Descriptive Report

MASTER CONTRACT: 0000304130
REPORT: 80177585
PROJECT: 80194238

EDITION

Edition	Issued On	Project	Location	Prepared By	Authorized By
Edition 1	November 21, 2023	80177585	China Shanghai	Lily Li	Lily Li
Edition 2	December 23, 2024	80194238	China Shanghai	Lily Li	Lily Li

CONTENTS

Added:
Att1-Page 3 to 4
Att2-Illustration 2 and 3
Att3-Photo 6 to 8

PRODUCTS

Class 4211 01 MOTORS AND GENERATORS - Motors and Generators
Class 4211 81 MOTORS AND GENERATORS - Certified to US Standards

Part A:Single-Phase Cage Induction Motor, Capacitor Start-Capacitor Run, with Manual Reset Thermal Protector, Series SY, Output Power 2HP~5HP, 2 poles, 60 Hz, NEMA Frame 56 and 184T, Enclosure ODP, Insulation Class F, Time Rating Continuous, 40 ºC max ambient.

Model(s)	Electric Rating	NEMA Frame
SY-2HP-56-SPL-A	2HP, 115/230V,60Hz,15.0/9.0A, 3450RPM	56
SY-3HP-56-A	3HP, 230V,60Hz,12.0A, 3450RPM	56
SY-3.7HP-56-C	3.7HP, 230V,60Hz,17.2A, 3450RPM	56
SY-5HP-184T-SPL-C, SY-5HP-184T-C	5HP, 230V,60Hz,20A, 3450RPM	184T

Part B: Single-Phase Cage Induction Motor, Capacitor Start-Capacitor Run and Capacitor Start type, with or without Manual Reset Thermal Protector, Series SY, Output Power 3/4HP~2HP, 2 and 4 poles, 60 Hz, NEMA Frame 56 and 140, Enclosure TEFC, Insulation Class F, Time Rating Continuous, 40 °C max ambient.

Model(s)	Electric Rating	NEMA Frame	Thermal Protector	Starting Capacitor	Running Capacitor
SY-1HP-2P-B34-C	1HP, 115/230V,60Hz,13.5/7.0A, 3450RPM	56	Without	Y	N
SY-1.5HP-2P-B34-C, SY-1.5HP-2P-B3-C	1.5HP, 115/230V,60Hz,15.0/7.5A, 3450RPM	56	Without	Y	Y
SY-3/4HP-4P-B3-C, SY-3/4HP-4P-B34-C	3/4HP, 115/230V,60Hz,12.0/6.0A, 1725RPM	56	With	Y	N
SY-1HP-4P-B34-C	1HP, 115/230V, 60Hz, 14.5/7.5A, 1725RPM	56	With	Y	N
SY-1.5HP-4P-B34-C	1.5HP, 115/230V, 60Hz, 16.0/8.0A, 1725RPM	56	With	Y	Y
SY-2HP-4P-B34-C	2HP, 115/230V, 60Hz, 21.0/10.5A, 1725RPM	56	With	Y	Y
SY-2HP-4P-B3-C	2HP, 115/230V, 60Hz, 21.0/10.5A, 1725RPM	140	With	Y	Y

Part C: Three-Phase Cage Induction Motor, 2 poles, 60 Hz, Enclosure TEFC, Insulation Class F, Time Rating Continuous, 40 °C max ambient.

Model(s)	Electric Rating	NEMA Frame	Thermal Protector
SY-2HP-2P-B34	2HP, 230/460V, 60Hz, 6.0/3.0A, 3450RPM	56	Without

Notes:
1. Certified only as a component of other certified equipment, where the suitability of the combination is to be determined in the end use application by CSA International.

CONDITIONS OF ACCEPTABILITY

None

APPLICABLE REQUIREMENTS

Standards Used	Description
CSA C22.2 No. 100-14 (Upd.1 April 2017)(Seventh Edition) (R2019)	Motors and generators
CSA C22.2 No. 77-14+Errata:2015(Eighth Edition)(R2019)	Motors with inherent overheating protection - Eighth Edition; Incorporated Errata: February 2015
UL 1004-3-2018(Second Ed.)	Standard for Safety for Thermally Protected Motors
ANSI/UL 1004-1:2012 - Second Edition	UL Standard for Safety Rotating Electrical Machines – General Requirements

Standards Notes

CSA C22.2 No.77-14 & UL 1004-3 only used for thermally protected motors

MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

- Submitter's name and/or CSA Master Contract number "304130"
- Model designation
- Electrical Ratings (voltage, current, HP, RPM, frequency)
- Number of phase
- Continuous or CONT
- Insulation class (F)
- Maximum ambient (40 ºC)
- Enclosure Type, ODP or TEFC, as application
- Thermally Protected, only for motor with thermal protector, including Part A, and Part B with indication
- Suitable connection diagram
- Date code or serial number
- CSA CUS mark

Method of Marking: Appeared on pressure-sensitive printed labels recognized by UL CUS.

