



Explosionproof Submersible Motors



Model EMQY

(Non Jacketed Motors)

Model EMJY

(Jacketed, CLC-Motors)

AC Motors 2HP to 125HP

Class I , Division 1
Groups C & D



ISO 9001 Certificate



E.I.M. ELECTRIC CO.,LTD.

● GENERAL INFORMATION

EMQY & EMJY Series Explosionproof Submersible Motors are investigated, tested and approved by Factory Mutual Research (FM) and are rated Class I , Division 1, Groups C & D Hazardous (Classified) Locations.

This certified explosionproof motor can be used for submersible equipments such as submersible pumps, aerators, mixers, etc. installed in wet well where flammable gases exist.

● GENERAL SPECIFICATIONS

Certifications	FM (United States, Canada)
Permitted Use	Class I (GAS/VAPOUR), Division 1, Groups C & D
Maximum Operating Temperature Range (T-Code)	T4 [135° C (275° F)]
Motor	Three Phase Squirrel Cage Induction Motor
Method of Cooling	Non Jacketed (EMQY) or Jacketed (EMJY)
Motor Rating HP	2 POLE (3600RPM) : 2 HP – 40 HP 4 POLE (1800RPM) : 2 HP – 125 HP 6 POLE (1200RPM) : 5 HP – 100 HP 8 POLE (900RPM) : 5 HP – 75 HP
Power Supply	208, 230, 460, 575V (Other voltages not more than 600V are available)
Insulation	Class F (155° C, 310° F) or Class H (180° C, 356° F)
Service Factor	1.15
Starting Method	Direct- On-Line or Star-Delta
Electrical Characteristics	NEMA Design B
Liquid Temperature	40° C (104° F) (Other temperatures are available on request)
Ambient Air Temperature	40° C (104° F)
Submersible Depth	Max. 65 ft (20m)
Leakage Detector	Single- or Dual-Electrode Leakage Detectors
Thermal Protector	Two Bi-Metallic Thermal Switches

[Reference Standards]

- NATIONAL ELECTRICAL CODE "Article 500 – Hazardous (Classified) Locations, Classes I , II , and III, Divisions 1 and 2"
"Article 501 – Class I Locations"
- FM Approval Standard 3600 : 1998 "Electric Equipment for use in Hazardous (Classified) Locations, General Requirements"
- FM Approval Standard 3615 : 2006 "Explosionproof Electrical Equipment, General Requirements"
- FM Approval Standard Supplement 3615.80 : 1999 "Electrical Submersible Pump Motors"
(Motor Performance and Test)
- NEMA MG1-1993 Part 12 "TESTS AND PERFORMANCE – AC MOTORS"

● **MODEL CODE (Ordering Information)**

▪ **EMQY Series (Non Jacketed)**

MODEL CODE : EMQY - x x x x x T x

Rated Horsepower
(See table below)

Number of poles
(See table below)

Insulation

Class	Code
F	Not described
H	H

Mating Flange Variation

Suffix "T"

identifies as flange-mounting motor

Electrode Leakage detector

Leakage Detector	Code
Dual	Not described
Single	S

Winding

Winding	Code
Direct on Line	Not described
Star - Delta	D

▪ **EMJY Series (Jacketed)**

MODEL CODE : EMJY - x x x x x T x

Same as Model Code for EMQY Series

● **MODEL NUMBER AND FRAME SIZE : EMQY Series**

Frame Size	2 POLE/3600RPM		4 POLE/1800RPM		6 POLE/1200RPM		8 POLE/900RPM	
	HP	Model No.	HP	Model No.	HP	Model No.	HP	Model No.
140T	2	EMQY- 22	2	EMQY- 24				
	3	- 32	3	- 34				
	5	- 52	5	- 54				
180T	7.5	- 82	7.5	- 84	5	EMQY- 56		
	10	-102	10	-104	7.5	- 86		
	15	-152	15	-154	10	-106	5	EMQY- 58
250T	20	-202	20	-204	15	-156	7.5	- 88
	25	-252	25	-254	20	-206	10	-108
	30	-302	30	-304	25	-256	15	-158
	40	-402	40	-404				
320T			50	-504	30	-306	20	-208
			60	-604	40	-406	25	-258
			75	-754	50	-506	30	-308
					60	-606	40	-408
360T			100	-1004	75	-756	50	-508
			125	-1254	100	-1006	60	-608
							75	-758

● GENERAL FEATURES

① CABLE

UL approved, specifically designed for submersible applications chloroprene cable withstands temperatures of up to 90° C(194° F).

