

## 0.75kW to 315kW – Frame 80 to 355

Techtop's TCI/TCP cast iron series motors combine superior electrical characteristics, high quality design and the robust strength of cast iron, making this series ideal for all industrial applications.



### Operating parameters

Standard TCI/TCP series motors are designed with the following parameters:

- ⚡ 380V to 415V, 50Hz & 440V to 480V, 60Hz supply
- ⚡ Continuous (S1) duty
- ⚡ Ambient temperatures up to 40°C
- ⚡ Installation up to 1000 MASL

### Connection

- ⚡ 230V Delta / 400V Star (3kW & below)
- ⚡ 400V Delta / 690V Star (4kW & above)

### Standards

Dimensions and rated outputs for the TCI/TCP series conform to Australian Standard AS/NZS 1359 and International Standards IEC 60034 and IEC 60072.

### Standard & High Efficiency

The TCI range complies with MEPS2 requirements of AS/NZS 1359.5:2004 Table A2 (**Standard Efficiency**). The TCP range complies with MEPS2 requirements of AS/NZS 1359.5:2004 Table A3 (**High Efficiency**). Motors are tested in accordance with Test Method A of AS/NZS 1359.102.3 as per IEC 60034-2-1.

### Insulation class

TCI/TCP motors are insulated with Class F materials and limited to Class B temperature rise. The windings are spike resistant making them suitable for use with VVVF drives.

### Thermistors

As standard all TCI/TCP series motors from 160 frame and above are fitted with one set of PTC thermistors. The thermistor termination is located in the main terminal box and has a trip temperature of 150°C as standard. Additional 130°C thermistors can be fitted as an option for alarm connection. Thermistors are available as an option for smaller frame sizes.

### IP Protection

The standard degree of enclosure protection is IP 55 (increased IP protection is available). Shafts are fitted with an oil seal as standard.

### Multi-mount design

TCI/TCP series motors from frame size 80 to 280 are fitted with detachable feet. The multi-mount design allows for the motor feet to be removed and repositioned to either side to produce a side mounted terminal box.

### Terminal box

The terminal box is manufactured from cast iron and is mounted on top of the motor as standard. Terminal box is separate to the motor body and can be rotated in 90° increments.

### Surface Finish

As standard TCI/TCP motors are painted with high quality alkyd enamel with the final colour being RAL 9005 Jet Black. Other colours are available upon request.

### Bearings

Bearings fitted are high quality NSK bearings with C3 diametrical clearances. As standard, frame sizes 80 to 132 have sealed for life deep groove ball bearings. Frame sizes 160 to 355 have re-greaseable bearings with facilities to replenish the grease during operation. Grease nipples are fitted to the top of the end shields with a grease relief fitted at the bottom.

Frame size	Bearing	
	Cast Iron	N.D.E
80	6204 ZZ C3	
90	6205 ZZ C3	
100	6206 ZZ C3	
112	6306 ZZ C3	
132	6308 ZZ C3	
160	6309 C3	
180	6311 C3	
200	6312 C3	
225	6313 C3	
250	6314 C3	
280	6316 C3	
315 (2P)	6317 C3	
315 (4/6/8)	NU319 C3	6319 C3
355 (2P)	6319 C3	
355 (4/6/8)	NU322 C3	6322 C3



### Part Number Logic

Detailed below is the part number logic which should be specified when placing orders. The part number is composed in accordance with the following example:

T	C	4	B	0	2	2	5	TCI	
1	2	3	4	5 - 7		8	9 - 12		13

#### Position 1

T = Techtop

#### Position 2

A = Aluminium

C = Cast Iron

#### Position 3

2 = 2 Pole

4 = 4 Pole

6 = 6 Pole

8 = 8 Pole

#### Position 4

A = less than 0.99kW

B = 1.0kW to 9.9kW

C = 10.0kW to 99.9kW

D = 100kW to 999kW

#### Position 8

Mounting position

1 = V1

3 = B3

4 = B3/5

5 = B5

6 = B3/B14A

7 = B14A

8 = B3/B14B

9 = B14B

#### Position 9 to 12

TCI = Cast iron Std Eff.