NAMEPLATE ADHESIVE LABEL MATERIAL APPROVAL INFORMATION

File No. MH20558, c UL us recognized.
Manufacture: AVERY (CHINA) CO LTD.
Model Designation: 50 Micron MAT WH PET TC/DS017HT
Suitable Printing Inks: Thermal transfer ribbon, ITW B324, in the black color unless otherwise indicated
Application Powder Coated Metal surface: Max.150 ℃

LABEL SERVICE

None

ALTERATIONS

Markings as noted above.

FACTORY TESTS

Each motor at the conclusion of manufacture, before shipment, shall be applied following AC voltages between live parts and exposed metal parts (frame or enclosure) for one min without insulation breakdown.
- Between stator winding and frame, apply potential of twice rated voltage plus 1,000 V AC.

As an alternative, potential 20 percent higher may be applied for one sec.

WARNING: The factory test(s) specified may present a hazard of injury to personnel and/or property and should only be performed by persons knowledgeable of such hazards and under conditions designed to minimize the possibility of injury.

SPECIAL INSTRUCTIONS FOR FIELD SERVICES

1. Component descriptions marked with either the "(INT)" or "(INT*)" identifiers may be substituted with other components providing the requirements specified under the notes in the "Description" are complied with.

COMPONENT SPECIAL PICKUP

1. Component descriptions marked with the identifier "(CT)" are subject to annual pickup and Conformity Testing.

DESCRIPTION

Notes:

1. Component Substitution
   a) Critical components (those identified by mfr name, cat no), which are NOT identified with either "INT" or "INT*" are not eligible for substitution without evaluation and report updating
   b) The term "INT" means a "Certified" and/or "Listed" (or a "Recognized" and/or "Accepted") component may be replaced by one "Certified" and/or "Listed" by another certification organization accredited by the appropriate accreditation body or scheme requirements to the correct standard, for the same application; providing the applicable country identifiers are included and requirements in item "d" below are complied with.
   c) The Term "(INT*)" means a "Recognized" and/or "Accepted" component may be replaced by a component that is CSA Certified. The applicable country identifiers shall be included, the requirements in item "d" below as well as any "conditions of suitability" for the component (as recorded in this descriptive report) shall be complied with;
   d) Components which have been substituted, must be of an equivalent rating, configuration (size, orientation, mounting) and the applicable minimum creepage and clearance distances are to be maintained from live parts to bonded metal parts and secondary parts.
   e) Substitution of a "Certified" and/or "Listed" component with a component that is "Recognized" or "Accepted" is not permitted without evaluation and report updating.
   f) Substitution of a "Recognized" and/or "Accepted" component by one that is not CSA Certified is not permitted without a proper evaluation as well as a report update because the Conditions of Acceptance of the original component may be different than the Conditions of Acceptance of the substitute component.

General: The subject products are single-phase cage induction motors, capacitor start-capacitor run type and capacitor-start type, with or without manual reset thermal protector, ODP or TEFC Enclosure. Also, included three-phase cage induction motor without thermal protection.

The end equipment is compressor. Motors intended to install at factory

Critical components detail construction information as follows:
Att2 Illustration 1 -Typical drawing for Part A, ODP Enclosure
Page 1- Assembly Drawing
Page 2- End Shield (Drive End)
Page 3- End Shield (Non-Drive End)
Page 4- Stator Enclosure
Page 5- Stator core with winding
Page 6- Stator Lamination
Page 7- Rotor Assembly
Page 8- Cast Aluminum Rotor
Page 9- Rotor Lamination
Page 10-Internal Fan
Page 11-Capacitor Housing

Att2 Illustration 2 -Typical drawing for Part B,TEFC Enclosure
Page 1- Assembly Drawing
Page 2- End Shield (Drive End)
Page 3- End Shield (Non-Drive End)
Page 4- Stator Enclosure

Page 5- Stator core with winding
Page 6- Stator Lamination
Page 7- Rotor Assembly
Page 8- Rotor Lamination
Page 9- Terminal Box Base
Page 10- Terminal Box Cover
Page 11- External Fan
Page 12- Fan Cover
Page 13-Capacitor Housing

Att2 Illustration 3 -Typical drawing for Part C, TEFC Enclosure
Page 1- Assembly Drawing
Page 2- Stator Enclosure
Page 3- Stator core with winding
Page 4- Stator Lamination
Page 5- Rotor Assembly
Page 6- Rotor Lamination

Part A: ODP Enclosure

1. End Shield (Drive End):
Material: Die-cast aluminum alloy
Ventilation Openings: Details as below
Dimensions: Details as below
Remark: Openings have such size and shape as to prevent the passage of a straight 12.7 mm diameter probe, with a straight cut-off end, from touching a bare live part.

Model	Mi. Thick(mm)	Openings	
		Width(mm)	Drawing No
SY-2HP-56-SPL-A	3	11	Att2 Illustration -Page 2
SY-3HP-56-A	3	11	Att2 Illustration -Page 2
SY-3.7HP-56-C	3	11	Att2 Illustration -Page 2
SY-5HP-184T-C, SY-5HP-184T-SPL-C	3	11	Att2 Illustration -Page 2

2. End shield (Non-Drive End):
Material: Die-cast aluminum alloy
Ventilation Openings: Details as below
Dimensions: Details as below
Remark: Openings have such size and shape as to prevent the passage of a straight 12.7 mm diameter probe, with a straight cut-off end, from touching a bare live part.

