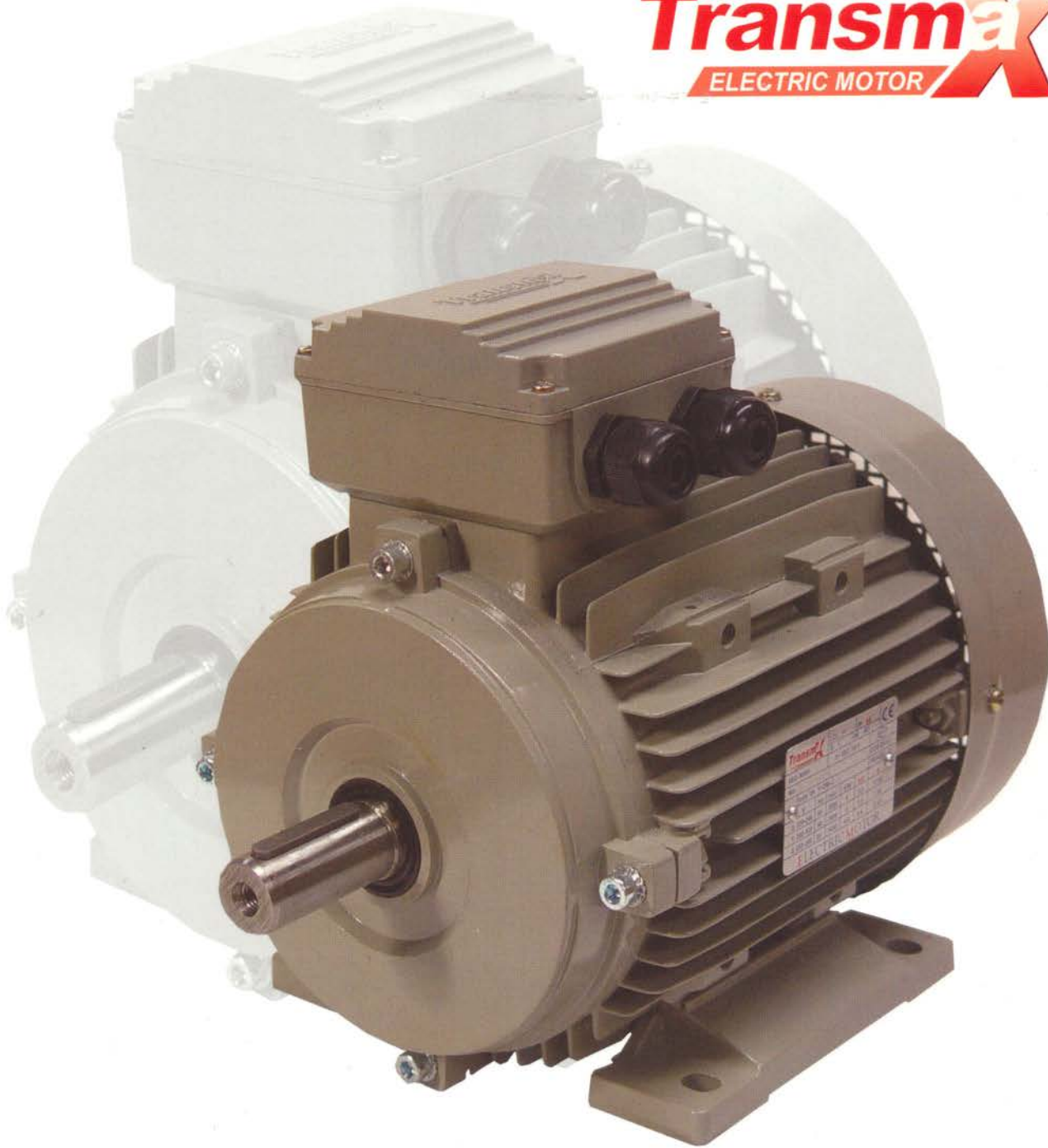




Transmax
ELECTRIC MOTOR



TA, TAB, TAJ SERIES



ELEKTRIK MOTOR

ELEKTRIK MOTOR

Elektrim
CANTONI
MOTOR
Made In Poland

DELTA
DELTA ELECTRONICS, INC.

Transmax
ELEKTRIK MOTOR

**ELEKTRIM
MOTOR**



Elektrim Motor

**YWE
SERIES**



Yuema Motor - YWE Series

**Y3
SERIES**



Yuema Motor - Y3 Series

**Y3A
SERIES**



Yuema Motor - Y3A Series

**YA
SERIES**



Yuema Motor - YA Series

**SA
SERIES**



Yuema Motor - SA Series

**MOTOR
FAN**



Fan Motor used inverter

**YU
SERIES**



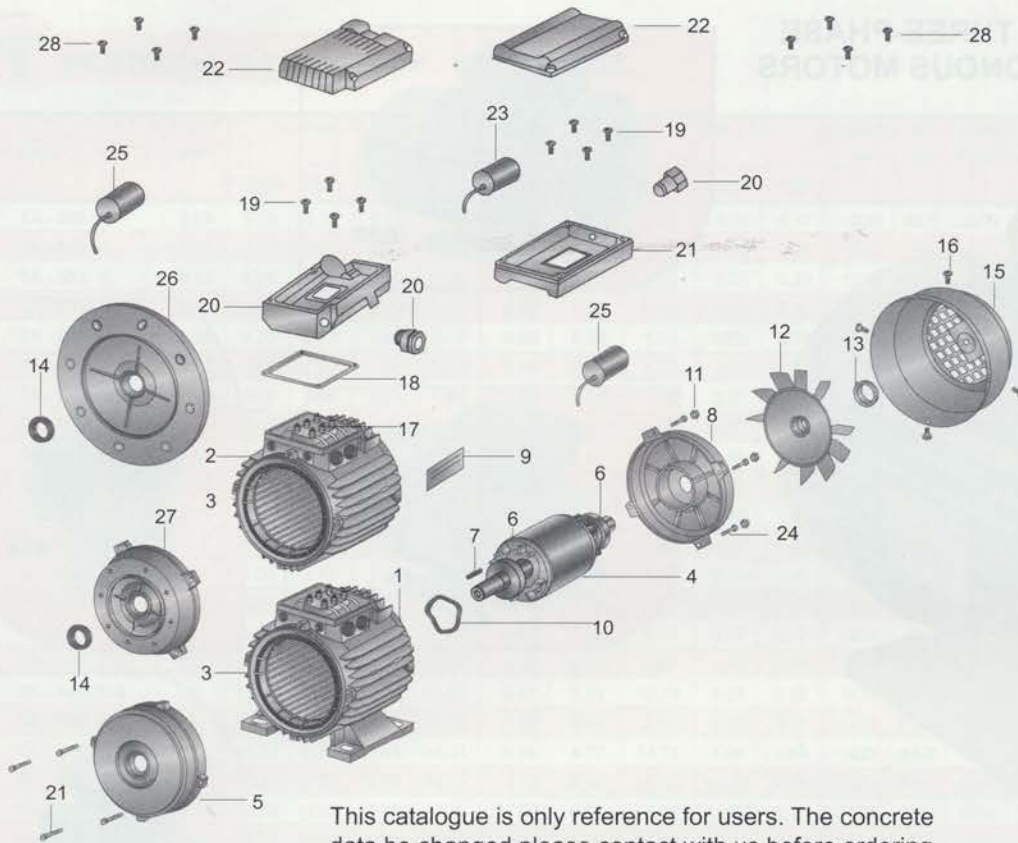
Yuema Motor - YU Series

**DELTA
INVERTER**



Inverter - VFD Series





1. Frame B3
2. Frame B5
3. Wound Stator
4. Rotor with shaft
5. Front shield
6. Bearings
7. Key
8. Back shield
9. Name plate
10. Compensation ring
11. Bolts and nuts
12. Cooling fan
13. Fan clamping bushing
14. Rubber seal ring
15. Fan cover
16. Self-threading screws for fan cover fixing
17. Terminal board complete with components
18. Terminal seal IP55
19. Screws for terminal box fixing IP56
20. Cable press
21. Terminal box IP65(base)
22. Terminal box IP65(cover)
23. Run capacitor
24. Mounting studs screws
25. Start capacitor
26. Flange B5
27. Flange B14
28. Screws for terminal

This catalogue is only reference for users. The concrete data be changed please contact with us before ordering.

MOUNTINGS AND POSITIONS

Mountings and positions for standard motors, according to IEC 60034-7, are dened by the codes mentioned in following table

	STANDARDS			FRAME SIZES 56-132		STANDARDS			FRAME SIZES 56-132
	CEI 2-14	IEC 60034-7				CEI 2-14	IEC 60034-7		
		Code I	Code II			Code I	Code II		
	B3	IM B3	IM 1001	Standard		V1	IM V1	IM 3011	Standard
	B3/B5	IM B35	IM 2001	Standard		V3	IM V3	IM 3031	Upon request
	B5	IM B5	IM 3001	Standard		V5	IM V5	IM 1011	Upon request
	B14	IM B14	IM 4001	Standard		V6	IM V6	IM 1031	Upon request
	B8	IM B8	IM 1071	Upon request		V1/V5	IMV15	IM 2011	Upon request
	B6	IM B6	IM 1051	Upon request					
	B7	IM B7	IM 1061	Upon request					

Aluminum Housing Electric Motors Bearings & Oilseals

Frame	Bearings		Oil seals		Thread of Cable Gland
	Drive end	Non-drive end	Drive end	Non-drive end	
56	6201	6201	12x22x5	12x22x5	M16
63	6201	6201	12x24x7	12x24x7	M16
71	6202	6202	15x25x7	15x25x7	M20
80	6204	6204	20x34x7	20x34x7	M20
90S	6205	6205(6204)☆☆	25x37x7	25x37x7(20x34x7)☆☆	M25
90L	6205	6205(6204)☆☆	25x37x7	25x37x7(20x34x7)☆☆	M25
100L	6206	6206	30x42x7	30x42x7	M25
112M	6306	6206	30x42x7	30x42x7	M25
132S	6308	6208	40x58x8	40x58x8	M32
132M	6308	6208	40x58x8	40x58x8	M32
160M	6309	6309	45x65x8	45x65x8	M32
160L	6309	6309	45x65x8	45x65x8	M32

☆ Other standard is also available as per request.
☆☆ The gures in bracket " () " is for the single phase motors.

TA SERIES THREE-PHASE
ASYNCRONOUS MOTORS
ALUMINIUM HOUSING



TA series aluminum housing three-phase asynchronous motors, with latest design in entirety, are made of selected quality materials and conform to the IEC standard.

