



6 Hoist Motor

6.1 Features of Three-phase Motor

- Squirrel cage motor
- Dual windings for two-speed motor, 4:1 speed ratio
- Synchronous speed – See Hoist Motor Data
- IP55 protection
- Class F insulation
- Klixon type bimetal switch for thermal protection
- Power rating – See Hoist Motor Data

6.2 Optional Motor Features

- Standby heater
- Tropicalized motor protection

6.3 Ambient Conditions

The standard motor is designed for operation at ambient temperatures between 14°F [-10°C] and 104°F [40°C] and a maximum altitude of 3280 feet [1000 meters].

6.4 Motor Temperature Protection

As standard, the hoist motor – whether single phase or three phase - is equipped with a normally closed automatic reset thermal protector, which is embedded in the stator winding(s).

6.5 Motor Cooling

The hoist motors have ribbed outer frames to maximize convection cooling. Motors on [LM16](#), [LM20](#) and [LM25](#) hoists are normally equipped with an integral cooling fan that is driven directly by the motor shaft. The shaft driven fan is only effective when the motor is running.



6.6 Hoist Motor Data-Two Speed, 50 Hertz

To match the motor type to the hoist model, go to Section 2 – Main Specification.

		MT06E-104		PC2		PC3 (obsolete) Replaced by MT07E-104		MT07E-104		PC4		PC5	
		Motor Type		Motor Type		Motor Type		Motor Type		Motor Type		Motor Type	
Synchronized speed	RPM	3000	750	3000	750	3000	750	3000	750	3000	750	3000	750
Braking torque	Nm	1.1	1.1	5.2	5.2	5.2	5.2	4.5	4.5	10.5	10.5	16	16
Max el. brk. torque	Nm												
El. brake torque	Nm												
Power fact. start													
Starting torque	Nm	1.33	1.43	5.5	5.0	5.5	5.0	6.4	4.5	13.0	10.6	29	26
Weight	kg												
Brake inertia	kgm ²												
Inertia w/o brake	kgm ²												
Load	kg	125	125	250	250	500	500	500	500	1000	1000	2500	2500
Nominal power	kW	0.20	0.034	0.85	0.21	0.85	0.21	0.8	0.2	1.75	0.43	3.5	0.86
Nominal torque	Nm	0.68	0.68	1.6	1.6	2.9	2.9	2.7	2.7	6.0	6.0	12	12
Nominal speed	RPM	2820	655	2882	710	2800	680	2470	580	2800	690	2710	635
Short time duty	min												
Power factor		0.68	0.69	0.63	0.41	0.78	0.49	0.8	0.64	0.90	0.59	0.89	0.63
Efficiency		0.47	0.18	0.69	0.22	0.72	0.32	0.6	0.21	0.83	0.46	0.77	0.49

6.7 Hoist Motor Data-Single Speed, 50 Hertz

To match the motor type to the hoist model, go to Section 2 – Main Specification.

		SC2-4 (obsolete) Replaced by MT07EA200	SC3-2 (obsolete)	MT07EA200	SC3-4	SC4-2
		Motor Type	Motor Type	Motor Type	Motor Type	Motor Type
Synchronized speed	RPM	1500	3000	1500	1500	3000
Braking torque	Nm	5.2	5.2	4.5	10.5	10.5
Max el. brake. torque	Nm					
El. brake torque	Nm					
Power fact. start						
Starting torque	Nm	5.5	5.5	5.7	12.9	13.0
Weight	kg					
Brake inertia	kgm ²					
Inertia w/o brake	kgm ²					
Load	kg	500	500	500	1000	1000
Nominal power	kW	0.45	0.85	0.4	0.88	1.75
Nominal torque	Nm	2.9	2.9		6	6.0
Nominal speed	RPM	1350	2800	1300	1394	2800
Short time duty	min					
Power factor		0.72	0.78	0.7	0.77	0.90
Efficiency		0.70	0.72	0.6	0.70	0.83



6.8 Hoist Motor currents-Two speed, 50 Hertz

To match the motor type to the hoist model, go to Section 2 – Main Specification.