Model	Mi. Thick(mm)	Openings	
		Width(mm)	Drawing No
SY-2HP-56-SPL-A	3	11	Att2 Illustration -Page 3
SY-3HP-56-A	3	11	Att2 Illustration -Page 3
SY-3.7HP-56-C	3	11	Att2 Illustration -Page 3
SY-5HP-184T-C, SY-5HP-184T-SPL-C	3	11	Att2 Illustration -Page 3

3. Stator Enclosure:
Material: Sheet Steel
Ventilation Openings: None
Dimension: See below table

Model	Thick(mm)	Inner Diament (mm)	Length (mm)
SY-2HP-56-SPL-A	2	160	167
SY-3HP-56-A	2	160	191
SY-3.7HP-56-C	2	160	210
SY-5HP-184T-C, SY-5HP-184T-SPL-C	2	160	249

4. Stator Core:
Material: Laminated silicon steel, 50WW600
Dimension: See below table

Model	Inner Diament (mm)	Outer Diament (mm)	Length (mm)	Slot Quantity
SY-2HP-56-SPL-A	72	160	55	24
SY-3HP-56-A	72	160	95	24
SY-3.7HP-56-C	72	160	95	24
SY-5HP-184T-C, SY-5HP-184T-SPL-C	72	160	116	24

5. Stator Winding:
Material: Copper or Aluminum, detail see below
Size: See below table

Model	Material	Conductor Size (Φ mm)		Winding Turns (Phase)		Winding Resistance (ohm,25 ºC)(230V)	
		Main	Auxiliary	Main	Auxiliary	Main	Auxiliary
SY-2HP-56-SPL-A	Aluminum	1.05	0.8	129	105	1.665	2.288
SY-3HP-56-A	Aluminum	0.9+0.95	0.85	89	93	0.9007	2.177
SY-3.7HP-56-C	Copper	0.9	0.9	77	80	0.536	1.105
SY-5HP-184T-C, SY-5HP-184T-SPL-C	Copper	1.04*2+1.08	0.83*2	56	75	0.375	1.418

6. Rotor Assembly:
Core Material: Laminated silicon steel, 50WW600
Conductor Type: Cast Aluminum
Dimension: See below table

Model	Outer Diament (mm)	Stack Length (mm)	Short Ring (Φ ID× Φ OD× Thick*) (mm)	Slot Quantity
SY-2HP-56-SPL-A	71.5	55	35×68×17	24
SY-3HP-56-A	71.5	95	35×68×17	24
SY-3.7HP-56-C	71.5	95	35×68×17	24
SY-5HP-184T-C, SY-5HP-184T-SPL-C	71.5	116	35×68×17	24

Note: * Denoting axial length

7. Insulation System: Accepted
The insulation system class is F, the main insulation material listed as follow:

Item	Designation and /or Material	Size(mm)	Thermal Class or Temperature	Manufacture
Magnet wire	JXMW35A, Aluminium	Φ0.8, Φ0.85, Φ0.9, Φ0.95, Φ1.0, Φ1.05	155 ºC	Tongling Jingda Special Magnet Wire Co Ltd.(E248026)
	QZY- 2/180, Copper	Φ0.83, Φ0.9, Φ1.04, Φ1.08	180	Zhejiang Grandwall Electric Intelligent Technology Co Ltd.(E206121)
Stator Insulation Paper	6641DMD	0.22,0.25 thick	Class F	Changzhou Jinlong Insulation Materials Co.,LTD.(E345386)
Sleeving	Grade A silicone resin coated fiberglass sleeve,2760	Φ2- Φ10	600V,200 ºC	NANTONG CITY DEMEI ELECTRIC GLASS FIBER CO LTD(E331136)
Tie Cords	High strength polyester filament	Φ1.0	160℃	LinAn GuangDa Motor Accessories Factory
Varnish	R-1140	--	Min.155 ºC	ZHEJIANG RONGTAI TECHNICAL INDUSTRY CO LTD(E227128)

Spacing: The stator wingding with its slot insulation, and the core are suitably varnished and mechanically secured.

Item	Spacing
Slot Insulation	The insulation extends 2.4 mm min beyond the stator core.
End Windings	2.4 mm min spacing away from the Stator Frame, End Shield (Drive End) and End Shield (None-Drive End).

8. Lead wire: c UL us recognized
Manufacturer: TAIZHOU FUANDA WIRE&CABLE CO LTD(E522166)

Location	UL style	CSA type	Rating
Stator Lead	3289	AWM Class I, Group A	150 ºC, 600V AC, Horizontal Flame, AWG 12-16

Note: May be replaced by alternative manufacturers with UL recognized wire with same style and rating.