② CABLE ENTRY

Bell-mouths are provided on junction chamber cover to reduce the likelihood of conductor insulation damage. Power cables and control cable are supported by clamps attached to the bell-mouths for a strain relief. The cable sealing between the cables and the junction chamber cover and strain relief for the cables are ensured by rubber bushings. All cables are potted into the junction chamber cover with cable sealing cement, forming the cable and cover assembly. Conductors located in the junction chamber cover are completely encapsulated in epoxy after removing the sheath and the other coverings for ensuring a non wicking cable entry.

③ LIFTING DEVICE

Oversized dual lifting rings of AISI-304 are provided for the safe handling.

④ BEARINGS

The support(upper) bearing consists of a single row ball bearing(frame size : 140T, 180T and 250T) or a roller bearing(frame size : 320T and 360T). The main(lower) bearing consists of a single row ball bearing (frame size : 140T) or a double row angular contact ball bearing (frame size : 180T, 250T, 320T and 360T).

Both upper and lower bearing are packed with lithium grease for high temperature usage.

Minimum bearing life L10 30,000 hours is standard for EMQY and EMJY series.

⑤ MOTOR HOUSING

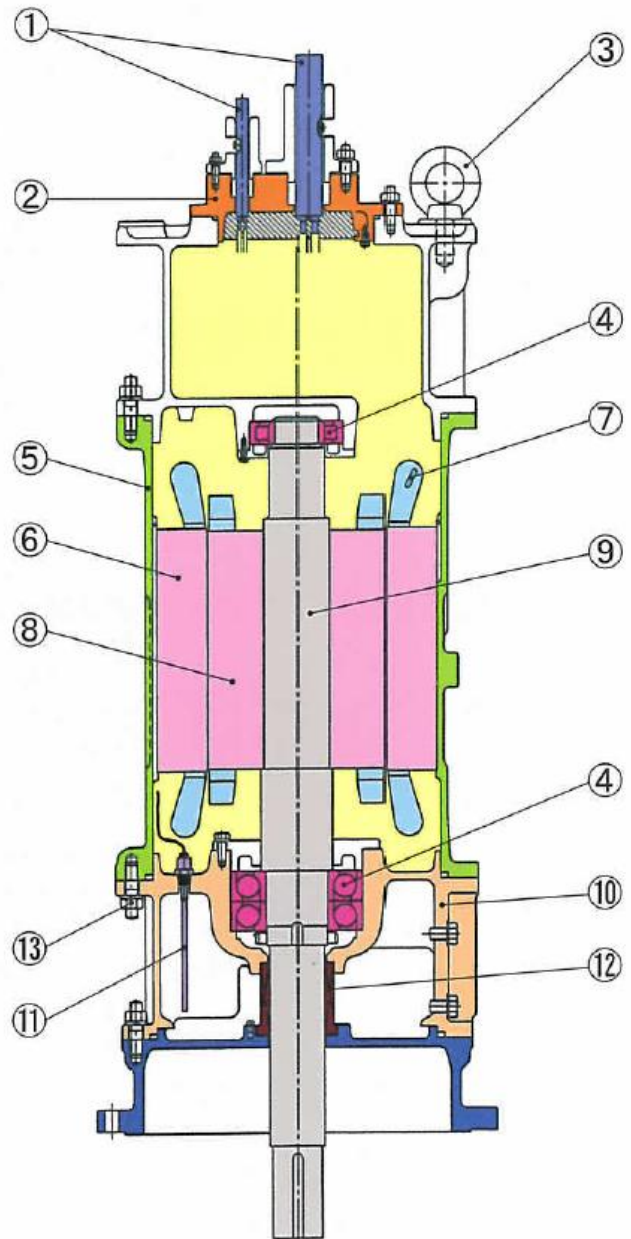
Rugged cast iron ASTM type A48, Class 35

⑥ MOTOR

An air filled, three phase squirrel cage induction motor for submersible or dry pit duty.