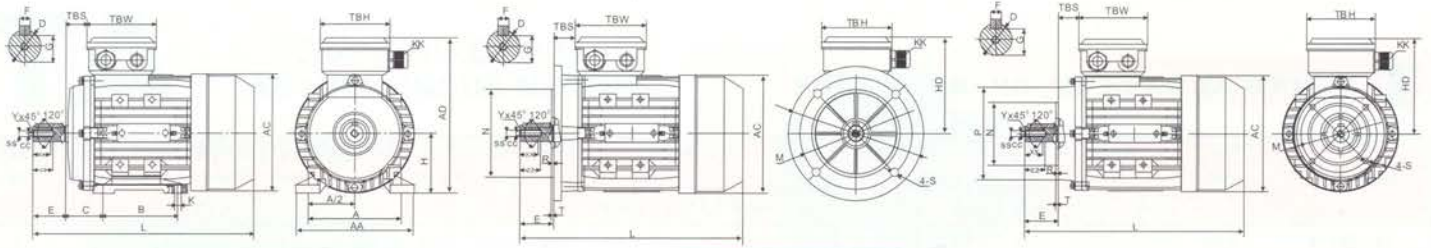
TA motors have good performance, safety and reliable operation, nice appearance, and can be maintained very conveniently, while with low noises, little vibration and at the same time light weight and simple construction. These series motors can be used for general drive.

T TECHNICAL DATA 2P @ 50HZ

Model	Power (kW)	Current (A)			Current (A)			Current (A)			Speed (r/min)	Eff. (%)	Power Factor	Tstart/Tn (Times)	Tmax/Tn (Times)	Tmax/Tn (Times)	Is/In (Times)	Noise dB(A)	W.t. (Kg)
		220V	380V	660V	230V	400V	690V	240V	415V	720V									
TA - 561- 2	0.09	0.64	0.37	0.21	0.61	0.35	0.20	0.58	0.34	0.19	2670	57	0.65	2.2	2.4	1.6	6	58	2.8
TA - 562- 2	0.12	0.74	0.43	0.25	0.70	0.40	0.23	0.67	0.39	0.22	2730	62	0.69	2.2	2.4	1.6	6	58	3.2
TA - 563- 2	0.18	1.00	0.58	0.34	0.96	0.56	0.32	0.93	0.54	0.31	2750	65	0.72	2.2	2.4	1.6	6	59	3.5
TA - 631- 2	0.18	1.00	0.58	0.33	0.95	0.55	0.32	0.92	0.53	0.31	2710	63	0.75	2.2	2.4	1.6	6	61	4
TA - 632- 2	0.25	1.29	0.75	0.43	1.23	0.71	0.41	1.19	0.69	0.40	2710	65	0.78	2.2	2.4	1.6	6	61	4.4
TA - 633- 2	0.37	1.92	1.11	0.64	1.82	1.05	0.61	1.76	1.02	0.59	2710	65	0.78	2.2	2.4	1.6	6	62	4.9
TA - 711- 2	0.37	1.76	1.02	0.59	1.67	0.97	0.56	1.61	0.93	0.54	2730	70	0.79	2.2	2.4	1.6	6	64	5.6
TA - 712- 2	0.55	2.57	1.49	0.86	2.45	1.42	0.82	2.36	1.36	0.79	2760	71	0.79	2.2	2.4	1.6	6	64	6.1
TA - 713- 2	0.75	3.33	1.93	1.11	3.18	1.83	1.06	3.06	1.77	1.02	2730	72	0.82	2.2	2.4	1.5	6	65	7
TA - 801- 2	0.75	3.21	1.86	1.07	3.06	1.77	1.02	2.94	1.70	0.98	2770	73	0.84	2.2	2.4	1.5	6	67	9.1
TA - 802- 2	1.1	4.56	2.64	1.52	4.35	2.51	1.45	4.18	2.42	1.39	2770	76.2	0.83	2.2	2.4	1.5	6	67	10.2
TA - 803- 2	1.5	6.04	3.50	2.01	5.87	3.32	1.92	5.54	3.20	1.85	2800	78.5	0.83	2.2	2.4	1.5	6	70	11.7
TA - 905- 2	1.5	5.97	3.46	1.99	5.76	3.28	1.90	5.47	3.16	1.82	2840	78.5	0.84	2.2	2.4	1.5	6	72	12
TA - 90L1- 2	2.2	8.39	4.85	2.80	8.0	4.61	2.66	7.69	4.45	2.56	2840	81	0.85	2.2	2.4	1.4	6	72	15
TA - 90L2- 2	3	11.08	6.42	3.69	10.56	6.10	3.52	10.16	5.88	3.39	2840	82.6	0.86	2.2	2.4	1.4	6	74	18.5
TA - 100L1- 2	3	10.96	6.34	3.65	10.44	6.03	3.48	10.04	5.81	3.35	2840	82.6	0.87	2.2	2.3	1.4	7	76	22.3
TA - 100L2- 2	4	14.33	8.30	4.78	13.65	7.88	4.55	13.14	7.60	4.38	2850	84.2	0.87	2.2	2.3	1.4	7.5	77	25.2
TA - 112M- 2	4	14.33	8.30	4.78	13.65	7.88	4.55	13.14	7.60	4.38	2880	84.2	0.87	2.2	2.3	1.4	7.5	77	26.7
TA - 112L- 2	5.5	19.14	11.08	6.38	18.23	10.53	6.08	17.54	10.15	5.85	2880	85.7	0.88	2.2	2.3	1.2	7.5	78	30.2
TA - 132S1- 2	5.5	19.14	11.08	6.38	18.23	10.53	6.08	17.54	10.15	5.85	2900	85.7	0.88	2	2.2	1.2	7.5	80	38.5
TA - 132S2- 2	7.5	25.71	14.88	8.57	24.49	14.14	8.16	23.57	13.63	7.86	2920	87	0.88	2	2.2	1.2	7.5	80	42.2
TA - 132M1- 2	9.2	30.86	17.85	10.28	29.87	17.25	9.96	28.26	16.34	9.42	2930	88	0.89	2	2.2	1.2	7.5	81	51.4
TA - 132M2- 2	11	36.28	21.01	12.09	34.57	19.96	11.52	33.26	19.23	11.09	2930	88.4	0.9	2	2.2	1.2	7.5	83	58.8
TA - 160M1- 2	11	36.28	21.01	12.09	34.57	19.96	11.52	33.26	19.23	11.09	2940	88.4	0.9	2	2.2	1.2	7.5	86	75
TA - 160M2- 2	15	48.39	28.01	16.13	46.09	26.61	15.36	44.35	25.62	14.78	2940	89.4	0.91	2	2.2	1.2	7.5	86	88
TA - 160L- 2	18.5	59.28	34.32	19.76	56.47	32.6	18.82	54.34	31.43	18.11	2940	90	0.91	2	2.2	1.1	7.5	86	99