9. Starting Capacitor: UL CUS Recognized, construction only, dry metallized-polypropylene film type
Manufacturer: ZHEJIANG SHUANGFENG ELECTRIC CO LTD (E220629)
Cat. No.: CBB60
Mounting: Secured on stator enclosure by screw with an individual protect enclosure without openings

Rating: See below table

Model	Voltage (V AC)	Frequency (Hz)	Capacitance (uF)	Max. Temperature (ºC)
SY-2HP-56-SPL-A	250	50/60	300	90
SY-3HP-56-A	250	50/60	300	90
SY-3.7HP-56-C	250	50/60	250	90
SY-5HP-184T-C, SY-5HP-184T-SPL-C	250	50/60	250	90

10. Starting Capacitor Housing:
Material: Sheet Steel, Thick 1.0 mm
Openings: None
Dimension: See below table
Mounting: Secured to stator enclosure by 2 screws.

Model	Length ×Width ×Height (mm)
SY-2HP-56-SPL-A	139.5×59×49
SY-3HP-56-A	
SY-3.7HP-56-C	
SY-5HP-184T-C, SY-5HP-184T-SPL-C	

11. Running Capacitor: UL CUS Recognized, construction only, dry metallized-polypropylene film type
Manufacturer: WENLING CITY ZEGUO YIHAO CAPACITOR FACTORY LTD (E355594)
Cat. No.: CBB60
Mounting: Secured on stator enclosure by screw with an individual protect enclosure without openings
Rating: See below table

Model	Voltage (V AC)	Frequency (Hz)	Capacitance (uF)	Max. Temperature (ºC)
SY-2HP-56-SPL-A	450	50/60	45±5%	85
SY-3HP-56-A	450	50/60	45±5%	85
SY-3.7HP-56-C	450	50/60	45±5%	85
SY-5HP-184T-C, SY-5HP-184T-SPL-C	450	50/60	45±5%	85

12. Running Capacitor Housing:
Same as starting capacitor housing, listed in Item 10

13. Centrifugal Switch: UL CUS recognized
Manufacturer: NINGBO ZHENHAI MICRO ELECTRIC MOTORS FACTORY (E302311)
Designation: L19-202S
Rating: 120/250 VAC, 50/60Hz,22A (break)
Structure: Consist of stationary switch and centrifugal mechanism
Mounting: Stationary switch is secured on end shield (non-drive end) by screws, and centrifugal mechanism is secured on shaft by press-fitting.
Remark: successfully completed 100,000 cycle endurance tests.

14. Thermal Protector: Manual Reset, UL CUS recognized
Manufacturer: Dong Guan Proprotors Electric Co., LTD(E498190)
Rating: See below table
Mounting: Securely fastened on the non-drive end shield by screw.

Motor Model	Protector Model	Open Temperature (ºC)
SY-2HP-56-SPL-A	TC4-0-E-1-44-V03	135 ± 5℃
SY-3HP-56-A	TC4-0-E-1-44-V12	135 ± 5℃
SY-3.7HP-56-C	TC4-0-E-1-44-V12	135 ± 5℃
SY-5HP-184T-C, SY-5HP-184T-SPL-C	TC4-0-E-1-44-V26	135 ± 5℃

15. Factory Wiring Compartment:
Construction: Rectangle-shaped, consist electrical insulation board (described in item 17), body (part of non-drive end shield) and cover
Material: Body with Cast aluminum, Cover with sheet metal
Dimension: See below
Remark: Wholly integral with the end shield (non-drive end). The threaded conduit entry also integrally casted with the end shield (non-drive end).

NEMA Frame	Overall Length× Width× Height (mm)	Min. Thickness Body × Cover(mm)	Usable Volume (cm 3)	Conduit Entry* Trade Size
56	80.2×43.2×23.5	2.5×1.5	>48cm3	M22
184T				

Note: * Threaded conduit entry not intended to receive rigid metal conduit. It is for connecting outlet bushing and fitting to protect power supply conductor from mechanical injury or abrasion.

16. Internal Cooling Fan:
Material: Reinforced nylon 1010
Dimension: Details as follows
Mounting: Secured on shaft near the drive-end end shield.

NEMA Frame	ID of Blade (mm)	OD of Blade (mm)	Thick of Blade (mm)	Axial Length of blade (mm)	Blade Quantity
56	45	130	2	20	19
184T					

17. Terminal Board:
Material Manufacturer: SABIC INNOVATIVE PLASTICS US L L C (E121562)
Material Designation: 420SE0(f1) (w)(GG)(rr1)
Flame Rating: V-0, 130℃, HWI PLC2, HAI PLC 0, CTI PLC3, Min 2.0mm thick, all color
Terminal Board Dimensions: 95 mm length by 57.4mm wide by 2.2 mm thick.
Terminals: 6.4 mm by 0.8 mm (Wide x Thick), with PVC insulation material, max. temperature 105 ℃.
Mounting: Secured to the non-drive end bell by rivets.
Remark: Same as the terminal board of centrifugal switch recognized by UL.

Alternative Terminal Board Material:
Material Manufacturer: SHENGYI TECHNOLOGY CO LTD (E109769)
Material Designation: S1130 (FR-4.0)
Flame Rating: V-0, 130℃, HWI PLC0, HAI PLC 0, CTI PLC0, Min 2.0mm thick, NC color

18. Bonding and Grounding:
One M4 machine screw is provided on the non-drive end shield, colored by green. The screw engages a minimum of two threads into the metal of the enclosure, and the grounding symbol is provided beside the screw.