				Currents					
Nominal voltage				230 V – 3PH		400 V – 3PH		500 V – 3PH	
Used in voltage range				220...240 V		380...415 V		500...525 V	
Motor Type			kg	fast	slow	fast	slow	fast	slow
MT06E-104	Starting current (A)		125	4.3	1.4	2.5	0.8	2.0	0.6
	Nominal current (A)			1.7	1.0	1.0	0.6	0.8	0.5
	No-load current (A)			2.17	1.17	1.25	0.67	1.00	0.54
PC2	Starting current (A)			14	5.5	8.3	3.1	7.2	2.7
	Nominal current (A)			2.5	3	1.6	1.9	1.3	1.6
	No-load current (A)			2.1	3.0	1.4	1.9	1.1	1.6
PC3 (Obsolete) Replaced by MT07E-104	Starting current (A)		500	14	5.5	8.3	3.1	7.2	2.7
	Nominal current (A)			3.4	3	2.2	1.9	1.7	1.6
	No-load current (A)			2.1	3.0	1.4	1.9	1.1	1.6
MT07E-104	Starting current (A)		500	15.7	4.3	9	2.5	7.2	2.0
	Nominal current (A)			4.5	3.1	2.6	1.8	2.1	1.4
	No-load current (A)			3.8	3.1	2.2	1.8	1.8	1.4
	Resistance	ohm		7.55	26.4	24.6	94.1	38.1	149
PC4	Starting current (A)		1000	25.6	9.6	16	5.3	12.3	4.2
	Nominal current (A)			5.9	4.1	3.4	2.3	2.7	1.9
	No-load current (A)			2.7	4.1	1.8	2.3	1.4	1.9
PC5	Starting current (A)		2500	53.9	14.4	31	8.1	24.8	6.6
	Nominal current (A)			12.9	6.4	7.4	3.7	5.9	3.0
	No-load current (A)			5.6	6.1	3.2	3.5	2.6	2.8

6.9 Hoist Motor currents-Single speed, 50 Hertz

				Currents					
Nominal voltage				230 V - 3PH		400 V – 3PH		500 V – 3PH	
Used in voltage range				220...240 V		380...415 V		500...575 V	
Motor Type			kg	fast		fast		fast	
SC2-4 1500 rpm	Starting current (A)		500	9.2		4.9		4.5	
	Nominal current (A)			2.3		1.3		1.2	
	No-load current (A)			1.0		1.3		1.2	
SC3-2 3000/750	Starting current (A)		500	14	5.5	8.3	3.1	7.2	2.7
	Nominal current (A)			3.4	3.0	2.2	1.9	1.7	1.6
	No-load current (A)			2.1	3.0	1.4	1.9	1.1	1.6
MT07EA200	Starting current (A)		500	5.74		3.3		2.64	
	Nominal current (A)			2.3		1.3		1	
	No-load current (A)			1.4		0.8		0.6	
	Resistance	ohm		12		38		59.3	
SC3-4 1500 rpm	Starting current (A)		1000	17.8		1.1		8.2	
	Nominal current (A)			4.1		2.3		1.9	
	No-load current (A)			2.0		1.4		1.2	
SC4-2 3000 rpm	Starting current (A)		1000	25.6		16		12.3	
	Nominal current (A)			5.9		3.4		2.7	
	No-load current (A)			2.7		1.8		1.4	



6.10 Hoist Motor Data-Two Speed, 60 Hertz

To match the motor type to the hoist model, go to Section 2 – Main Specification.

		MT06E-104		PC2		PC3 (obsolete) Replaced by MT07E-104	
		Motor Type		Motor Type		Motor Type	
Synchronized speed	RPM	3600	900	3600	900	3600	900
Braking torque	lb-ft	0.8107	0.8107	3.8324	3.8324	3.8324	3.8324
Braking torque	Nm	1.1	1.1	5.2	5.2	5.2	5.2
Max el. brk torque	Nm						
El. brake torque	Nm						
Power fact. start							
Starting torque	Nm	1.32	1.54	5.4	4.8	5.4	4.8
Weight	kg						
Brake inertia	kgm ²						
Inertia w/o brake	kgm ²						
Load	kg	125	125	250	250	500	500
Nominal power	HP	0.33	0.08	0.79	0.19	1.4	0.3
Nominal power	kW	0.250	0.060	0.590	0.140	1.05	0.23
Nominal torque	lb-ft	0.5012	0.5012	1.1792	1.1792	2.1373	2.1373
Nominal torque	Nm	0.68	0.68	1.6	1.6	2.9	2.9
Nominal speed	RPM	3420	805	3500	861	3410	830
Short time duty	min						
Power factor		0.68	0.69	0.67	0.38	0.79	0.46
Efficiency		0.47	0.18	0.73	0.26	0.74	0.36