TECHNICAL DATA 4P, 6P, 8P @ 50HZ

Model	Power (kW)	Current (A)			Current (A)			Current (A)			Speed (r/min)	Eff. (%)	Power Factor	Tstart/Tn (Times)	Tmax/Tn (Times)	Tmax/Tn (Times)	Is/In (Times)	Noise dB(A)	W.t. (Kg)
		220V	380V	660V	230V	400V	690V	240V	415V	720V									
TA - 561-4	0.06	0.55	0.32	0.18	0.52	0.30	0.17	0.50	0.29	0.17	1320	48.5	0.59	2.3	2.4	1.7	6	50	3
TA - 562-4	0.09	0.77	0.45	0.26	0.74	0.43	0.25	0.71	0.41	0.24	1320	50	0.61	2.3	2.4	1.7	6	50	3.3
TA - 563-4	0.12	0.96	0.56	0.32	0.92	0.53	0.31	0.88	0.51	0.29	1320	52	0.63	2.2	2.4	1.7	6	51	3.5
TA - 631-4	0.12	0.86	0.50	0.29	0.82	0.47	0.27	0.79	0.46	0.26	1350	57	0.64	2.2	2.4	1.7	6	52	3.9
TA - 632-4	0.18	1.23	0.71	0.41	1.17	0.68	0.39	1.13	0.65	0.38	1350	59	0.65	2.2	2.4	1.7	6	52	4.3
TA - 633-4	0.25	1.66	0.96	0.55	1.58	0.91	0.53	1.52	0.88	0.51	1350	60	0.66	2.2	2.4	1.7	6	54	4.8
TA - 711-4	0.25	152	0.88	0.51	1.45	0.84	0.48	1.39	0.81	0.46	1350	60	0.72	2.2	2.4	1.7	6	55	5.4
TA - 712-4	0.37	2.02	1.17	0.67	1.92	1.11	0.64	1.85	1.07	0.62	1370	65	0.74	2.2	2.4	1.7	6	55	6.2
TA - 713-4	0.55	2.92	1.69	0.97	2.78	1.60	0.93	2.67	1.55	0.89	1380	66	0.75	2.2	2.4	1.7	6	57	7.3
TA - 801-4	0.55	2.87	1.66	0.96	2.74	1.58	0.91	2.63	1.52	0.88	1370	67	0.75	2.2	2.4	1.7	6	58	9
TA - 802-4	0.75	3.50	2.03	1.17	3.34	1.93	1.11	3.21	1.86	1.07	1380	72	0.78	2.2	2.4	1.5	6	58	10
TA - 803-4	1.1	4.86	2.81	1.62	4.63	2.67	1.54	4.45	2.57	1.48	1390	76.2	0.78	2.2	2.4	1.5	6	60	12.3
TA - 90S-4	1.1	4.80	2.78	1.60	4.57	2.64	1.52	4.40	2.54	1.47	1400	76.2	0.79	2.2	2.4	1.5	6	61	12.1
TA - 90L-4	1.5	6.27	3.63	2.09	5.97	3.45	1.99	5.75	3.32	1.92	1400	78.5	0.8	2.2	2.4	1.5	6	61	14.6
TA - 90L2-4	2.2	8.91	5.16	2.97	8.45	4.90	2.83	8.17	4.72	2.72	1400	81	0.8	2.2	2.4	1.	7	63	18.3
TA - 100L1-4	2.2	8.80	5.09	2.93	8.38	4.84	2.79	8.07	4.66	2.69	1420	81	0.81	2.2	2.3	1.5	7	64	21
TA - 100L2-4	3	11.77	6.81	3.92	11.21	6.47	3.74	10.79	6.24	3.60	1420	82.6	0.81	2.2	2.3	1.5	7	64	24.7
TA - 100L3-4	4	15.20	8.80	5.07	14.18	8.36	4.83	13.94	8.06	4.65	1430	84.2	0.82	2.2	2.2	1.5	7	65	29
TA - 112M-4	4	15.02	8.70	5.01	14.31	8.26	4.77	13.77	7.96	4.59	1430	84.2	0.83	2.2	2.2	1.5	7	65	30.5
TA - 112L-4	5.5	20.29	11.75	6.76	19.33	11.16	6.44	18.60	10.76	6.20	1440	85.7	0.83	2.2	2.2	1.4	7	68	34.8
TA - 132S-4	5.5	20.05	11.61	6.68	19.1	11.03	6.37	18.38	10.63	6.13	1450	85.7	0.84	2.2	2.2	1.4	7	71	40.4
TA - 132M-4	7.5	26.62	15.41	8.87	25.35	14.64	8.45	24.40	14.11	8.13	1450	87	0.85	2.2	2.2	1.4	7	71	49.6
TA - 132L1-4	9.2	32.46	18.79	10.82	30.92	17.85	10.31	29.76	17.21	9.92	1460	87.5	0.85	2.2	2.2	1.4	7.5	74	56.6
TA - 132L2-4	10	35.08	20.31	11.69	33.42	19.3	11.14	32.16	18.60	10.72	1460	88	0.85	2.2	2.2	1.4	7.5	74	58.6
TA - 132L3-4	11	37.97	21.98	12.66	36.17	20.88	12.06	34.81	20.13	11.60	1460	88.4	0.86	2.2	2.2	1.4	7.5	74	64
TA - 160M-4	11	37.54	21.73	12.51	35.76	20.64	11.92	34.41	19.90	11.47	1460	88.4	0.87	2.2	2.2	1.4	7	75	78
TA - 160L-4	15	51.18	29.63	17.06	48.76	28.15	16.25	46.92	27.13	15.64	1460	88.4	0.87	2.2	2.2	1.4	7.5	75	98
TA - 631-6	0.09	0.92	0.53	0.31	0.88	0.51	0.29	0.85	0.49	0.28	840	42	0.61	2	2	1.5	3.5	50	4.2
TA - 632-6	0.12	1.129	0.65	0.38	1.08	0.62	0.36	1.03	0.60	0.34	850	45	0.62	2	2	1.5	3.5	50	4.8
TA - 711-6	0.18	1.28	0.74	0.43	1.22	0.70	0.41	1.17	0.68	0.39	880	56	0.66	1.6	1.7	1.5	4	52	6
TA - 712-6	0.25	1.6	0.92	0.53	1.51	0.87	0.50	1.46	0.84	0.49	900	59	0.7	2.1	2.2	1.5	4	52	6.5
TA - 713-6	0.37	2.31	1.34	0.77	2.2	1.27	0.73	2.11	1.22	0.70	890	61	0.69	2	2.1	1.5	4	54	7.2
TA - 801-6	0.37	2.24	1.30	0.75	2.13	1.23	0.71	2.05	1.19	0.68	900	62	0.7	1.9	1.9	1.5	4	56	8.2
TA - 802-6	0.55	2.99	1.73	1.00	2.85	1.65	0.95	2.74	1.59	0.91	900	67	0.72	2	2.3	1.5	4	56	9.9
TA - 803-6	0.75	4.02	2.33	1.34	3.83	2.21	1.28	3.69	2.13	1.23	900	68	0.72	2	2.3	1.5	4	58	11.3
TA - 90S-6	0.75	3.96	2.29	1.32	3.77	2.18	1.26	3.63	2.10	1.21	920	69	0.72	2.2	2.2	1.5	5.5	59	11.7
TA - 90L-6	1.1	5.49	3.18	1.83	5.23	3.02	1.74	5.03	2.91	1.68	925	72	0.73	2.2	2.2	1.3	5.5	59	15.1
TA - 100L-6	1.5	7.00	4.05	2.33	6.67	3.85	2.22	6.42	3.71	2.14	945	74	0.76	2.2	2.2	1.3	6	61	19.1
TA - 112M-6	2.2	9.74	5.64	3.25	9.28	5.36	3.09	8.93	5.16	2.98	955	78	0.76	2.2	2.2	1.3	6	64	25.4
TA - 132S-6	3	13.11	7.59	4.37	12.49	7.21	4.16	12.02	6.95	4.01	960	79	0.76	2	2	1.3	6.5	64	36.1
TA - 132M1-6	4	17.16	9.93	5.72	16.35	9.44	5.45	15.73	9.10	5.24	960	80.5	0.76	2	2	1.3	6.5	68	45
TA - 132M2-6	5.5	22.58	13.08	7.53	21.51	12.42	7.17	20.70	11.97	6.90	960	83	0.77	2	2	1.3	6.5	68	55.5
TA - 132L-6	7.5	30.07	17.41	10.02	28.65	16.54	9.55	27.57	15.94	9.19	960	85	0.77	2	2	1.3	6.5	68	60
TA - 160M-6	7.5	28.61	16.56	9.54	27.25	15.73	9.08	26.22	15.17	8.74	960	86	0.8	2	2.2	1.3	6.5	68	72
TA - 160L-6	11	41.76	24.18	13.92	39.78	22.97	13.26	38.28	22.14	12.76	960	87.5	0.79	2	2.2	1.3	6.5	73	92
TA - 711-8	0.09	0.88	0.51	0.29	0.84	0.48	0.28	0.81	0.47	0.27	680	48	0.56	1.5	1.7	1.3	3	50	6
TA - 712-8	0.12	1.05	0.61	0.35	1.00	0.58	0.33	0.96	0.55	0.32	690	51	0.59	1.6	1.7	1.3	2.7	50	6.8
TA - 801-8	0.18	1.52	0.88	0.51	1.45	0.84	0.48	1.39	0.80	0.46	680	51	0.61	1.5	1.7	1.3	2.8	52	9.9
TA - 802-8	0.25	1.92	1.11	0.64	1.83	1.06	0.61	1.76	1.02	0.59	680	56	0.61	1.6	2	1.3	2.7	52	10.9
TA - 803-8	0.37	2.45	1.42	0.82	2.33	1.35	0.78	2.24	1.30	0.75	680	63	0.63	1.6	1.8	1.3	2.8	56	14.8
TA - 90S-8	0.55	3.36	1.95	1.12	3.21	1.85	1.07	3.08	1.78	1.03	680	66	0.65	1.6	1.8	1.3	3	56	17.2
TA - 100L1-8	0.75	4.45	2.58	1.48	4.24	2.45	1.41	4.08	2.36	1.36	710	66	0.67	1.7	2.1	1.3	3.5	59	17.5
TA - 100L2-8	1.1	5.81	3.36	1.94	5.54	3.20	1.85	5.33	3.08	1.78	710	72	0.69	1.7	2.1	1.2	3.5	59	19.7
TA - 112M-8	1.5	7.82	4.53	2.61	7.45	4.30	2.48	7.17	4.15	2.39	710	74	0.68	1.8	2.1	1.2	4.2	61	25.6
TA - 132S-8	2.2	10.84	6.28	3.61	10.33	5.96	3.44	9.94	5.75	3.31	720	75	0.71	2	2	1.2	5.5	64	35.5
TA - 132M-8	3	14.01	8.11	4.67	13.34	7.70	4.45	12.84	7.43	4.28	720	77	0.73	2	2	1.2	5.5	64	45
TA - 160M1-8	4	17.97	10.41	5.99	17.12	9.89	5.71	16.48	9.53	5.49	730	80	0.73	1.9	2.1	1.2	6	68	60
TA - 160M2-8	5.5	23.36	13.52	7.79	22.25	12.85	7.42	21.41	12.38	7.14	720	83.5	0.74	2	2.2	1.2	6	68	72
TA - 160L-8	7.5	30.87	17.87	10.29	29.41	17.0	9.8	28.30	16.37	9.43	720	85	0.75	1.9	2.2	1.2	6	68	92



IMB3

IMB5

IMB14

OVERALL & INSTALLATION DIMENSIONS

B3 Overall & Installation Dimension

FRAME	H	A	B	C	D	E	F	G	K	M	AD	AC	L	Lcc	Lca	Lam	KK	TBS	TBW	TBH	SS	XX	ZZ	CC	Y
56	56	90	71	36	φ9	20	3	7.2	5.8X8.8	110	156/151	φ120	195				1-M16X1.5	14/21	88/73	88/73	M3	8	12	2.5	0.5
63	63	100	80	40	φ11	23	4	8.5	7X10	120	173/165	φ130	215	232	265	283	1-M16X1.5	14/21	94/80	94/80	M4	10	15	3.3	0.8
71	71	112	90	45	φ14	30	5	11	7X10	132	188/180	φ145	240(254)	252(267)	307	345	1-M20X1.5	20/27	94/80	94/80	M5	12	18	4.2	0.8
80	80	125	100	50	φ19	40	6	15.5	10X13	160	217	φ165	290	300	353	390	1-M20X1.5	27	105	105	M6	16	22	5	1
90S	90	140	100	56	φ24	50	8	20	10X13	175	235	φ185	310	320	367	448	1-M20X1.5	30	105	105	M8	20	25	6.8	1
90L1/L2	90	140	125	56	φ24	50	8	20	10X13	175	235	φ185	335/365	345/375	392	463	1-M20X1.5	30	105	105	M8	20	25	6.8	1
100	100	160	140	63	φ28	60	8	24	12X16	196	252	φ205	368(386)	392(410)	474	445	1-M20X1.5	26	105	105	M10	22	28	8.5	1.5
112	112	190	140	70	φ28	60	8	24	12X16	220	292	φ230	395	410	483	455	2-M25X1.5	32	112	119	M10	22	28	8.5	1.5
132S	132	216	140	89	φ38	80	10	33	12X16	252	325	φ270	436	468	553	636	2-M25X1.5	38	112	119	M12	28	34	10.2	1.5
132M/L	132	216	178	89	φ38	80	10	33	12X16	252	325	φ270	474/500	484/510	564/590	648/674	2-M25X1.5	38	112	119	M12	28	34	10.2	1.5
160M/L	160	254	210/254	108	φ42	110	12	37	15X19	290	390	φ320	640	652	705	795	2-M32X1.5	64	143	146	M16	35	42	14.2	2

B5 Overall & Installation Dimension

FRAME	B5						B5R						D	E	F	G	KK	AC	HD	L	Lcc	LccL	LCA	TBS	TBW	TBH	SS	XX	ZZ	CC	Y	
	M	N	P	T	S	R	M	N	P	T	S	R																				
56	φ100	φ80	φ120	3.0	φ7	0							φ9	20	3	7.2	1-M16X1.5	φ120	100/95	195					14/21	88/73	88/73	M3	8	12	2.5	0.5
63	φ115	φ95	φ140	3.0	φ10	0							φ11	23	4	8.5	1-M16X1.5	φ130	110/102	215	232	265	283	14/21	94/80	94/80	M4	10	15	3.3	0.8	
71	φ130	φ110	φ160	3.5	φ10	0	φ115	φ95	φ140	3.0	φ10	0	φ14	30	5	11	1-M20X1.5	φ145	117/109	240(254)	252(267)	307	345	20/27	94/80	94/80	M5	12	18	4.2	0.8	
80	φ165	φ130	φ200	3.5	φ12	0	φ130	φ110	φ160	3.5	φ10	0	φ19	40	6	15.5	1-M20X1.5	φ165	137	290	300	353	390	27	105	105	M6	16	22	5	1	
90S	φ165	φ130	φ200	3.5	φ12	0	φ130	φ110	φ160	3.5	φ12	0	φ24	50	8	20	1-M20X1.5	φ185	145	310	320	367	448	30	105	105	M8	20	25	6.8	1	
90L1/L2	φ165	φ130	φ200	3.5	φ12	0	φ130	φ110	φ160	3.5	φ12	0	φ24	50	8	20	1-M20X1.5	φ185	145	335/365	345/375	392	463	30	105	105	M8	20	25	6.8	1	
100	φ215	φ180	φ250	4.0	φ15	0	φ165	φ130	φ200	3.5	φ12	0	φ28	60	8	24	1-M20X1.5	φ205	152	368(386)	392(410)	474	445	26	105	105	M10	22	28	8.5	1.5	
112	φ215	φ180	φ250	4.0	φ15	0	φ165	φ130	φ200	3.5	φ12	0	φ28	60	8	24	2-M25X1.5	φ230	180	395	410	483	455	32	112	119	M10	22	28	8.5	1.5	
132S	φ265	φ230	φ300	4.0	φ15	0	φ215	φ180	φ250	4.0	φ15	0	φ38	80	10	33	2-M25X1.5	φ270	193	436	468	553	636	38	112	119	M12	28	34	10.2	1.5	
132M/L	φ265	φ230	φ300	4.0	φ15	0	φ215	φ180	φ250	4.0	φ15	0	φ38	80	10	33	2-M25X1.5	φ270	193	474/500	484/510	564/590	648/674	38	112	119	M12	28	34	10.2	1.5	
160M/L	φ300	φ250	φ350	5.0	φ19	0							φ42	110	12	37	2-M32X1.5	φ320	230	640	652	705	795	64	143	146	M16	35	42	14.2	2	