-End of description of Part A-

Part B: Single-phase, TEFC enclosure

1. End Shield (Drive End):
Material: Die-cast aluminum alloy
Ventilation Openings: None
Dimensions: Min.thick 2.5 mm

2. End shield (Non-Drive End):
Material: Die-cast aluminum alloy
Ventilation Openings: None
Dimensions: Min.thick 2.5 mm

3. Stator Enclosure:
Material: Sheet Steel
Ventilation Openings: None
Dimension: See below table

Model	Thick(mm)	Inner Diament (mm)	Length (mm)
SY-1HP-2P-B34-C	2	160	170
SY-1.5HP-2P-B34-C, SY-1.5HP-2P-B3-C	2	160	190
SY-3/4HP-4P-B3-C, SY-3/4HP-4P-B34-C	2	160	170
SY-1HP-4P-B34-C	2	160	190
SY-1.5HP-4P-B34-C	2	160	190
SY-2HP-4P-B34-C	2	160	210
SY-2HP-4P-B3-C	2	160	210

4. Stator Core:
Material: Laminated silicon steel, 50WW600
Dimension: See below table

Model	Inner Diament (mm)	Outer Diament (mm)	Length (mm)	Slot Quantity
SY-1HP-2P-B34-C	72.2	160	55	24
SY-1.5HP-2P-B34-C, SY-1.5HP-2P-B3-C	72.2	160	60	24
SY-3/4HP-4P-B3-C, SY-3/4HP-4P-B34-C	98	160	50	36
SY-1HP-4P-B34-C	98	160	80	36
SY-1.5HP-4P-B34-C	98	160	80	36

Model	Inner Diament (mm)	Outer Diament (mm)	Length (mm)	Slot Quantity
SY-2HP-4P-B34-C	98	160	100	36
SY-2HP-4P-B3-C	98	160	100	36

5. Stator Winding:
Material: Copper, detail see below
Size: See below table

Model	Conductor Size (Φ mm)		Winding Turns (Phase)		Winding Resistance (ohm,25 ºC)(230V)	
	Main	Auxiliary	Main	Auxiliary	Main	Auxiliary
SY-1HP-2P-B34-C	Φ0.77*2	Φ0.90	151	145	2.039	3.293
SY-1.5HP-2P-B34-C, SY-1.5HP-2P-B3-C	Φ0.77*2	Φ0.95	124	140	2.315	3.57
SY-3/4HP-4P-B3-C, SY-3/4HP-4P-B34-C	Φ0.71*2	Φ0.77	121	79	2.914	3.5
SY-1HP-4P-B34-C	Φ0.80*2	Φ0.71*2	87	53	2.019	1.661
SY-1.5HP-4P-B34-C	Φ0.85*2	Φ0.74+ Φ0.77	70	64	2.55	2.11
SY-2HP-4P-B34-C	Φ0.9+ Φ1.0	Φ0.85*2	55	45	0.999	1.107
SY-2HP-4P-B3-C	Φ0.9+ Φ1.0	Φ0.85*2	55	45	0.999	1.107

6. Rotor Assembly:
Core Material: Laminated silicon steel, 50WW600
Conductor Type: Cast Aluminum
Dimension: See below table

Model	Outer Diament (mm)	Stack Length (mm)	Short Ring (Φ ID× Φ OD× Thick*) (mm)	Slot Quantity
SY-1HP-2P-B34-C	71.3	55	34×70×11/16	18
SY-1.5HP-2P-B34-C, SY-1.5HP-2P-B3-C	71.3	60	34×70×11/16	18
SY-3/4HP-4P-B3-C, SY-3/4HP-4P-B34-C	97.15	50	56.2×95.6×11.5	32
SY-1HP-4P-B34-C	97.15	80	56.2×95.6×11.5	32
SY-1.5HP-4P-B34-C	97.15	80	56.2×95.6×11.5	32
SY-2HP-4P-B34-C	97.15	100	56.2×95.6×11.5	32
SY-2HP-4P-B3-C	97.15	100	56.2×95.6×11.5	32

Note: * Denoting axial length

7. Insulation System: Accepted
The insulation system class is F, the main insulation material listed as follow:

Item	Designation and /or Material	Size(mm)	Thermal Class or Temperature	Manufacture
Magnet wire	QZY- 2/180, Copper	Φ0.71, Φ0.74, Φ0.77, Φ0.8, Φ0.85, Φ0.9, Φ0.95, Φ1.0	180	Zhejiang Grandwall Electric Intelligent Technology Co Ltd.(E206121)
Stator Insulation Paper	6641DMD	0.22,0.25 thick	Class F	Changzhou Jinlong Insulation Materials Co.,LTD.(E345386)
Sleeving	Grade A silicone resin coated fiberglass sleeving,2760	Φ2- Φ10	600V,200 ºC	NANTONG CITY DEMEI ELECTRIC GLASS FIBER CO LTD(E331136)
Tie Cords	High strength polyester filament	Φ1.0	160℃	LinAn GuangDa Motor Accessories Factory
Varnish	R-1140	--	Min.155 ºC	ZHEJIANG RONGTAI TECHNICAL INDUSTRY CO LTD(E227128)

Spacing: The stator wingding with its slot insulation, and the core are suitably varnished and mechanically secured.