		MF07E-104		PC4		PC5	
		Motor Type		Motor Type		Motor Type	
Synchronized speed	RPM	3600	900	3600	900	3600	900
Braking torque	lb-ft	3.3165	3.3165	7.7385	7.7385	11.792	11.792
Braking torque	Nm	4.5	4.5	10.5	10.5	16	16
Max el. brk. torque	Nm						
El. brake torque	Nm						
Power fact. start							
Starting torque	Nm	6.6	4.8	11.9	10.1	29	26
Weight	kg						
Brake inertia	kgm ²						
Inertia w/o brake	kgm ²						
Load	kg	500	500	1000	1000	2500	2500
Nominal power	HP	1.3	0.3	2.8	0.75	5.6	1.4
Nominal power	kW	0.95	0.23	2.10	0.56	4.20	1.05
Nominal torque	lb-ft	1.9899	1.9899	4.422	4.422	8.844	8.844
Nominal torque	Nm	2.7	2.7	6.0	6.0	12	12
Nominal speed	RPM	3350	750	3380	840	3552	762
Short time duty	min						
Power factor		0.8	0.62	0.91	0.56	0.77	0.49
Efficiency		0.62	0.24	0.83	0.54	0.77	0.49



6.11 Hoist Motor Data-Single Speed, 60 Hertz

To match the motor type to the hoist model, go to Section 2 – Main Specification.

		MT06E-200	SC2-4* (obsolete) Replaced by MT07EA200	SC3-2* (obsolete) Replaced by MT07EC100	MT07EA200*
		Motor Type	Motor Type	Motor Type	Motor Type
Synchronized speed	RPM	3600	3000	3600	1800
Braking torque	lb-ft	0.8107	3.8324	3.8324	3.3165
Braking torque	Nm	1.1	5.2	5.2	4.5
Max el. brake torque	Nm				
El. brake torque	Nm				
Power fact. start					
Starting torque	Nm		5.4	5.4	5.7
Weight	kg				
Brake inertia	kgm ²				
Inertia w/o brake	kgm ²				
Load	kg	125	500	500	500
Nominal power	HP	0.16	0.7	1.5	0.64
Nominal power	kW	0.12	0.525	1.1	0.48
Nominal torque	lb-ft	0.4966	2.1373	2.1373	2.1008
Nominal torque	Nm	0.67	2.9	2.9	2.85
Nominal speed	RPM	1692	1660	3380	1600
Short time duty	min				
Power factor		0.69	0.76	0.85	0.74
Efficiency		0.47	0.7	0.77	0.6

		MT07EY-200	MT07EC100*	SC3-4*	SC4-2*
		Motor Type	Motor Type	Motor Type	Motor Type
Synchronized speed	RPM	1800	3600	1800	3600
Braking torque	lb-ft	3.3165	3.3165	7.7385	7.7385
Braking torque	Nm	4.5	4.5	10.5	10.5
Max el. Brake. Torque	Nm				
El. Brake torque	Nm				
Power fact. Start					
Starting torque	Nm	6.4	8	11.9	11.9
Weight	kg				
Brake inertia	kgm ²				
Inertia w/o brake	kgm ²				
Load	kg	500	500	1000	1000
Nominal power	HP	0.64	1.3	1.5	2.8
Nominal power	kW	0.48	0.95	1.1	2.10
Nominal torque	lb-ft	2.0127	2.1599	4.422	4.422
Nominal torque	Nm	2.7	2.93	6.0	6.0
Nominal speed	RPM	1670	3080	1690	3350
Short time duty	min				
Power factor			0.88	0.79	0.86
Efficiency			0.63	0.76	0.8

*230/460V reconnectable hoist motor



6.12 Hoist Motor Data-Inverter Motor

To match the motor type to the hoist model, go to Section 2 – Main Specification.

