



PRODUCT CATALOG

# RPM AC & V\*S MASTER MOTORS



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# WORLD LEADER IN VARIABLE SPEED MOTOR PRODUCTS



Baldor-Reliance® offers the widest, most comprehensive product line of motors designed specifically for variable speed control. More products and more capability than any other motor manufacturer. From the smallest fractional HP motor to the largest industrial motors Baldor-Reliance has the right variable speed product for just about any application.

Baldor-Reliance inverter duty motors for open loop control and vector duty motors for closed loop control are available from 1/3 Hp - 2250 Hp in totally enclosed and open designs. These motors are designed for constant torque as well as variable torque applications.

The RPM AC product line continues to evolve provide the ultimate in power density performance in either enclosed or open construction. From 2 - 2250 Hp, the RPM AC product line provides continuous constant torque performance from zero speed to base speed in one to four frame sizes smaller than NEMA.

RPM AC motors can be designed for specific horse powers and speeds to provide the ultimate in system matched performance using a unique laminated steel square frame construction. RPM AC motors are available in both induction and permanent magnet rotor designs.

V\*S Master motors provide continuous constant torque performance across the entire speed range from zero speed to base speed in standard NEMA frame sizes in TENV, TEFC and TEBC designs from 1/3 Hp - 500 Hp.



# VARIABLE SPEED MOTOR

## Product selection guide

	V*S Master	RPM AC Generation 3
Continuous CT base speed to 0 speed	X	X
Suitable for sine wave operation	S	
NEMA frame size	X	
Blower cooling acceptable		X
TEFC – No blower desired, NEMA frame	S	
Compact power dense design		X
Low inertia		X
High speed		X
Severe duty	X	X
Division 2 CSA certified	X	X
IEC	X	X
Servo performance and motion control		X
Synchronous PM technology		X
Induction technology	X	X
<b>Special duty designs</b>		
Cooling tower direct drive		X
ACC (Air cooled condenser)		X
ACHE (Air cooled heat exchanger)		X
Top drive		X
TENV 30 minute and 60 minute duty		X
Extruder duty		X
Crane and hoist		X
High vibration press duty		X
Winder duty with wide CHP speed range		X

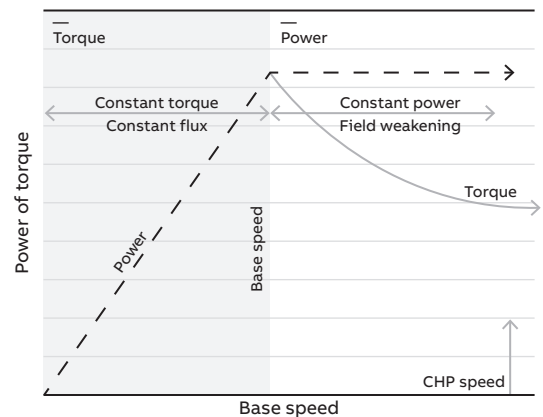
S = Some models

# AC MOTOR VARIABLE SPEED RANGE CAPABILITIES

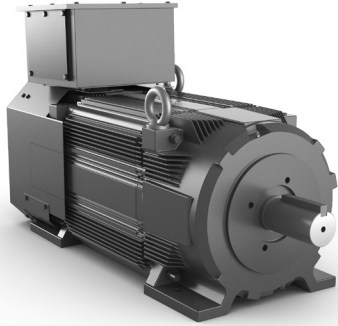
Family	Catalog prefix	Enclosure	Frame size	Comments
V*S Master 230, 460 and 575 volts				
V*S Master Inverter Duty	IDVSM, IDVSNM	TEFC	56-449	Inverter Duty
	IDM	TEBC	56-449	
	IDNM	TENV	56-449	
V*S Master Vector Duty	ZDVSM, ZDVSNM	TEFC	56-449	Vector Duty
	ZDM	TEBC	56-449	
	ZDNM	TENV	56-449	
RPM AC motors 230, 460 and 575 volts				
RPM AC Inverter Duty	IDF, IDC	TEFC	FL180-FL5800	Inverter Duty, PM
	IDBRPM	TEBC	FL180-FL5800	
	IDNRPM	TENV	FL180-FL440	
	IDDRPM	DPFV	RL180-RL5800	
RPM AC Vector Duty	ZDFRPM	TEFC	FL180-FL5800	Vector Duty, PM
	ZDBRPM	TEBC	FL180-FL5800	
	ZDNRPM	TENV	FL180-FL440	

## Product line overview terminology

- **V\*S or variable speed** = Designed to be used with an inverter/ AC drive
- **FL** = Fin laminated; **FDL** = Fin laminated IEC frame
- **RL** = Reduced length laminated frame motor; **RDL** = Reduced length IEC frame
- **URL, UFL, URDL, UFDL** = Roller bearing version respective frame RPM AC motor
- **HL** = High-foot RPMXE motor (standard NEMA frame)
- **Inverter** = A device used to vary the speed of an AC motor – also known as an AC drive
- **Inverter Duty** = A motor specifically designed for use with an AC drive
- **Vector Duty** = Same as Inverter Duty but always includes a speed feedback device (encoder or resolver)
- **TEFC** = Totally Enclosed Fan Cooled
- **TEBC** = Totally Enclosed Blower Cooled
- **TENV** = Totally Enclosed Non-Ventilated
- **DPFV** = Drive Proof Guarded Force Ventilated
- **Speed range** = The range (usually expressed as a ratio – e.g., 1000:1) of speed over which the motor can deliver 100% torque
- **CT** = Constant Torque
- **VT** = Variable Torque
- **CHP** = Constant Horsepower
- **O.D.E or ODE** = Opposite Drive End
- **D.E. or DE** = Drive End



## RPM AC



### The ultimate in power density

When space is at a premium, the Baldor-Reliance RPM AC induction motor is answer. RPM AC induction motors pack maximum torque into a small space. Available in totally enclosed and drip-proof guarded designs, the RPM AC Generation 3 motor can be up to three frame sizes smaller than the traditional NEMA or IEC motor. Leveraging our knowledge of variable speed DC motors the RPM AC motor combines square frame design, efficient cooling, and premium insulation systems to provide ultimate torque performance in a compact package.

### Features

- Designed for optimized performance and longer life on adjustable frequency power supplies
- Provides continuous constant torque down to zero speed in addition high overload torque
- Custom designs for any base speed and extended top speeds using optimum pole technology
- Capable of handling the most demanding applications from 1/3 Hp to 2250 Hp.

The laminated steel frame design in the 210 frame and larger offers the advantage of improved active material space utilization by replacing the common heavy cast iron frame with a rugged steel structure utilizing 100% of the active material. This is the same proven design technology that has been used in DC motors for generations

### CCT - Continuous constant torque to zero speed

All RPM AC motors are designed to provide continuous constant torque from base speed down to and including zero speed. Unlike conventional sine wave motors, this means that at any speed below base speed, the RPM AC motor will generate full rated torque, run continuously, and not overheat. Almost unbelievable - but true. Above base speed the RPM AC motor produces constant horsepower up to its rated CHP speed.

### Optimum pole design

RPM AC motors are designed to utilize the best available winding designs for use on adjustable frequency power. By utilizing the best winding configuration (number of poles) the efficiency, power factor, and current requirements can be optimized. Lower current draw resulting from the optimum pole design means that the adjustable frequency controller size can be minimized. The motor nameplate clearly defines the proper volts and frequency controller settings at the base speed to assure proper motor performance.

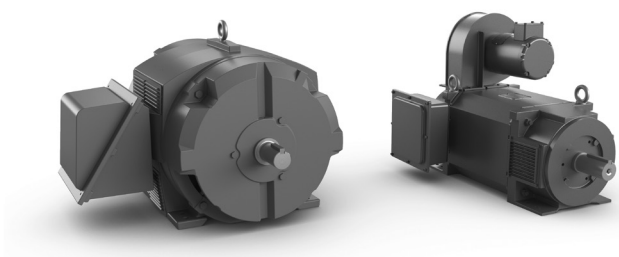
### Premium adjustable frequency insulation system

It takes a total insulation system to make a motor suitable for adjustable frequency power on today's high switching PWM wave form inverters. The insulation systems found in RPM AC motors are a combination of; high film copper magnet wire, high build resin varnish, slot and phase insulation, sleeving, extensive coil head ties, and power lead materials all engineered to provide superior performance on adjustable frequency power. These systems meet or exceed NEMA MG-1 part 31 for adjustable frequency power operation and have CIV (corona inception voltage) ratings above 1600 volts for 460 volt motors. ABB guarantees RPM AC motors corona free operation. This is your assurance of a trouble free, long life electrical system.

### RPM AC today

From its beginnings in 1987, RPM AC has always represented a high-performance, power dense, true variable speed motor family. Since those early days, RPM AC has been enhanced and extended to represent one of the broadest variable speed ac motor offerings available. From 1 Hp to 1250 Hp, in nearly any enclosure type (DPFV/Open, TENV, TEFC, TEBC, TEAO, PIPO), and very customizable speed ranges, RPM AC can handle the most difficult and demanding applications. With Generation 3, ABB Ability smart motor sensor provisions and internal grounding brushes are now standard. The power range has been extended again in the new RL5800 frame RPM AC motors that now provide up to 2250 Hp. QR codes allow for easy access to motor information and simple setup with your drive.

## Drip-proof guarded force ventilated RPM AC



NEMA Std ODP vs. RPM AC DPFV

### Drip-proof guarded force ventilated

The RPM AC DPFV is the ultimate power dense machine. Utilizing laminate square frame technology, up to 2250 horsepower can be packed into a 5800 frame. Commonly used in some of the most demanding industrial applications such as paper and converting, steel processing, extruders, traction, or oil well drilling, the RPM AC force ventilated design is the motor choice.

### Features

- The most compact and lowest weight design
- Continuous constant torque from zero speed to base speed
- 150% maximum overload torque from zero speed to base speed for 1 minute
- High torque to inertia ratio - up to 80% less inertia than the corresponding standard NEMA frame motor
- Class H insulation standard
- Surpasses NEMA MG-1 Part 31 insulation system requirements for AF power
- PLS (Positive Lubrication System)
- Available in IEC metric dimensions
- Encoder mounting provisions
- Thermal protection, three thermostats (1 N.C. per phase)
- Insulated ODE bearing standard on 440 through 5800 frames, available as option on other frames
- Numerous modifications available
- Top or side mount blower construction
- Shaft grounding brush is standard on all frame sizes
- Provisions for mounting ABB Ability™ Smart Sensor
- QR Code on nameplate provides web access to important motor data

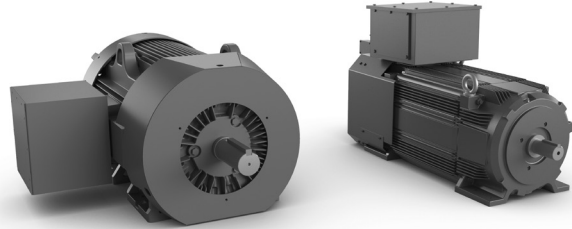
Industry	Application
Pulp & paper, converting	Winding and unwinding
	Web process control
	DC conversions to AC
Petroleum, chemical	Pump - process control
	Division 2
Drilling	Top drive (high shock, high vibration, high peak torque, and extreme environmental conditions)
Metal	Winding and unwinding
	Stamping press
Automotive & aviation	Test stands
Plastic	Extrusion and injection molding

### Open drip proof power density chart induction designs (Hp by frame size, 1800 RPM, RPM AC = 1000:1 CT)

Hp (kW)	NEMA Std ODP	RPM AC DPFV
3 (2.2)		-
5 (3.7)	180	
7.5 (5.6)		
10 (7.5)	210	
15 (11.2)		180
20 (14.9)	250	
25 (18.6)		
30 (22.4)	280	
40 (30)		
50 (37)	320	210
60 (45)		
75 (56)	360	
100 (75)		250
125 (93)	400	
150 (112)		280
200 (149)		
250 (186)		
300 (224)	440	320
350 (261)		360
400 (298)		
500 (373)		400
600 (447)		
700 (522)		
800 (597)		440
900 (671)		
1000 (746)	-	
1100 (820)		
1200 (895)		
1250 (932)		5000
1500 (1119)		
1750 (1305)		
1800 (1342)		
2000 (1491)		5800
2250 (1678)		



## Totally enclosed RPM AC



NEMA Std Enclosed vs RPM AC Enclosed

### Fan cooled and blower cooled

For applications requiring totally enclosed protection, RPM AC motors are available in non-ventilated, fan cooled and in-line blower cooled construction.

Extra Tough - XT construction is available for outdoor, washdown, corrosive or harsh environments.

### Features

- Compact power dense design
- Continuous constant torque from zero to base speed
- 200% maximum overload torque from zero speed to base speed for 1 minute
- 2:1 constant horsepower above base speed on most ratings
- Class H insulation standard
- Surpasses NEMA MG-1 Part 31 insulation system requirements for AF power
- PLS (Positive Lubrication System)
- Available in IEC metric dimensions
- Encoder mounting provisions
- Thermal protection, three thermostats (1 N.C. per phase)
- Insulated ODE bearing standard on 440 and 5800 frames, available as option on other frames
- Numerous modifications available including flanges, brakes, and encoders
- F1 mounted terminal box is standard
- Shaft grounding brush is standard on all frame sizes
- Provisions for mounting ABB Ability Smart Sensor
- QR Code on nameplate provides web access to important motor data

Industry	Application
Pulp & paper, converting	Winding and unwinding
	Spindles (TEBC)
	Web process control
	Power servo
	Conveyors
Petroleum, chemical	DC conversions to AC
	Pump - process control
Metal	Division 2
	Winding and unwinding
	Roll out table
	DC conversions to AC
Food	Pump - wash down
	High speed fan-drying
	Cutter knife (low inertia & high cyclic duty)
	Conveyors
Machine tool	Food process equipment
	Spindles
Automotive	Traction (total electric and hybrid)
	Test stands, dynamometers
	Conveyors, pumps and fans

### Totally enclosed power density chart induction designs (Hp by frame size, 1800 RPM)

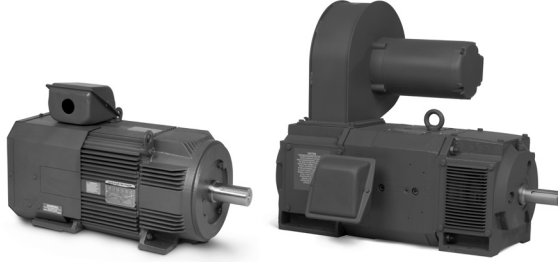
Hp (kW)	NEMA Std TEFC <sup>(1)</sup>	RPM AC TENV <sup>(2)</sup>	RPM AC TEFC <sup>(3)</sup>	RPM AC TEBC <sup>(2)</sup>
3 (2.2)	180	180	180	180
5 (3.7)				
7.5 (5.6)	210	210	210	210
10 (7.5)				
15 (11.2)	250	250	250	250
20 (14.9)				
25 (18.6)	280	280	280	280
30 (22.4)				
40 (30)	320	320	320	320
50 (37)				
60 (45)	360	360	360	360
75 (56)				
100 (75)	400	400	400	400
125 (93)				
150 (112)	440	440	440	440
200 (149)				
250 (186)	5800	5800	5800	5800
300 (224)				
500 (373)	-	-	-	-
600 (447)				
700 (522)	-	-	-	-
800 (597)				
900 (671)	-	-	-	-
1000 (746)				

(1) 2:1 CT, 4:1 VT

(2) 1000:1 CT

(3) 1000:1 CT 3 - 500 Hp (2.2 - 373 kW), 4:1 VT 600 - 1000 Hp (447 - 746 kW)

## IEC RPM AC



### IEC - Totally enclosed motors and drip-proof guarded force ventilated

"The global motor solution"

RPM AC IEC motors are true metric designs. Mounting dimensions and electrical designs meet IEC global standards. All motor hardware is metric including bolts and conduit box connections. These motors are CE compliant and meet IEC standards for your high performance IEC applications. IEC flange mounting is also available.

