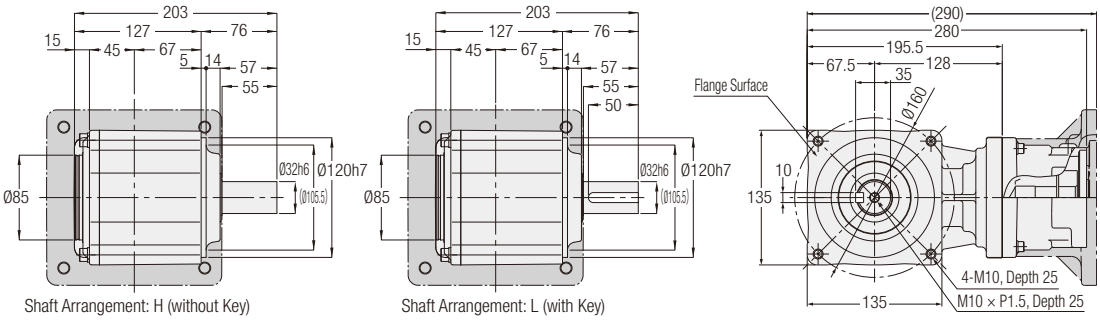
Note: The drawings shown in the dark color are outline drawings of flange type K75.

Note: Please refer to page 818 for the performance table.

<Figure 4>



<Figure 5>



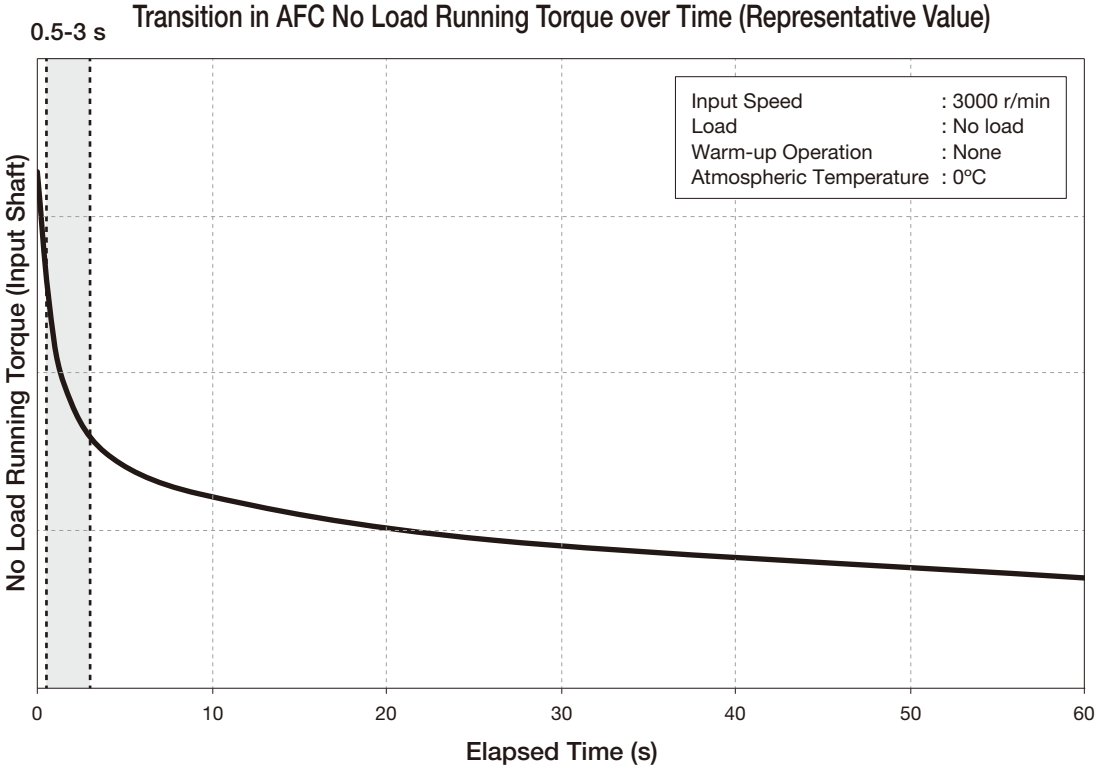
Motor Power Class	Part Number	Reduction Ratio	Figure Number	Flange Type	Approx. Weight (kg)
1000 W	AFCZ32#-***□1000△	10, 12, 15, 20, 25, 30	4	KC9	11.5
2000 W	AFCZ32#-***□2000△	7.5, 10	5	K13/K21/K22/K23/K31/K32/K33/ K41	12
2000 W	AFCZ32#-***□2000△	7.5, 10	5	K75	13
3000 W	AFCZ32#-***□3000△	3, 5	5	K13/K21/K22/K23/K32/K33/K34/ K52/KBC	12
3000 W	AFCZ32#-***□3000△	3, 5	5	K75	13