Item	Spacing
Slot Insulation	The insulation extends 2.4 mm min beyond the stator core.
End Windings	2.4 mm min spacing away from the Stator Frame, End Shield (Drive End) and End Shield (None-Drive End).

8. Lead wire: c UL us recognized
Manufacturer: TAIZHOU FUANDA WIRE&CABLE CO LTD(E522166)

Location	UL style	CSA type	Rating
Stator Lead	3289	AWM Class I, Group A	150 ºC, 600V AC, Horizontal Flame, AWG 16

Note: May be replaced by alternative manufacturer with UL recognized wire with same style and rating.

9. Starting Capacitor: UL CUS Recognized, construction only, dry metallized-polypropylene film type
Manufacturer: ZHEJIANG SHUANGFENG ELECTRIC CO LTD (E220629)
Cat. No.: CBB60
Mounting: Secured on stator enclosure by screw with an individual protect enclosure without openings
Rating: See below table

Model	Voltage (V AC)	Frequency (Hz)	Capacitance (uF)	Max. Temperature (ºC)
SY-1HP-2P-B34-C	250	50/60	250	90
SY-1.5HP-2P-B34-C, SY-1.5HP-2P-B3-C	250	50/60	200	90
SY-3/4HP-4P-B3-C, SY-3/4HP-4P-B34-C	250	50/60	250	90
SY-1HP-4P-B34-C	250	50/60	250	90

Model	Voltage (V AC)	Frequency (Hz)	Capacitance (uF)	Max. Temperature (ºC)
SY-1.5HP-4P-B34-C	250	50/60	300	90
SY-2HP-4P-B34-C	250	50/60	350	90
SY-2HP-4P-B3-C	250	50/60	300	90

10. Starting Capacitor Housing:
Material: Sheet Steel, Thick 1.0 mm
Openings: None
Dimension: Same as Part A
Mounting: Secured to stator enclosure by 2 screws.

11. Running Capacitor: UL CUS Recognized, construction only, dry metallized-polypropylene film type
Manufacturer: WENLING CITY ZEGUO YIHAO CAPACITOR FACTORY LTD (E355594)
Cat. No.: CBB60
Mounting: Secured on stator enclosure by screw with an individual protect enclosure without openings
Rating: See below table

Model	Voltage (V AC)	Frequency (Hz)	Capacitance (uF)	Max. Temperature (ºC)
SY-1.5HP-2P-B34-C, SY-1.5HP-2P-B3-C	450	50/60	35±5%	85
SY-1.5HP-4P-B34-C	450	50/60	50±5%	85

11.1 Running Capacitor: UL CUS Recognized, construction only, dry metallized-polypropylene film type
Manufacturer: TAI ZHOU KANG PAI CAPACITOR CO LTD (E240778)
Cat. No.: CBB60
Mounting: Secured on stator enclosure by screw with an individual protect enclosure without openings
Rating: See below table

Model	Voltage (V AC)	Frequency (Hz)	Capacitance (uF)	Max. Temperature (ºC)
SY-2HP-4P-B34-C SY-2HP-4P-B3-C	450	50/60	80±5%	105

12. Running Capacitor Housing:
Same as starting capacitor housing, listed in Item 10

13. Centrifugal Switch: UL CUS recognized
Manufacturer: NINGBO ZHENHAI MICRO ELECTRIC MOTORS FACTORY (E302311)
Designation: L18.7-30 2S (for 2 Poles); L18.7-30 4S(for 4 Poles)
Rating: 120/250 VAC, 50/60Hz
Structure: Consist of stationary switch and centrifugal mechanism
Mounting: Stationary switch is secured on end shield (non-drive end) by screws, and centrifugal mechanism is secured on shaft by press-fitting.
Remark: successfully completed 100,000 cycle endurance tests.

14. Thermal Protector: Manual Reset, UL CUS recognized
Manufacturer: VICTOR ELECTRIC CO LTD (E254470)
Rating: See below table

Mounting: Securely fastened in terminal box by screws.

Motor Model	Protector Model	Open Temperature (ºC)
SY-3/4HP-4P-B3-C, SY-3/4HP-4P-B34-C	VC4-0-E-1-30 (V17)	135 ± 5℃
SY-1HP-4P-B34-C	VC4-0-E-1-30（V10）	135 ± 5℃
SY-1.5HP-4P-B34-C	VC4-0-E-1-40（V11）	140 ± 5℃
SY-2HP-4P-B34-C SY-2HP-4P-B3-C	VC4-0-E-1-30（V27）	135 ± 5℃

15. Terminal Box:
Construction: Rectangle-shaped, consists of box body and cover
Material: Sheet metal
Dimension: See below
Mounting: Fastened on station enclosure by screws.