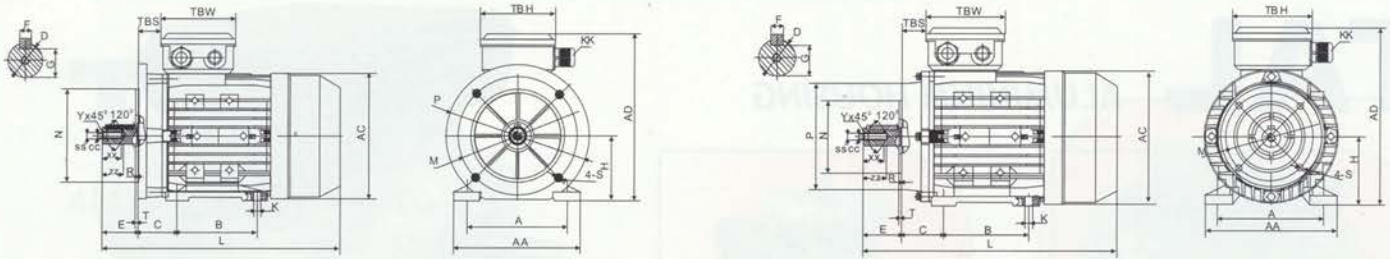
B14 Overall & Installation Dimension

FRAME	B14						B14B						D	E	F	G	KK	AC	HD	L	Lcc	LccL	LCA	TBS	TBW	TBH	SS	XX	ZZ	CC	Y	
	N	M	P	T	S	R	N	M	P	T	S	R																				
56	φ50	φ65	φ80	2.5	M5	0							φ9	20	3	7.2	1-M16X1.5	φ120	100/95	195					14/21	88/73	88/73	M3	8	12	2.5	0.5
63	φ60	φ75	φ90	2.5	M5	0	φ80	φ100	φ120	3.0	M6	0	φ11	23	4	8.5	1-M16X1.5	φ130	110/102	215	232	265	283	14/21	94/80	94/80	M4	10	15	3.3	0.8	
71	φ70	φ85	φ105	2.5	M6	0	φ95	φ115	φ140	3.0	M8	0	φ14	30	5	11	1-M20X1.5	φ145	117/109	240(254)	252(267)	307	345	20/27	94/80	94/80	M5	12	18	4.2	0.8	
80	φ80	φ100	φ120	3.0	M6	0	φ110	φ130	φ160	3.5	M8	0	φ19	40	6	15.5	1-M20X1.5	φ165	137	290	300	353	390	27	105	105	M6	16	22	5	1	
90S	φ95	φ115	φ140	3.0	M8	0	φ110	φ130	φ160	3.5	M8	0	φ24	50	8	20	1-M20X1.5	φ185	145	310	320	367	448	30	105	105	M8	20	25	6.8	1	
90L1/L2	φ95	φ115	φ140	3.0	M8	0	φ110	φ130	φ160	3.5	M8	0	φ24	50	8	20	1-M20X1.5	φ185	145	335/365	345/375	392	463	30	105	105	M8	20	25	6.8	1	
100	φ110	φ130	φ160	3.5	M8	0	φ130	φ165	φ200	3.5	M10	0	φ28	60	8	24	1-M25X1.5	φ205	152	368(386)	392(410)	474	445	26	105	105	M10	22	28	8.5	1.5	
112	φ110	φ130	φ160	3.5	M8	0	φ130	φ165	φ200	3.5	M10	0	φ28	60	8	24	2-M25X1.5	φ230	180	395	410	483	455	32	112	119	M10	22	28	8.5	1.5	
132S	φ130	φ165	φ200	3.5	M10	0	φ180	φ215	φ250	4.0	M12	0	φ38	80	10	33	2-M25X1.5	φ270	193	436	468	553	636	38	112	119	M12	28	34	10.2	1.5	
132M/L	φ130	φ165	φ200	3.5	M10	0	φ180	φ215	φ250	4.0	M12	0	φ38	80	10	33	2-M32X1.5	φ270	193	475/500	484/510	564/590	648/674	38	112	119	M12	28	34	10.2	1.5	

☆ : For Brake Motors
 ☆☆ : This frame size has two housing size the rated output is for normal (refer to the figures in the bracket " () ")

" L " size and increased output is for the bigger " L " sizes

DIMENSION



IMB35

IMB34

B35 Overall & Installation Dimension

FRAME	H	B35						B35R						A	B	C	D	E	F
		N	M	P	T	R	S	M	N	P	T	R	S						
56	56	Φ98	Φ80	Φ120	3.0	0	Φ7							90	71	36	Φ9	20	3
63	63	Φ115	Φ95	Φ140	3.0	0	Φ10							100	80	40	Φ11	23	4
71 **	71	Φ130	Φ110	Φ160	3.5	0	Φ10	Φ115	Φ95	Φ140	3.0	0	Φ10	112	90	45	Φ14	30	5
80	80	Φ165	Φ130	Φ200	3.5	0	Φ12	Φ130	Φ110	Φ160	3.5	0	Φ10	125	100	50	Φ19	40	6
90S	90	Φ165	Φ130	Φ200	3.5	0	Φ12	Φ130	Φ110	Φ160	3.5	0	Φ12	140	100	56	Φ24	50	8
90L1/L2	90	Φ165	Φ130	Φ200	3.5	0	Φ12	Φ130	Φ110	Φ160	3.5	0	Φ12	140	125	56	Φ24	50	8
100 **	100	Φ215	Φ180	Φ250	4.0	0	Φ15	Φ165	Φ130	Φ200	3.5	0	Φ12	160	140	63	Φ28	60	8
112	112	Φ215	Φ180	Φ250	4.0	0	Φ15	Φ165	Φ130	Φ200	3.5	0	Φ12	190	140	70	Φ28	60	8
132S	132	Φ265	Φ230	Φ300	4.0	0	Φ15	Φ215	Φ180	Φ250	4.0	0	Φ15	216	140	89	Φ38	80	10
132M/L	132	Φ265	Φ230	Φ300	4.0	0	Φ15	Φ215	Φ180	Φ250	4.0	0	Φ15	216	178	89	Φ38	80	10
160M/L	160	Φ300	Φ250	Φ350	5.0	0	Φ19							254	210/254	108	Φ42	110	12

FRAME	G	K	KK	M	AD	AC	L	Lcc *	LeCL*	LcA *	TBS	TBW	TBH	SS	XX	ZZ	CC	Y
56	72	5.8x5.8	1-M16X1.5	110	156/151	Φ120	195				14/21	88/73	88/73	M3	8	12	2.5	0.5
63	8.5	7x10	1-M16X1.5	120	173/165	Φ130	215	232	265	283	14/21	94/80	94/80	M4	10	15	3.3	0.8
71 **	11	7x10	1-M20X1.5	132	188/180	Φ145	240(254)	252(267)	307	345	20/27	94/80	94/80	M5	12	18	4.2	0.8
80	15.5	10x13	1-M20X1.5	160	217	Φ165	290	300	353	390	27	105	105	M6	16	22	5	1
90S	20	10x13	1-M20X1.5	175	235	Φ185	310	320	367	448	30	105	105	M8	20	25	6.8	1
90L1/L2	20	10x13	1-M20X1.5	175	235	Φ185	335/365	345/375	392	463	30	105	105	M8	20	25	6.8	1
100 **	24	10x13	1-M20X1.5	196	252	Φ205	368(386)	392(410)	474	445	26	105	105	M10	22	28	8.5	1.5
112	24	12x16	2-M25X1.5	220	292	Φ230	395	410	483	455	32	112	119	M10	22	28	8.5	1.5
132S	33	12x16	2-M25X1.5	252	325	Φ270	436	468	553	636	38	112	119	M12	28	34	10.2	1.5
132M/L	33	12x16	2-M25X1.5	252	325	Φ270	474/500	484/510	564/590	648/674	38	112	119	M12	28	34	10.2	1.5
160M/L	37	15x19	2-M32X1.5	290	390	Φ320	640	652	705	795	64	143	146	M16	35	42	14.2	2

B34 Overall & Installation Dimension

FRAME	H	A	B	C	D	E	F	G	K	KK	B34						M	N
											M	N	P	T	R	S		
56	56	90	71	36	Φ9	20	3	72	5.8x5.8	1-M16X1.5	Φ65	Φ50	Φ80	2.5	0	M5		
63	63	100	80	40	Φ11	23	4	8.5	7x10	1-M16X1.5	Φ75	Φ60	Φ90	2.5	0	M5	Φ100	Φ80
71 **	71	112	90	45	Φ14	30	5	11	7x10	1-M20X1.5	Φ85	Φ70	Φ105	2.5	0	M6	Φ115	Φ95
80	80	125	100	50	Φ19	40	6	15.5	10x13	1-M20X1.5	Φ100	Φ80	Φ120	3.0	0	M6	Φ130	Φ110
90S	90	140	100	56	Φ24	50	8	20	10x13	1-M20X1.5	Φ115	Φ95	Φ140	3.0	0	M8	Φ130	Φ110
90L1/L2	90	140	125	56	Φ24	50	8	20	10x13	1-M20X1.5	Φ115	Φ95	Φ140	3.0	0	M8	Φ130	Φ110
100 **	100	160	140	63	Φ28	60	8	24	10x13	1-M20X1.5	Φ130	Φ110	Φ160	3.5	0	M8	Φ165	Φ130
112	112	190	140	70	Φ28	60	8	24	12x16	2-M25X1.5	Φ130	Φ110	Φ160	3.5	0	M8	Φ165	Φ130
132S	132	216	140	89	Φ38	80	10	33	12x16	2-M25X1.5	Φ165	Φ130	Φ200	3.5	0	M10	Φ215	Φ180
132M/L	132	216	178	89	Φ38	80	10	33	12x16	2-M25X1.5	Φ165	Φ130	Φ200	3.5	0	M10	Φ215	Φ180