#### Features

- IEC 34 and IEC 72 mechanical and electrical specifications
- CE compliant, ratings up to 746kW
- IEC nameplate
- IEC terminal connection block
- Enclosures IC06, IC410, IC411, IC416
- Continuous torque from zero speed to base speed
- 150% maximum overload torque from zero speed to base speed for 1 minute (IC06)
- 200% maximum overload torque from zero speed to base speed for 1 minute (IC410, IC411, IC416)
- Class H insulation standard
- Surpasses NEMA MG-1 Part 31 insulation system requirements for AF power
- PLS (Positive Lubrication System)
- Encoder mounting provisions
- Thermal protection, three thermostats (1 N.C. per phase)
- Insulated ODE bearing standard on 280 and 400 frames, available as option on other frames
- Numerous modifications available including DIN flange, IEC brakes, and encoders
- Top mounted conduit box with terminal block is standard.
- Provisions for mounting ABB Ability Smart Sensor
- QR Code on nameplate provides web access to important motor data

Industry	Application
	Winding and unwinding
	Spindles (TEBC)
Pulp & paper, converting	Web process control
	Power servo
	Conveyors
	DC conversions to AC
Petroleum, chemical	Pump - process control
	Division 2
	Winding and unwinding
Metal	Roll out table
	DC conversions to AC
	Pump - wash down
	High speed fan-drying
Food	Cutter knife (low inertia & high cyclic duty)
	Conveyors
	Food process equipment
Machine tool	Spindles
	Traction (total electric and hybrid)
Automotive	Test stands, dynamometers
	Conveyors, pumps and fans

#### Totally enclosed power density chart induction designs (kW by frame size, 1500 RPM)

Kilowatts	IEC Std IC411/ TEFC <sup>(1)</sup>	RPM AC IC410/ TENV <sup>(2)</sup>	RPM AC IC411/ TEFC <sup>(3)</sup>	RPM AC IC416/ TEBC <sup>(2)</sup>	RPM AC IC06/ DPFV <sup>(2)</sup>
5.6					
7.5	130	130	110		
11				110	
15	160	160	130		110
18.6					
22	180	180	160	130	
30	200	200			
37			180		130
45	220	220		160	
56	250		200		
75		250			160
91	280	280	220	180	
110					
132			250	200	180
150				220	
186					200
224			280	250	
260					
300					220
336	-	-		280	
373			280		
447					250
522					
600			400 (5800)	400 (5800)	280
672					
707					
746					

(1) 2:1 CT, 4:1 VT

(2) 1000:1 CT

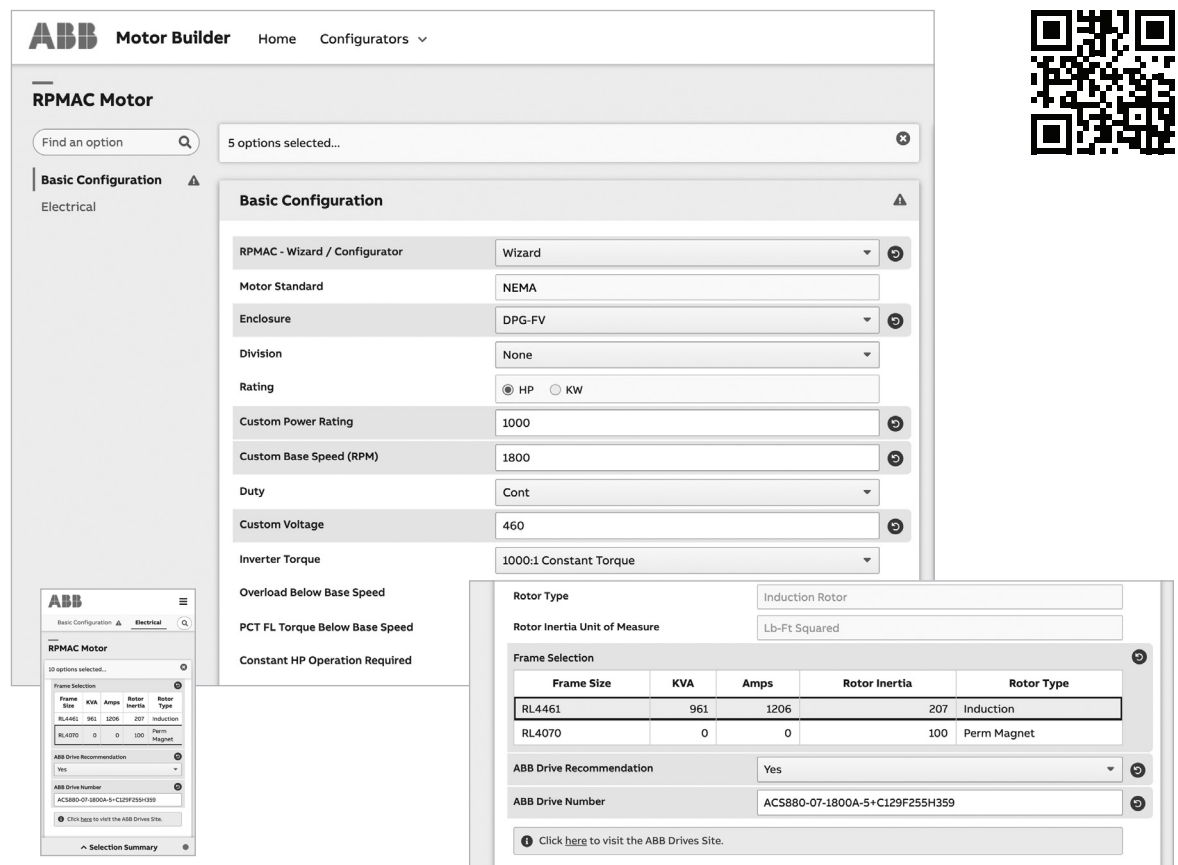
(3) Full torque down to zero speed 5.6 - 300 kW,  
4:1 VT 336 - 707 kW

# RPM AC WIZARD AND CONFIGURATOR

## Motor design and selection tool

### The RPM AC Wizard and Configurator

You are no longer limited to conventional NEMA or IEC ratings. With the RPM AC Wizard tool, you design the motor that best satisfies your application requirements. You can select or input your unique horsepower, base speed, top speed, and overload requirements. (1) With one click, the RPM AC Wizard (selection tool) will design a motor that best fulfills your needs. The frame size and full load current rating are immediately defined. (2) With another click, you get complete electrical design curves and performance data. (3) Another click gets you a dimension sheet. The Wizard will even give you a couple of design options if a larger frame design could provide a lower full load current draw. Got an unusual duty cycle? No problem. (4) The Wizard can handle that too. This is a true motor design tool and not just a table look up program. You can design either NEMA or IEC compliant motors. Get performance and dimensional data in standard or metric formats. The RPM AC Wizard is now available as an online tool so that you know RPM AC design information is always current! Go to [motorbuilder.abb.com](http://motorbuilder.abb.com) to design your RPM AC motor today! There is also a mobile version available that is compatible with iOS and Android operating systems.



**ABB Motor Builder** Home Configurators ▾

**RPMAC Motor**

Find an option 🔍 5 options selected...

**Basic Configuration** ⚠

Electrical

RPMAC - Wizard / Configurator Wizard

Motor Standard NEMA

Enclosure DPG-FV

Division None

Rating ☒ HP ☐ KW

Custom Power Rating 1000

Custom Base Speed (RPM) 1800

Duty Cont

Custom Voltage 460

Inverter Torque 1000:1 Constant Torque

Overload Below Base Speed

PCT FL Torque Below Base Speed

Constant HP Operation Required

**Frame Selection**

Frame Size	KVA	Amps	Rotor Inertia	Rotor Type
RL4461	961	1206	207	Induction
RL4070	0	0	100	Perm Magnet

ABB Drive Recommendation Yes

ABB Drive Number ACS880-07-1800A-5+C129F255H359

Click here to visit the ABB Drives Site.

**Induction Rotor**

**Rotor Inertia Unit of Measure** Lb-Ft Squared

# THE RPM AC QUICK SHIP TOOL



The RPM AC Quick Ship program allows customers to obtain selected modifications on RPM AC motors in much shorter time frames than ordering a custom RPM AC motor.



Enter our tool: <https://config.baldor.com/>

You will start with a standard catalog number RPM AC motor and make selected modifications in the Quick Ship Configurator.

Many common RPM AC modifications are covered in this user-friendly order entry process. Choose your RPM AC catalog number and choose your modifications with drop down choices for modifications – this greatly simplifies entering common RPM AC configured motors.

The motor will be built in the Gainesville motor plant and shipped in 3 to 4 weeks of receipt of the order (instead of the normal RPM AC custom motor lead time).

If the Quick Ship Configurator will not meet your needs, you can click on “Fully Configure” at any time. All Quick Ship selections will be copied over to the complete RPM AC configurators.

## **Quick ship change/cancellation policy**

A Quick Ship order may be changed or canceled up to the time the order enters production. Once a Quick Mod order is in production in the Gainesville plant, it may not be changed or canceled. Release to production will normally occur within 2 to 3 days upon receipt of order.



Over 90% of Baldor-Reliance motors meet the Buy-American Act. Find out more here.

# RPM AC QUICK SHIP PROGRAM MATRIX

The table below identifies the motor features available on the Gainesville Quick Ship program.

Mod	Description	RPM AC			
		DPFV	TEBC	TENV	TEFC
Q3	<b>Balance</b>	Q3	Q3	Q3	Q3
Q4	<b>Bearings</b> - insulated	Q4	Q4	Q4	Q4
Q5	<b>Belted drive</b> - roller bearings	Q5	Q5	Q5	Q5
	<b>Conduit box</b> - one size larger	Q6	Q6	Q6	Q6
Q6	Cast iron	Q6	Q6	Q6	Q6
	Mill type	Q6	Q6	Q6	Q6
	Mounting - F1, F2, F3	Q6	Q6	Q6	Q6
Q7	<b>DPFV covers</b> - vertical drip covers	Q7	N/A	N/A	N/A
Q8	<b>Drains</b>	Q8	Q8	Q8	Q8
	<b>Enclosure</b> - separate ventilated	Q9	N/A	N/A	N/A
Q9	TEAO - piggyback	N/A	Q9	N/A	N/A
	CP/XT features	Q9	Q9	Q9	Q9
	Relocate blower	Q9	Q9	N/A	N/A
Q10	<b>End brackets</b> - C-face standard	Q10	Q10	Q10	Q10
	C-face NEMA	Q10	Q10	Q10	Q10
Q11	<b>Encoders</b> for Quick Ship program	Q11	Q11	Q11	Q11
Q12	<b>Encoder/resolver</b> mounting provisions	Q12	Q12	Q12	Q12
Q13	<b>Filters</b>	Q13	N/A	N/A	N/A
Q14	<b>Insulation</b> - tropical	Q14	Q14	Q14	Q14
Q15	<b>Lubrication</b> - automatic grease relief fittings	Q15	Q15	Q15	Q15
	<b>Nameplates</b> - re-rate	Q16	Q16	Q16	Q16
Q16	Aux N/P markings	Q16	Q16	Q16	Q16
	N/P blankline markings	Q16	Q16	Q16	Q16
	Add CSA stamp	Q16	Q16	Q16	Q16
	Customer part number marks	Q16	Q16	Q16	Q16
Q17	<b>Packaging</b> - enclosed crate - export	Q17	Q17	Q17	Q17
Q18	<b>Paint</b> - special	Q18	Q18	Q18	Q18
Q19	<b>Seals</b> - slinger - V-ring	Q19	Q19	Q19	Q19
	Lip seal	Q19	Q19	Q19	Q19
Q20	<b>Space heaters</b>	Q20	Q20	Q20	Q20
Q21	<b>Terminal blocks</b> - main terminal board	Q21	Q21	Q21	Q21
	Accessory terminal blocks	Q21	Q21	Q21	Q21
Q22	<b>Test</b> - routine, with report	Q22	Q22	Q22	Q22
Q23	<b>Winding RTD's</b>	Q23	Q23	Q23	Q23

## RPM AC Quick Ship program

### Q3 - Balance, dynamic

#### Electric motor balance and vibration preface

Balance can be defined as the state of the mass distribution within the rotating assembly about its axis of rotation. The eccentricities of this mass distribution are referred to as unbalance. The amount of unbalance is stated in units of mass times a distance, such as gram-inches, gram-centimeters or gram-millimeters.

Vibration is defined as the motion of a body in response to forces imposed upon that body. Vibration in assembled motors can be measured as amplitude in inches, peak to peak, or as velocity in inches per second or as velocity in millimeters per second.

Displacement, inches, peak to peak =  $19.10 \times \text{velocity, inches per second, peak} \div \text{RPM}$

Displacement, inches, peak to peak =  $1.062 \times \text{velocity, millimeters per second, RMS} \div \text{RPM}$

Displacement, inches, peak to peak =  $0.752 \times \text{velocity, millimeters per second, Peak} \div \text{RPM}$

Velocity, in./sec. peak =  $\text{displacement, inches peak} \times 2 \pi \times f \div 60$  or

Displacement, in p-p  $\times \pi \times f \div 60$

RMS =  $\text{peak to peak} \times 0.707$

Peak =  $\text{peak to peak} \times 0.50$  (f = RPM)

In addition to unbalance, there are other sources of motor vibration such as uneven air gap, frame distortion due to improper torquing of foot mounting bolts, operation at or near critical speed and various bearing, support, coupling and electromagnetic effect problems. Unbalance is the predominant component in vibration when displacement is measured. The many other, higher frequency components show up when measuring velocity.

#### Pricing

Standard Baldor-Reliance motors are manufactured in accordance with the vibration limits stated in NEMA MG1, Part 7.

Per NEMA, bearing housing vibration is stated as "the peak value of the unfiltered vibration velocity in inches per second".

Table I shows bearing housing vibration velocity in inches per second as well as other units for comparison. Shaft vibration measurements are recommended for sleeve bearing machines only. Contact ABB when you have sleeve bearing requirements

**Table I - standard machine vibration limits**

Speed RPM	(NEMA standard) unfiltered vibration velocity in./sec. peak	(IEC terminology) unfiltered vibration velocity mm./sec. RMS
1801-3600	0.15	2.7
1201-1800	0.15	2.7
901-1200	0.15	2.7
721-900	0.12	2.1
601-720	0.09	1.6
Less than 600	0.08	1.4

**Table II - special machine vibration limits**

Speed RPM	Unfiltered vibration velocity (in./sec.) peak	
	Standard	Precision
0-1200	0.15	0.04
1201-1800	0.15	0.04
1801-3600	0.15	0.06
3601-5000	0.2	0.06
5001-8000 <sup>(2)</sup>	0.2	0.08

## RPM AC Quick Ship program

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### Q4 - Bearings - insulated

Provides for insulated bearing on O.D.E and or D.E. of the RPM AC motor. An O.D.E. insulated bearing is standard on all RL/ FL440 and larger frame sizes. Roller bearings only option is an insulated O.D.E. bearing. Shaft ground brush option is also available on both ball bearing and roller bearing designs for all frame sizes.

**Q4-1** - One bearing

**Q4-2** - Both bearings

—

### Q5 - Belted drive

Provides for roller bearings and special shaft used for belted drive.

**Q5** - Roller bearing <sup>(1)</sup>

(1) Standard oversized ball bearing is normally suitable for belted or coupled duty. See RADIAL LOAD CAPACITY in application section.

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### Q6 - Conduit box

**Q6-1** - One size larger C/B

**Q6-2** - Cast iron C/B

**Q6-3** - Mill type C/B <sup>(1)</sup>

**Q6-4** - F-1, F-2, F-3 mounting charge

(1) Heavy gauge, large rectangular metal box.

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### Q8 - Drain plugs

Corrosion resistant "T" drain\*

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### Q9 - Enclosure modification

**Q9-1** - Separately ventilated

**Q9-2** - TEAO piggyback

**Q9-3** - CP/XT features

**Q9-4** - DPFV blower location change

**Separately ventilated** - For applications where ventilated air is piped into the machine from an external source, basic DPFV enclosures may be separately ventilated at 3, 9 and 12 o'clock for the above list price deductions, (FL180 ventilated at 12 o'clock only, exit atmosphere). The inlet pipe can be fastened to one end bracket, and, if required and specified, an outlet pipe can be fastened to the other end bracket. Price does not include blower or pipe. Locations of air entry and air exhaust, if used, should be specified on order. Motors must not be operated without the separate air supply. Contact ABB for separate ventilating air requirements. (To insure adequate protection of a separately ventilated motor against loss of cooling air, an overtemperature device for interlocking with the controller overload protection circuit is recommended and should be added as standard practice. An air pressure differential switch is also recommended.) See pricing deduction chart below.

Note: Air entry must be opposite drive end of motor for proper thermostat protection of windings

**TEAO-piggyback** - For totally enclosed machines where blower motor must be on top or side of base motor housing, use the following pricing chart to add to TEAO inline price for top- or side-mounted blower and shroud for direct cooling air over base motor frame.

**CP/XT-features (IP55)** - (FL210 thru FL440 frames) The Baldor-Reliance CP/XT Severe Duty motor is designed for operation in damp locations where the motor will be subjected to corrosive conditions. Typical applications are paper, chemical, petroleum, fertilizer and plastics industries. XT motors are provided in totally enclosed non-ventilated, totally enclosed fan-cooled and totally enclosed air-over construction. TEAO-BC will use an XT blower motor with longer blower housing than TEAO-BC standard.

**DPFV blower location change** - The DPFV blower can be located in F1, F2, F3 on the ODE as long as it is not the same location as the conduit box.

## RPM AC Quick Ship program

### Q10 - End brackets and custom shafts

All totally enclosed RPM AC 5–30 Hp are stocked with a C-face per 501 catalog as noted. NEMA C-face bracket with standard dimensions and feet. Special Seals required when oil will be around the shaft. C-face available on frames FL180C thru FL360C only.

Note: Since RPM AC motors are designed for maximum horsepower per frame size, it is important to state the specific NEMA C-face and shaft diameter required for mounting, when motor will be mounted to a reducer.

Type	List price by frame size							
	FL180	FL / RL210	FL / RL250	FL / RL280	FL / RL320	FL / RL360	FL / RL400	FL / RL440
Q10-1 - C-face standard						Price upon request	N/A	N/A
Q10-2 - C-face NEMA	Can be 180TC or 210TC	Can be 180TC, 210TC or 250 TC	Can be 180TC, 210TC or 250 TC	280TC	Can be 320TC, 360TC or 400 TC	Can be 320TC, 360TC or 400 TC	N/A	N/A
						Price upon request	N/A	N/A

C-face available on frames FL180C thru FL360C only.