Motor Code		MF10MA200	MF10MA200		
Speed Control		Inverter	Inverter		
Motor Voltage	V	460	400		
Motor Frequency	Hz	120	100		
Rated power	kW	2.2	1.8		
Rated power	HP	2.9	2.4		
Synchronized speed	RPM	3600	3000		
Braking torque	lb-ft	15.49	15.49		
Braking torque	Nm	21	21		
Max el. brake torque	Nm				
El. brake torque	Nm				
Power fact. start					
Pull-out torque	Nm	16	16.6		
Speed at 80% of Pull-out torque	rpm	3100	2500		
Starting torque	Nm				
Weight	kg	23	23		
Brake inertia	kgm ²	0.00017	0.00017		
Inertia w/o brake	kgm ²	0.0027	0.0027		
Nominal power	HP	2.9	2.4		
Nominal power	kW	2.2	1.8		
Nominal torque	lb-ft	4.5	1.3		
Nominal torque	Nm	6.1	6.1		
Nominal speed	RPM	3420	2830		
Short time duty	min	60	60		
Power factor		0.75	0.74		
Efficiency		0.71	0.73		
Nominal power	HP	2.4	2.0		
Nominal power	kW	1.8	1.5		
Nominal torque	lb-ft	3.6	3.6		
Nominal torque	Nm	4.9	4.9		
Nominal speed	RPM	3450	2860		
Short time duty	min				
Power factor		0.72	0.69		
Efficiency		0.69	0.71		

6.13 Hoist Motor Currents & Resistance – Inverter Motors, 100 Hz and 120 Hz

Find the motor type for your hoist from the table in Section 2 – Main Specification.

		100 Hz		120 Hz	
		Current		Current	
Nominal voltage		400 V		460 V	
Used in voltage range		380...415 V		440...480 V	
		tm/min		tm/min	
T1	Current at 80% of pull-out torque (A)	11.0		11.0	
MF10MA200	Nominal current (A)	10	4.8	12	4.9
		8	4.4	9.6	4.6
		6.3	4.1	7.6	4.1
		5	3.7	6	3.7
	No-load current (A)	3.2		3.0	



6.14 Hoist Motor Currents & Resistance –Two speed, 60 Hertz

Find the motor type for your hoist from the table in Section 2 – Main Specification.

Nominal voltage			208 V – 3PH	230 V – 3PH	460 V – 3PH	575 V – 3PH				
Used in voltage range			200...208 V	220...240 V	440...480 V	575...600 V				
Motor Type		kg	fast	slow	fast	slow	fast	slow	fast	slow
MT06E-104	Starting current (A)	125	6.0	2.0	5.2	1.8	2.6	0.9	2.1	0.7
	Nominal current (A)		2.3	1.38	2.0	1.2	1.0	0.6	0.8	0.5
	No-load current (A)		2.6	1.43	2.3	1.32	1.15	0.66	0.92	0.53
	RESISTANCE Ohm		28	84	28	84	112	330	174	511
PC2	Starting current (A)		21	7.4	19	7	8.7	3.2	7.5	2.8
	Nominal current (A)		3.2	4.0	2.9	3.8	1.5	1.8	1.3	1.6
	No-load current (A)		2.6	4.1	2.4	3.7	1.2	1.8	1.0	1.6
	RESISTANCE Ohm		6.1	14.7	6.1	14.7	22.4	63	33.8	98.7
PC3 (obsolete) Replaced by MT07E-104	Starting current (A)	500	16.1	8	19	7	8.7	3.2	7.5	2.8
	Nominal current (A)		4.6	4.49	4	3.9	2.2	1.9	1.7	1.6
	No-load current (A)		2.7	4.49	2.4	3.9	1.2	1.8	1.0	1.6
	RESISTANCE Ohm		6.1	14.7	6.1	14.7	22.4	63.0	33.8	98.7
MT07E-104	Starting current (A)	500	21.8	5.8	19.2	5.2	9.6	2.6	7.7	2.1
	Nominal current (A)		5.8	3.98	5.2	3.6	2.6	1.8	2.1	1.4
	No-load current (A)		4.4	3.98	4.0	3.6	2	1.8	1.6	1.4
	RESISTANCE Ohm		5.8	18.5	5.8	18.5	24.6	94.1	38.1	149
PC4	Starting current (A)	1000	38.9	13.2	33.8	11	16.5	5.5	13	4.4
	Nominal current (A)		8.28	5.52	7.2	4.8	3.5	2.2	2.8	1.8
	No-load current (A)		3.4	5.7	3.0	4.4	1.6	2.2	1.2	1.8
	RESISTANCE Ohm		3.3	11.0	3.3	11.0	10.6	46.4	15.8	78.8
PC5	Starting current (A)	2500	76.7	22.7	66.8	17.7	32	8.5	26.7	7.1
	Nominal current (A)		17.7	9.9	15.4	7.7	7.4	3.7	6.2	3.1
	No-load current (A)		9.3	9.4	8.1	8.1	3.9	3.9	3.3	3.3
	RESISTANCE Ohm		1.6	5	1.6	5	5	20	7.3	29