TCP = Cast iron Hi-Eff.

TCIM = Cast iron Mine Spec.

#### Position 13

H = Class H insulation

#### Position 5 to 7

Output kW

### Vibration

Vibration levels are within Level N (normal) limits of vibration severity as per IEC 60034 – 14:2007 which are listed below:

Vibration Grade	Frame size	56 - 132	160 - 280	315 - 355
	Mounting Type	(mm/s)	(mm/s)	(mm/s)
A	Suspension	1.5	2.2	2.8
	Rigid Mount	1.3	1.8	2.3

### Conduit Entries

Frame Size	Entry Size	Number of Entries
80	M20 x 1.5	2
90	M20 x 1.5	2
100	M20 x 1.5	2
112	M25 x 1.5	2
132	M25 x 1.5	2
160*	M32 x 1.5	2
180*	M32 x 1.5	2
200*	M50 x 1.5	2
225*	M50 x 1.5	2
250*	M50 x 1.5	2
280*	M50 x 1.5	2
315*	M63 x 1.5	2
355*	M63 x 1.5	2

\*Frames fitted with 1 X M20 cable gland for thermistor termination.

### Noise Level

Noise levels comply with the limits shown in IEC 60034.9 and AS1359.109 standards.

Output kW	Sound pressure dB(A) @ 1 metre no load			
	2 Pole	4 Pole	6 Pole	8 Pole
0.75	64	60	58	55
1.1	64	60	59	55
1.5	68	60	59	55
2.2	68	62	59	55
3	71	62	63	58
4	71	66	63	58
5.5	69	63	58	58
7.5	69	63	61	58
11	75	67	61	58
15	75	67	61	61
18.5	75	67	63	66
22	75	67	63	66
30	75	70	66	66
37	75	70	66	66
45	75	70	66	66
55	77	70	66	69
75	78	73	73	69
90	78	73	73	69
110	80	77	73	69
132	80	77	73	79
160	80	77	82	79
200	80	77	82	79
250	86	84	82	-
315	86	84	-	-

## GREASE

TCI bearings are lubricated with polyurea (Mobil Polyrex EM) based bearing grease suitable for operation in ambient temperatures from -20°C to +55°C. Bearings are prepacked with grease but it is recommended to lubricate the bearings one hour after commissioning.

## RECOMMENDED BEARING MAINTENANCE

Frame	Bearing	Grease Qty (g)	Interval Hours			
			2P	4P	6P	8P
160	6309 C3	15	6,600	11,000	14,000	16,200
180	6311 C3	18	6,100	10,600	14,000	15,250
200	6312 C3	20	5,200	10,200	14,100	15,000
225	6313 C3	25	4,900	9,600	13,600	15,000
250	6314 C3	38	2,600	9,200	13,200	14,600
280	6316 C3	42	2,100	9,000	12,800	14,000
315 (2P)	6317 C3	44	2,000	–	–	–
315 (4/6/8)	NU/6319 C3	48	–	6,400	9,300	12,000
355 (2P)	6319 C3	48	1,900	–	–	–
355 (4/6/8)	NU/6322 C3	68	–	4,400	8,300	11,000

## RADIAL & AXIAL LOADS

The table below details the permissible force that can be applied to the motor shaft and are applicable for horizontal mounting only. The values shown are calculated on a basic bearing life of  $L_{10}$  of 40,000 hours.