Stator windings are insulated with specially treated Class F(155° C, 310° F) or Class H (180° C, 356° F) nonhygroscopic insulation system.

Direct on Line for up to 10HP and Star-Delta winding for 15HP and above are standard.



⑦ THERMAL PROTECTOR

Two automatic-resetting bimetallic thermostats connected in series for limiting motor temperature are embedded in the motor windings.

⑧ ROTOR

Cast aluminum, dynamically balanced

⑨ SHAFT

AISI-420 stainless steel, oversized for maximum strength and life.

⑩ OIL CHAMBER

The oil in the oil chamber lubricates and cools the shaft seals and functions as a buffer to prevent water penetration into the motor.

⑪ LEAKAGE DETECTOR

A single-electrode or dual-electrode leakage detectors are installed in the oil chamber for sensing water penetration into there.

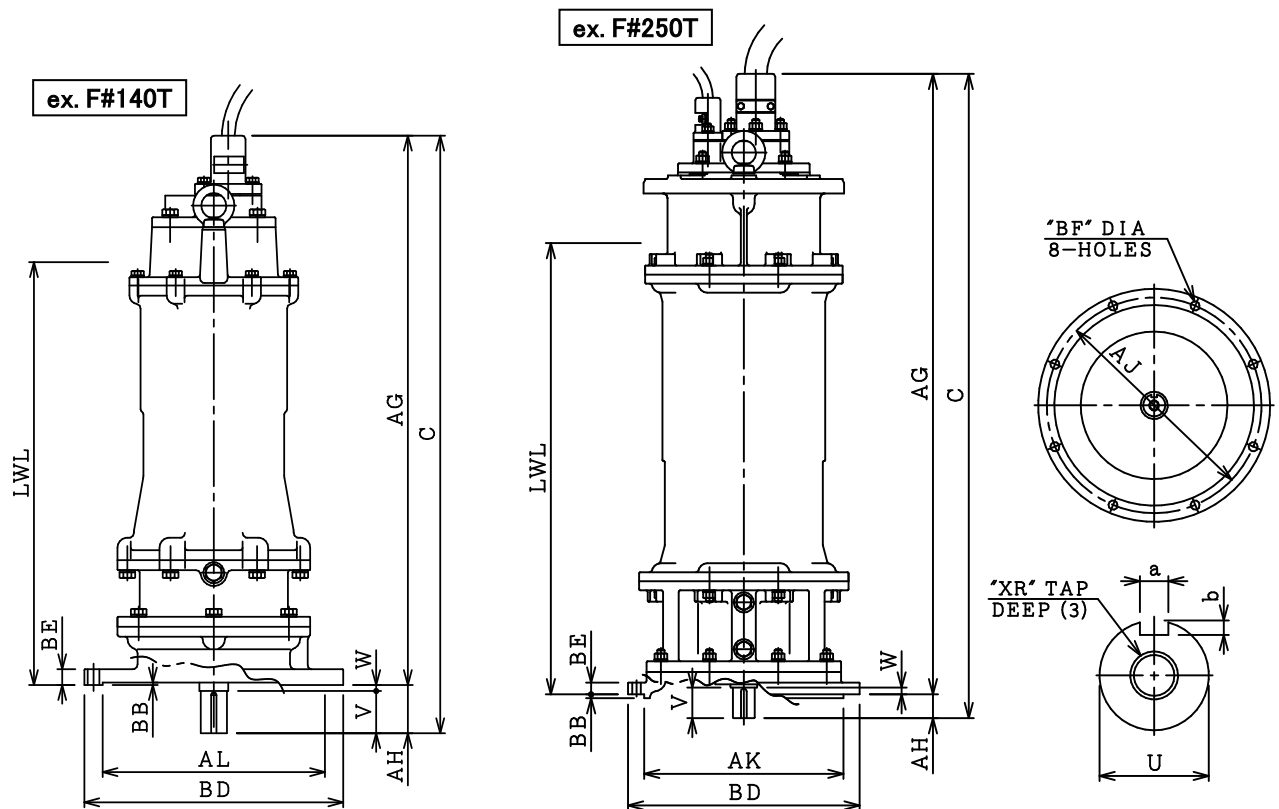
⑫ SHAFT SEALS

Double mechanical seals prevent the water from penetrating into the oil chamber and the motor housing. The inner seal (motor side) uses carbon against ceramic faces (frame size : 140T, 180T and 250T) or dual silicon carbide faces (frame size : 320T and 360T). The outer seal (process side) uses dual silicon carbide faces for all frame sizes.

⑬ HARDWARE

All external hardware are made of AISI-304 stainless steel.