Note: Since RPM AC motors are designed for maximum horsepower per frame size, it is important to state the specific NEMA C-Face required.

Important: Motor C-face is intended for mounting auxiliary equipment such as pumps, gears, etc.

When mounted horizontally, frames FL280C thru FL360C must be supported by the feet and not by the C-face alone.

Note: Prices above cover only a bracket change with no shaft changes.

### Q11 - Encoders for Quick Ship program

1024 PPR, includes all mounting hardware and mating connector.

Q11	Motor enclosure	Frame	Mfg.	Model	Output	PPR	Conn. type
-1	DPFV, DPSV, TENV, TEAO-PB	All	Avtron	AV85	Single	1024, 2048	EPIC
-2	DPFV, DPSV, TENV, TEAO-PB, TEAO-BC	All	Avtron	AV56	Single	1024, 2048	EPIC
-3	DPFV, DPSV, TENV, TEAO-PB, TEAO-BC	All	Avtron	HS35M	Single	1024, 2048	EPIC, MS-ST, MS-TL
-4	DPFV, DPSV, TENV, TEAO-PB	All	Dynapar	ST85	Single	1024, 2048	EPIC, MS-ST, MS-TL
-5	DPFV, DPSV, TENV, TEAO-PB, TEAO-BC	All	Dynapar	ST67Z	Single	1024, 2048	EPIC, MS-ST, MS-TL
-6	DPFV, DPSV, TENV, TEAO-PB, TEAO-BC	All	Dynapar	HS35R	Single	1024, 2048	MS-ST, MS-TL
-7	DPFV, DPSV, TENV, TEAO-PB, TEAO-BC	All	Dynapar	HS20	Single	1024, 2048	MS-ST, MS-TL
-8	DPFV, DPSV, TENV, TEAO-PB, TEAO-BC	All	BEI	HS35	Single	1024, 2048	MS-ST, MS-TL
-9	TEFC	All	Avtron	HS35M	Single	1024, 2048	EPIC, MS-ST, MS-TL
-10	TEFC	All	Dynapar	HS35R	Single	1024, 2048	MS-ST, MS-TL
-11	TEFC	All	Dynapar	HS20	Single	1024, 2048	MS-ST, MS-TL
-12	TEFC	All	BEI	HS35	Single	1024, 2048	MS-ST, MS-TL

### Q12 - Encoder/resolver mounting provisions only

Complete provisions for allowed encoders

### Q13 - Filters

Filter addition



## RPM AC Quick Ship program

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### Q14 - Insulation

Tropical protection

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### Q15 - Lubrication

Automatic grease relief fittings - 2 fittings

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### Q16 - Nameplate

**Q16-1** - Rerate of stock motors

**Q16-2** - Separate nameplate for customer data

**Q16-3** - Private brand nameplate <sup>(1)</sup>

**Q16-4** - Special marks <sup>(2)</sup>

**Q16-5** - CSA stamp

(1) If nameplate exists in Bus System

(2) Up to 24 characters

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### Q17 - Packaging

Enclosed crate - export\*

\* For ocean freight shipment. Does not include broker fees, customs, documentation, etc.

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### Q18 - Paint

Special paint - factory supplied

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### Q19 - Seals

**Q19-1** - Slinger - V-ring

**Q19-2** - Lip seal

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### Q20 - Space heaters

Space heaters

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### Q21 - Terminal blocks

**Q21-1** - Main terminal board <sup>(1)</sup>

**Q21-2** - Accessory terminal block <sup>(2)</sup>

(1) Provides terminal block in conduit box for connection of RPM AC motor power leads, instead of the standard leads. Includes accessory terminal block.

(2) Accessory terminal block for thermostats, RTD's and space heaters.

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### Q22 - Tests

As standard practice, every RPM AC motor is full load check tested on a dynamometer with a PWM power supply, and receives a routine test per IEEE 112 modified for inverter power supply.

Routine test with report <sup>(1)</sup>

(1) Certified routine test report per IEEE 112 modified for inverter power

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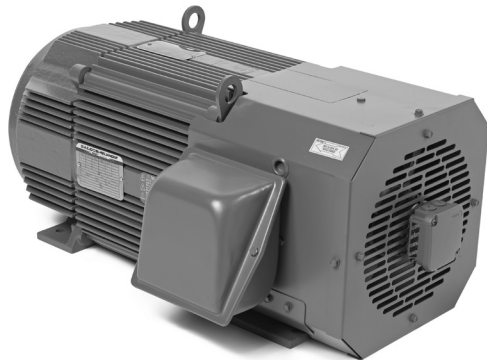
### Q23 - Winding RTDs

**Q23-1** - 3 stator RTD's

**Q23-2** - 6 stator RTD's

## Totally enclosed blower cooled (TEBC)

Permanent magnet rotor



- 10-1250 Hp
- 3-phase, 460V<sup>(1)</sup>
- Continuous constant torque to zero speed

### Features

- Interior salient pole permanent magnet (PM) rotor construction
- Synchronous speed performance matched with PM drive control
- Continuous duty
- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload - 200% below base Speed - 100% above base speed
- Optimum pole design - 4, 6, or 8 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)
- Top mounted conduit box
- Resolver with twist lock connector for closed loop vector control on catalog number motors
- Low noise over wide speed range

Hp	Speed Base	Enclosure	Frame	Catalog number	FLA <sup>(2)</sup> @ 460
10	1800	TEBC	FL1831	ZDPM18010C-BV	10.6
15	1800	TEBC	FL1838	ZDPM18015C-BV	16
20	1800	TEBC	FL1844	ZDPM18020C-BV	21.7
25	1800	TEBC	FL1852	ZDPM18025C-BV	26.6
30	1800	TEBC	FL1852	ZDPM18030C-BV	32.3
40	1800	TEBC	FL2162	ZDPM21040-BV	43.2
50	1800	TEBC	FL2168	ZDPM21050-BV	53.4
60	1800	TEBC	FL2173	ZDPM21060-BV	66.5
75	1800	TEBC	FL2578	ZDPM25075-BV	81.8
100	1800	TEBC	FL2586	ZDPM25100-BV	110.6
125	1800	TEBC	FL2882	ZDPM28125-BV	137
150	1800	TEBC	FL2890	ZDPM28150-BV	168
200	1800	TEBC	FL3213	Custom	240
250	1800	TEBC	FL3698	Custom	262
300	1800	TEBC	FL3614	Custom	303
350	1800	TEBC	FL3614	Custom	354
400	1800	TEBC	FL4034	Custom	426
450	1800	TEBC	FL4046	Custom	471
500	1800	TEBC	FL4046	Custom	523
600	1800	TEBC	FL4070	Custom	645
700	1800	TEBC	FL4073	Custom	824
800	1200	TEBC	FL5822	Custom	900
900	1200	TEBC	FL5824	Custom	1036
1000	1200	TEBC	FL5828	Custom	1140
1250	1200	TEBC	FL5832	Custom	1433

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

- All RPM AC IPM motors are optimum pole designs, the 180-280 frames are four pole designs, the 320 frames are a six pole design, and the 360 - 5800 frames are eight pole designs

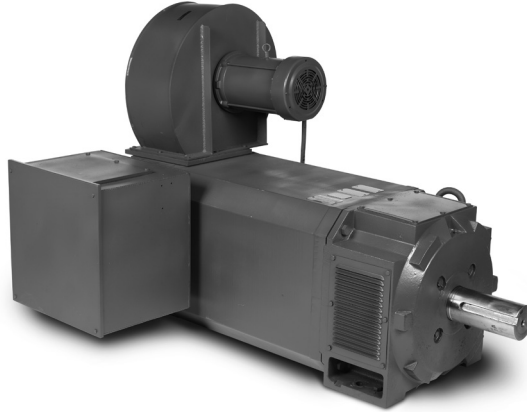
- For estimating purpose only

- Wide range of CHP possible. Consult RPM AC Wizard.

- All RPM AC FL440 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

## Drip-proof guarded forced ventilated (DPFV)

### Permanent magnet rotor



- 10-250 Hp
- 3-phase, 460V<sup>(1)</sup>
- Continuous constant torque to zero speed

#### Features

- Interior salient pole permanent magnet (PM) rotor construction
- Synchronous speed performance matched with ABB PM drive control
- Continuous duty
- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 200% below base speed
  - 100% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)
- Top mounted conduit box
- Resolver with twist lock connector for closed loop vector control
- Low noise over wide speed range

Hp	Speed Base	Enclosure	Frame	FLA <sup>(2)</sup> @ 460V
10	1800	DPFV	FL1831	14
15	1800	DPFV	FL1831	21
20	1800	DPFV	FL1831	27
30	1800	DPFV	FL1838	40
40	1800	DPFV	FL1852	52
50	1800	DPFV	RL2162	65
60	1800	DPFV	RL2168	77
75	1800	DPFV	RL2168	96
100	1800	DPFV	RL2570	124
125	1800	DPFV	RL2578	156
150	1800	DPFV	RL2586	180
200	1800	DPFV	RL2890	240
250	1800	DPFV	RL2898	302
300	1800	DPFV	RL4022	377
350	1800	DPFV	RL4022	440
400	1800	DPFV	RL4022	503
450	1800	DPFV	RL4022	566
500	1800	DPFV	RL4022	628
600	1800	DPFV	RL4022	754
700	1800	DPFV	RL4034	833
800	1800	DPFV	RL4046	946
900	1800	DPFV	RL4046	1064
1000	1800	DPFV	RL4070	1134
1100	1200	DPFV	RL4461	1274
1200	1200	DPFV	RL4473	1382

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages

(2) For estimating purpose only

- All RPM AC IPM motors are optimum pole designs, the 180-280 frames are four pole designs, the 320 frames are a six pole design, and the 360 - 5800 frames are eight pole designs.

• For estimating purpose only

• Wide range of CHP possible. Consult RPM AC Wizard.

\* All RPM AC RL440 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

## Drip-proof guarded force ventilated (DPFV)

### Induction



- 5 -1000 Hp
- 3-phase, 460V <sup>(1)</sup>
- Continuous constant torque to zero speed

#### Features

- Continuous duty
- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 150% below base speed
  - 110% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)
- Machined bracket & tapped shaft for stub shaft for encoder

Hp	Base	Speed CHP	Frame	Catalog number	FLA <sup>(2)</sup> @ 460V
5	1750		FL1831		7.6
	1450		FL1831		7.6
	1150		FL1831		7.6
	850		FL1831		7.6
	650		FL1838		7.6
	500		FL1844		7.6
7.5	1750		FL1831		11
	1450		FL1831		11
	1150		FL1831		11
	850		FL1838		11
	650		FL1844		11
	500		FL1852		11
10	3550		FL1831		14
	1750		FL1831		14
	1450		FL1831		14
	1150		FL1838		14
	850		FL1844		14
	650		FL1852		14
15	500	-	RL2162	-	14
	3550		FL1831		21
	2500		FL1831		21
	1750		FL1838		21
	1450		FL1838		21
	1150		FL1844		21
20	850		FL1852		21
	650		RL2162		21
	500		RL2168		21
	3550		FL1831		27
	2500		FL1831		27
	1750		FL1838		27
25	1450		FL1844		27
	1150		FL1852		27
	850		RL2162		27
	650		RL2168		27
	500		RL2570		27
	3550		FL1831		34
25	2500		FL1838		34
	1750	3150	FL1844	IDDRPM18254C	34
	1450		FL1852		34
25	1150		RL2162		34
	850	-	RL2168	-	34
	650		RL2570		34
	500		RL2578		34

Hp	Base	Speed CHP	Frame	Catalog number	FLA <sup>(2)</sup> @ 460V
30	3550		FL1838		40
	2500	-	FL1844	-	40
	1750	3475	FL1852	IDDRPM18304C	40
	1450		RL2162		40
	1150		RL2168		40
	850		RL2168		40
40	650	-	RL2578	-	40
	500		RL2586		40
	3550		FL1844		52
	2500		FL1852		52
	1750	2000	RL2162	IDDRPM21404	52
	1450		RL2168		52
50	1150		RL2168		52
	850		RL2578		52
	650	-	RL2586	-	52
	500		RL2882		52
	3550		FL1852		65
	2500		RL2168		65
60	1750	2400	RL2168	IDDRPM21504	65
	1450	1300	RL2168	-	65
	1150		RL2570	IDDRPM25506	65
	850		RL2586		65
	650	-	RL2882		65
	500		RL2898	-	65
75	3550		RL2168		77
	2500		RL2168		77
	1750	2200	RL2168	IDDRPM21604	77
	1450	-	RL2570	-	77
	1150	1300	RL2578	IDDRPM25606	77
	850		RL2586		77
75	650		RL2890	-	77
	500	-	RL2898		77
	3550		RL2168		96
	2500		RL2173	-	96
	1750	2000	RL2570	IDDRPM25754	96
	1450	-	RL2578	-	96
75	1150	3450	RL2586	IDDRPM25756	96
	850		RL2882		96
	650	-	RL2898	-	96
	500		RL3203		96

**Drip-proof guarded force ventilated (DPFV)**

Induction

Hp	Speed		Frame	Catalog number	FLA <sup>(2)</sup> @ 460V
	Base	CHP			
100	3550	-	RL2578	-	124
	2500	-	RL2578	-	124
	1750	2000	RL2578	IDDRPM251004	124
	1450	-	RL2586	-	124
	1150	3450	RL2882	IDDRPM281006	124
	850	-	RL2898	-	124
	650	-	RL3203	-	124
	500	-	RL3614	-	124
	3550	-	RL2578	-	156
	2500	-	RL2578	-	156
125	1750	2330	RL2586	IDDRPM251254	156
	1450	-	RL2882	-	156
	1150	1970	RL2898	IDDRPM281256	156
	850	-	RL3203	-	156
	650	-	RL3213	-	156
	500	-	RL3614	-	156
	3550	-	RL2586	-	180
	2500	-	RL2586	-	180
	1750	2000	RL2882	IDDRPM281504	180
	1450	-	RL2898	-	180
150	1150	3600	RL3203	IDDRPM321506	180
	850	-	RL3213	-	180
	650	-	RL3614	-	180
	500	-	RL4034	-	180
	3550	-	RL2882	-	240
	2500	-	RL2890	-	240
	1750	2700	RL2898	IDDRPM282004	240
	1450	-	RL3203	-	240
	1150	2000	RL3213	IDDRPM322006R1	240
	850	-	RL3614	-	240
200	650	-	RL4034	-	240
	500	-	RL4058	-	240
	3550	-	RL2898	-	302
	2500	-	RL2898	-	302
	1750	2945	RL3203	IDDRPM322504R1	302
	1450	-	RL3213	-	302
	1150	2000	RL3614	IDDRPM362506R1	302
	850	-	RL4022	-	302
	650	-	RL4046	-	302
	500	-	RL4451*	-	323
250	3550	-	RL3203	-	361
	2500	-	RL3203	-	361
	1750	3000	RL3213	IDDRPM323004R1	361
	1450	-	RL3614	-	361
	1150	2000	RL3614	IDDRPM363006R1	378.5
	850	-	RL4046	-	361
	650	-	RL4451*	-	385
	500	-	RL4461*	-	385
	3550	-	RL3203	-	414
	2500	-	RL3213	-	414
350	1750	-	RL3698	-	414
	1450	-	RL3614	-	444.6
	1150	-	RL4034	-	414
	850	-	RL4058	-	414
	650	-	RL4461	-	446.3

Hp	Speed		Frame	Catalog number	FLA <sup>(2)</sup>
	Base	CHP			@ 460V
400	3550	-	RL3213	-	477
	2500	-	RL3213	-	477
	1750	2700	RL3614	IDDRPM364004	477
	1450	-	RL4022	-	477
	1150	2000	RL4046	IDDRPM404006R1	460
	850	-	RL4440	-	507.4
	650	-	RL4461	-	507.4
450	3550	-	RL3213	-	533.5
	2500	-	RL3614	-	533.5
	1750	-	RL3614	-	533.5
	1450	-	RL4034	-	533.5
	1150	-	RL4058	-	533.5
	850	-	RL4451	-	568
	3550	-	RL3614	-	590
500	2500	-	RL3614	-	590
	1750	2400	RL4034	IDDRPM405004R1	590
	1450	-	RL4046	-	590
	1150	2400	RL4058	IDDRPM445006R1	590
	850	-	RL4461	-	628
	3550	-	RL4034	-	708
	2500	-	RL4034	-	708
600	1780	2665	RL4046	IDDRPM406004R1	708
	1450	-	RL4440*	-	747
	1150	-	RL4451*	-	747
	1000	-	RL4473*	-	747
	1750	2400	RL4429	IDDRPM407004R1	864.3
700	1450	-	RL4440	-	864.3
	1200	-	RL4461*	-	864.6
800	1750	-	RL4440	-	980
	1450	-	RL4461	-	980
900	1750	-	RL4451	-	1094
1000	1750	2550	RL4461*	IDDRPM4410004R1	1206
	1150	1800	RL5024*	IDDRPM5010006	1133
1250	1750	2100	RL5024*	IDDRPM5012504	1373
	1150	1800	RL5035*	IDDRPM5012506	1379
1400	1150	1725	RL5035*	IDDRPM5014006	1577
1500	1750	2100	RL5030*	IDDRPM5015004	1633
1750	1750	2100	RL5035*	IDDRPM5017504	1483**

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

• All RPM AC induction motors are optimum pole four pole designs with the exception of 440 and FL5800 frames which are optimum pole eight pole designs.