Frame size	Permissible Radial Load (N)				Permissible Axial Load (N)			
	2 Pole	4 Pole	6 Pole	8 Pole	2 Pole	4 Pole	6 Pole	8 Pole
80	470	595	690	750	395	540	655	635
90	485	625	720	785	420	570	685	690
100	710	890	1,035	1,150	570	780	940	1,075
112	950	1,240	1,420	1,580	790	1,085	1,310	1,520
132	1,420	1,820	2,100	2,325	1,160	1,590	1,915	2,210
160	1,800	2,350	2,720	3,040	1,480	2,035	2,450	2,810
180	2,490	3,200	3,780	4,215	1,990	2,710	3,270	3,760
200	2,915	3,750	4,350	4,835	2,225	3,065	3,710	4,235
225	3,270	4,000	4,700	5,210	2,460	3,390	4,130	4,750
250	3,590	4,650	5,400	5,980	2,725	3,780	4,575	5,225
280	3,700	8,100	9,375	10,300	3,280	4,560	5,590	6,375
315 (2P)	4,500	-	-	-	3,825	-	-	-
315 (4/6/8)	-	15,800	17,950	19,750	-	4,855	5,895	6,780
355 (2P)	4,560	-	-	-	3,980	-	-	-
355 (4/6/8)	-	22,145	25,360	27,890	-	6,135	7,395	8,555