6.15 Hoist Motor Currents & Resistance – Single speed, 60 Hertz

To match the motor type to the hoist model, go to Section 2 – Main Specification.

Nominal voltage			115 V – 1PH	208 V - 3 PH	230 V – 3PH	460 V – 3PH	575 V – 3PH
Used in voltage range				200...208 V	220...240 V	440...480 V	575...600 V
Motor Type		kg		fast	fast	fast	fast
MT06E-200	Starting current (A)	125	5.31				
	Nominal current (A)		3.45				
	No-load current (A)		3				
	RESISTANCE Ohm		7.15				
SC2-4 obsolete (1800 RPM)	Starting current (A)	500			19	8.7	7.5
	Nominal current (A)				2	1.3	1.2
	No-load current (A)				1.5	0.7	0.7
	RESISTANCE Ohm				7.1	13.6	42.7
SC3-2 obsolete (3600 RPM)	Starting current (A)	250			19	8.7	7.5
	Nominal current (A)				4.2	2.1	1.7
	No-load current (A)				2.5	1.4	1.0
	RESISTANCE Ohm				3.6	13.6	33.8
MT07EA200	Starting current (A)	500		7.74	7	3.5	---
	Nominal current (A)			3.1	2.8	1.4	---
	No-load current (A)			1.5	1.4	0.7	---
	RESISTANCE Ohm			9.5	9.5	38	---
MT07EY-200	Starting current (A)	500	18.5				
	Nominal current (A)		11.5				
	No-load current (A)		9.3				
	RESISTANCE Ohm		1.8				
MT07EC100	Starting current (A)	500		17.3	15.6	7.8	---
	Nominal current (A)			4.9	4.4	2.2	---
	No-load current (A)			1.8	1.6	0.8	---
	RESISTANCE Ohm			4.1	4.1	17.7	---
SC3-4 (1800 RPM)	Starting current (A)	500			33.8	16.5	13
	Nominal current (A)				4.6	2.3	1.2
	No-load current (A)				1.9	1.0	0.5
	RESISTANCE Ohm				5.0	9.3	28.3
SC4-2 (3600 RPM)	Starting current (A)	500			33.8	16.5	13
	Nominal current (A)				8.6	4.3	2.8
	No-load current (A)				3.6	1.9	1.2
	RESISTANCE Ohm				2.9	5.1	15.8

6.16 Brake Coil Resistance (Ohms)

Main Voltage	Coil Voltage	LM1	LM05	LM05 Series II*	LM10	LM16/20/25
115	90 - 100 VDC	615	---	436	---	---
230	90 - 100 VDC	615	435	436	320	145
230/460 or 460	190 VDC	2300	1700	1650	1100	550
575	240 VDC	3400	2500	2550	1800	830

* WAR type brake