• For estimating purpose only

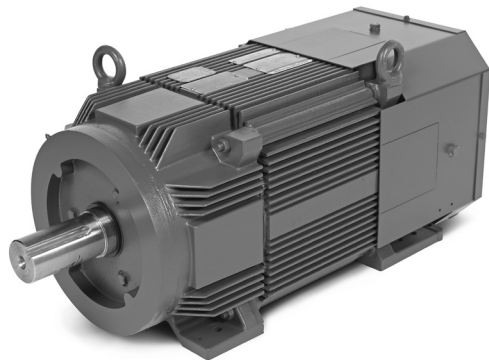
• Wide range of CHP possible. Consult RPM AC Wizard.

\* All RPM AC RL440 frames and above include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

\*\* 600V rating

## Totally enclosed blower cooled (TEBC)

### Induction



- 5-1000 Hp
- 3-phase, 460V <sup>(1)</sup>
- Continuous constant torque to zero speed

#### Features

- Continuous duty
- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 200% below base speed
  - 125% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)
- Top mounted conduit box
- Machined bracket & tapped shaft for stub shaft for encoder
- Low noise over wide speed range

Hp	Speed		Enclosure	Frame	Catalog number	FLA <sup>(2)</sup> @ 460V
	Base	CHP				
5	1750		TEBC	FL1831		7.6
	1450		TEBC	FL1831		7.6
	1150		TEBC	FL1831		7.6
	850		TEBC	FL1838		7.6
	650		TEBC	FL1844		7.6
	500		TEBC	FL2162		7.6
7.5	1750		TEBC	FL1831		11
	1450		TEBC	FL1831		11.5
	1150		TEBC	FL1838		11
	850		TEBC	FL1844		11
	650	-	TEBC	FL2162	-	11
	500		TEBC	FL2162		11
10	3550		TEBC	FL1831		14
	1750		TEBC	FL1838		14
	1450		TEBC	FL1838		14
	1150		TEBC	FL1844		14
	850		TEBC	FL1852		14
	650		TEBC	FL2162		14
15	500		TEBC	FL2168		14
	3550		TEBC	FL1831		21
	2500		TEBC	FL1838		21
	1750	3510	TEBC	FL1844	IDBRPM18154C	21
	1450		TEBC	FL1852		21
	1150		TEBC	FL2162		21
20	850		TEBC	FL2162	-	21
	650	-	TEBC	FL2173		21
	500		TEBC	FL2578		21
	3550		TEBC	FL1838		27
	2500		TEBC	FL1844		27
	1750	3505	TEBC	FL1852	IDBRPM18204C	27
	1450		TEBC	FL2162		27
	1150		TEBC	FL2162		27
	850	-	TEBC	FL2168	-	27
	650		TEBC	FL2578		27
	500		TEBC	FL2586		27

Hp	Speed		Enclosure	Frame	Catalog number	FLA <sup>(2)</sup> @ 460V
	Base	CHP				
25	3550		TEBC	FL1838		34
	2500	-	TEBC	FL1852		34
	1750	3535	TEBC	FL2162	IDBRPM21254C	34
	1450		TEBC	FL2162		34
	1150		TEBC	FL2168		34
	850	-	TEBC	FL2173	-	34
30	650		TEBC	FL2578		34
	500		TEBC	FL2586		34
	3550		TEBC	FL1844		40
	2500	-	TEBC	FL2162	-	40
	1750	3525	TEBC	FL2162	IDBRPM21304C	40
	1450		TEBC	FL2168		40
40	1150		TEBC	FL2173		40
	850		TEBC	FL2578		40
	650	-	TEBC	FL2586	-	40
	500		TEBC	FL2890		40
	3550		TEBC	FL2162		52
	2500		TEBC	FL2162		52
50	1750	3525	TEBC	FL2173	IDBRPM21404	52
	1450		TEBC	FL2570		52
	1150		TEBC	FL2578		52
	850		TEBC	FL2586	-	52
	650	-	TEBC	FL2898		52
	500		TEBC	FL3203		52
60	3550		TEBC	FL2162		65
	2500		TEBC	FL2168		65
	1750	3545	TEBC	FL2570	IDBRPM25504	65
	1450		TEBC	FL2578		65
	1150		TEBC	FL2586		65
	850		TEBC	FL2890	-	65
	650	-	TEBC	FL3203		65
	500		TEBC	FL3213		65
	3550		TEBC	FL2168		77
	2500		TEBC	FL2173		77
	1750	3540	TEBC	FL2578	IDBRPM25604	75
	1450		TEBC	FL2586		77
	1150		TEBC	FL2890		77
	850	-	TEBC	FL2898	-	77
	650		TEBC	FL3203		77
	500		TEBC	FL3698		77

**Totally enclosed blower cooled (TEBC)**

## Induction

Hp	Speed		Enclosure	Frame	Catalog number	FLA <sup>(2)</sup> @ 460V
	Base	CHP				
75	3550	-	TEBC	FL2173	-	96
	2500	-	TEBC	FL2578	-	96
	1750	3545	TEBC	FL2586	IDBRPM25754	95
	1450	-	TEBC	FL2890	-	96
	1150	-	TEBC	FL2898	-	96
	850	-	TEBC	FL3203	-	96
	650	-	TEBC	FL3698	-	96
	500	-	TEBC	FL3614	-	96
100	3550	-	TEBC	FL2578	-	124
	2500	-	TEBC	FL2586	-	124
	1750	3555	TEBC	FL2890	IDBRPM281004R1	126.8
	1450	-	TEBC	FL2898	-	124
	1150	-	TEBC	FL3203	-	124
	850	-	TEBC	FL3698	-	124
	650	-	TEBC	FL4022	-	124
	500	-	TEBC	FL4046	-	124
125	3550	-	TEBC	FL2586	-	156
	2500	-	TEBC	FL2890	-	156
	1750	3560	TEBC	FL2898	IDBRPM321254	159.5
	1450	-	TEBC	FL3203	-	156
	1150	-	TEBC	FL3698	-	156
	850	-	TEBC	FL3614	-	156
	650	-	TEBC	FL4046	-	156
	500	-	TEBC	FL4429*	-	157.9
150	3550	-	TEBC	FL2890	-	180
	2500	-	TEBC	FL2898	-	180
	1750	3560	TEBC	FL3203	IDBRPM321504	179
	1450	-	TEBC	FL3698	-	180
	1150	-	TEBC	FL3614	-	180
	850	-	TEBC	FL4034	-	180
	650	-	TEBC	FL4058	-	180
	500	-	TEBC	FL4440*	-	187.7
200	3550	-	TEBC	FL3203	-	240
	2500	-	TEBC	FL3213	-	240
	1750	3600	TEBC	FL3698	IDBRPM362004R1	240
	1450	-	TEBC	FL3614	-	240
	1150	-	TEBC	FL4034	-	240
	850	-	TEBC	FL4058	-	240
	650	-	TEBC	FL4440*	-	276.1
	500	-	TEBC	FL4473*	-	247.2
250	3550	-	TEBC	FL3698	-	302
	2500	-	TEBC	FL3698	-	302
	1750	3565	TEBC	FL3614	IDBRPM362504R1	302
	1450	-	TEBC	FL4046	-	302
	1150	-	TEBC	FL4058	-	302
	850	-	TEBC	FL4440*	-	306.4
	650	-	TEBC	FL4461*	-	306.4
	2500	-	TEBC	FL3614	-	361
300	1750	3570	TEBC	FL4046	IDBRPM403004R1	341
	1450	-	TEBC	FL4058	-	361
	1150	-	TEBC	FL4440*	-	365.2
	850	-	TEBC	FL4461*	-	362.5
	650	-	TEBC	FL5820*	-	361
	2500	-	TEBC	FL4046	-	414
	1750	-	TEBC	FL4058	-	414
	1450	-	TEBC	FL4440*	-	423.7
350	1150	-	TEBC	FL4451*	-	423.7
	850	-	TEBC	FL4473*	-	423.7
	2500	-	TEBC	FL4058	-	477
	1750	-	TEBC	FL4440*	-	481.9
	1450	-	TEBC	FL4451*	-	481.9
	1150	-	TEBC	FL4461*	-	481.9
	1150	-	TEBC	FL4461*	-	481.9
	1150	-	TEBC	FL4461*	-	481.9

Hp	Speed		Enclosure	Frame	Catalog number	FLA <sup>(2)</sup> @ 460V
	Base	CHP				
450	2500	-	TEBC	FL4440*	-	539.8
	1750	-	TEBC	FL4451*	-	539.8
	1450	-	TEBC	FL4461*	-	539.8
	1150	-	TEBC	FL4473*	-	539.8
500	2500	-	TEBC	FL4451*	-	597.3
	1750	-	TEBC	FL4451*	-	597.3
	1450	-	TEBC	FL4473*	-	597.3
	2500	-	TEBC	FL4473*	-	711.4
600	1750	-	TEBC	FL5824*	-	708
	1450	-	TEBC	FL5824*	-	708
	1750	-	TEBC	FL5824*	-	826
	1450	-	TEBC	FL5826*	-	826
800	1750	-	TEBC	FL5826*	-	944
	1450	-	TEBC	FL5830*	-	944
	1750	-	TEBC	FL5830*	-	1062
	1450	-	TEBC	FL5832*	-	1062
1000	1750	-	TEBC	FL5832*	-	1180

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

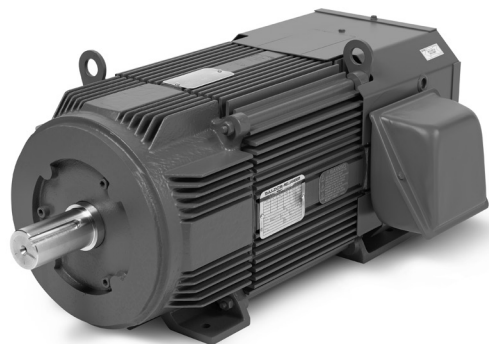
(2) For estimating purpose only

- All RPM AC induction motors are optimum pole four pole designs with the exception of 440 frames which are optimum pole eight pole designs.
- For estimating purpose only
- Wide range of CHP possible. Consult RPM AC Wizard.

\* All RPM AC FL440 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

## Totally enclosed fan cooled (TEFC)

### Induction



- 7.5 - 800 Hp
- 3-phase, 460V<sup>(1)</sup>
- Continuous constant torque to zero speed

#### Features

- Continuous duty
- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 200% below base speed
  - 125% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)
- Top mounted conduit box

Hp	Base	Speed CHP	Frame	Catalog number	FLA <sup>(2)</sup> @ 460V
5	1750		FL1831		7.6
	1450		FL1838		7.6
	1150		FL1844		7.6
	850		FL1852		7.6
	650		FL2168		7.6
	500		FL2173		7.6
7.5	2500	-	FL1838	-	11
	1750		FL1838		11
	1450		FL1844		11
	1150		FL1852		11
	850		FL2162		11
	2500		FL1844		14
10	1750	3530	FL1844	IDFRPM18104C	14
	1450		FL2162		14
	1150		FL2162		14
	850	-	FL2168	-	14
	3550		FL1844		21
	2500		FL1852		21
15	1750	3550	FL2162	IDFRPM21154C	21
	1450		FL2162		21
	1150		FL2168		21
	850	-	FL2578	-	21
	3550		FL1852		27
	2500		FL2162		27
20	1750	3545	FL2162	IDFRPM21204C	27
	1450		FL2173		27
	1150		FL2578		27
	850	-	FL2586	-	27
	3550		FL2162		34
	2500		FL2162		34
25	1750	3555	FL2173	IDFRPM21254C	34.2
	1450		FL2578		34
	1150		FL2586		34
	850	-	FL2882	-	34
	3550		FL2168		40
	2500		FL2168		40
30	1750	3555	FL2570	IDFRPM25304C	40.3
	1450		FL2586		40
	1150	-	FL2882	-	40
	850		FL2890		40

Hp	Base	Speed CHP	Frame	Catalog number	FLA <sup>(2)</sup> @ 460V
40	3550		FL2173		52
	2500	-	FL2570	-	52
	1750	3560	FL2586	IDFRPM25404	52
	1450		FL2882		52
	1150		FL2890		52
	850	-	FL3213	-	52
50	3550		FL2570		65
	2500		FL2578		65
	1750	3565	FL2882	IDFRPM28504	65
	1450		FL2890		65
	1150		FL2898		65
	850	-	FL3213	-	65
60	3550		FL2578		77
	2500		FL2882		77
	1750	3565	FL2890	IDFRPM28604	77
	1450		FL2898		77
	1150		FL3213		77
	850		FL3698		77
75	650	-	FL4034	-	77
	500		FL4058		77
	3550		FL2586		96
	2500		FL2882		96
	1750	3565	FL2898	IDFRPM28754	96
	1450		FL3213		96
100	1150		FL3698		96
	850		FL3614		96
	650		FL4046		96
	500		FL4440*		103.7
	2500		FL2898		124
	1750		FL3213		124
125	1450		FL3698		124
	1150		FL3614		124
	850	-	FL4034	-	124
	650		FL4440*		137.2
	500		FL4451*		141.8
	2500		FL3213		156
150	1750		FL3698		156
	1450		FL3614		156
	1150		FL4034		156
	850		FL4440*		165.6
	650		FL4451*		171.6
	500		FL4473*		176.3



**Totally enclosed blower cooled (TEFC)**

## Induction

Hp	Speed Base	Frame	Catalog number	FLA <sup>(2)</sup> @ 460V
150	2500	FL3698		180
	1750	FL3614		180
	1450	FL4034		180
	1150	FL4058		180
	850	FL4451*		195.4
	650	FL4473*		201.4
200	2500	FL3614		240
	1750	FL4034		240
	1450	FL4429*		247.2
	1150	FL4451*		255.6
200	850	FL4473*		247.2
250	2500	FL4046		302
	1750	FL44219		306
	1450	FL4440		317
	1150	FL4461		334
	850	FL5820		298
300	2500	FL4429		365
	1750	FL4440		365
	1450	FL4461		365
	1150	FL4461		436
	850	FL5822		356
350	2500	FL4429		424
	1750	FL4451		424
	1450	FL4473		429
	1150	FL5820	-	415
	850	FL5826		415
400	2500	FL4451		482
	1750	FL4473		482
	1450	FL5820		482
	1150	FL5820		474
	850	FL5828		472
450	2500	FL4461		540
	1750	FL5820		548
	1450	FL5820		543
	1150	FL5822		534
	850	FL5830		533
500	2500	FL4473		597
	1750	FL5820		609
	1450	FL5822		597
	1150	FL5824		600
	850	FL5832		601
600	1750	FL5824		727
	1450	FL5826		712
	1150	FL5828		715
700	1750	FL5828		831
	1450	FL5828		824
	1150	FL5832		816
800	1750	FL5830		954
	1450	FL5832		933

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

- All RPM AC induction motors are optimum pole four pole designs with the exception of 440 frames which are optimum pole eight pole designs.

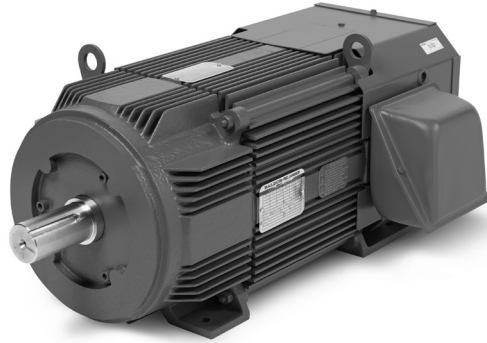
• For estimating purpose only

- Wide range of CHP possible. Consult RPM AC Wizard.