DIMENSIONS : EMQY Series



Dimensions are in inches.

Frame Size	C	AG	AH (V+W)	AJ	AL/AK (4)	LWL (5)	BB	BD (1)	BE	BF	U (2)	V	W	XR (3)	KEY WAY	
															a	b
140T1	25.56	24.00	1.56	10.00	9.125	18.00	0.12	11.062	0.75	0.44	0.875	1.25	0.31	3/8-16	0.187	0.09
140T3	26.28	24.00	2.28	11.50	10.625	18.00	0.12	12.375	0.75	0.56	1.250	2.00	0.28	1/2-13	0.250	0.12
180T1	33.26	30.98	2.28	11.50	10.625	24.00	0.12	12.375	0.75	0.56	1.250	2.00	0.28	1/2-13	0.250	0.12
180T3	33.00	31.44	1.56	14.12	13.125	24.00	0.25	15.250	0.75	0.56	1.438	2.00	-0.44	5/8-11	0.375	0.19
250T3	42.20	40.64	1.56	14.12	13.125	32.00	0.25	15.250	0.75	0.56	1.438	2.00	-0.44	5/8-11	0.375	0.19
250T1	43.73	40.70	3.03	16.00	15.000	32.00	0.25	17.000	0.88	0.69	1.750	3.31	-0.28	5/8-11	0.375	0.19
320T1	51.45	46.14	5.31	17.25	16.000	35.00	0.25	18.750	0.88	0.69	2.500	3.19	2.12	3/4-10	0.500	0.25
360T1	58.69	52.13	6.56	18.75	17.500	40.00	0.25	20.250	0.88	0.69	2.500	3.19	3.37	1-8	0.500	0.30

- (1) "BD" varies ± 0.1 (2) "U" varies +0.0000 to -0.001. (3) "XR" Tap depth : 140T1 is 0.88, 140T3 thru 250T1 is 1.38, 320T1 is 1.5 and 360T1 is 2.0.
 (4) "AL" (on 140T1 thru 180T1) varies +0.004 to -0.000. / "AK" (on 180T3 thru 360T1) varies +0.000 to -0.002. (5) Minimum submerged depth