# TCI / TCIM SERIES

## TCI / TCIM SERIES PERFORMANCE DATA

Output kW	Full Load Speed [RPM]	Frame Size	Shaft Dia [mm]	Current @ 400v		Efficiency		Power Factor		Torque				Noise Level dB (A)	Weight Foot Mount [Kg]
				Full Load [A]	Locked Rotor [%]	Full Load [%]	3/4 Load [%]	Full Load [%]	3/4 Load [%]	Full Load [Nm]	Locked Rotor [% FLT]	Pull Up [% FLT]	Break Down [% FLT]		
0.75	2880	80A	19	1.76	687	80.1	80.2	0.79	0.71	2.5	292	196	302	64	16
	1420	80B	19	1.94	550	81.1	81.5	0.69	0.60	5	303	270	310	60	18
	940	90S	24	2.22	444	76.3	75.7	0.65	0.54	7.6	225	196	252	58	20
	690	100LA	28	2.21	363	72.3	73.3	0.68	0.58	10.4	177	175	213	55	34
1.1	2880	80A	19	2.39	758	81.2	81.3	0.82	0.74	3.6	283	186	285	64	17
	1420	90S	24	2.57	618	82.8	83.8	0.75	0.67	7.4	296	247	297	60	22
	950	90L	24	2.98	487	78.4	78.7	0.69	0.60	11	207	180	245	59	29
	690	100LA	28	3.17	390	74.8	75.2	0.67	0.57	15.1	198	192	230	55	35
1.5	2880	90S	24	3.19	690	83.1	83.5	0.83	0.75	5.0	276	187	308	68	21
	1440	90L	24	3.44	713	85.5	86.1	0.76	0.68	9.9	316	240	313	60	26
	945	100LA	28	3.71	472	80.1	82	0.74	0.66	15.1	172	161	225	59	34
	700	112M	28	4.18	403	78.4	79.3	0.68	0.59	20.4	182	180	212	55	42
2.2	2890	90L	24	4.61	811	84	84.4	0.83	0.75	7.2	300	222	318	68	22
	1440	100LA	28	4.55	726	85.8	86.6	0.82	0.76	14.6	260	218	305	62	36
	950	112M	28	5.36	547	82.8	83.9	0.73	0.64	22	220	181	271	59	40
	710	132S	38	5.95	420	80.0	80.6	0.67	0.58	29.4	186	174	233	55	68
3	2900	100L	28	5.59	920	87.0	87.6	0.90	0.87	9.9	309	249	351	71	35
	1445	100LB	28	6.27	760	86.0	86.6	0.80	0.73	19.8	239	244	325	62	37
	960	132S	38	6.42	601	85.5	86.6	0.76	0.70	29.6	188	157	258	63	65
	715	132M	38	7.8	529	82.7	83.1	0.70	0.61	39.9	231	203	274	58	77
4	2915	112M	28	7.56	960	87.4	87.7	0.89	0.84	13.1	332	208	365	71	47
	1440	112M	28	8.17	781	87.5	88.2	0.82	0.75	26.4	257	231	335	66	51
	960	132MA	38	9.21	583	84.7	85.6	0.74	0.68	39.6	200	165	257	63	67
	720	160MA	42	9.56	556	85.5	86.0	0.71	0.63	53.0	232	169	254	58	116
5.5	2910	132SA	38	10.3	823	87.8	88.3	0.89	0.85	18.0	244	195	343	69	61
	1460	132SA	38	11.0	856	88.1	88.5	0.83	0.77	35.9	217	193	350	63	65
	960	132MB	38	12.4	654	86.3	87.5	0.75	0.69	54.5	240	184	261	58	68
	720	160MB	42	14.9	600	85.8	84.7	0.63	0.61	74.0	230	190	260	58	147
7.5	2920	132SA	38	13.9	1029	89.2	89.6	0.89	0.86	24.5	314	202	366	69	66
	1450	132M	38	14.3	823	89.5	90.4	0.85	0.82	49.4	299	117	295	63	77
	980	160M	42	17.5	855	89.7	89.4	0.71	0.63	73.0	331	194	336	61	120
	720	160L	42	18.6	600	87.2	86.9	0.67	0.64	100.1	240	190	270	58	147
11	2950	160MA	42	19.5	858	89.9	90.2	0.91	0.89	35.6	260	93	302	75	113
	1470	160M	42	20.4	838	91.7	91.7	0.86	0.81	71.3	287	203	329	67	125
	975	160L	42	23.8	818	89.4	89.7	0.75	0.68	107.5	309	140	152	61	135
	730	180L	48	23.8	660	88.8	88.7	0.75	0.69	145.9	230	200	280	58	183
15	2950	160MB	42	25.8	901	91.8	92.1	0.92	0.90	48.4	257	132	316	75	132
	1470	160L	42	27.4	881	91.1	91.5	0.88	0.84	97.4	253	177	316	67	140
	980	180L	48	31.4	882	89.6	88.9	0.77	0.70	145.7	267	153	322	61	183
	730	200L	55	30.6	660	90.0	90.1	0.78	0.76	198.9	220	200	290	61	240
18.5	2950	160L	42	32.0	976	92.1	92.6	0.92	0.91	59.8	302	140	332	75	146
	1470	180M	48	33.2	786	91.8	92	0.88	0.84	120.1	254	194	311	67	158
	980	200LA	55	36.9	853	91.2	91.2	0.81	0.74	179.4	207	139	320	63	232
	730	225S	60	38.7	660	90.7	90.4	0.76	0.72	243.7	220	200	320	66	315
22	2950	180M	48	39.1	843	91.2	91	0.90	0.88	71.2	266	163	330	75	177
	1465	180L	48	38.9	767	91.9	92.5	0.89	0.86	143.1	225	155	269	67	183
	980	200LB	55	42.6	1031	91.9	92.1	0.83	0.78	213.5	313	156	342	63	250
	740	225M	60	43.5	660	91.2	91.4	0.80	0.78	289.7	210	190	310	66	348