\* All RPM AC FL440 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

## Totally enclosed fan cooled (TEFC) 4:1 CT

### Induction



- 4:1 constant torque below base speed
- 15-250 Hp
- 3-phase, 460V<sup>(1)</sup>

#### Features

- Continuous duty
- 4:1 constant torque below base speed
- Standard 1 minute overload
  - 200% below base speed
  - 125% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)
- Top mounted conduit box

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
7.5	2500	FL1831	11
	1750	FL1838	11
	1450	FL1844	11
	1150	FL1852	11
	850	FL2162	11
10	2500	FL1838	14
	1750	FL1844	14
	1450	FL1852	14
	1150	FL2162	14
	850	FL2162	14
15	3550	FL1838	21
	2500	-	-
	1750	FL2162	21
	1450	FL1844	21
	1150	FL2168	21
20	850	FL2578	21
	3550	FL1844	27
	2500	FL1852	27
	1750	FL2162	27
	1450	FL2168	27
25	1150	FL2173	27
	850	FL2586	27
	3550	FL1852	34
	2500	FL2162	34
	1750	FL2168	34
30	1450	FL2578	34
	1150	FL2578	34
	850	FL2882	34
	3550	FL2162	40
	2500	FL2168	40
40	1750	FL2173	40
	1450	FL2586	40
	1150	FL2586	40
	850	FL2890	40
	3550	FL2168	52
50	2500	FL2173	52
	1750	FL2578	52
	1450	FL2586	52
	1150	FL2882	52
	850	FL2898	52
60	3550	FL2173	65
	2500	FL2570	65
	1750	FL2586	65
	1450	FL2882	65
	1150	FL2890	65
75	850	FL3203	65
	3550	FL2570	77
	2500	FL2578	77
	1750	FL2882	77
	1450	FL2890	77
100	1150	FL3203	77
	850	FL3213	77
	3550	FL2578	96
	2500	FL2586	96
	1750	FL2890	96
125	1450	FL2898	96
	1150	FL3698	96
	850	FL3614	96
	3550	FL2586	124
	2500	FL2882	124
150	1750	FL3203	124
	1450	FL3698	124
	1150	FL3614	124
	850	FL4058	124
	3550	FL2586	156
200	2500	FL2898	156
	1750	FL3213	156
	1450	FL3614	156
	1150	FL4046	156
	850	FL4429*	157.9
250	2500	FL3203	180
	1750	FL3614	180
	1450	FL3614	180
	1150	FL4058	180
	850	FL4440	188
300	2500	FL3614	240
	1750	FL4022	240
	1450	FL4046	240
	1150	FL4440	263
	850	FL4461	276
400	2500	FL4022	302
	1750	FL4046	302
	1450	FL4429	309
	1150	FL4451	336
	850	FL5820	303
500	2500	FL4022	361
	1750	FL4058	361
	1450	FL4451	363
	1150	FL4473	387
	850	FL5820	363

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
60	3550	FL2570	77
	2500	FL2578	77
	1750	FL2882	77
	1450	FL2890	77
	1150	FL3203	77
75	850	FL3213	77
	3550	FL2578	96
	2500	FL2586	96
	1750	FL2890	96
	1450	FL2898	96
100	1150	FL3698	96
	850	FL3614	96
	3550	FL2586	124
	2500	FL2882	124
	1750	FL3203	124
125	1450	FL3698	124
	1150	FL3614	124
	850	FL4058	124
	3550	FL2586	156
	2500	FL2898	156
150	1750	FL3213	156
	1450	FL3614	156
	1150	FL4046	156
	850	FL4429*	157.9
	2500	FL3203	180
200	1750	FL3614	180
	1450	FL3614	180
	1150	FL4058	180
	850	FL4440	188
	2500	FL3614	240
250	1750	FL4022	240
	1450	FL4046	240
	1150	FL4440	263
	850	FL4461	276
	2500	FL4022	302
300	1750	FL4046	302
	1450	FL4429	309
	1150	FL4451	336
	850	FL5820	303
	2500	FL4022	361
400	1750	FL4058	361
	1450	FL4451	363
	1150	FL4473	387
	850	FL5820	363

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
350	2500	FL4046	414
	1750	FL4440	424
	1450	FL4461	424
	1150	FL5820	425
	850	FL5822	434
400	2500	FL4058	477
	1750	FL4451	482
	1450	FL4473	483
	1150	FL5820	485
	850	FL5826	480
450	2500	FL4451	540
	1750	FL4461	540
	1450	FL5820	536
	1150	FL5820	546
	850	FL5828	543
500	2500	FL4461	597
	1750	FL4473	597
	1450	FL5820	595
	1150	FL5824	600
	850	FL5830	615
600	1750	FL5822	715
	1450	FL5824	704
	1150	FL5828	715
	850	FL5826	817
	2500	FL5828	824
700	1750	FL5826	816
	1450	FL5828	932
	1150	FL5832	816
	850	FL5832	933
	2500	FL5832	1094

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

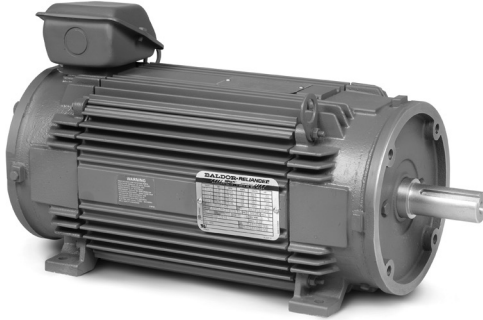
- All RPM AC induction motors are optimum pole four pole designs with the exception of 440 frames which are optimum pole eight pole designs.

• For estimating purpose only

- Wide range of CHP possible. Consult RPM AC Wizard.

\* All RPM AC FL440 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

## Totally enclosed non-ventilated (TENV) Induction



- Continuous duty, continuous constant torque to zero speed
- 2 - 100 Hp
- 3-phase, 460V<sup>(1)</sup>

### Features

- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 200% below base speed
  - 125% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)
- Top mounted conduit box

Hp	Speed Base	Frame	Catalog number	FLA <sup>(2)</sup> @ 460V
2	1450	FL1831		3.4
	1150	FL1831		3.4
	850	FL1838		3.4
	650	FL1838		3.4
	500	FL1852		3.4
3	3550	FL1831		4.8
	2500	FL1831		4.8
	1750	FL1831		4.8
	1450	FL1831		4.8
	1150	FL1838		4.8
5	850	FL1838		4.8
	650	FL1852		4.8
	500	FL2168		4.8
	3550	FL1831		7.6
	2500	FL1831		7.6
7.5	1750	FL1838		7.6
	1450	FL1844		7.6
	1150	FL1852		7.6
	850	FL2162		7.6
	650	FL2168		7.6
10	500	FL2173		4.8
	3550	FL1838		11
	2500	FL1844		11
	1750	FL1852		11
	1450	FL2162		11
15	1150	FL2162		11
	850	FL2168		11
	650	FL2173		11
	500	FL2578		11
	3550	FL1844		11
20	2500	FL1852		14
	1750	FL2162		14
	1450	FL2162		14
	1150	FL2168		14
	850	FL2570		14
25	650	FL2578		14
	500	FL2898		14
	3550	FL2162		21
	2500	FL2162		21
	1750	FL2173		21
30	1450	FL2570		21
	1150	FL2578		21
	850	FL2586		21
	650	FL3203		21
	500	FL3203		21

## Totally enclosed non-ventilated (TENV-60M)

### Induction



- 60 minute duty
- 2-500 Hp,
- 3-phase, 460V <sup>(1)</sup>

#### Features

- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 200% below base speed
  - 125% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)
- Top mounted conduit box

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
2	1450	FL1831	3.4
	1150	FL1831	3.4
	850	FL1831	3.4
	650	FL1838	3.4
	500	FL1838	3.4
3	1750	FL1831	4.8
	1450	FL1831	4.8
	1150	FL1831	4.8
	850	FL1838	4.8
	650	FL1844	4.8
5	500	FL1844	4.8
	3550	FL1831	7.6
	2500	FL1831	7.6
	1750	FL1831	7.6
	1450	FL1838	7.6
7.5	1150	FL1838	7.6
	850	FL1844	7.6
	650	FL1852	7.6
	500	FL2162	7.6
	3550	FL1831	11
10	2500	FL1831	11
	1750	FL1838	11
	1450	FL1844	11
	1150	FL1844	11
	850	FL2162	11
15	650	FL2168	11
	500	FL2173	11
	3550	FL1831	14
	2500	FL1838	14
	1750	FL1844	14
	1450	FL1844	14
	1150	FL2162	14
	850	FL2162	14
	650	FL2173	14
	500	FL2570	14
	3550	FL1838	21
	2500	FL1844	21
	1750	FL1852	21
	1450	FL2162	21
	1150	FL2168	21
	850	FL2570	21
	650	FL2578	21
	500	FL2586	21

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
20	3550	FL1844	27
	2500	FL1852	27
	1750	FL2162	27
	1450	FL2168	27
	1150	FL2173	27
25	850	FL2578	27
	650	FL2586	27
	500	FL2882	27
	3550	FL1852	34
	2500	FL2162	34
30	1750	FL2168	34
	1450	FL2173	34
	1150	FL2570	34
	850	FL2578	34
	650	FL2882	34
40	500	FL2890	34
	3550	FL2162	40
	2500	FL2168	40
	1750	FL2173	40
	1450	FL2570	40
50	1150	FL2578	40
	850	FL2882	40
	650	FL2890	40
	500	FL2898	40
	3550	FL2168	52
	2500	FL2173	52
	1750	FL2578	52
	1450	FL2578	52
	1150	FL2882	52
	850	FL2882	52
	650	FL2898	52
	500	FL3203	52
	3550	FL2173	65
	2500	FL2578	65
	1750	FL2578	65
	1450	FL2882	65
	1150	FL2882	65
	850	FL2890	65
	650	FL3203	65
	500	FL3698	65

**Totally enclosed non-ventilated (TENV-60M)**

## Induction

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
60	3550	FL2578	77
	2500	FL2578	77
	1750	FL2586	77
	1450	FL2882	77
	1150	FL2890	77
	850	FL2898	77
	650	FL3213	77
75	500	FL3614	77
	3550	FL2586	96
	2500	FL2882	96
	1750	FL2882	96
	1450	FL2890	96
	1150	FL2898	96
	850	FL3203	96
100	650	FL3698	96
	500	FL4022	96
	3550	FL2890	124
	2500	FL2890	124
	1750	FL2890	124
	1450	FL2898	124
	1150	FL3203	124
125	850	FL3698	124
	650	FL4022	124
	500	FL4429*	127.9
	3550	FL2890	156
	2500	FL2890	156
	1750	FL2890	156
	1450	FL3203	156
150	1150	FL3698	156
	850	FL4022	156
	650	FL4058	156
	500	FL4451*	157.9
	3550	FL2898	180
	2500	FL2898	180
	1750	FL3203	180
200	1450	FL3698	180
	1150	FL3614	180
	850	FL4046	180
	650	FL4440*	187.7
	500	FL4461*	187.7
	3550	FL3203	240
	2500	FL3213	240
250	1750	FL3698	240
	1450	FL3614	240
	1150	FL4046	240
	850	FL4440*	247.2
	650	FL4473*	247.2
	3550	FL3698	302
	2500	FL3698	302
300	1750	FL4022	302
	1450	FL4046	302
	1150	FL4440*	306.9
	850	FL4461*	306.4
	3550	FL3614	361
	2500	FL3614	361
	1750	FL2168	361
	1450	FL4429*	365.2
	1150	FL4451*	365.2

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
350	2500	FL4034	414
	1750	FL4429*	423.7
	1450	FL4440*	423.7
	1150	FL4473*	423.7
400	2500	FL4058	477
	1750	FL4440*	481.9
	1450	FL4461*	481.9
450	2500	FL4440*	539.8
	1750	*FL4451	539.8
	1450	FL4473*	560.8
500	2500	FL4451*	597.3
	1750	FL4461*	597.3

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

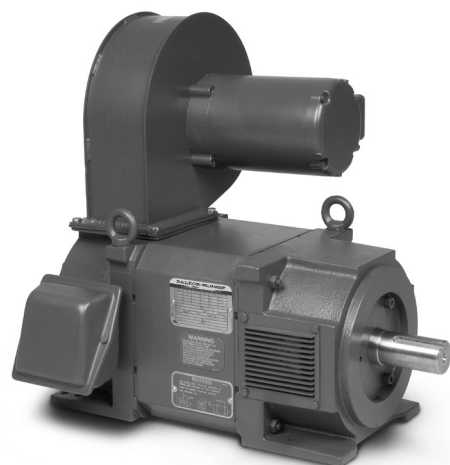
(2) For estimating purpose only

- All RPM AC induction motors are optimum pole four pole designs with the exception of 440 frames which are optimum pole eight pole designs.
- For estimating purpose only
- Wide range of CHP possible. Consult RPM AC Wizard.

\* All RPM AC FL440 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

## Class 1 division 2 group D, CSA certified (DPFV)

### Induction



- For temperature code T2A (280°C) (3)
- Drip-proof guarded force ventilated
- 3-phase
- 460V <sup>(1)</sup> - 60 Hz blower frequency
- Continuous constant torque to zero speed

#### Features

- Standard 1 minute overload
  - 150% below base speed
  - 110% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation / class F rise
- 40°C ambient / 1.0 S.F.
- Three thermostat (1 N.C. per phase)

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
7.5	850	FL1844	12.4
	650	FL1852	12.4
10	850	FL1852	14.7
	650	RL2162	15.3
15	3550	FL1831	21
	1750	FL1844	21.1
	1150	RL2162	21
	850	RL2162	24.3
20	650	RL2168	22.3
	3550	FL1831	27
	1750	FL1852	27
	1150	RL2162	31.2
	850	RL2168	28.9
	650	RL2168	33
25	3550	FL1838	34
	1750	RL2162	35.9
	1150	RL2168	35.2
	850	RL2168	40.7
	650	RL2570	42.5
	3550	FL1844	40
30	1750	RL2162	46.3
	1150	RL2168	45.4
	850	RL2570	47.9
	650	RL2578	48.9
	3550	RL2162	52
	1750	RL2168	55.7
40	1150	RL2570	62.2
	850	RL2578	64.2
	650	RL2586	63.9
	3550	RL2162	65
	1750	RL2168	77.9
	1150	RL2578	73.2
50	850	RL2586	75.9
	650	RL2882	78.9
	3550	RL2168	77
	1750	RL2570	86.5
60	1150	RL2586	95
	850	RL2882	89.5
	650	RL2898	95.5

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
75	3550	RL2173	96
	1750	RL2578	108
	1150	RL2586	117.2
	850	RL2898	116.3
100	650	RL3202	96
	3550	RL2578	124
	1750	RL2586	140.9
	1150	RL2890	146.7
	850	RL3203	124
	650	RL3213	134.6
125	3550	RL2578	156
	1750	RL2882	184.7
	1150	RL2898	188.8
	850	RL3203	164.3
	650	RL3614	156
	3550	RL2586	180
150	1750	RL2890	207.6
	1150	RL3203	180
	850	RL3614	190.2
	650	RL3614	192.3
	3550	RL2890	240
	1750	RL3203	240
200	1150	RL3698	247.9
	850	RL3614	258.9
	650	RL4046	245.5
	3550	RL2898	302
	1750	RL3213	314.2
	1150	RL3614	318.6
250	850	RL4034	302.3
	650	RL4058	302
	3550	RL3203	361
	1750	RL3698	413.1
	1150	RL4022	368.1
	850	RL4058	365.1
300	650	RL4451▲	437.8
	3550	RL3213	414
	1750	RL3614	426.3
	1150	RL4046	425.3
350	850	RL4440▲	421.8

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
400	3550	RL3213	477.3
	1750	RL3614	525.1
	1150	RL4058	487.3
	850	RL4451▲	560.6
450	3550	RL3213	533.5
	1750	RL4034	533.5
	1150	RL4058	540.9
	3550	RL3614	590
500	1750	RL4046	606.7
	1150	RL4440▲	712.5
	3550	RL4046	708
	1750	RL4058	738.8
600	1150	RL4461▲	872
	3550	RL4429▲	864.3
	1750	RL4440▲	996.7
	800	3550	RL4429▲
700	1750	RL4451▲	1144.6
	3550	RL4440▲	1093.6
	1750	RL4461▲	1293.4
	1000	3550	RL4451▲
1200	3550	RL4461▲	1424.5

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

(3) For class 1 division 2 group C T2A, a blower motor with Group C listing is required.

• All accessories, including blower motors, must either be CSA certified for class 1 group d division 2, or division 1 listed.

• All RPM AC induction motors are optimum pole four pole designs with the exception of 440 frames which are optimum pole eight pole designs.

• For estimating purpose only

• Wide range of CHP possible. Consult RPM AC Wizard.

\* All RPM AC RL440 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

## Class 1 division 2 group D, CSA certified (TEBC)

### Induction



- For temperature code T2A (280°C)<sup>(3)</sup>
- Totally enclosed blower cooled (TEBC)
- 3-phase
- 460V<sup>(1)</sup>
- 60 Hz blower frequency
- Continuous constant torque to zero speed

#### Features

- Continuous duty
- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 200% below base speed
  - 125 % above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation / class F rise
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
5	850	FL1838	7.6
	650	FL1852	7.6
	1150	FL1844	11
7.5	850	FL1852	11
	650	FL2162	11
	1150	FL1852	14
10	850	FL2162	14
	650	FL2168	14
	3550	FL1838	21
15	1750	FL1852	21
	1150	FL2162	21
	850	FL2168	21
	650	FL2570	21
	3550	FL1838	27
20	1750	FL2162	27
	1150	FL2168	27
	850	FL2173	27
	650	FL2578	27
	3550	FL1844	34
25	1750	FL2162	34
	1150	FL2173	34
	850	FL2578	34
	650	FL2586	34
	3550	FL2162	40
30	1750	FL2168	40
	1150	FL2570	40
	850	FL2586	40
	650	FL2890	40
	3550	FL2162	52
40	1750	FL2570	52
	1150	FL2586	52
	850	FL2890	52
	650	FL3203	52
	3550	FL2168	65
50	1750	FL2578	65
	1150	FL2890	65
	850	FL3203	65
	650	FL3203	65
	3550	FL2173	77
60	1750	FL2586	77
	1150	FL2898	77
	850	FL3203	77
	650	FL3614	77

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
75	3550	FL2570	96
	1750	FL2890	96
	1150	FL3203	96
100	850	FL3213	96
	650	FL4022	96
	3550	FL2578	124
125	1750	FL2898	124
	1150	FL3213	124
	850	FL4034	124
150	650	FL4046	124
	3550	FL2898	156
	1750	FL3203	156
200	1150	FL4034	156
	850	FL4046	156
	650	FL4429▲	158
250	3550	FL3203	180
	1750	FL3213	180
	1150	FL4034	180
300	850	FL4429▲	188
	650	FL4440▲	188
	3000	FL3614	240
350	1750	FL4034	240
	1150	FL4429▲	248
	850	FL4440▲	248
400	3000	FL4034	302
	1750	FL4058	302
	1150	FL4440▲	307
450	850	FL4451▲	307
	3000	FL4058	361
	1750	FL4429▲	366
500	1150	FL4451▲	366
	850	FL4473▲	366
	3000	FL4429▲	424
600	1750	FL4440▲	424
	1150	FL4461▲	424
	850	FL5820▲	414
700	3000	FL4451▲	482
	1750	FL4451▲	482
	1150	FL5820▲	477
800	850	FL5820▲	477
	3000	FL4461▲	540
	1750	FL4461▲	540
900	1150	FL5820▲	534
	850	FL5824▲	591.7

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
500	3000	FL4473▲	618
	1750	FL5824▲	590
	1150	FL5824▲	590
600	850	FL5826▲	590
	1750	FL5824▲	708
	1150	FL5826▲	708
700	850	FL5832▲	708
	1750	FL5824▲	826
	1150	FL5830▲	826
800	850	FL5824▲	826
	1750	FL5826▲	944
	1150	FL5832▲	944
900	1750	FL5830▲	1062
1000	1750	FL5832▲	1180

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

(3) For class 1 division 2 group C T2A, a blower motor with Group C listing is required.