FRAME	B34B				AC	AD	AA	L	LCC *	LCCL*	LCA *	TBS	TBW	TBH	SS	XX	ZZ	CC	Y
	P	T	R	S															
56					Φ120	156/151	110	195				14/21	88/73	88/73	M3	8	12	2.5	0.5
63	F120	3.0	0	M6	Φ130	173/165	120	215	232	265	283	14/21	94/80	94/80	M4	10	15	3.3	0.8
71 **	F140	3.0	0	M8	Φ145	188/180	132	240(254)	252(267)	307	345	20/27	94/80	94/80	M5	12	18	4.2	0.8
80	F160	3.5	0	M8	Φ165	217	160	290	300	353	390	27	105	105	M6	16	22	5	1
90S	F160	3.5	0	M8	Φ185	235	175	310	320	367	448	30	105	105	M8	20	25	6.8	1
90L1/L2	F160	3.5	0	M8	Φ185	235	175	335/365	345/375	392	463	30	105	105	M8	20	25	6.8	1
100 **	F200	3.5	0	M10	Φ205	252	196	368(386)	392(410)	474	445	26	105	105	M10	22	28	8.5	1.5
112	F200	3.5	0	M10	Φ230	292	220	395	410	483	455	32	112	119	M10	22	28	8.5	1.5
132S	F250	4.0	0	M12	Φ270	325	252	436	468	553	636	38	112	119	M12	28	34	10.2	1.5
132M/L	F250	4.0	0	M12	Φ270	325	252	474/500	484/510	564/590	648/674	38	112	119	M12	28	34	10.2	1.5

** : This frame size has two housing sizes, the rated output is for normal (refer to the figures in the bracket " () ")

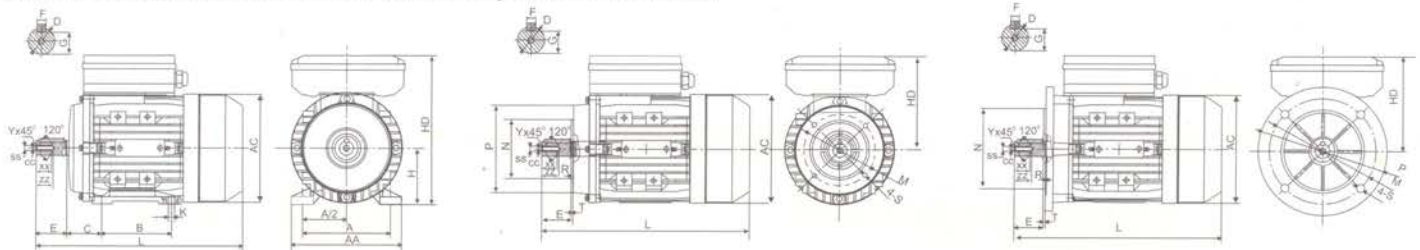
" L " size and increased output is for the bigger " L " sizes

TAL ALUMINIUM HOUSING



TAL series aluminum housing single-phase dual-capacitor asynchronous motors, with latest design in entirety, are made of selected quality materials and conform to the IEC standard.

TAL motors have good performance, safety and reliable operation, nice appearance and, can be maintained very conveniently, while with low noises, lift vibrator and at the same time of lightweight and simple construction. The composite performance is good, the multiple of starting torque is 1.8-2.5. These series motors are suitable for the occasion where the requirements of big starting torque and high over load, such as air-compressors, pumps, fans, medical apparatus and instruments, and many other small machines



IMB3

IMB14

IMB5

Frame Size	MOUNTING DIMENSIONS															OVERALL DIMENSIONS					SHAFTSCREW DIMENSIONS										
	IMB14										IMB5																				
	A	B	C	D	E	F	G	H	K	M	N	P	R	S	T	M	N	P	R	S	T	AA	AC	AD	HD	L	SS	XX	ZZ	CC	Y
63	100	80	40	11	23	4	8.5	63	7X10	75	60	90	0	M5	2.5	115	95	140	0	Φ10	3.0	120	130	179	116	212	M4	10	15	3.3	0.8
71	112	90	45	14	30	5	11	71	7X10	185	70	105	0	M6	2.5	130	110	160	0	Φ10	3.5	132	145	194	123	255	M5	12	18	4.2	0.8
80	125	100	50	19	40	6	15.5	80	10X13	100	80	120	0	M6	3.0	165	130	200	0	Φ12	3.5	157	165	223	143	290	M6	16	22	5	1
90S	140	100	56	24	50	8	20	90	10X13	115	95	140	0	M8	3.0	165	130	200	0	Φ12	3.5	172	185	240	150	335	M8	20	25	6.8	1
90L	140	125	56	24	50	8	20	90	10X13	115	95	140	0	M8	3.0	165	130	200	0	Φ12	3.5	172	185	240	150	365	M8	20	25	6.8	1
100L	160	140	63	28	60	8	24	100	12X15	130	110	160	0	M8	3.5	215	180	250	0	Φ15	4.0	196	205	260	160	445	M10	22	28	8.5	1.5
112M	190	140	70	28	60	8	24	112	12X15	130	110	160	0	M8	3.5	215	180	250	0	Φ15	4.0	222	230	295	183	453	M10	22	28	8.5	1.5

Model	Power (kW)	Current (A)	Speed (r/min)	Eff. (%)	Power Factor	Rated Torque (N M)	Tstart/Tn (Times)	Tmax/Tn (Times)	Starting Current (A)	Run Capacitor (μ f/V)	Start Capacitor (μ f/V)	Noise dB(A)	W.t. (Kg)
TAL - 631-2	0.18	1.31	2750	65	0.92	0.63	2.5	1.7	8	8 μ F/450V	40 μ F/250V	70	4.2
TAL - 632-2	0.25	1.76	2760	67	0.92	0.87	2.5	1.7	10	10 μ F/450V	50 μ F/250V	73	4.7
TAL - 711-2	0.37	2.42	2780	70	0.95	1.27	2.5	1.7	15	12 μ F/450V	75 μ F/250V	75	5.3
TAL - 712-2	0.55	3.45	2790	73	0.95	1.88	2.5	1.7	20	16 μ F/450V	100 μ F/250V	76	7.4
TAL - 801-2	0.75	4.54	2800	74	0.97	2.59	2.5	1.7	30	20 μ F/450V	100 μ F/250V	76	9.5
TAL - 802-2	1.1	6.45	2810	76	0.97	3.74	2.5	1.7	40	25 μ F/450V	150 μ F/250V	79	11.2
TAL - 90S-2	1.5	8.62	2810	78	0.97	5.10	2.5	1.8	55	40 μ F/450V	150 μ F/250V	84	14
TAL - 90L-2	2.2	12.5	2810	79	0.97	7.48	2.2	1.8	75	50 μ F/450V	250 μ F/250V	84	17
TAL - 100L-2	3.0	16.6	2830	80	0.98	10.12	2.2	2.0	95	60 μ F/450V	400 μ F/300V	88	25
TAL - 112M-2	3.7	20.5	2850	80	0.98	12.40	2.0	2.0	120	60 μ F/450V	500 μ F/300V	90	30.5
TAL - 631-4	0.12	1.04	1350	55	0.91	0.85	2.5	1.6	6	10 μ F/450V	40 μ F/250V	64	4
TAL - 632-4	0.18	1.54	1360	56	0.91	1.26	2.5	1.6	8.5	12 μ F/450V	40 μ F/250V	64	4.8
TAL - 711-4	0.25	1.94	1380	61	0.92	1.73	2.5	1.6	10	14 μ F/450V	50 μ F/250V	66	5.9
TAL - 712-4	0.37	2.80	1380	62.5	0.92	2.56	2.5	1.5	15	16 μ F/450V	75 μ F/250V	68	6.9
TAL - 801-4	0.55	3.80	1400	67	0.94	3.75	2.5	1.7	20	20 μ F/450V	100 μ F/250V	71	9.6
TAL - 802-4	0.75	4.75	1410	73	0.94	5.08	2.5	1.7	30	25 μ F/450V	150 μ F/250V	71	10.8
TAL - 90S-4	1.1	6.76	1410	74.5	0.95	7.45	2.2	1.8	40	30 μ F/450V	150 μ F/250V	74	13.5
TAL - 90L-4	1.5	9.03	1420	76	0.95	10.09	2.2	1.8	55	40 μ F/450V	200 μ F/250V	79	16.5
TAL - 100L1-4	2.2	12.6	1430	78	0.97	14.69	2.2	1.8	75	50 μ F/450V	300 μ F/250V	79	24
TAL - 100L2-4	3	17.0	1440	79	0.97	19.90	2.2	1.8	95	60 μ F/450V	400 μ F/250V	83	30
TAL - 112M-4	3.7	20.7	1440	80	0.97	24.54	2.0	2.0	120	60 μ F/450V	500 μ F/250V	86	36

TAB

ALUMINIUM HOUSING

ASYNCHRONOUS THREE-PHASE BRAKE MOTORS
WITH SQUIRREL CAGE ROTOR
DIRECT CURRENT BRAKE



TAB series -enclosed construction externally ventilated -sizes 63 – 160

The brake-motors of the **TAB** series result from coupling an asynchronous three-phase motor and an electromagnetic D.C. brake unit. Due to their reliability and operating safety, as well as their quick braking time (connection & disconnection time = 5-80 milliseconds) they are suitable for a great variety of applications. as:

- Braking of loads or torques on driving shaft.
- Braking of rotating masses to reduce any lost-time.
- Braking operations to increase the set-up precision.
- Braking of machine parts, according to safety rules.