Note: A shaft arrangement (H, L) will be indicated as # in the nomenclature. In addition, a reduction ratio will be indicated as ***, backlash will be indicated as □, and a flange type will be indicated as △.
Note: Please refer to pages 905 to 911 for the detailed dimensions of the input shaft area.
Note: The drawings shown in the dark color are outline drawings of flange type K75.
Note: Please refer to page 818 for the performance table.

1-3. Low Temperature Startup Characteristics (No Load Running Torque (Input Shaft))

No load running torque means the input shaft torque required to run the gearbox at the rated input speed (3000 r/min) under no load state.

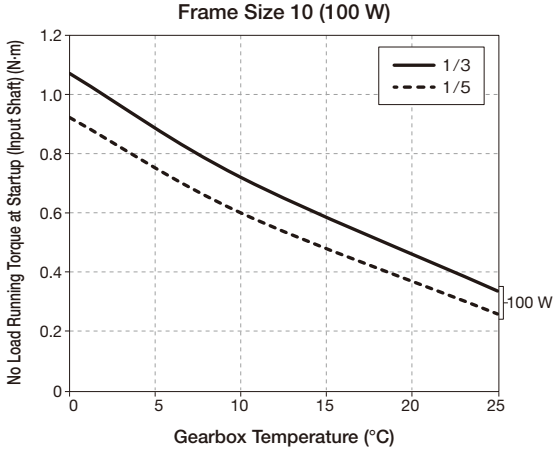
When the gearbox is used at low temperature, the no load running torque at a startup will increase.
When the operation is continued, the no load running torque will decrease with the temperature rise of the gearbox.
The rate of decrease differs depending on the model and the usage environment.
The figure below shows a representative value in a state where a warm-up operation is not performed.



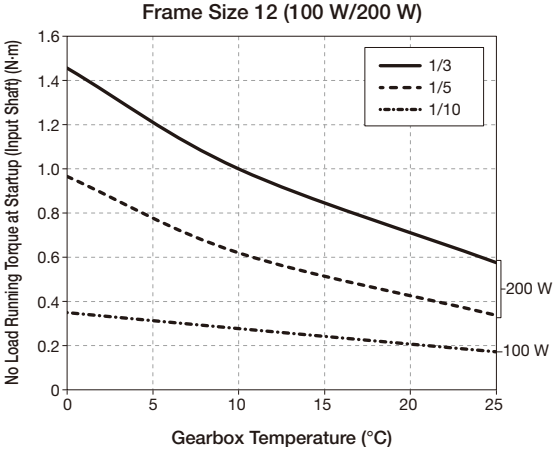
The figures on the pages that follow show the average value of the no load running torque of each type between 0.5 and 3 seconds.

Input Speed: 3000 r/min
No Load Running Torque (Input Shaft): Average value between 0.5 and 3 seconds
Each figure shows a representative value in a state where a warm-up operation is not performed.