• All accessories, including blower motors, must either be CSA certified for class 1 group d division 2, or division 1 listed.

• All RPM AC induction motors are optimum pole four pole designs with the exception of 440 frames which are optimum pole eight pole designs.

• For estimating purpose only

• Wide range of CHP possible. Consult RPM AC Wizard.

▲ All FL440 and FL5800 frames include as standard features an insulated O.D.E. bearing, VPI insulation system, oversized conduit box and PLS / ball bearing lubrication system.



## Class 1 division 2 groups A, B, C & D, CSA certified (TENV)

### Induction



- For temperature code T2A (280°C) (3)
- Totally enclosed non-ventilated (TENV)
- 3- phase
- 460V <sup>(1)</sup>
- Continuous constant torque to zero speed

#### Features

- Continuous duty
- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 200% below base speed
  - 125 % above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation / class F rise
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
2	1150	FL1838	3.4
	850	FL1838	3.4
	650	FL1852	3.4
3	1150	FL1844	4.8
	850	FL1852	4.8
	650	FL2162	4.8
5	3550	FL1838	7.6
	1750	FL1852	7.6
	1150	FL2162	7.6
	850	FL2168	7.6
	650	FL2173	7.6
7.5	3550	FL1844	11
	1750	FL2162	11
	1150	FL2168	11
	850	FL2570	11
	650	FL2578	11
10	3550	FL2162	14
	1750	FL2168	14
	1150	FL2570	14
	850	FL2578	14
	650	FL2586	14
15	3550	FL2168	21
	1750	FL2570	21
	1150	FL2568	21
	850	FL2898	21
	650	FL3203	21
20	3550	FL2570	27
	1750	FL2578	27
	1150	FL2898	27
	850	FL3203	27
	650	FL3213	27
25	3550	FL2570	34
	1750	FL2586	34
	1150	FL3203	34
	850	FL3203	34
	650	FL3614	34
30	3550	FL2586	40
	1750	FL2898	40
	1150	FL3203	40
	850	FL3614	40
	650	FL4034	40

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
40	3550	FL2898	52
	1750	FL3203	52
	1150	FL3614	52
	850	FL4034	52
	650	FL4046	52
50	3550	FL3203	65
	1750	FL3614	65
	1150	FL4034	65
	850	FL4046	65
	3550	FL3213	77
60	1750	FL4034	77
	1150	FL4046	77
	850	FL4451▲	80
	3550	FL3614	96
	1750	FL4046	96
75	1150	FL4451▲	98
	3550	FL4058	124
	1750	FL4461▲	128

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

(3) For class 1 division 2 group C T2A, a blower motor with group C listing is required.

• All accessories, including blower motors, must either be CSA certified for class 1 group d division 2, or division 1 listed.

• All RPM AC induction motors are optimum pole four pole designs with the exception of 440 frames which are optimum pole eight pole designs.

• For estimating purpose only

• Wide range of CHP possible. Consult RPM AC Wizard.

▲ All FL440 frames include as standard features an insulated O.D.E. bearing, VPI insulation system, oversized conduit box and PLS / ball bearing lubrication system.



## Class 1 division 2 groups A, B, C & D, CSA certified (TEFC)

### Induction



- For temperature code T2A (280°C)<sup>(3)</sup>
- Totally enclosed fan cooled (TEFC) - variable torque
- 3- phase
- 460V<sup>(1)</sup>

#### Features

- Continuous duty
- Variable torque - Hp varies as cube of RPM
- Standard 1 minute overload
  - 200% below base speed
  - 125% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation / class F rise
- 40°C ambient / 1.0 S.F
- Three thermostats (1 N.C. per phase)
- Top mounted conduit box

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
7.5	2500	See TENV for Cl 1, Gp D T2A	11
	1750		
	1150		
	850		
10	2500	See TENV for Cl 1, Gp D T2A	14
	1750		
	1150		
	850		
15	2500	FL1844	21
	1750	FL1852	21
	1150	FL2168	21
	850	FL2570	21
20	2500	FL1852	27
	1750	FL2162	27
	1150	FL2570	27
	850	FL2578	27
25	2500	FL2162	34
	1750	FL2168	34
	1150	FL2570	34
	850	FL2586	34
30	2500	FL2168	40
	1750	FL2173	40
	1150	FL2578	40
	850	FL2890	40
40	2500	FL2173	52
	1750	FL2570	52
	1150	FL2586	52
	850	FL3203	52
50	2500	FL2570	65
	1750	FL2578	65
	1150	FL2898	65
	850	FL3203	65
60	2500	FL2578	77
	1750	FL2586	77
	1150	FL3203	77
	850	FL3213	77
75	2500	FL2578	96
	1750	FL2890	96
	1150	FL3203	96
	850	FL4034	96
100	2500	FL2890	124
	1750	FL3203	124
	1150	FL4022	124
	850	FL4046	124

Hp	Speed Base	Frame	FLA <sup>(2)</sup> @ 460V
125	2500	FL3203	156
	1750	FL3203	156
	1150	FL4034	156
	850	FL4058	156
150	2500	FL3203	180
	1750	FL3213	180
	1150	FL4046	180
	850	FL4058	180
200	2500	FL3614	240
	1750	FL4034	240
	1150	FL4429	247.2
	850	FL4440	247.2
300	2500	FL4058	361
	1750	FL4429	365.2
	1150	FL4451	365.2
	850	FL5820	361
400	2500	FL4429	481.9
	1750	FL4429	481.9
	1150	FL5820	477
	850	FL5824	477
500	2500	FL4440	597.3
	1750	FL4461	597.3
	1150	FL5824	590
	850	FL5828	590
600	2500	FL4461	711.4
	1750	FL5824	708
	1150	FL5826	708
	850	FL5832	708
700	2500	FL4473	824.2
	1750	FL5824	826
	1150	FL5820	826
	1750	FL5826	944
800	1150	FL5832	944
	1750	FL5830	1062
1000	1750	FL5832	1180

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

(3) For class 1 division 2 group C T2A, a blower motor with group C listing is required.

- All accessories, including blower motors, must either be CSA certified for class 1 group d division 2, or division 1 listed.
- All RPM AC induction motors are optimum pole four pole designs with the exception of 440 frames which are optimum pole eight pole designs.
- For estimating purpose only
- Wide range of CHP possible. Consult RPM AC Wizard.

## IEC drip-proof guarded force ventilated (DPFV)

### Induction



- 3-phase
- 380V<sup>(1)</sup>
- 50 Hz blower
- Continuous constant torque to zero speed

#### Features

- S1 duty (continuous)
- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 150% below base speed
  - 110% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)
- Side mounted conduit box with terminal block

kW	Speed Base	Frame	FLA <sup>(2)</sup> @ 380V
5.6	850	FDL1108	13.3
	650	FDL1110	13.3
	850	FDL1110	17
7.5	650	RDL1307	17
	500	RDL1307	17.2
	3550	FDL1106	25
11	2950	FDL1106	25
	2500	FDL1106	25
	1750	FDL1108	25
	1450	FDL1108	25
	1150	FDL1110	25
	850	RDL1307	25
	650	RDL1308	25
	500	RDL1308	25.1
	3550	FDL1106	32.9
15	2950	FDL1106	32.9
	2500	FDL1106	32.9
	1750	FDL1110	32.9
	1450	FDL1112	32.9
	1150	RDL1307	33.4
	850	RDL1308	32.9
	650	RDL1308	32.9
	500	RDL1611	32.9
	3550	FDL1106	41
18.6	2950	FDL1108	41
	2500	FDL1108	41
	1750	FDL1112	41
	1450	RDL1307	41
	1150	RDL1308	41
	850	RDL1308	41
	650	RDL1609	41
	500	RDL1613	41
	3550	FDL1108	47.7
22	2950	FDL1110	47.7
	2500	FDL1110	47.7
	1750	RDL1307	47.7
	1450	RDL1307	47.7
	1150	RDL1308	47.7
	850	RDL1609	47.7
	650	RDL1611	47.7
	500	RDL1613	47.7

kW	Speed Base	Frame	FLA <sup>(2)</sup> @ 380V
30	3550	FDL1110	63.3
	2950	FDL1112	63.3
	2500	RDL1307	63.3
	1750	RDL1308	63.3
	1450	RDL1308	63.3
	1150	RDL1609	65.5
	850	RDL1611	64.7
	650	RDL1613	63.3
	500	RDL1813	63.3
37	3550	FDL1112	78.1
	2950	RDL1307	78.1
	2500	RDL1308	78.1
	1750	RDL1308	78.1
	1450	RDL1609	78.1
	1150	RDL1611	78.1
	850	RDL1613	78.1
	650	RDL1811	78.8
	500	RDL1815	78.1
45	2950	RDL1308	93.7
	2500	RDL1308	93.7
	1750	RDL1609	93.7
	1450	RDL1611	93.7
	1150	RDL1613	93.7
	850	RDL1811	93.7
	650	RDL1815	93.7
	500	RDL2010	93.7
	2950	RDL1609	116.3
56	2500	RDL1609	116.3
	1750	RDL1611	116.6
	1450	RDL1611	116.3
	1150	RDL1613	116.3
	850	RDL1815	116.3
	650	RDL2010	116.3
	500	RDL2010	116.9
	2950	RDL1611	150.9
	2500	RDL1611	150.9
75	1750	RDL1613	150.9
	1450	RDL1811	150.9
	1150	RDL1813	150.9
	850	RDL2010	150.9
	650	RDL2012	150.9
	500	RDL2212	150.9

**IEC drip-proof guarded force ventilated (DPFV)**

## Induction

kW	Speed Base	Frame	FLA <sup>(2)</sup> @ 380V
91	2950	RDL1613	184.2
	2500	RDL1613	184.2
	1750	RDL1811	184.2
	1450	RDL1813	184.2
	1150	RDL1815	184.2
	850	RDL2010	184.2
	650	RDL2212	184.2
	500	RDL2212	184.2
110	2950	RDL1613	214.9
	2500	RDL1611	214.9
	1750	RDL1813	214.9
	1450	RDL1815	214.9
	1150	RDL2010	214.9
	850	RDL2012	214.9
	650	RDL2212	214.9
	500	RDL2510	214.9
132	2950	RDL1813	257
	2500	RDL1813	257
	1750	RDL1815	257
	1450	RDL2010	257
	1150	RDL2010	257
	850	RDL2212	257
	650	RDL2508	257
	500	RDL2512	257
150	2950	RDL1813	292.1
	2500	RDL1813	292.1
	1750	RDL2010	292.1
	1450	RDL2010	292.1
	1150	RDL2012	292.1
	850	RDL2212	292.1
	650	RDL2510	292.1
	500	RDL2514	292.1
186	2950	RDL2010	364.6
	2500	RDL2010	364.6
	1750	RDL2010	364.6
	1450	RDL2210	364.6
	1150	RDL2212	364.6
	850	RDL2510	364.6
	650	RDL2514	364.6
	500	RDL2814	390
224	2950	RDL2010	437.3
	2500	RDL2010	437.3
	1750	RDL2210	437.3
	1450	RDL2212	437.3
	1150	RDL2508	437.3
	850	RDL2512	437.3
	650	RDL28120	466.3
260	2950	RDL2012	499.3
	2500	RDL2012	499.3
	1750	RDL2212	499.3
	1450	RDL2212	499.3
	1150	RDL2510	499.3
	850	RDL2514	499.3
	650	RDL28140	538.1
300	2950	RDL2012	580.4
	2500	RDL2212	580.4
	1750	RDL2212	580.4
	1450	RDL2510	580.4
	1150	RDL2512	580.4
	850	RDL28120	617.3

kW	Speed Base	Frame	FLA <sup>(2)</sup> @ 380V
336	2950	RDL2212	646.4
	2500	RDL2212	646.4
	1750	RDL2510	646.4
	1450	RDL2512	646.4
	1150	RDL2514	646.4
	850	RDL28140	688.1
	2950	RDL2212	714.2
	2500	RDL2508	714.2
373	1750	RDL2510	714.2
	1450	RDL2514	714.2
	1150	RDL28100	760.3
	2950	RDL2512	855.9
447	2500	RDL2512	855.9
	1750	RDL2514	855.9
	1450	RDL28100	903.2
	1150	RDL28140	903.2
	2950	RDL2514	999.5
522	2500	RDL28080	1045.9
	1750	RDL28100	1045.9
	1450	RDL28120	1045.9
	2950	RDL28080	1192.1
600	2500	RDL28080	1192.1
	1750	RDL28120	1192.1
	1450	RDL28160	1192.1

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

- All RPM AC induction motors are optimum pole four pole designs with the exception of 280 frames which are optimum pole eight pole designs.

- For estimating purpose only

- Wide range of CHP possible. Consult RPM AC Wizard.

\* All RPM AC RDL280 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

## IEC totally enclosed blower cooled (TEBC) (IP44-IC416)

### Induction



- 3-phase
- 380V<sup>(1)</sup>
- 50 Hz blower
- Continuous constant torque to zero speed

#### Features

- S1 duty (continuous)
- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 150% below base speed
  - 110% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)
- Top mounted conduit box with terminal block (FDL112 - DL250)
- Side mounted conduit box with terminal block (DL280)

Kw	Speed Base	Frame	FLA <sup>(2)</sup> @ 380V
3.7	1750	FDL1106	9.1
	1450	FDL1106	9.1
	1150	FDL1106	9.1
	850	FDL1108	9.1
	650	FDL1110	9.1
	500	FDL1307	9.1
5.6	1750	FDL1106	13.3
	1450	FDL1106	14.3
	1150	FDL1108	13.3
	850	FDL1110	13.3
	650	FDL1307	13.3
	500	FDL1307	13.3
7.5	3550	FDL1106	17
	2950	FDL1106	17
	2500	FDL1106	17
	1750	FDL1108	17
	1450	FDL1108	17
	1150	FDL1110	17
	850	FDL1307	17
	650	FDL1307	17
	500	FDL1308	17
	3550	FDL1106	25
11	2950	FDL1108	25
	2500	FDL1108	25
	1750	FDL1110	25
	1450	FDL1112	25
	1150	FDL1307	25
	850	FDL1307	25.3
	650	FDL1310	25
	500	FDL1611	25
	3550	FDL1108	32.9
	2950	FDL1110	32.9
15	2500	FDL1110	32.9
	1750	FDL1307	32.9
	1450	FDL1307	32.9
	1150	FDL1307	33.5
	850	FDL1310	33.3
	650	FDL1611	32.9
	500	FDL1613	32.9
	500	FDL1613	32.9

Kw	Speed Base	Frame	FLA <sup>(2)</sup> @ 380V
18.6	3550	FDL1110	41.6
	2950	FDL1112	41.6
	2500	FDL1112	41.6
	1750	FDL1307	41.6
	1450	FDL1307	42.7
	1150	FDL1308	42
	850	FDL1609	43.8
	650	FDL1613	41.6
	500	FDL1813	41.6
	3550	FDL1110	47.7
22	2950	FDL1112	47.7
	2500	FDL1307	47.7
	1750	FDL1307	48
	1450	FDL1308	47.7
	1150	FDL1310	47.7
	850	FDL1611	47.7
	650	FDL1613	48.3
	500	FDL2010	47.7
	3550	FDL1307	63.3
	2950	FDL1307	63.3
30	2500	FDL1307	63.3
	1750	FDL1310	63.3
	1450	FDL1609	63.3
	1150	FDL1611	63.3
	850	FDL1613	68.2
	650	FDL1815	65.8
	500	FDL2010	63.3
	3550	FDL1307	78.1
	2950	FDL1307	78.1
	2500	FDL1308	78.1
37	1750	FDL1609	78.1
	1450	FDL1611	78.1
	1150	FDL1613	80.4
	850	FDL1815	78.1
	650	FDL2010	78.1
	500	FDL2012	78.1
	500	FDL2012	78.1