Please refer to the **TA** motor overall dimensions

T **ECHNICAL FEATURES**

2 poles-3000rpm-50Hz

Brake motors have a $\pm 6\%$ tolerance on the supply voltage

Model	Power (KW)	Speed (r/min)	Eff. N	Power factor	Rated Current (A)			Tstart/Tn (Times)	Tmax/Tn (Times)	Tmin/Tn (Times)	Is/In	Noise dB(A)
					230V	400V	690V					
TAB - 631- 2	0.18	2710	63	0.75	0.95	0.55	0.32	2.2	2.4	1.6	6	61
TAB - 632- 2	0.25	2710	65	0.78	1.23	0.71	0.41	2.2	2.4	1.6	6	61
TAB - 633- 2	0.37	2710	65	0.78	1.82	1.05	0.61	2.2	2.4	1.6	6	62
TAB - 711- 2	0.37	2730	70	0.79	1.67	0.97	0.56	2.2	2.4	1.6	6	64
TAB - 712- 2	0.55	2760	71	0.79	2.45	1.42	0.82	2.2	2.4	1.6	6	64
TAB - 713- 2	0.75	2730	72	0.82	3.18	1.83	1.06	2.2	2.4	1.5	6	65
TAB - 801- 2	0.75	2770	73	0.84	3.06	1.77	1.02	2.2	2.4	1.5	6	67
TAB - 802- 2	1.1	2770	76.2	0.83	4.35	2.51	1.45	2.2	2.4	1.5	6	67
TAB - 803- 2	1.5	2800	78.5	0.83	5.87	3.32	1.92	2.2	2.4	1.5	6	70
TAB - 90S- 2	1.5	2840	78.5	0.84	5.76	3.28	1.90	2.2	2.4	1.5	6	72
TAB - 90L1- 2	2.2	2840	81	0.85	8.0	4.61	2.66	2.2	2.4	1.4	6	72
TAB - 90L2- 2	3	2840	82.6	0.86	10.56	6.10	3.52	2.2	2.4	1.4	6	74
TAB - 100L1- 2	3	2840	82.6	0.87	10.44	6.03	3.48	2.2	2.3	1.4	7	76
TAB - 100L2- 2	4	2850	84.2	0.87	13.65	7.88	4.55	2.2	2.3	1.4	7.5	77
TAB - 112M- 2	4	2880	84.2	0.87	13.65	7.88	4.55	2.2	2.3	1.4	7.5	77
TAB - 112L- 2	5.5	2880	85.7	0.88	18.23	10.53	6.08	2.2	2.3	1.2	7.5	78
TAB - 132S1- 2	5.5	2900	85.7	0.88	18.23	10.53	6.08	2	2.2	1.2	7.5	80
TAB - 132S2- 2	7.5	2920	87	0.88	24.49	14.14	8.16	2	2.2	1.2	7.5	80
TAB - 132M1- 2	9.2	2930	88	0.89	29.87	17.25	9.96	2	2.2	1.2	7.5	81
TAB - 132M2- 2	11	2930	88.4	0.9	34.57	19.96	11.52	2	2.2	1.2	7.5	83
TAB - 160M1- 2	11	2940	88.4	0.9	34.57	19.96	11.52	2	2.2	1.2	7.5	86
TAB - 160M2- 2	15	2940	89.4	0.91	46.09	26.61	15.36	2	2.2	1.2	7.5	86
TAB - 160L- 2	18.5	2940	90	0.91	56.47	32.6	18.82	2	2.2	1.1	7.5	86

Type	Brake Type K ^C	Brake torque Nm	Brake Rated Power W	J brake Pd ² kgm ²	No.of Starts/Hr. Under no load	Delayed Cut-in Time * Msec.	Quick Cut-in Time Msec.	Cut out Time Msec.	Noise dB(A)
TAB 63	K1	5	15	0.00005	3000	45	20	10	62
TAB 71	K2	12	20	0.00014	3000	50	30	15	64
TAB 80	K3	16	25	0.00021	1300	55	30	15	67
TAB 90S	K4	20	30	0.00039	1100	65	40	15	72
● TAB 90S	K4 D	40	30	0.00078	1100	65	40	15	72
TAB 90L	K4	20	30	0.00039	1100	65	40	15	72
● TAB 90L	K4 D	40	30	0.00078	1100	65	40	15	72
TAB 100L	K5	40	45	0.00104	900	75	45	20	76
● TAB 100L	K6	60	50	0.00135	900	180	85	25	76
TAB 112 MT	K5	40	45	0.00104	880	75	45	20	77
TAB 112M	K6	60	50	0.00135	880	180	85	25	78
TAB 132S	K7	90	55	0.00219	480	200	95	50	80
● TAB 132S	K7 D	180	55	0.00438	480	200	95	50	80
TAB 132M	K7	90	55	0.00219	450	200	95	50	80
● TAB 132M	K7 D	180	55	0.00438	480	200	95	50	80
TAB 160MT	K7 D	180	55	0.00438	350	200	95	50	86
TAB 160L	K8	200	60	0.00408	350	210	100	60	86
● TAB 160L	K8 D	400	60	0.00816	350	210	100	60	86

● Motor with increased braking torque on request

* On request, delayed brake cut in time for lifting equipments, We suggest double disk brake D for lifting equipments.

TECHNICAL FEATURES

4 poles - 1500 rpm- 50Hz

Brake motors have a ± 6% tolerance on the supply voltage

Model	Power (KW)	Speed (r/min)	Eff. (%)	Power factor	Rated Current (A)			Tstar tan (Times)	Tmaxa n (Times)	Tmin/Tn (Times)	Is/In	Noise dB(A)
					230V	400V	690V					
TAB - 631- 4	0.12	1350	57	0.64	0.82	0.47	0.27	2.2	2.4	1.7	6	52
TAB - 632- 4	0.18	1350	59	0.65	1.17	0.68	0.39	2.2	2.4	1.7	6	52
TAB - 633- 4	0.25	1350	60	0.66	1.58	0.91	0.53	2.2	2.4	1.7	6	54
TAB - 711- 4	0.25	1350	60	0.72	1.45	0.84	0.48	2.2	2.4	1.7	6	55
TAB - 712- 4	0.37	1370	65	0.74	1.92	1.11	0.64	2.2	2.4	1.7	6	55
TAB - 713- 4	0.55	1380	66	0.75	2.78	1.60	0.93	2.2	2.4	1.7	6	57
TAB - 801- 4	0.55	1370	67	0.75	2.74	1.58	0.91	2.2	2.4	1.7	6	58
TAB - 802- 4	0.75	1380	72	0.78	3.34	1.93	1.11	2.2	2.4	1.6	6	58
TAB - 803- 4	1.1	1390	76.2	0.78	4.63	2.67	1.54	2.2	2.4	1.6	6	60
TAB - 90S- 4	1.1	1400	76.2	0.79	4.57	2.64	1.52	2.2	2.4	1.6	6	61
TAB - 90L- 4	1.5	1400	78.5	0.8	5.97	3.45	1.99	2.2	2.4	1.6	6	61
TAB - 90L2- 4	2.2	1400	81	0.8	8.45	4.90	2.83	2.2	2.4	1.5	7	63
TAB - 100L1- 4	2.2	1420	81	0.81	8.38	4.84	2.79	2.2	2.3	1.5	7	64
TAB - 100L2- 4	3	1420	82.6	0.81	11.21	6.47	3.74	2.2	2.3	1.5	7	64
TAB - 100L3- 4	4	1430	84.2	0.82	14.18	8.36	4.83	2.2	2.3	1.5	7	65
TAB - 112M- 4	4	1430	84.2	0.83	14.31	8.26	4.77	2.2	2.2	1.5	7	65
TAB - 112L- 4	5.5	1440	85.7	0.83	19.33	11.16	6.44	2.2	2.2	1.4	7	68
TAB - 132S- 4	5.5	1450	85.7	0.84	19.1	11.03	6.37	2.2	2.2	1.4	7	71
TAB - 132M- 4	7.5	1450	87	0.85	25.35	14.64	8.45	2.2	2.2	1.4	7	71
TAB - 132L1- 4	9.2	1460	87.5	0.85	30.92	17.85	10.31	2.2	2.2	1.4	7.5	74
TAB - 132L2- 4	10	1460	88	0.85	33.42	19.3	11.14	2.2	2.2	1.4	7.5	74
TAB - 132L3- 4	11	1460	88.4	0.86	36.17	20.88	12.06	2.2	2.2	1.4	7.5	74
TAB - 160M- 4	11	1460	88.4	0.87	35.76	20.64	11.92	2.2	2.2	1.4	7	75
TAB - 160L- 4	15	1460	88.4	0.87	48.76	28.15	16.25	2.2	2.2	1.4	7.5	75

Type	Brake Type k	Brake torque N m	Brake Rated Power W	J brake Pd ² kgm ²	No.of Starts/Hr. Under no load	Delayed Cut-in Time* Msec.	Quick Cut-in Time Msec.	Cut out Time Msec.	Noise dB(A)
TAB 63	K1	5	15	0.00005	3000	45	20	10	52
TAB 71	K2	12	20	0.00014	3000	50	30	15	55
TAB 80	K3	16	25	0.00021	1300	55	30	15	58
TAB 90S	K4	20	30	0.00039	1100	65	40	15	61
● TAB 90S	K4 D	40	30	0.00078	1100	65	40	15	61
TAB 90L	K4	20	30	0.00039	1100	65	40	15	63
● TAB 90L	K4 D	40	30	0.00078	1100	65	40	15	63
TAB 100L	K5	40	45	0.00104	900	75	45	20	64
TAB 100L	K6	60	50	0.00135	900	180	85	25	65
TAB 112MT	K5	40	45	0.00104	880	75	45	20	65
TAB 112 M	K6	60	50	0.00135	880	180	85	25	65
TAB 132S	K7	90	55	0.00219	480	200	95	50	71
● TAB 132S	K7 D	180	55	0.00438	480	200	95	50	71
TAB 132M	K7	90	55	0.00219	450	200	95	50	71
● TAB 132M	K7 D	180	55	0.00438	480	200	95	50	71
TAB 160MT	K7 D	180	55	0.00438	350	200	95	50	75
TAB 160L	K8	200	60	0.00408	350	210	100	60	75
● TAB 160L	K8 D	400	60	0.00816	350	210	100	60	75

● Motor with increased braking torque on request

* On request, delayed brake cut in time for lifting equipments, We suggest double disk brake D for lifting equipments.

T **ECHNICAL FEATURES**

6 poles - 1000 rpm- 50Hz

Brake motors have a ± 6% tolerance on the supply voltage

Model	Power (KW)	Speed (r/min)	Eff. (%)	Power factor	Rated Current (A)			Tstar tan (Times)	Tmaxan (Times)	Tminan (Times)	is/in	Noise dB(A)
					230V	400V	690V					
TAB - 631- 6	0.09	840	42	0.61	0.88	0.51	0.29	2	2	1.5	3.5	50
TAB - 632- 6	0.12	850	45	0.62	1.08	0.62	0.36	2	2	1.5	3.5	50
TAB - 711- 6	0.18	880	56	0.66	1.22	0.70	0.41	1.6	1.7	1.5	4	52
TAB - 712- 6	0.25	900	59	0.7	1.51	0.87	0.50	2.1	2.2	1.5	4	52
TAB - 713- 6	0.37	890	61	0.69	2.2	1.27	0.73	2	2.1	1.5	4	54
TAB - 801- 6	0.37	900	62	0.7	2.13	1.23	0.71	1.9	1.9	1.5	4	56
TAB - 802- 6	0.55	900	67	0.72	2.85	1.65	0.95	2	2.3	1.5	4	56
TAB - 803- 6	0.75	900	68	0.72	3.83	2.21	1.28	2	2.3	1.5	4	58
TAB - 905- 6	0.75	920	69	0.72	3.77	2.18	1.26	2.2	2.2	1.5	5.5	59
TAB - 90L- 6	1.1	925	72	0.73	5.23	3.02	1.74	2.2	2.2	1.3	5.5	59
TAB - 100L- 6	1.5	945	74	0.76	6.67	3.85	2.22	2.2	2.2	1.3	6	61
TAB - 112M- 6	2.2	955	78	0.76	9.28	5.36	3.09	2.2	2.2	1.3	6	64
TAB - 132S- 6	3	960	79	0.76	12.49	7.21	4.16	2	2	1.3	6.5	64
TAB - 132M1- 6	4	960	80.5	0.76	16.35	9.44	5.45	2	2	1.3	6.5	68
TAB - 132M2- 6	5.5	960	83	0.77	21.51	12.42	7.17	2	2	1.3	6.5	68
TAB - 132L- 6	7.5	960	85	0.77	28.65	16.54	9.55	2	2	1.3	6.5	68
TAB - 160M- 6	7.5	960	86	0.8	27.25	15.73	9.08	2	2.2	1.3	6.5	68
TAB - 160L- 6	11	960	87.5	0.79	39.78	22.97	13.26	2	2.2	1.2	6.5	73