Dimensions of flange and shaft extension are optional

CHARACTERISTICS : EMQY Series

460V/60Hz

No. of Poles	Model No.	Frame Size	Output		Rated C't (A)	Efficiency			Power Factor			Rated Speed (min-1)	Starting Characteristics(DOL)				Weight (lb)
			HP	(kW)		1/1 (%)	3/4 (%)	1/2 (%)	1/1 (%)	3/4 (%)	1/2 (%)		Is (A)	Code Letter	Ts (%)	Tm (%)	
2	EMQY - 22	140T	2	(1.5)	3.1	73	70	63	82	77	68	3460	23	K	300	260	125
	- 32		3	(2.2)	4.5	74	71	64	85	81	73	3460	31	K	290	250	125
	- 52		5	(3.7)	7.0	76	75	70	88	85	78	3410	42	H	240	220	130
	- 82	180T	7.5	(5.5)	10.0	76	73.5	67.5	92.5	91.5	88	3450	58	G	270	260	250
	- 102		10	(7.5)	12.7	79	77.5	72.5	93	91.5	88	3450	78	G	270	270	265
	- 152		15	(11)	18.2	82.5	81.5	78	93.5	92	89	3450	112	G	260	260	295
	- 202	250T	20	(15)	25	82.5	81	77	92	91	88	3490	140	F	170	220	450
	- 252		25	(18.5)	30	84.5	83.5	79.5	92	91	88	3500	180	G	180	230	470
	- 302		30	(22)	36	85.5	85	82	92	91.5	88.5	3500	210	F	180	220	500
	- 402		40	(30)	47	87.5	86.5	83.5	91.5	90	85	3520	340	H	220	250	520
4	EMQY - 24	140T	2	(1.5)	3.1	75	73.5	69	80.5	74	62.5	1735	23	L	350	270	125
	- 34		3	(2.2)	4.4	77	76.5	73.5	83.5	77.5	66.5	1725	30	J	310	250	130
	- 54		5	(3.7)	6.9	79	79.5	78	86.5	82.5	72.5	1710	44	H	270	225	140
	- 84	180T	7.5	(5.5)	9.7	84	83	81	86	81	70.5	1735	63	H	270	250	255
	- 104		10	(7.5)	12.5	86	86	84	87	82.5	73	1735	80	H	270	250	275
	- 154		15	(11)	18.6	86	87	85	88	84	75	1730	115	G	250	240	300
	- 204	250T	20	(15)	24	86.5	87	85.5	88.5	86	78.5	1750	139	F	235	210	445
	- 254		25	(18.5)	30	87	87.5	86.5	89	87	81	1745	165	F	220	205	465
	- 304		30	(22)	36	87.5	88	87.5	89.5	87.5	82	1745	193	F	215	200	490
	- 404		40	(30)	48	88.5	89	88	89	86.5	80	1750	286	G	250	215	530
	- 504	320T	50	(37)	61	90	90	88.5	85.5	82.5	74	1760	340	F	200	210	760
	- 604		60	(45)	73	90.5	90.5	89	85	81.5	72.5	1760	430	G	210	220	795
- 754	75		(55)	89	91	91	90	87	84	77	1760	520	F	200	210	870	
- 1004	360T	100	(75)	118	91.5	91.5	90.5	87	85	78	1760	725	G	210	210	1130	
- 1254		125	(90)	146	92	92	91	87	85	78	1760	905	G	210	210	1200	
6	EMQY - 56	180T	5	(3.7)	8.0	79	78	74	74	67	55	1150	45	J	200	220	255
	- 86		7.5	(5.5)	11.5	80	80	76.5	76	69.5	57.5	1140	62	H	190	205	260
	- 106		10	(7.5)	15.0	81	81	78.5	77	71	59	1140	78	G	180	200	275
	- 156	250T	15	(11)	20.9	85	84.5	82.5	79	73	61.5	1160	112	G	190	210	445
	- 206		20	(15)	26.7	86.5	86	84	81	75.5	64.5	1160	140	G	180	210	480
	- 256		25	(18.5)	34.1	87	86.5	84.5	79	73	62	1160	185	G	200	220	505
	- 306	320T	30	(22)	40	87.5	87	85	80	75	64.5	1165	216	G	190	210	690
	- 406		40	(30)	53	88	88	86.5	81	76.5	66	1165	285	G	170	200	720
	- 506		50	(37)	64	88.5	88.5	87	82.5	78.5	69.5	1165	350	F	170	200	840
	- 606		60	(45)	79	88.5	88.5	87	80	75	64.5	1165	435	G	190	210	875
- 756	360T	75	(55)	90	90	90	89	86.5	84.5	78	1170	520	F	140	200	1140	
- 1006		100	(75)	120	91	90.5	89.5	86	83.5	76.5	1175	720	G	140	200	1200	
8	EMQY - 58	180T	5	(3.7)	8.2	78.5	77.5	73	73	66	54	860	44	J	200	205	275
	- 88	250T	7.5	(5.5)	11.1	82	82	79.5	77	70	58	860	58	G	170	215	435
	- 108		10	(7.5)	14.8	82.5	82.5	80	76.5	69.5	57	855	72	G	170	205	435
	- 158		15	(11)	21.9	84.5	84.5	81	76	69	56	855	110	G	180	215	480
	- 208	320T	20	(15)	29	85	85	82.5	77	71	59.5	870	145	G	180	200	680
	- 258		25	(18.5)	36	86	86	83.5	76.5	70.5	59	870	180	G	180	200	720
	- 308		30	(22)	42	86.5	87	85.5	78	73	62	870	205	F	170	200	775
	- 408		40	(30)	56	87	87.5	86	77.5	72.5	61	870	280	F	180	200	810
	- 508	360T	50	(37)	69	88	87.5	85	77.5	72.5	61.5	880	350	F	160	205	1030
	- 608		60	(45)	79	88.5	88.5	86.5	80.5	76.5	67	880	390	F	145	200	1100
- 758	75		(55)	99	89	89	87	80	75.5	66	880	490	F	150	200	1170	