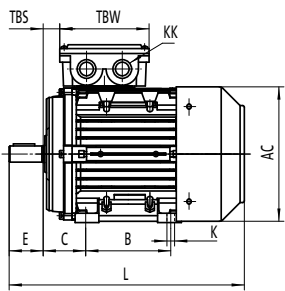


## TCI / TCIM SERIES PERFORMANCE DATA CONTINUED

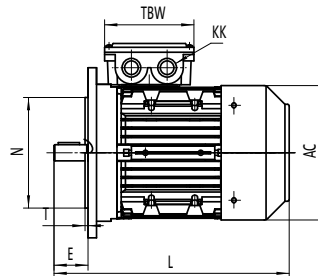
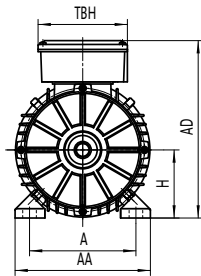
Output kW	Full Load Speed [RPM]	Frame Size	Shaft Dia [mm]	Current @ 400v		Efficiency		Power Factor		Torque				Noise Level dB (A)	Weight Foot Mount [Kg]
				Full Load [A]	Locked Rotor [%]	Full Load [%]	3/4 Load [%]	Full Load [%]	3/4 Load [%]	Full Load [Nm]	Locked Rotor [% FLT]	Pull Up [% FLT]	Break Down [% FLT]		
30	2955	200LA	55	52.9	703	92.0	92.3	0.90	0.88	96.9	205	104	254	75	233
	1480	200L	55	57.2	814	92.5	92.7	0.82	0.76	193.5	237	191	295	70	242
	985	225M	60	54.9	815	91.9	92.4	0.86	0.83	290.5	264	151	257	66	335
	740	250M	65	61.5	660	92.1	91.6	0.76	0.71	392.4	210	190	270	66	397
37	2955	200LB	55	64.9	759	92.7	93.1	0.90	0.88	119.6	244	144	260	75	246
	1475	225S	60	65.4	743	91.2	90.7	0.85	0.82	239.1	222	147	243	70	315
	980	250M	65	68.7	646	93.2	93.3	0.85	0.82	359.2	186	135	232	66	398
	740	280S	75	73.5	660	92.7	92.5	0.78	0.74	484.0	210	180	250	66	500
45	2955	225M	55	77.6	744	93.2	93.4	0.91	0.89	145.2	273	113	251	75	322
	1475	225M	60	85.1	695	93.1	92.9	0.83	0.78	290.5	207	187	333	70	352
	985	280S	75	81.5	850	92.7	93.0	0.86	0.82	434.7	284	156	272	66	505
	740	280M	75	88.9	660	93.2	93.1	0.78	0.77	584.7	200	180	250	66	594
55	2970	250M	60	93.3	892	94.5	94.3	0.91	0.90	176.8	302	142	299	77	420
	1480	250M	65	98.7	805	93.6	93.9	0.86	0.83	354.4	264	167	268	70	420
	985	280M	75	99.0	897	93.5	93.6	0.87	0.83	531.3	321	181	311	66	596
	740	315S	80	107.2	750	93.7	93.1	0.79	0.76	709.8	200	180	240	69	1025
75	2970	250MB	60	126.3	970	94.3	94.2	0.91	0.91	241.0	291	153	339	77	475
	2970	280S	65	125.3	898	93.9	93.9	0.93	0.93	241.0	256	105	281	78	572
	1480	250MB	65	131.4	755	94.0	93.8	0.89	0.85	485.6	258	149	230	70	448
	1480	280S	75	127.7	756	94.9	95.2	0.90	0.89	482.5	254	211	237	73	570