Type	Brake Type k	Brake torque N Nm	Brake Rated Power W	J brake Pd ² kgm ²	No.of Starts/Hr. Under no load	Delayed Cut-in Time * Msec.	Quick Cut-in Time Msec.	Cut out Time Msec.	Noise dB(A)
TAB 63	K1	5	15	0.00005	3000	45	20	10	50
TAB 71	K2	12	20	0.00014	3000	50	30	15	52
TAB 80	K3	16	25	0.00021	1300	55	30	15	56
TAB 905	K4	20	30	0.00039	1100	65	40	15	59
● TAB 905	K4 D	40	30	0.00078	1100	65	40	15	59
TAB 90 L	K4	20	30	0.00039	1100	65	40	15	59
● TAB 90 L	K4 D	40	30	0.00078	1100	65	40	15	59
TAB 100 L	K5	40	45	0.00104	900	75	45	20	61
● TAB 100 L	K6	60	50	0.00135	900	180	85	25	61
TAB 112MT	K5	40	45	0.00104	880	75	45	20	64
TAB112M	K6	60	50	0.00135	880	180	85	25	64
TAB 132 S	K7	90	55	0.00219	480	200	95	50	64
● TAB 132 S	K7 D	180	55	0.00438	480	200	95	50	64
TAB 132 M	K7	90	55	0.00219	450	200	95	50	68
● TAB 132 M	K7 D	180	55	0.00438	480	200	95	50	68
TAB 160 MT	K7 D	180	55	0.00438	350	200	95	50	68
TAB 160 L	K8	200	60	0.00408	350	210	100	60	73
● TAB 160 L	K8 D	400	60	0.00816	350	210	100	60	73

● Motor with increased braking torque on request

* On request, delayed brake cut in time for lifting equipments, We suggest double disk brake D for lifting equipments.

TECHNICAL FEATURES

8 poles - 750 rpm- 50Hz

Brake motors have a $\pm 6\%$ tolerance on the supply voltage

Model	Power (KW)	Speed (r/min)	Eff. (%)	Power factor	Rated Current (A)			Tstart/Tn (Times)	Tmaxi/Tn (Times)	Tmin/n (Times)	s Is/In	Noise dB(A)
					230V	400V	690V					
TAB - 711- 8	0.09	680	48	0.56	0.84	0.48	0.28	1.5	1.7	1.3	3	50
TAB - 712- 8	0.12	690	51	0.59	1.00	0.58	0.33	1.6	1.7	1.3	2.7	50
TAB - 801- 8	0.18	680	51	0.61	1.45	0.84	0.48	1.5	1.7	1.3	2.8	52
TAB - 802- 8	0.25	680	56	0.61	1.83	1.06	0.61	1.6	2	1.3	2.7	52
TAB - 905- 8	0.37	680	63	0.63	2.33	1.35	0.78	1.6	1.8	1.3	2.8	56
TAB - 90L- 8	0.55	680	66	0.65	3.21	1.85	1.07	1.6	1.8	1.3	3	56
TAB - 100L1- 8	0.75	710	66	0.67	4.24	2.45	1.41	1.7	2.1	1.3	3.5	59
TAB - 100L2- 8	1.1	710	72	0.69	5.54	3.20	1.85	1.7	2.1	1.2	3.5	59
TAB - 112M- 8	1.5	710	74	0.68	7.45	4.30	2.48	1.8	2.1	1.2	4.2	61
TAB - 1325- 8	2.2	720	75	0.71	10.33	5.96	3.44	2	2	1.2	5.5	64
TAB - 132M- 8	3	720	77	0.73	13.34	7.70	4.45	2	2	1.2	5.5	64
TAB - 160M1- 8	4	730	80	0.73	17.12	9.89	5.71	1.9	2.1	1.2	6	68
TAB - 160M2- 8	5.5	720	83.5	0.74	22.25	12.85	7.42	2	2.2	1.2	6	68
TAB - 160L- 8	7.5	720	85	0.75	29.41	17.0	9.8	1.9	2.2	1.2	6	68

Type	Brake Type k	Brake torque N m	Brake Rated Power W	J brake Pd ² kgm ²	No. of Starts/Hr. Under no load	Delayed Cut-in Time* Msec.	Quick Cut-in Time Msec.	Cut out Time Msec.	Noise dB(A)
TAB 63	K1	5	15	0.00005	3000	45	20	10	50
TAB 71	K2	12	20	0.00014	3000	50	30	15	50
TAB 80	K3	16	25	0.00021	1300	55	30	15	52
TAB 90 S	K4	20	30	0.00039	1100	65	40	15	56
● TAB 90 S	K4 D	40	30	0.00078	1100	65	40	15	56
TAB 90 L	K4	20	30	0.00039	1100	65	40	15	56
● TAB 90 L	K4 D	40	30	0.00078	1100	65	40	15	56
TAB 100 L	K5	40	45	0.00104	900	75	45	20	59
● TAB 100 L	K6	60	50	0.00135	900	180	85	25	59
TAB 112 MT	K5	40	45	0.00104	880	75	45	20	61
TAB 112 M	K6	60	50	0.00135	880	180	85	25	61
TAB 132 S	K7	90	55	0.00219	480	200	95	50	64
● TAB 132 S	K7 D	180	55	0.00438	480	200	95	50	64
TAB 132 M	K7	90	55	0.00219	450	200	95	50	64
TAB 132 M	K7 D	180	55	0.00438	480	200	95	50	64
TAB 160 MT	K7 D	180	55	0.00438	350	200	95	50	68
TAB 160 L	K8	200	60	0.00408	350	210	100	60	68
● TAB 160 L	K8 D	400	60	0.00816	350	210	100	60	68

● Motor with increased braking torque on request

★ On request, delayed brake cut in time for lifting equipments, We suggest double disk brake D for lifting equipments.

ELECTROMAGNETIC DIRECT CURRENT
BRAKE SERIES TAB

OPERATING PRINCIPLE

The direct current brake is fed by means of an electronic circuit with diode bridge (rectifier) situated inside the terminal-box.

- (5) When feeding the electromagnet
 - (4) The movable anchor is attracted towards the same,
 - (9) thus loading the braking torque springs,
 - (2) And allowing the disk
 - (6) Equipped with friction packing and fitted on the groove hub
 - (1) To turn solitary the motor shaft,
 - (7) By means of a key
 - (4) By interrupting the feeding, the movable anchor
 - (9) Pushed by the braking torque springs
 - (2) Exerts a pressure upon the friction surface of the disk
- Thus causing its stopping.

ADJUSTMENT OF THE AIR GAP.

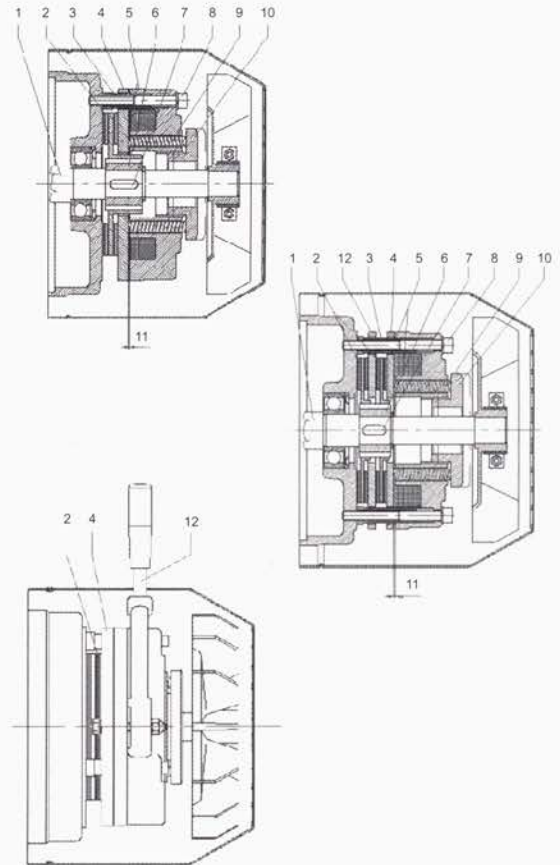
- (11) The air gap
- (5) Is the distance between the electromagnet
- (9) And the movable anchor
- (2) The air gap has to be regularly checked, since due to the wear of the friction packing It tends to increase.
- (3) Act no the brake adjusters
- (8) After having unloosen the screws To bring the air gap to the required value.
- (10) Act on the ring nut
- (9) which acts on the braking torque springs to adjust the braking torque.

Pls. contact our technical department for information on the air gap adjustm

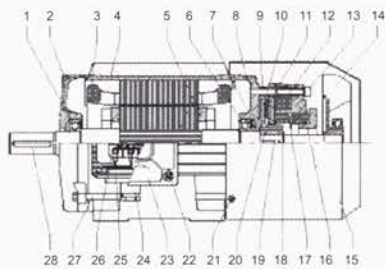
HANDRELEASE WITH LEVER

Upon request a hand release with lever can be supplied.

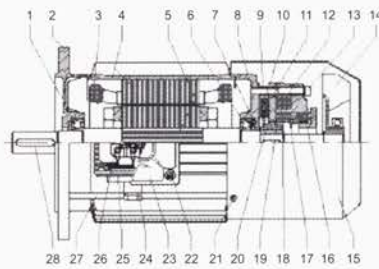
- (12) In case of a current cutoff, acting on the lever
- (4) The release, connected to the movable anchor
- (2) overcomes the springs pressure, thus detaching the movable anchor from the disc friction packing allowing the shaft to turn.