**IEC totally enclosed blower cooled (TEBC) (IP44-IC416)**

## Induction

Kw	Speed Base	Frame	FLA <sup>(2)</sup> @ 380V
45	3550	FDL1308	93.7
	2950	FDL1310	93.7
	2500	FDL1310	93.7
	1750	FDL1611	95.6
	1450	FDL1613	93.7
	1150	FDL1815	93.7
	850	FDL2010	93.7
	650	FDL2012	93.7
	500	FDL2210	93.7
56	3550	FDL1310	116.3
	2950	FDL1609	116.3
	2500	FDL1611	116.3
	1750	FDL1613	116.3
	1450	FDL1813	117.2
	1150	FDL1815	116.3
	850	FDL2012	116.3
	650	FDL2210	116.3
	500	FDL2510	116.3
75	3550	FDL1611	150.9
	2950	FDL1613	150.9
	2500	FDL1811	150.9
	1750	FDL1813	157.2
	1450	FDL1815	154.6
	1150	FDL2012	150.9
	850	FDL2212	150.9
	650	FDL2510	150.9
	500	FDL2512	150.9
91	2950	FDL1813	184.2
	2500	FDL1813	184.2
	1750	FDL1815	189
	1450	FDL2012	184.2
	1150	FDL2210	184.2
	850	FDL2212	184.2
	650	FDL2512	184.2
	500	FDL2810*	201.3
	2950	FDL1815	214.9
110	2500	FDL2010	214.9
	1750	FDL2012	214.9
	1450	FDL2210	214.9
	1150	FDL2212	214.9
	850	FDL2510	214.9
	650	FDL2810*	232.4
	500	FDL2812*	253.7
	500	FDL2812*	223.6
	2950	FDL2010	257
132	2500	FDL2012	257
	1750	DL2210	257
	1450	FDL2212	257
	1150	FDL2510	257
	850	FDL2514	257
	650	FDL2812▲	290.1
	500	FDL2816▲	275.8
	2950	FDL2012	290.1
	2500	FDL2210	290.1
149	1750	FDL2212	290.1
	1450	FDL2212	290.1
	1150	FDL2512	290.1
	850	FDL2810▲	316.2
	650	FDL2814▲	319.8

Kw	Speed Base	Frame	FLA <sup>(2)</sup> @ 380V
186	2950	FDL2210	364.6
	2500	FDL2210	364.6
	1750	FDL2510	364.6
	1450	FDL2512	364.6
	1150	FDL2810▲	389.1
	850	FDL2812▲	418.7
223	2950	FDL2212	435.5
	2500	FDL2212	435.3
	1750	FDL2512	435.3
	1450	FDL2810▲	492.7
	1150	FDL2812▲	484.7
260	850	FDL2816▲	479.9
	2500	FDL2512	499.3
	1750	FDL2514	499.3
	1450	FDL2812▲	588.3
	1150	FDL2814▲	567.7
300	2500	FDL2812▲	586.4
	1750	FDL2812▲	689.7
	1450	FDL2816▲	652.9
336	2500	FDL2814▲	654
	1750	FDL2816▲	742.9
373	2500	FDL2816▲	723.1

(1) Standard voltages available: 230, 380, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

• All RPM AC induction motors are optimum pole four pole designs with the exception of 280 frames which are optimum pole eight pole designs.

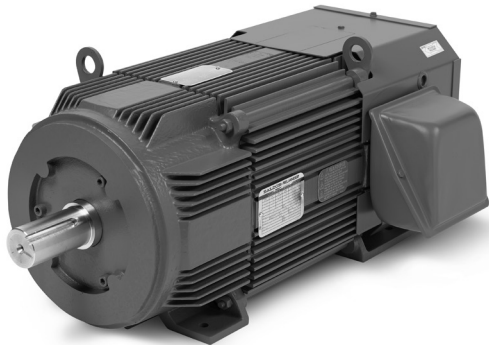
• For estimating purpose only

• Wide range of CHP possible. Consult RPM AC Wizard.

▲ All RPM AC FDL280 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

## IEC totally enclosed fan cooled (TEFC) (IP44-IC411)

### Induction



- 100% Constant torque from base speed down to zero speed
- Continuous constant torque to zero speed
- IP44 - IC411
- 3-phase
- 380 volts<sup>(1)</sup>

#### Features

- S1 duty (continuous)
- Standard 1 minute overload
  - 200% below base speed
  - 125% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostat (1 N.C. per phase)
- Top mounted conduit box with terminal block

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
5.6	3550	FDL1106	13.3
	2500	FDL1108	13.3
	1750	FDL1108	13.3
	1450	FDL1110	13.3
	1150	FDL1112	13.3
	850	FDL1307	13.3
	650	FDL1310	13.3
7.5	500	FDL1611	13.3
	3550	FDL1108	17
	2500	FDL1110	17
	1750	FDL1110	17
	1450	FDL1307	17
	1150	FDL1307	17
	850	FDL1308	17
11	650	FDL1611	17
	500	FDL1613	17
	3550	FDL1110	25
	2500	FDL1112	25
	1750	FDL1307	25
	1450	FDL1307	25
	1150	FDL1308	25
15	850	FDL1611	25
	650	FDL1613	25
	3550	FDL1112	32.9
	2500	FDL1307	32.9
	1750	FDL1307	32.9
	1450	FDL1310	32.9
	1150	FDL1611	32.9
18.6	850	FDL1613	32.9
	3550	FDL1307	41
	2500	FDL1307	41
	1750	FDL1310	41
	1450	FDL1611	41
	1150	FDL1613	41
	850	FDL1811	41
22	3550	FDL1308	47.7
	2500	FDL1308	47.7
	1750	FDL1609	47.7
	1450	FDL1611	47.7
	1150	FDL1811	47.7
	850	FDL1813	47.7

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
30	3550	FDL1310	63.3
	2500	FDL1609	63.3
	1750	FDL1613	63.3
	1450	FDL1811	63.3
	1150	FDL1813	63.3
	850	FDL2012	63.3
	3550	FDL1609	78.1
37	2500	FDL1611	78.1
	1750	FDL1811	78.1
	1450	FDL1813	78.1
	1150	FDL1815	78.1
	850	FDL2012	78.1
	3550	FDL1611	93.7
	2500	FDL1811	93.7
45	1750	FDL1813	93.7
	1450	FDL1815	93.7
	1150	FDL2012	93.7
	850	FDL2210	93.7
	650	FDL2510	93.7
	500	FDL2808▲	97.1
	3550	FDL1613	116.3
56	2500	FDL1813	116.3
	1750	FDL2010	116.3
	1450	FDL2012	116.3
	1150	FDL2210	116.3
	850	FDL2212	116.3
	650	FDL2512	116.3
	500	FDL2810▲	118.6
75	2500	FDL1815	150.9
	1750	FDL2010	150.9
	1450	FDL2210	150.9
	1150	FDL2212	150.9
	850	FDL2510	150.9
	650	FDL2810▲	155.6
	500	FDL2812▲	155.6
93	2500	FDL2012	188.3
	1750	FDL2210	188.3
	1450	FDL2212	188.3
	1150	FDL2510	188.3
	850	FDL2810▲	190.6
	650	FDL2812▲	190.6
	500	FDL2816▲	190.6

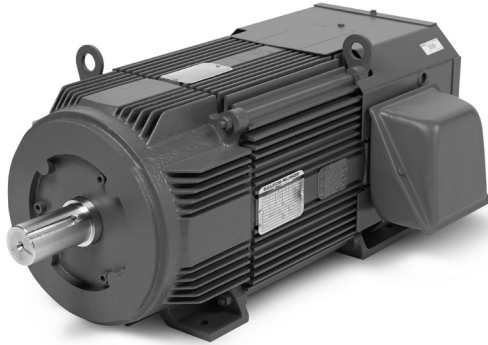
Kw	Speed Base	Frame	FLA <sup>(2)</sup>
110	2500	FDL2210	214.9
	1750	FDL2212	214.9
	1450	FDL2510	214.9
	1150	FDL2512	214.9
	850	FDL2812▲	223.6
	650	FDL2814▲	223.6
150	2500	FDL2212	292.1
	1750	FDL2510	292.1
	1450	FDL2808▲	300.8
	1150	FDL2812▲	300.8
	850	FDL2816▲	300.8
186	2500	FDL2512	364.6
	1750	FDL2808▲	369.9
	1450	FDL2810▲	369.9
	1150	FDL2814▲	369.9
224	2500	FDL2808▲	442.5
	1750	FDL2810▲	442.5
	1450	FDL2814▲	442.5
260	2500	FDL2808▲	510.9
	1750	FDL2812▲	510.9
	1450	FDL2816▲	510.9
300	2500	FDL2812▲	586.4
	1750	FDL2816▲	586.4
336	2500	FDL2814▲	654
373	2500	FDL2816▲	723.1

(1) Standard voltages available: 230, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

- All RPM AC induction motors are optimum pole four pole designs with the exception of 280 frames which are optimum pole eight pole designs.
- For estimating purpose only
- Wide range of CHP possible. Consult RPM AC Wizard.
- \* All RPM AC FDL280 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

## IEC Totally Enclosed Fan Cooled (TEFC) (IP44-IC411) 4:1 Induction



- 4:1 constant torque below base speed
- IP44 - IC411
- 3-phase
- 380 volts<sup>(1)</sup>

### Features

- S1 duty (continuous)
- 4:1 constant torque below base speed
- Standard 1 minute overload
  - 200% below base speed
  - 125% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostat (1 N.C. per phase)
- Top mounted conduit box with terminal block

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
5.6	3550	FDL1106	13.3
	2500	FDL1106	13.3
	1750	FDL1108	13.3
	1450	FDL1110	13.3
	1150	FDL1112	13.3
	850	FDL1307	13.3
	650	FDL1310	13.3
	500	FDL1611	13.3
7.5	3550	FDL1106	17
	2500	FDL1108	17
	1750	FDL1110	17
	1450	FDL1112	17
	1150	FDL1307	17
	850	FDL1307	17
	650	FDL1611	17
	500	FDL1613	17
11	3550	FDL1108	25
	2500	FDL1110	25
	1750	FDL1307	25
	1450	FDL1307	25
	1150	FDL1308	25
	850	FDL1611	25
	650	FDL1613	25
	500	FDL1110	32.9
15	3550	FDL1112	32.9
	2500	FDL1307	32.9
	1750	FDL1307	32.9
	1450	FDL1308	32.9
	1150	FDL1310	32.9
	850	FDL1613	32.9
	3550	FDL1112	41
	2500	FDL1307	41
18.6	1750	FDL1308	41
	1450	FDL1310	41
	1150	FDL1611	41
	850	FDL1811	41
	3550	FDL1307	47.7
	2500	FDL1308	47.7
	1750	FDL1310	47.7
	1450	FDL1611	47.7
22	1150	FDL1613	47.7
	850	FDL1813	47.7

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
30	3550	FDL1308	63.3
	2500	FDL1310	63.3
	1750	FDL1611	63.3
	1450	FDL1613	63.3
	1150	FDL1811	63.3
	850	FDL2010	63.3
	3550	FDL1310	78.1
	2500	FDL1609	78.1
37	1750	FDL1613	78.1
	1450	FDL1811	78.1
	1150	FDL1813	78.1
	850	FDL2010	78.1
	3550	FDL1609	93.7
	2500	FDL1611	93.7
	1750	FDL1811	93.7
	1450	FDL1813	93.7
45	1150	FDL2010	93.7
	850	FDL2210	93.7
	3550	FDL1611	116.3
	2500	FDL1613	116.3
	1750	FDL1813	116.3
	1450	FDL2010	116.3
	1150	FDL2210	116.3
	850	FDL2212	116.3
56	3550	FDL1613	150.9
	2500	FDL1811	150.9
	1750	FDL2010	150.9
	1450	FDL2210	150.9
	1150	FDL2212	150.9
	850	FDL2514	150.9
	3550	FDL1613	188.3
	2500	FDL1815	188.3
75	1750	FDL2012	188.3
	1450	FDL2212	188.3
	1150	FDL2512	188.3
	850	FDL2808▲	190.6
	2500	FDL2010	214.9
	1750	FDL2212	214.9
	1450	FDL2212	214.9
	1150	FDL2514	214.9

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
150	2500	FDL2212	292.1
	1750	FDL2510	292.1
	1450	FDL2514	292.1
	1150	FDL2810▲	300.8
	850	FDL2816▲	300.8
	2500	FDL2508	364.6
	1750	FDL2512	364.6
	1450	FDL2808▲	369.9
186	1150	FDL2812▲	369.9
	2500	FDL2508	437.3
	1750	FDL2808▲	442.5
	1450	FDL2812▲	442.5
	1150	FDL2816▲	442.5
	2500	FDL2512	499.3
	1750	FDL2810▲	510.9
	1450	FDL2814▲	510.9
260	2500	FDL2514	580.4
	1750	FDL2812▲	586.4
	1450	FDL2816▲	589.4
	2500	FDL2812▲	654
	1750	FDL2814▲	654
	2500	FDL2814▲	723.1
	1750	FDL2816▲	723.1

(1) Standard voltages available: 230, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

- All RPM AC induction motors are optimum pole four pole designs with the exception of 280 frames which are optimum pole eight pole designs.

• For estimating purpose only

- Wide range of CHP possible. Consult RPM AC Wizard.

\* All RPM AC FDL280 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.



## IEC totally enclosed non-ventilated (TENV)

### Induction



- S1 duty (continuous)
- IP44 - IC410
- 3-phase
- 380 volts<sup>(1)</sup>

#### Features

- 100% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 200% below base speed
  - 125% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostat (1 N.C. per phase)
- Top mounted conduit box with terminal block

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
1.5	1450	FDL1106	4.1
	1150	FDL1106	4.1
	850	FDL1108	4.1
	650	FDL1108	4.1
	500	FDL1112	4.1
2.2	3550	FDL1106	5.7
	2950	FDL1106	5.7
	2500	FDL1106	5.7
	1750	FDL1106	5.7
	1450	FDL1106	5.7
3.7	1150	FDL1108	5.7
	850	FDL1108	5.7
	650	FDL1112	5.7
	500	FDL1308	5.7
	3550	FDL1106	9.1
5.6	2950	FDL1106	9.1
	2500	FDL1106	9.1
	1750	FDL1108	9.1
	1450	FDL1110	9.1
	1150	FDL1112	9.1
7.5	850	FDL1307	9.1
	650	FDL1308	9.1
	500	FDL1310	9.1
	3550	FDL1108	13.3
	2950	FDL1110	13.3
11	2500	FDL1110	13.3
	1750	FDL1112	13.3
	1450	FDL1307	13.3
	1150	FDL1307	13.3
	850	FDL1308	13.3
15	650	FDL1310	13.3
	500	FDL1611	13.3
	3550	FDL1110	17
	2950	FDL1112	17
	2500	FDL1112	17
18.6	1750	FDL1307	17
	1450	FDL1307	17
	1150	FDL1308	17
	850	FDL1609	17
	650	FDL1611	17
22	500	FDL1815	17
	3550	FDL1110	17
	2950	FDL1112	17
	2500	FDL1112	17
	1750	FDL1307	17
30	1450	FDL1307	17
	1150	FDL1308	17
	850	FDL1609	17
	650	FDL1611	17
	500	FDL1815	17

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
11	3550	FDL1307	25
	2950	FDL1307	25
	2500	FDL1307	25
	1750	FDL1310	25
	1450	FDL1609	25
15	1150	FDL1611	25
	850	FDL1613	25
	650	FDL2010	25
	500	FDL2010	25
	3550	FDL1308	32.9
18.6	2950	FDL1310	32.9
	2500	FDL1310	32.9
	1750	FDL1609	32.9
	1450	FDL1611	32.9
	1150	FDL1613	32.9
22	850	FDL1815	32.9
	650	FDL2010	32.9
	500	FDL2012	32.9
	3550	FDL1310	41
	2950	FDL1609	41
30	2500	FDL1609	41
	1750	FDL1611	41
	1450	FDL1613	41
	1150	FDL1815	41
	850	FDL2010	41
37	650	FDL2012	41
	500	FDL2210	41
	3550	FDL1609	47.7
	2950	FDL1611	47.7
	2500	FDL1611	47.7
45	1750	FDL1613	47.7
	1450	FDL1813	47.7
	1150	FDL2010	47.7
	850	FDL2012	47.7
	650	FDL2210	47.7
56	500	FDL2212	47.7
	3550	FDL1613	63.3
	2950	FDL1811	63.3
	2500	FDL1813	63.3
	1750	FDL2010	63.3
75	1450	FDL2010	63.3
	1150	FDL2012	63.3
	850	FDL2212	63.3
	650	FDL2212	63.3
	500	FDL2512	63.3

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
37	3550	FDL1813	78.1
	2950	FDL1815	78.1
	2500	FDL1815	78.1
	1750	FDL2010	78.1
	1450	FDL2012	78.1
45	1150	FDL2210	78.1
	850	FDL2212	78.1
	650	FDL2510	78.1
	500	FDL2514	78.1
	3550	FDL2010	93.7
56	2950	FDL2010	93.7
	2500	FDL2010	93.7
	1750	FDL2210	93.7
	1450	FDL2212	93.7
	1150	FDL2212	93.7
75	850	FDL2512	93.7
	650	FDL2514	93.7
	3550	FDL2210	116.3
	2950	FDL2210	116.3
	2500	FDL2210	116.3
91	1750	FDL2212	116.3
	1450	FDL2510	116.3
	1150	FDL2512	116.3
	850	FDL2814*	118.6
	2950	FDL2212	150.9
110	2500	FDL2212	150.9
	1750	FDL2512	150.9
	1450	FDL2514	150.9
	1150	FDL2814*	172.5
	2500	FDL2512	184.2
132	1750	FDL2814*	186.7

(1) Standard voltages available: 230, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

- All RPM AC induction motors are optimum pole four pole designs with the exception of 280 frames which are optimum pole eight pole designs.