Model	Overall Length× Width× Height (mm)	Min. Thickness Body × Cover(mm)	Usable Volume (cm 3)	*Conduit Entry
All models	90×80×60	1.0 ×1.0	421	Φ25 mm

Note: * Knock out type

16. External cooling fan:
Material: Reinforced nylon 1010
Dimension: Details as follows
Mounting: Secured on shaft near the drive-end end shield.

Model	ID of Blade (mm)	OD of Blade (mm)	Thick of Blade (mm)	Axial Length of blade (mm)	Blade Quantity
All	24	148	3	23	11

17.Fan Cover:
Material: Sheet steel
Dimension: Details as follows
Mounting: Secured on the end-shield (non-drive).

Model	ID (mm)	Thick (mm)	Axial Length (mm)	Opening size(mm) (Max. width)
All	173	1.0	60	7

18. Bonding and Grounding:
One M4 machine screw is provided in the terminal box, colored by green. The screw engages a minimum of two threads into the metal of the enclosure, and the grounding symbol is provided beside the screw.

-End of description of Part B-

Part C: Three-phase motor, TEFC enclosure

1. End Shield (Drive End):
Material: Die-cast aluminum alloy
Ventilation Openings: None
Dimensions: Min.thick 2.5 mm

2. End shield (Non-Drive End):
Material: Die-cast aluminum alloy
Ventilation Openings: None
Dimensions: Min.thick 2.5 mm

3. Stator Enclosure:
Material: Sheet Steel
Ventilation Openings: None
Dimension: See below table

Model	Thick(mm)	Inner Diament (mm)	Length (mm)
SY-2HP-2P-B34	2.0	160	210

4. Stator Core:
Material: Laminated silicon steel, 50WW600
Dimension: See below table

Model	Inner Diament (mm)	Outer Diament (mm)	Length (mm)	Slot Quantity
SY-2HP-2P-B34	82	160	65	Totally 28, detail as Att2 Illustration 3-Page 6

5. Stator Winding:
Material: Copper or Aluminum, detail see below
Size: See below table

Model	Conductor Size (Φ mm)	Winding Turns (Phase)	Winding Resistance (ohm,25 ºC) (230V)
SY-2HP-2P-B34	0.77	61	2.93

6. Rotor Assembly:
Core Material: Laminated silicon steel, 50WW600
Conductor Type: Cast Aluminum
Dimension: See below table

Model	Outer Diament (mm)	Stack Length (mm)	Short Ring (Φ ID× Φ OD× Thick*) (mm)	Slot Quantity
SY-2HP-2P-B34	81.15	65	94×79×5	34

7. Insulation System: Accepted
The insulation system class is F, the main insulation material listed as follow:

Item	Designation and /or Material	Size(mm)	Thermal Class or Temperature	Manufacture
Magnet wire	QZY- 2/180, Copper	Φ0.77	180	Zhejiang Grandwall Electric Intelligent Technology Co Ltd.(E206121)
Stator Insulation Paper	6641DMD	0.22,0.25 thick	Class F	Changzhou Jinlong Insulation Materials Co.,LTD.(E345386)
Sleeving	Grade A silicone resin coated fiberglass sleeving,2760	Φ2- Φ10	600V,200 ºC	NANTONG CITY DEMEI ELECTRIC GLASS FIBER CO LTD(E331136)
Tie Cords	High strength polyester filament	Φ1.0	160℃	LinAn GuangDa Motor Accessories Factory
Varnish	R-1140	--	Min.155 ºC	ZHEJIANG RONGTAI TECHNICAL INDUSTRY CO LTD(E227128)

Spacing: The stator wingding with its slot insulation, and the core are suitably varnished and mechanically secured.

Item	Spacing
Slot Insulation	The insulation extends 2.4 mm min beyond the stator core.
End Windings	2.4 mm min spacing away from the Stator Frame, End Shield (Drive End) and End Shield (None-Drive End).

8. Lead wire: c UL us recognized
Manufacturer: TAIZHOU FUANDA WIRE&CABLE CO LTD(E522166)

Location	UL style	CSA type	Rating
Stator Lead	3289	AWM Class I, Group A	150 ºC, 600V AC, Horizontal Flame, AWG 16

Note: May be replaced by alternative manufacturers with UL recognized wire with same style and rating.

9. Terminal Box:
Same as that of Part B

10. External cooling fan:
Same as that of Part B

11. Fan Cover:
Same as that of Part B

12. Bonding and Grounding:
One M4 machine screw is provided in the terminal box, colored by green. The screw engages a minimum of two threads into the metal of the enclosure, and the grounding symbol is provided beside the screw.

-End of description -

TEST HISTORY

Project 80177585 (Ed. 1)

Original certification of single-phase cage induction motor, thermally protector, manual reset, output 2HP to 5HP, Poles 2, Continuous, Insulation Class F, Max. ambient 40 °C. IFE conducted.
Involved in WMTC assessment of client designated test facility of Leo Group Pump(Zhejiang) Co.,Ltd. No. 1, 3rd Street,East Industry Center,Taizhou, Zhejiang 317500.