	980	315S	80	128.9	790	94.4	94.1	0.89	0.86	730.8	210	190	250	73	809
	740	315M	80	145.2	770	94.4	94.0	0.79	0.75	967.8	200	180	230	69	1108
90	2970	280M	65	148.3	1009	94.5	94.3	0.93	0.92	289.1	294	123	302	78	637
	1485	280M	75	152.9	860	94.4	94.8	0.92	0.90	578.7	297	229	260	73	658
	980	315M	80	152.3	800	94.8	94.2	0.90	0.88	877.0	200	180	230	73	962
	740	315LA	80	171.5	780	94.7	94.5	0.80	0.78	1161.4	200	180	220	69	1155
110	2980	315S	65	185.5	770	95.1	95.2	0.90	0.88	357.3	190	170	225	80	1008
	1480	280MB	75	188.4	773	94.7	94.6	0.89	0.88	709.8	246	172	308	73	658
	1485	315S	80	185.1	780	95.3	95.1	0.91	0.89	709.8	210	180	230	77	1049
	980	315LA	80	185.5	770	95.1	95.3	0.90	0.87	1071.9	200	180	235	73	989
132	2980	315M	65	219.5	760	95.4	95.2	0.91	0.89	428.7	190	160	220	80	1062
	1485	315M	80	222.8	700	95.0	94.2	0.90	0.87	848.9	248	164	323	77	1049
	980	315LB	80	224.4	800	95.4	95.1	0.89	0.87	1286.2	200	175	230	73	1082
160	2980	315LA	65	268.7	780	95.5	95.4	0.90	0.90	518.8	205	180	240	80	1222
	1485	315LA	80	265.2	790	95.7	95.5	0.91	0.91	1032.4	200	180	230	77	1222
	985	355MA	100	265.5	760	95.6	95.3	0.91	0.89	1559.0	220	195	238	82	1580
	745	355MB	100	287.3	780	95.7	95.4	0.84	0.82	2050.9	200	180	235	79	1740
200	2985	315LB	65	339.7	790	95.5	95.2	0.89	0.88	648.5	215	170	240	80	1240
	1490	315LB	80	335.2	770	95.7	95.6	0.90	0.90	1290.5	200	180	235	77	1190
	985	355MB	100	336.0	760	95.6	95.7	0.90	0.88	1948.8	210	190	245	82	1760
	745	355LB	100	350.8	770	95.7	95.5	0.86	0.85	2563.6	205	185	235	79	1990
250	2985	355M	75	419.8	780	95.5	95.2	0.90	0.89	810.6	200	180	240	86	1780
	1490	355M	100	423.7	790	95.7	95.4	0.89	0.87	1613.0	230	190	260	84	1820
	985	355LB	100	424.1	780	95.6	95.2	0.89	0.86	2436.0	210	190	250	82	1990
315	2985	355LB	75	531.8	740	95.0	95.6	0.90	0.86	1021.4	225	195	240	86	1780
	1490	355LB	100	532.3	758	95.8	96.1	0.89	0.89	2020.3	275	185	255	84	1700