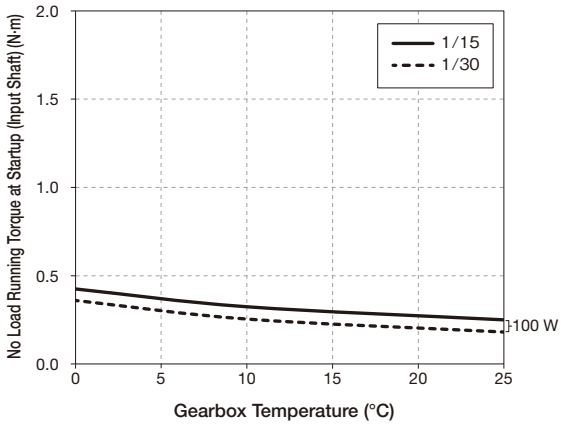
Frame Size 10 (100 W)



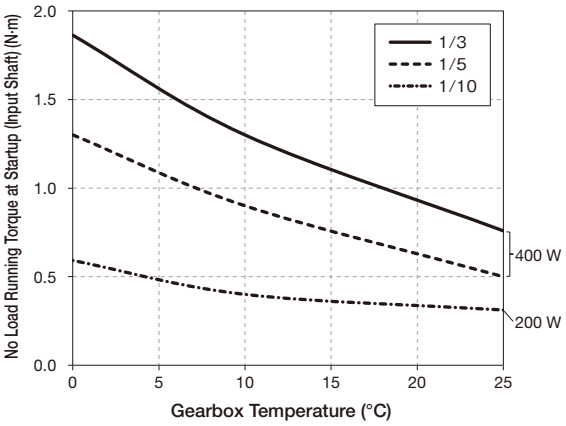
Frame Size 12 (100 W/200 W)



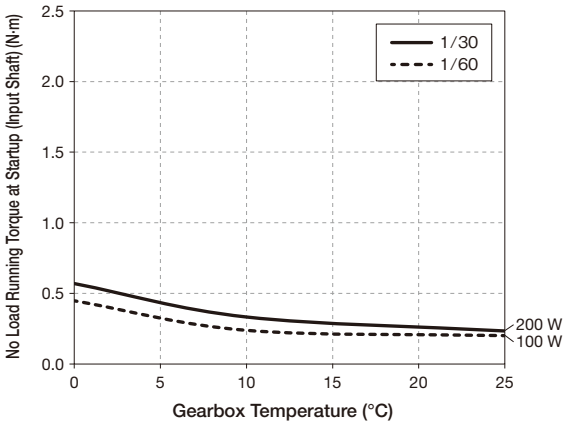
Frame Size 15 (100 W)



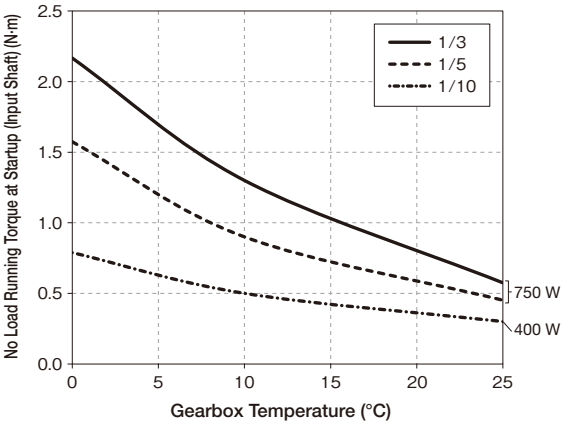
Frame Size 15 (200 W/400 W)



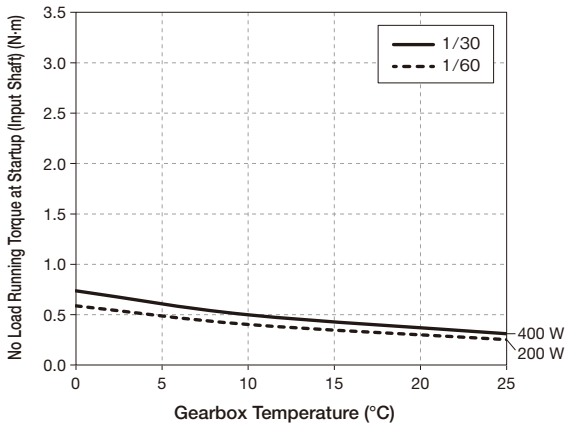
Frame Size 18 (100 W/200 W)