Note : (1) Starting Characteristics

Is : Locked Rotor Current

Ts : Locked Rotor Torque

Tm: Breakdown Torque

DOL : Direct On Line Start

(2) Rated C't and LOK AMPS in the table above are applicable to voltage rating of 460Volts.

When voltage rating V other than 460Volts, AMPS are calculated as follows;

$$\text{AMPS at } V = (460/V) \times \text{AMPS at } 460\text{Volts}$$

Explosion Proof Submersible Motors with the Closed Loop Cooling System : MODEL EMJY

FM Approved Class I , Division 1, Groups C & D, T4 Temperature Code

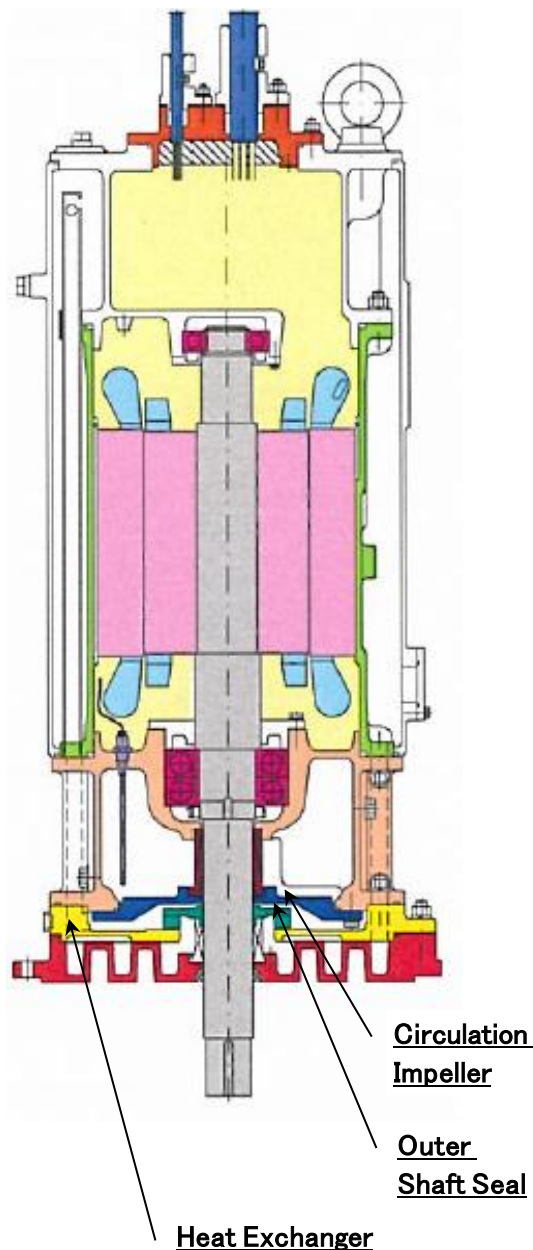
DESCRIPTION OF EMJY

As same as the General Specifications, but,

- * Continuous submerged and dry operation
- * Class F non-hygroscopic winding insulation
- * Silicon carbide faces (both rotating and stationary faces) outer shaft seal