The following tests were conducted based on standards (CSA C22.2 No. 100-14 (Upd.1 April 2017)(Seventh Edition) (R2019))
W= Waived; P= Passed

Tests Location
Leo Group Pump(Zhejiang) Co.,Ltd., No. 1, 3rd Street,East Industry Center, Taizhou, Zhejiang 317500

Clause Number	Requirement	Comments	Verdict
7	**Performance**		
7.2	Temperature Test		P
7.3	Rating		P
7.4	Dielectric strength test		P
7.8	Water tests		P
8	**DC machines and AC machines**		
8.4.2	Rating – AC motors		P
8.4.4	Temperature test		P

The following tests were conducted based on standards (CSA C22.2 No. 77-14+Errata:2015(Eighth Edition)(R2019))
W= Waived; P= Passed

Tests Location
Leo Group Pump(Zhejiang) Co.,Ltd., No. 1, 3rd Street,East Industry Center, Taizhou, Zhejiang 317500

Clause Number	Requirement	Comments	Verdict
6	**Tests**		
6.3	Running heating temperature		P
6.4	Locked rotor Temperature	see test pack	P
6.5	Dielectric Strength		P
6.6	Locked rotor Endurance		P
6.7	Manual reset Protectors		P

The following tests were conducted based on standards (UL 1004-1-2020(Second Ed.))
W= Waived; P= Passed

Tests Location
Leo Group Pump(Zhejiang) Co.,Ltd., No. 1, 3rd Street,East Industry Center, Taizhou, Zhejiang 317500

Clause Number	Requirement	Comments	Verdict
30-42	**Performance**		
31.2	Motor rating test		P
32	Temperature Test		P
37	Dielectric Voltage-Withstand Test		P

The following tests were conducted based on standards (UL 1004-3-2018(Second Ed.))
W= Waived; P= Passed

Tests Location
Leo Group Pump(Zhejiang) Co.,Ltd., No. 1, 3rd Street,East Industry Center, Taizhou, Zhejiang 317500

Clause Number	Requirement	Comments	Verdict
6-11	**Performance**		
8	Locked Rotor Temperature Test	see test pack	P
9	Locked Rotor Endurance Test	see test pack	P
10	Running Heating Temperature Test		P

Construction review performed with satisfactory results.

Project 80194238 (Ed. 2)

update report 80177585 to add new models, with and without thermally protected motors, and resolve FIR findings, FC 605652, inspection dated 12 Dec ,2024

The following tests were conducted based on standards (ANSI/UL 1004-1:2012 - Second Edition)
W= Waived; P= Passed

Tests Location
Leo Group Pump(zhejiang) Co., Ltd., No. 1, 3rd Street,East Industry Center Taizhou, Zhejiang 317500 China

Clause Number	Requirement	Comments	Verdict
30-42	**Performance**		
31.2	Motor rating test		P
32	Temperature Test		P
37	Dielectric Voltage-Withstand Test		P

The following tests were conducted based on standards (CSA C22.2 No. 100-14 (Upd.1 April 2017)(Seventh Edition) (R2019))
W= Waived; P= Passed

Tests Location
China Shanghai (JV)

Clause Number	Requirement	Comments	Verdict
7	**Tests**		
7.7	Guarded machine test	for external fan cover with ventilation openings	P
7.11	Physical abuse (terminal boxes)		P

Tests Location
Leo Group Pump(zhejiang) Co., Ltd., No. 1, 3rd Street,East Industry Center Taizhou, Zhejiang 317500 China

Clause Number	Requirement	Comments	Verdict
7	**Tests**		
7.2	Temperature Test		P
7.3	Rating		P
7.4	Dielectric strength test		P
8	**DC machines and AC machines**		
8.4.4	Temperature test		P

The following tests were conducted based on standards (CSA C22.2 No. 77-14+Errata:2015(Eighth Edition)(R2019))
W= Waived; P= Passed

Tests Location
Leo Group Pump(zhejiang) Co., Ltd., No. 1, 3rd Street,East Industry Center Taizhou, Zhejiang 317500 China

Clause Number	Requirement	Comments	Verdict
6	**Tests**		
6.3	Running heating temperature	see test pack	P
6.4	Locked rotor Temperature	see test pack	P
6.5	Dielectric Strength		P
6.6	Locked rotor Endurance	motor with manual protector	P
6.7	Manual reset Protectors		P

The following tests were conducted based on standards (UL 1004-3-2018(Second Ed.))
W= Waived; P= Passed

Tests Location
Leo Group Pump(zhejiang) Co., Ltd., No. 1, 3rd Street,East Industry Center Taizhou, Zhejiang 317500 China

Clause Number	Requirement	Comments	Verdict
6-11	**Performance**		
8	Locked Rotor Temperature Test	see test pack	P
9	Locked Rotor Endurance Test	see test pack	P
10	Running Heating Temperature Test		P

The WMTC assessment was covered in project 80177585. The test data was kept in Test Result and Data Folder located in SharePoint Project Bin.

Construction review performed with satisfactory results.

This edition supersedes all previous editions

-End of Report-