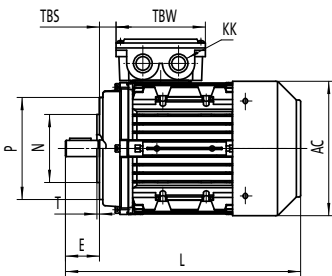
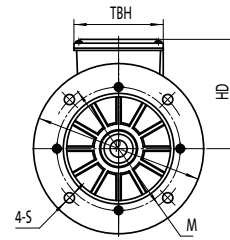
## TCI / TCP / TCIM SERIES MOTOR OUTLINE DIMENSIONS



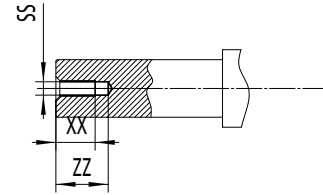
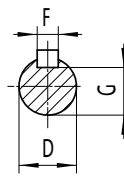
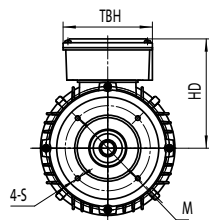
**B3**



**B5**



**B14**



**SHAFT**

## TCI / TCP / TCIM SERIES DIMENSIONAL DATA

Frame Size	Foot Mounting				Shaft					General								
	H	A	B	C	D	E	F	G	K	AA	AD	HD	AC	L	TBS	TBW	TBH	
80	80	125	100	50	19	40	6	15.5	9	154	209	129	158	290	48	105	105	
90S/L	90	140	100/125	56	24	50	8	20	10	178	231	150	176	320/345	49	114	114	
100	100	160	140	63	28	60	8	24	12	203	251	151	199	385	76	114	114	
112	112	190	140	70	28	60	8	24	12	231	292	180	220	405	73	134	134	
132S/M	132	216	140/178	89	38	80	10	33	12	264	330	198	259	457/505	62	134	134	
160M/L	160	254	210/254	108	42	110	12	37	15	316	404	244	313	605/650	91	162	162	
180M/L	180	279	241/279	121	48	110	14	42.5	15	361	442	262	360	687/725	160/180	162	187	
200L	200	318	305	133	55	110	16	49	19	392	500	300	399	769	193	186	233	
225S	4,8	225	356	286	149	60	140	18	53	19	438	557	332	465	810	199	186	233
225M	2	225	356	311	149	55	110	16	49	19	438	557	332	465	805	212	186	233
	4,6,8	225	356	311	149	60	140	18	53	19	438	557	332	465	835	212	186	233
250M	2	250	406	349	168	60	140	18	53	24	484	616	366	506	915	234	218	260
	4,6,8	250	406	349	168	65	140	18	58	24	484	616	366	506	915	234	218	260
280S/M	2	280	457	368/419	190	65	140	18	58	24	557	673/690	393/410	559	984/1035	265/277	218/245	260/280
	4,6,8	280	457	368/419	190	75	140	20	67.5	24	557	673/690	393/410	559	984/1035	265/277	218/245	260/280
315S	2	315	508	406	216	65	140	18	58	28	628	825	510	682	1205	200	290	350
	4,6,8	315	508	406	216	80	170	22	71	28	628	825	510	682	1235	200	290	350
315M/L	2	315	508	457/508	216	65	140	18	58	28	628	825	510	682	1355	200	290	350
	4,6,8	315	508	457/508	216	80	170	22	71	28	628	825	510	682	1385	200	290	350
355M/L	2	355	610	560/630	254	75	140	20	67.5	28	740	1010	655	820	1500	140	330	380
	4,6,8	355	610	560/630	254	100	210	28	90	28	740	1010	655	820	1570	140	330	380

Frame Size	B5				
	N	M	P	S	T
80 - 90	130	165	198	4-12	3.5
100 - 112	180	215	250	4-15	4
132	230	265	300	4-15	4
160 - 180	250	300	350	4-19	5
200	300	350	400	4-19	5
225	350	400	450	8-19	5
250 - 280	450	500	550	8-19	5
315	550	600	660	8-24	6
355	680	740	800	8-24	6

Frame Size	B14A				
	N	M	P	S	T
80	80	100	118	M6	3
90	95	115	138	M8	3
100 - 112	110	130	158	M8	3.5
132	130	165	198	M10	3.5

# TCI / TCIM SERIES

## MOUNTING ARRANGEMENTS

Frame Size	B3	B5	B3/B5	V1	V3	V5	V6	B6	B7	B8	V1/V5	V3/V6
56 - 200	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
225 - 250	✓	✓	✓	✓	-	-	-	-	-	-	-	-
280 - 355	✓	-	✓	✓	-	-	-	-	-	-	-	-
Frame Size	B14	B3/B14	V18	V19	V5/V18	V6/V19						
56 - 160	✓	✓	✓	✓	✓	✓						

## MAXIMUM STARTING TIME (SECONDS)

Frame	Method	2 Pole	4 Pole	6 Pole	8 Pole
56-71	D.O.L	20	28	44	-
80	D.O.L	15	26	40	40
90	D.O.L	10	15	25	30
100	D.O.L	12	14	18	40
112	D.O.L	10	10	18	35
132	D.O.L	14	12	12	25
160-315	D.O.L	15	15	20	22
355	Star-Delta	45	45	60	65

## STARTS PER HOUR

Frame	2 Pole	4 Pole	6 Pole	8 Pole
56-71	22	40	40	-
80-90	18	35	40	40
100-132	12	22	25	25
160-180	10	18	22	22
200	6	12	12	12
225	5	10	10	10
250	4	8	8	8
280	3	6	6	8
315	3	4	6	6
355	2	3	3	3