FEATURES OF EMJY

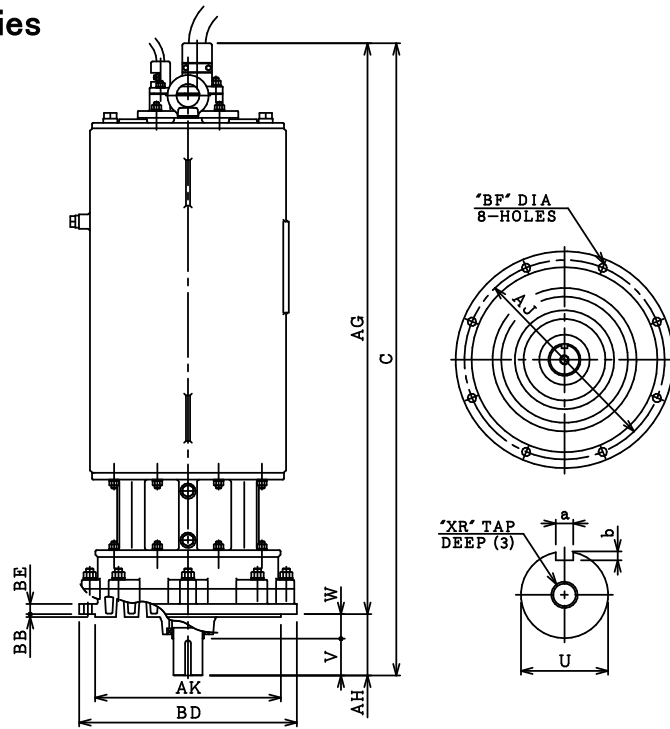
- Model EMJY with the internal closed loop cooling system features a unique corrugate shape heat exchanger incorporated into the bottom of motor. Through this configuration with wide heat transfer surfaces, the heat exchanger has superior performance in the cooling effect.
- The cooling circuit separated from the oil chamber
- The cooling media of the clean water/glycol mix having excellent heat conductivity compared with the conventional cooling media such as oil is circulated by means of a motor shaft mounted circulation impeller located between the oil chamber and the outer shaft seal.
- The circulation impeller causes the water to move through and around the motor housing from which it picks up heat generated in the motor active parts. This heat is then directed into the heat exchanger which transfers the heat to the pumped liquid.
- The EMJY cooling system with superior cooling power allows to realize the compact motor design.



MODEL NUMBER AND FRAME SIZE : EMJY Series

Frame Size	4 POLE/1800RPM		6 POLE/1200RPM		8 POLE/900RPM	
	HP	Model No.	HP	Model No.	HP	Model No.
250T1	25	EMJY - 254	15	EMJY - 156	10	EMJY - 108
	30	- 304	20	- 206	15	- 158
	40	- 404	25	- 256		
320T1	50	EMJY - 504	30	EMJY - 306	20	EMJY - 208
	60	- 604	40	- 406	25	- 258
	75	- 754	50	- 506	30	- 308
			60	- 606	40	- 408
360T1	100	EMJY - 1004	75	EMJY - 756	50	EMJY - 508
	125	- 1254	100	- 1006	60	- 608
					75	- 758

DIMENSIONS : EMJY Series



Dimensions are in inches.

Frame Size	C	AG	AH	AJ	AK (4)	BB	BD (1)	BE	BF	U (2)	V	W	XR (3)	KEY WAY	
														a	b
250T1	47.5	44.47	3.03	16.00	15.00	0.25	17.00	0.88	0.69	1.750	3.31	0.28	5/8-11	0.375	0.19
320T1	54.7	49.39	5.31	17.25	16.00	0.25	18.75	0.88	0.69	2.500	3.19	2.12	3/4-10	0.500	0.25
360T1	60.3	53.74	6.56	18.75	17.50	0.25	20.25	0.88	0.69	2.500	3.19	3.37	1-8	0.500	0.30

(1) "BD" varies ± 0.1

(2) "U" varies +0.0000 to -0.001.