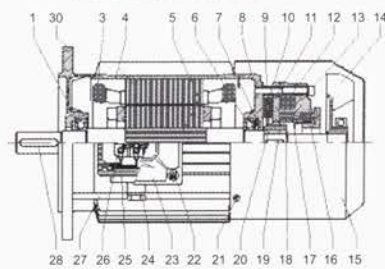
TAB Brake motor B3 63 ~ 112



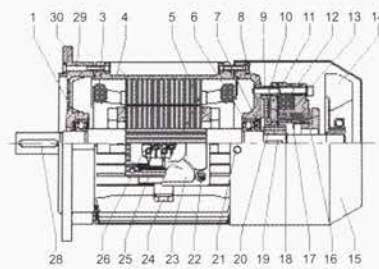
TAB Brake motor B3 132 ~ 160



TAB Brake motor B5 63 ~ 112



TAB Brake motor B5 132 ~ 160



SPARE PARTS

- 1. Front bearing
- 2. Front shield
- 3. Winding
- 4. Frame with stator package
- 5. Shaft with rotor
- 6. Rear bearing
- 7. Spring
- 8. Rear shield
- 9. Adjusting bush
- 10. Brake disc
- 11. Moving anchor
- 12. Electromagnet coil with diode
- 13. Fixing screws for brake
- 14. Cooling fan
- 15. Fan hood
- 16. Ring nut
- 17. Spring
- 18. See gearing
- 19. Key brake side
- 20. Toothed pinion
- 21. Fixing screw for fan hood
- 22. Fixing crew for terminal-box
- 23. Terminal-box
- 24. able-holder
- 25. Packing
- 26. Terminal-block
- 27. Tie-bolt
- 28. Coupling side key
- 29. Fixing screw for shield
- 30. Flange shield

ASYNCHRONOUS THREE-PHASE BRAKE MOTORS with direct current 63-160 Type C FECCL Frame B3 Sizes 63-160, Type FC FECCLFrame B5 Sizes 63-160 Enclosed construction -External ventilation

NEW PRODUCT



TKM SERIES
INTERCHANGEABLE
MOTOVARIO SERIES



TKB SERIES
INTERCHANGEABLE
BONFIGLIOLI SERIES

Type	Stage	Ratio	Motor size up to	Motor power up to	Torque MAX (Nm)	Worm gear units type
TKM 27B	2	7.73 ~ 58.36	90	1.5	140	YMRV050
TKM 27C	3	52.36 ~ 291.79	90	1.5	140	YMRV050
TKM 37B	2	7.60 ~ 60.50	90	1.5	200	YMRV063
TKM 37C	3	52.48 ~ 302.52	90	1.5	200	YMRV063
TKM 47B	2	7.48 ~ 59.71	100 - 112	4	400	YMRV075
TKM 47C	3	49.18 ~ 298.57	100 - 112	4	400	YMRV075
TKM 57B	2	7.48 ~ 59.04	100 - 112	5.5	600	YMRV090
TKM 57C	3	49.18 ~ 295.18	100 - 112	5.5	600	YMRV090
TKB 37B	2	7.60 ~ 60.50	90	1.5	200	W63
TKB 37C	3	52.48 ~ 302.52	90	1.5	200	W63
TKB 47B	2	7.48 ~ 59.71	100 - 112	4	400	W75
TKB 47C	3	49.18 ~ 298.57	100 - 112	4	400	W75
TKB 57B	2	7.48 ~ 59.04	100 - 112	5.5	600	W86
TKB 57C	3	49.18 ~ 295.18	100 - 112	5.5	600	W86

DESIGN FEATURES :

1. DRIVEN BY BEVEL GEAR, HAS BIG RATIO.
2. HIGH EFFICIENCY, ENERGY SAVING AND ENVIRONMENTAL PROTECTION
3. ALUMINIUM CASTING, LIGHT IN WEIGHT
4. THE MOUNTING OF TKM SERIES ARE COMPATIBLE WITH MOTOVARIO SERIES
5. THE MOUNTING OF TKB SERIES ARE COMPATIBLE WITH BONFIGLIOLI SERIES
6. MODULAR AND MULTISTRUCTURE CAN MEET THE DEMAND OF VARIOUS CONDITIONS

Type	Ratio	Input speed(n1)	Efficiency(η)
TKM37B	59.71	1400	94%
YMRV063	60	1400	62%
W63	64	1400	67%

HELICAL GEAR REDUCER

SUMMARIZE

TR Series helical gearmotor is a new generation mechanic-electrical integrated product, which designed basing on the modular system. It can be connected respectively with motors such as normal motor, brake motor, explosion-proof motor, frequency conversion motor, servo motor, IEC motor and so on. It can be mounted discretionary six orientation in solid space. This kind of product is widely used in drive fields such as textile, foodstuff, beverage, chemical industry, automatic arm ladder, automatic storage equipment, metallurgy, tobacco, environment-protection, logistics and so on.

PERFORMANCE CHARACTERISTICS

1. Transmission ratio with fine stage covers a wide range;
2. Compact structure takes up small room;
3. low vibration; low noise; low energy dissipation;
4. Refined design; reliable and wearable; wide usage;
5. Modular, multistructure, can be combined in many forms to meet needs of all kinds of transmission conditions.

TR Series helical gearmotor of 1-stage, 2-stage or 3-stage helical gears unit and motor. The helical gear which use the material of high quality alloy steel with the surface hardened takes shape through processing of high-precision equipment. Except the TR..27 housing with aluminum alloy, all are cast iron housing. housing is exactly processed to ensure the shape and position precision. And it reaches advantageous performance such as: strong bearing capacity, long service-life; small volume; big ratio; light weight, high efficiency, low noise.

TR Series helical gearmotor has more than ten models. Combined with TRF series, the multi-stage gear reduction can be achieved. Power 0.12-160KW; Ratio 1.3-27001; Torque 69-18000Nm. It can connect (foot, flange) discretionary and use multi-mounting positions according to customers' requirements.



TR & TRF Helical Gear



TK / TKF - SERIES
(HELICAL BEVEL MOTOR)



TF - SERIES
(HELICAL PARAREL SHAFT)

G EAR REDUCER



CHC Series helical gear units is a new generation mechanic-electrical integrated product, which designed basing on the modular system. It can be connected respectively with motors such as normal motor, brake motor, explosion-proof motor, frequency conversion motor, servo motor, IEC motor and so on. It can be mounted discretionary six orientation in solid space. This kind of product is widely used in drive fields such as textile, foodstuff, beverage, chemical industry, automatic arm ladder, automatic storage equipment, metallurgy, tobacco, environment-protection, logistics and so on.

1. 1 Products characteristics

- Modularity;
- High efficiency;
- Low noise;
- Space effective, refined design;
- Universal mounting;
- Aluminium housing, light in weight;
- Gears in carbonize hard,durable;
- Multistructure, can be combined in many forms to meet needs of all kinds of transmission conditions.



CHC..P(IEC)
Foot-mounted helical gear unit



CHC..HS
Shaft input foot - mounted helical gear unit



CHCF..P(IEC)
Flange-mounted helical gear unit



CHCF..HS
Shaft input Flange-mounted helical gear unit



CHCZ..P(IEC)
B14 Flange-mounted helical gear unit



CHCZ..HS
Shaft input B14 Flange-mounted helical gear unit

CHC Series helical gear units has more than 4 types. Power 0.12 ~ 4KW ; Ratio 3.66-54 ; Torque max 120-500Nm. It can be connected (foot, flange) discretionary and use multi-mounting positions according to customers requirements.

WORM GEAR



Products characteristics

YMRV series worm gear units is a new-generation of product developed by our company on the basis of perfecting WJ series products with a compromise of advanced technology both at home and abroad, its main features are as follows:

1. Made of high-quality aluminum alloy, light in weight and non-rusting.
2. Large in output torque.
3. Smooth in running and low in noise, can work long time in dreadful conditions.
4. High in radiating efficiency.
5. Good-looking in appearance, durable in service life and small in volume.
6. Suitable for omnibearing installation.

Surface painting

Aluminum alloy housing:

1. Shot blasting and special antiseptic treatment on the aluminum alloy surface.
2. After phosphating, paint with RAL 5010 blue .

Cast iron housing :

First paint with red antirust paint, then paint with RAL 5010 blue

Main materials

1. Housing: die-cast aluminum alloy (frame size: 025 to 105); cast iron (frame size : 110 to 130).
2. Worm: 20Cr, carbonize & quencher heat treatment make the hardness of gear's surface up to 56-62 HRC retain carburization layer's thickness between 0.3 and 0.5mm after precise grinding.
3. Worm wheel: wearable stannum bronze alloy.



MINI HELICAL GEAR



GENERAL INTRODUCTION

- Made of high quality die casting aluminum alloy housing, good-looking in appearance, suitable for universal mounting.
- Helical gear made of high-strength alloy make construction more compacter, and housing smaller, efficiency higher, output torque bigger .
- Hardened gears with fine grinded has little metamorphosis and high precision , low noise and stably running, also can work long time in dreadful conditions.
- The diameter of output shaft have 4 specifications, such as $\Phi 18$, $\Phi 22$, $\Phi 28$, $\Phi 32$.
- 2nd or 3rd stage transmission, Larger speed ratio range, each single frame size has 14 ratios from 5:1 to 200:1
- Using "NSK" bearing can prolong running life.
- Temperature resistant oil seal can prevent lubricant grease from leaking back to the inner of motor
- Three phase motor combined totally enclosed aluminum motor with aluminum terminal box, can resist water, easily volatilizing heat, run with high efficiency.
- Modularization combination extend the ratio of speed reducer from $i = 5:1$ to 1400:1

PAINT

- Shot blasting and special antiseptic treatment on the aluminum alloy surface
- After phosphating , Paint with silvery white paint

OUTPUT TORQUE OF IEC INPUT REDUCER

Normal ratio		5	10	15	20	25	30	40	50	60	80	100	100	120	160	200	
0.12kW	output shaft	$\Phi 18$											$\Phi 22$				
	M2 (Nm)	50Hz	3.9	7.8	11.7	15.4	19.3	23.5	30.9	37.3	45.0	59.4	75.5	—	91.3	120.9	150.4
		60Hz	3.2	6.5	9.8	12.9	16.1	20.4	25.7	31.1	37.5	49.5	62.9	—	76.1	100.7	125.4
0.18kW	output shaft	$\Phi 18$						$\Phi 22$						$\Phi 28$			
	M2 (Nm)	50Hz	5.9	11.4	17.2	23.6	29.3	35	45.3	56.7	68.1	90.7	93.5	112.8	135	180.3	225.6
		60Hz	4.9	9.5	14.9	19.7	24.4	29.2	37.8	47.3	56.7	75.6	77.9	94	112.5	150.3	188
0.37kW	output shaft	$\Phi 22$						$\Phi 28$						$\Phi 32$			
	M2 (Nm)	50Hz	11.9	23.1	35.7	47.6	60.5	72.3	93.2	116	138.8	185.3	191.3	231.9	278.5	370.7	427.2
		60Hz	9.9	19.2	29.7	39.6	50.4	60.3	77.6	96.6	115.6	154.4	159.4	193.3	232.1	308.9	356
0.75kW	output shaft	$\Phi 28$						$\Phi 32$						$\Phi 40$			
	M2 (Nm)	50Hz	24.6	48.2	72.9	97.5	122.1	145.7	187.5	235.7	282.9	376.1	387.9	439	527	703	764
		60Hz	20.5	40.2	60.7	81.3	201.8	121.4	156.3	196.4	235.7	313.4	323.2	366	439	585	732
1.5kW	output shaft	$\Phi 32$						$\Phi 40$						$\Phi 50$			
	M2 (Nm)	50Hz	48.2	97.5	145.7	193.9	242.1	272	351	439	527	703	724	878	1060	1230	1230
		60Hz	40.2	81.3	121.4	161.6	201.8	226	293	366	439	585	603	732	878	1170	1230
2.2kW	output shaft	$\Phi 40$						$\Phi 50$									
	M2 (Nm)	50Hz	67	133	200	266	332	399	515	644	773	1029	1230				
		60Hz	56	111	167	221	277	332	429	537	644	858	1080				

以心相交 成其久遠



古云
以利相交 利盡則散
以勢相交 勢去則傾
以權相交 權失則棄
以心相交 成其久遠



Type B Series



Type L Series



HMI (DOP Series)



Type F Series



Type M Series



Type S Series