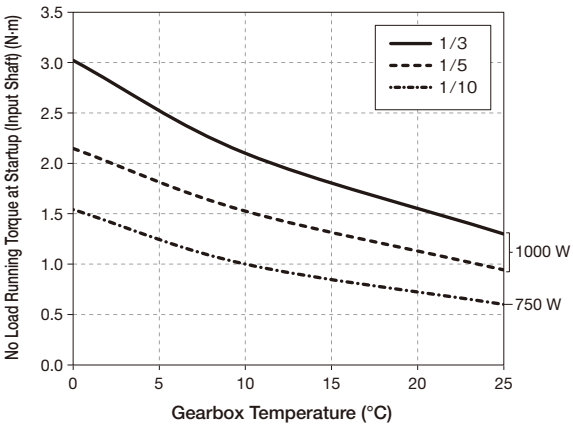
Frame Size 18 (400 W/750 W)



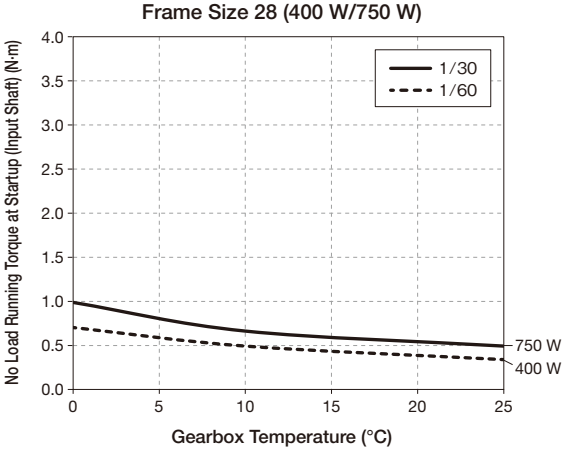
Frame Size 22 (200 W/400 W)



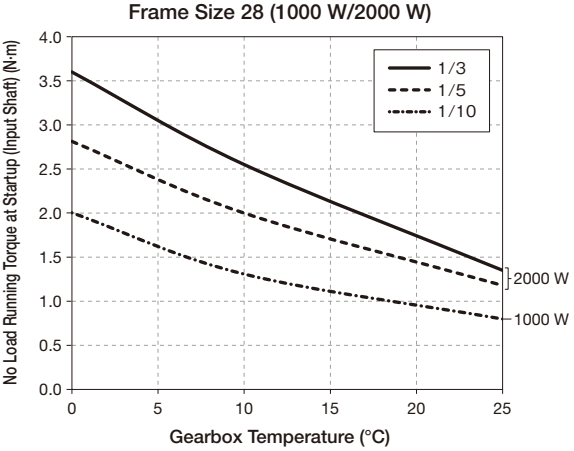
Frame Size 22 (750 W/1000 W)



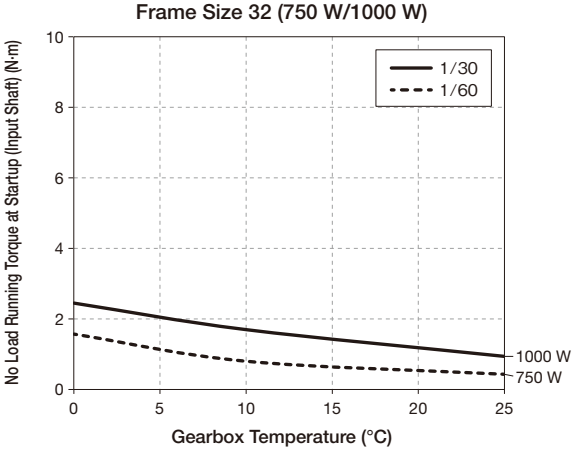
Frame Size 28 (400 W/750 W)



Frame Size 28 (1000 W/2000 W)



Frame Size 32 (750 W/1000 W)



Frame Size 32 (2000 W/3000 W)