(3) "XR" Tap depth is 1.5

(4) "AK" varies +0.000 to -0.002.

CHARACTERISTICS : EMJY Series

460V/60Hz

No. of Poles	Model No.	Frame Size	Output		Rated C't (A)	Efficiency			Power Factor			Rated Speed (min ⁻¹)	Starting Characteristics(DOL)				Weight (lb)
			HP	(kW)		1/1 (%)	3/4 (%)	1/2 (%)	1/1 (%)	3/4 (%)	1/2 (%)		Is (A)	Code Letter	Ts (%)	Tm (%)	
4	EMJY - 254	250T1	25	(18.5)	31	86.5	86.5	85	89.5	88	82.5	1750	165	F	220	205	700
	- 304		30	(22)	36	87	87.5	86.5	90	89	84	1750	195	F	215	200	740
	- 404		40	(30)	48	88.5	89	88	89	86.5	80	1750	290	G	250	215	740
	- 504	320T1	50	(37)	61	89	88.5	86.5	87.5	85	78.5	1760	330	F	230	220	1070
	- 604		60	(45)	72	90	89.5	87.5	87.5	85	78.5	1760	410	F	215	210	1140
	- 754		75	(55)	89	91	91	90	87	84	77	1760	520	F	215	210	1140
- 1004	360T1	100	(75)	117	91	90.5	89	88.5	87	82	1760	700	F	210	210	1550	
- 1254		125	(90)	146	91.5	91.5	90.5	88	86.5	81.5	1760	850	F	200	200	1550	
6	EMJY - 156	250T1	15	(11)	22	83.5	82.5	79.5	79.5	73.5	62	1160	110	G	190	210	660
	- 206		20	(15)	27	85.5	84.5	82	81	75.5	64.5	1160	140	F	180	210	690
	- 256		25	(18.5)	35	86	85.5	83	79	73	62	1160	180	G	200	220	720
	- 306	320T1	30	(22)	40	86.5	86	83.5	82	78	69	1165	210	F	190	210	990
	- 406		40	(30)	52	87.5	87.5	85.5	83	79.5	70.5	1165	270	F	180	200	1110
	- 506		50	(37)	64	88	88	86	83	79.5	70.5	1165	330	F	180	200	1150
- 606	360T1	60	(45)	77	89.5	90	88.5	81.5	76.5	66	1165	435	G	200	210	1170	
- 756		75	(55)	92	89.5	89	87	85.5	83	76	1175	520	F	145	205	1550	
- 1006	100	(75)	121	91	91	90	85	82	73.5	1175	720	G	145	205	1550		
8	EMJY - 108	250T1	10	(7.5)	15	81	81	78	77	70.5	58.5	855	72	G	180	205	650
	- 158		15	(11)	23	83	83	80	76.5	70	57.5	855	110	G	180	215	690
	- 208		320T1	20	(15)	29	84	83.5	80.5	77	71	60	870	145	G	190	205
	- 258	25		(18.5)	36	85	84.5	81.5	77	71	60	870	180	G	190	205	990
	- 308	30		(22)	42	86	86	83.5	78	73	62.5	870	205	F	180	200	1050
	- 408	360T1	40	(30)	56	86.5	86.5	84.5	78	73	62	870	280	F	180	200	1080
- 508	50		(37)	69	87	86	83	78	73	62.5	880	350	F	170	210	1380	
- 608	360T1	60	(45)	80	87.5	87.5	85	81	77	68	880	390	F	150	200	1450	
- 758		75	(55)	100	88.5	88	85.5	80	76	66.5	880	490	F	150	200	1520	

Note : Starting Characteristics

Is : Locked Rotor Current

Ts : Locked Rotor Torque

Tm : Breakdown Torque

DOL : Direct On Line Start

The designs or specifications of the models in this catalogue are subject to change without prior notice due to continual improvement.



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PCE-2025

Printed in Japan May 2011 RYO 1000