• For estimating purpose only

- Wide range of CHP possible. Consult RPM AC Wizard.

\* All RPM AC FDL280 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.



## IEC totally enclosed non-ventilated (TENV), S2 Induction



- S2 - 60 duty (60 minutes)
- IP44 - IC410
- 3-phase
- 380 volts<sup>(1)</sup>

### Features

- 00% Constant torque from base speed down to zero speed
- Standard 1 minute overload
  - 200% below base speed
  - 125% above base speed
- Optimum pole design - 4 or 6 pole designs
- Class H insulation
- 40°C ambient / 1.0 S.F.
- Three thermostat (1 N.C. per phase)
- Top mounted conduit box with terminal block

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
1.5	1450	FDL1106	4.1
	1150	FDL1106	4.1
	850	FDL1106	4.1
	650	FDL1108	4.1
	500	FDL1108	4.1
2.2	3550	FDL1106	5.7
	2950	FDL1106	5.7
	2500	FDL1106	5.7
	1750	FDL1106	5.7
	1450	FDL1106	5.7
3.7	1150	FDL1106	5.7
	850	FDL1108	5.7
	650	FDL1108	5.7
	500	FDL1110	5.7
	3550	FDL1106	9.1
5.6	2950	FDL1106	9.1
	2500	FDL1106	9.1
	1750	FDL1106	9.1
	1450	FDL1108	9.1
	1150	FDL1108	9.1
7.5	850	FDL1110	9.1
	650	FDL1112	9.1
	500	FDL1307	9.1
	3550	FDL1106	13.3
	2950	FDL1106	13.3
11	2500	FDL1106	13.3
	1750	FDL1108	13.3
	1450	FDL1110	13.3
	1150	FDL1110	13.3
	850	FDL1307	13.3
15	650	FDL1308	13.3
	500	FDL1310	13.3
	3550	FDL1106	17
	2950	FDL1106	17
	2500	FDL1108	17
18.6	1750	FDL1110	17
	1450	FDL1110	17
	1150	FDL1307	17
	850	FDL1307	17
	650	FDL1310	17
22	500	FDL1609	17
	3550	FDL1106	17
	2950	FDL1106	17
	2500	FDL1108	17
	1750	FDL1110	17
30	1450	FDL1110	17
	1150	FDL1307	17
	850	FDL1307	17
	650	FDL1310	17
	500	FDL1609	17

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
11	3550	FDL1108	25
	2950	FDL1110	25
	2500	FDL1110	25
	1750	FDL1112	25
	1450	FDL1307	25
15	1150	FDL1308	25
	850	FDL1609	25
	650	FDL1611	25
	500	FDL1611	25
	3550	FDL1110	32.9
18.6	2950	FDL1112	32.9
	2500	FDL1112	32.9
	1750	FDL1307	32.9
	1450	FDL1308	32.9
	1150	FDL1609	32.9
22	850	FDL1611	32.9
	650	FDL1613	32.9
	500	FDL1811	32.9
	3550	FDL1112	41
	2950	FDL1307	41
30	2500	FDL1307	41
	1750	FDL1308	41
	1450	FDL1310	41
	1150	FDL1609	41
	850	FDL1611	41
36	650	FDL1811	41
	500	FDL1813	41
	3550	FDL1307	47.7
	2950	FDL1307	47.7
	2500	FDL1308	47.7
45	1750	FDL1310	47.7
	1450	FDL1609	47.7
	1150	FDL1611	47.7
	850	FDL1811	47.7
	650	FDL1811	47.7
55	500	FDL1815	47.7
	3550	FDL1308	63.3
	2950	FDL1308	63.3
	2500	FDL1310	63.3
	1750	FDL1611	63.3
63	1450	FDL1611	63.3
	1150	FDL1811	63.3
	850	FDL1813	63.3
	650	FDL1815	63.3
	500	FDL2010	63.3

**IEC totally enclosed non-ventilated (TENV), S2**

Induction

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
37	3550	FDL1310	78.1
	2950	FDL1609	78.1
	2500	FDL1611	78.1
	1750	FDL1611	78.1
	1450	FDL1613	78.1
	1150	FDL1811	78.1
	850	FDL1813	78.1
	650	FDL2010	78.1
	500	FDL2012	78.1
45	3550	FDL1611	93.7
	2950	FDL1611	93.7
	2500	FDL1611	93.7
	1750	FDL1811	93.7
	1450	FDL1811	93.7
	1150	FDL1813	93.7
	850	FDL2010	93.7
	650	FDL2012	93.7
	500	FDL2212	93.7
56	3550	FDL1613	116.3
	2950	FDL1613	116.3
	2500	FDL1811	116.3
	1750	FDL1811	116.3
	1450	FDL1813	116.3
	1150	FDL1815	116.3
	850	FDL2012	116.3
	650	FDL2210	116.3
	500	FDL2508	116.3
75	3550	FDL1813	150.9
	2950	FDL1813	150.9
	2500	FDL1813	150.9
	1750	FDL1813	150.9
	1450	FDL1815	150.9
	1150	FDL2010	150.9
	850	FDL2212	150.9
	650	FDL2508	150.9
	500	FDL2808*	155.6
91	3550	FDL1813	184.2
	2950	FDL1813	184.2
	2500	FDL1813	184.2
	1750	FDL1815	184.2
	1450	FDL2010	184.2
	1150	FDL2210	184.2
	850	FDL2508	184.2
	650	FDL2514	184.2
	500	FDL2812*	186.7
110	3550	FDL1815	214.9
	2950	FDL1815	214.9
	2500	FDL1815	214.9
	1750	FDL2010	214.9
	1450	FDL2210	214.9
	1150	FDL2212	214.9
	850	FDL2512	214.9
	650	FDL2810*	223.6
	500	FDL2814*	223.6
149	3550	FDL2010	290.1
	2950	FDL2012	290.1
	2500	FDL2012	290.1
	1750	FDL2210	290.1
	1450	FDL2212	290.1
	1150	FDL2512	290.1
	850	FDL2810*	298.9
	650	FDL2816*	298.9

Kw	Speed Base	Frame	FLA <sup>(2)</sup>
186	3550	FDL2012	364.6
	2950	FDL2210	364.6
	2500	FDL2210	364.6
	1750	FDL2212	364.6
	1450	FDL2512	364.6
	1150	FDL2810*	369.9
	850	FDL2814*	369.9
	3550	FDL2212	435.5
	2950	FDL2212	435.5
223	2500	FDL2212	435.5
	1750	FDL2512	435.5
	1450	FDL2808*	440.6
	1150	FDL2812*	440.6
	2500	FDL2510	499.3
	1750	FDL2514	499.3
	1450	FDL2810*	510.9
	1150	FDL2816*	510.9
	2500	FDL2514	580.4
300	1750	FDL2810*	586.4
	1450	FDL2814*	586.4
	2500	FDL2810*	654
	1750	FDL2812*	654
	1450	FDL2816*	654
	2500	FDL2812*	723.1
	1750	FDL2814*	723.1
	2500	FDL2816*	860.1

(1) Standard voltages available: 230, 400, 415, 460 & 575V. Other special voltages available. For FLA sizing use the RPM AC Wizard.

(2) For estimating purpose only

• All RPM AC induction motors are optimum pole four pole designs with the exception of 280 frames which are optimum pole eight pole designs.

• For estimating purpose only

• Wide range of CHP possible. Consult RPM AC Wizard.

\* All RPM AC FDL280 frames include as standard premium VPI insulation, an insulated opposite drive end bearing, mill conduit box and PLS bearing system.

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## RPM AC modification - E2

Please visit [motorbuilder.abb.com](http://motorbuilder.abb.com) to access the RPM AC wizard selection tool and RPM AC configurator to custom design your motor.

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### Adapter rails

For adapting an RPM AC motor to match a larger shaft height and footprint of larger frame NEMA AC or DC motor. Refer to RPM AC configurator for pricing. If rail height exceeds 4 inches, use price shown times 1.5.

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### Air pressure switch

Monitors pressure differential between inside and outside of motor to actuate SPDT switch when pressure drops below preset value giving an immediate indication that the air supply to the motor is reduced. Applicable to forced ventilated motors with either motor mounted blower or separately forced ventilated by customer supplied air. Since motors dependent on force ventilation will have a rapid rise in temperature after the air supply is interrupted, the customer must take immediate corrective action when the switch trips. Required for hazardous atmosphere applications with purged enclosure TEPV (Totally Enclosed Pipe Ventilated). Contacts rated 15 amps, 120-480 volts, 60 Hz AC resistive; 1/8 Hp at 125 volts; 1/4 HP at 250 volts, 60Hz AC. The motor enclosure will always be set to TEPV (Totally Enclosed Pipe Ventilated) when application is selected as purged for hazardous location. Switches are also available in a weatherproof/explosion proof<sup>(1)</sup> option. Refer to RPM AC custom motor configurator for more details and pricing.

(1) Mounted on motor bracket at air inlet end. The addition of this modification does not provide a UL listed explosion proof motor.

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### Altitude

Altitudes up to 15,000 feet are available. Consult RPM AC configurator or RPM AC wizard for sizing and pricing.

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### Ambient temperature

Ambients up to 65°C are available. Consult RPM AC configurator or RPM AC wizard for sizing and pricing. Motor should have space heater added to prevent condensation of moisture when unenergized.

Standard motor ratings are suitable for ambient temperatures down to -25°C. For motors suitable for operation in ambients between -25°C and -40°C, refer to the RPM AC configurator for pricing. Note: Motor should have space heater added to prevent condensation of moisture when unenergized.

## RPM AC modification - E2

### Balance, dynamic

Use the following chart for machine vibration limits. For further information on dynamic balance, please refer to the 9AKK107328 for dynamic balance.

Standard balance<sup>(1)</sup> is provided on all frame sizes. Special machine vibration limits (Grade R or Grade S) are available for an additional charge. Refer to the RPM AC configurator for pricing. For further information on dynamic balance and limiting values of vibration velocity, please refer to the 9AKK107328.

#### Special machine vibration limits (NEMA standard)

Unfiltered vibration / velocity peak (inch/sec)			
Speed, RPM	Standard	Ultra standard	Precision
0-1200	0.15	0.08	0.04
1201-1800	0.15	0.08	0.04
1801-3600	0.15	0.1	0.06
3601-5000	0.2	0.12	0.06
5001-8000 <sup>(2)</sup>	0.2	0.12	0.08

#### Special machine vibration limits (IEC standard)

Unfiltered vibration / velocity peak (mm/sec RMS)			
Speed, RPM	Grade N	Grade R	Grade S
0-1200	2.7	1.4	0.7
1201-1800	2.7	1.4	0.7
1801-3600	2.7	1.8	1.1
3601-5000	3.6	2.2	1.1
5001-8000 <sup>(2)</sup>	3.6	2.2	1.4

## Bearings

### Roller bearings

Provides for roller bearings and special shaft on frames UFL180-UFL/URL440 used for belted drive<sup>(1)</sup>. Refer to the 9AKK107328 for minimum sheave diameter and center-to-center distance. Details of the drive system must accompany the order. Belted drive applications not meeting the standard minimum sheave diameters, etc., require special pricing for mounting of customer's finished bore sheave. Roller bearings will be provide with PLS system, grease fittings, and regreasable bearings. Refer to the RPM AC configurator for pricing.

Note: Not available with precision balance or custom high speed motors

(1) All FL & RL210 & 250 frames are suitable for coupled and belted duty in most application with standard oversized ball bearings. See radial load capacity in 9AKK107328.

### Insulated bearings

Provides for insulated bearing on O.D.E and or D.E. of the RPM AC motor. An O.D.E. insulated bearing is standard on all FL/ RL440 frame sizes. Both D.E. and O.D.E. insulated bearings are standard on FL5800 frame sizes. Refer to RPM AC custom motor configurator for pricing.

Insulated roller bearings are not available. Shaft ground brush option is also available on both ball bearing and roller bearing designs for all frame sizes. Refer to the RPM AC configurator for pricing.

### Precision bearings

Precision bearings are required for high speed application using phase 2, 3, and 4 constructions. See the 9AKK107328 high speed section for specific information on speed limitations and phase construction requirements. Both bearings will be ABEC 3 minimum. High speed grease and precision balance is also required when specifying precision bearings for high speed applications. This option is available on all frame sizes. Refer to the RPM AC configurator for pricing.

## RPM AC modification - E2

### Brakes and brake modifications

#### Disc type AC magnetic, electrical release, spring set

Brakes are available in ratings from 3-1000 ft.-lbs.<sup>(1)</sup> of nominal brake torque depending on type, speed<sup>(2)</sup> and enclosure. Refer to the RPM AC configurator for pricing and availability.

Opposite drive end – For best price the solenoid actuated brake AC coil<sup>(7)</sup> (230/460v 1-phase 60 Hz)<sup>(3)</sup> is normally specified in either NEMA2 IP23 standard enclosure or NEMA 4 IP54 dust-tight and waterproof enclosure. If desired, an armature actuated brake (115, 230 or 460V 1-phase)<sup>(5)</sup> can be specified in either NEMA2 IP23 standard enclosure or NEMA 4 IP54<sup>(6)</sup> dust-tight and waterproof enclosure.

An opposite drive end brake can be supplied for DPFV, TENV and TEAO-PB enclosures in all frame sizes up to FL/RL 440 and FDL/RDL 280. They can be supplied on TEFC enclosures in frame sizes up to FL/RL 250 and FDL/RDL 160. Motor mounting position, i.e., horizontal or vertical must be specified on the order. For some combinations of brake and motor, the brake may extend below the motor feet. Special motor mounting is required to provide clearance. Refer to ABB for special brakes and for brakes of special manufacturer. Manual release – standard on all Stearns brakes. Add space heater on brakes, when required. For brake space heater, see space heater modification.

Brakes & encoders – For recommended encoders with opposite drive end brake, see feedback devices.

Drive end<sup>(4)</sup> – Use when coupling a C-face motor to a C-face gear reducer. The brake is Stearns double C-face 87,700 series, Solenoid actuated brake AC coil, (230/460v 1-phase 60 Hz)<sup>(3)</sup>, mounted on the drive end. It's available in either NEMA 2 IP23 standard enclosure or NEMA 4 IP54 dust-tight and waterproof enclosure. Motor mounting positions, i.e. horizontal or vertical, must be specified on the order. Note: Drive end mounted brakes are not suitable for belted duty or any overhung load on the brake output shaft. Manual release – standard on all Stearns brakes. Add space heater on brakes, when required. For brake space heater, see space heater modification.

Class I Division II brakes – Opposite drive end brakes from 6 - 105 ft.-lb. are available. Contact ABB for pricing.

(1) Nominal static torque (ft.-lbs.) = (Hp X 5252) / (motor base speed)

(2) Maximum speed by nominal brake torque:

Ft.-lbs.	3-25	35-105	125-1000
RPM	5000	4000	1800

(3) 115 VAC coil available for additional fee.

(4) For coupled duty only.

(5) Direct acting (armature actuated) disc brakes are common on automotive applications and are available with a wide range of DC input voltages, in addition to the AC voltages shown.

(6) Internal manual release is standard on IP54 armature actuated brakes.

(7) DC coil available instead of AC, rated 115V or 230V DC. Additional fee applies.

#### Brake limit switch

Indicates condition of brake. Specify if switch is to be open or closed when brake coil is energized. Refer to the RPM AC configurator for pricing.

#### Brake provisions

Provisions for mounting a customer supplied brake can be provided on DPFV, TENV and TEAO-PB enclosures in all frame sizes up to FL/RL 440 and FDL/RDL 280. They can be supplied on TEFC enclosures in frame sizes up to FL/RL 250 and FDL/RDL 160. Refer to the RPM AC configurator for pricing.

## RPM AC modification - E2

### Brake space heater

A 115V or 230V single phase space heater for brake can be provided for an additional charge. Not available for Division II classified motors. Refer to the RPM AC configurator for pricing.

### Brake wheel

Mounting of customer's finished bore brake wheel (with a diameter of 23" or less) on motor opposite drive end shaft extension. Wheel must be finish bored, balance and keyseated for mounting on standard Baldor-Reliance opposite drive end shaft extension. A standard opposite drive end shaft must be added in addition to this modification. Price does not include brake wheel which must be received at plant eight weeks prior to motor shipment with customer tag attached. Refer to RPM AC configurator for pricing. Contact ABB for price to mount larger brake wheels.

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### Conduit box (terminal housing)

Boxes can be rotated in 90 degree increments and located in any quadrant as long as accessories are not in the same quadrant. Standard construction for frames FL180 thru FL5800 and RL210 thru RL5800 are heavy gauge mill type conduit boxes which can be mounted on either side or the top of the motor as long as not in the same quadrant as the blower.

Conduit box location may be ordered as F-1, F-2 or F-3 (top) as long as there is no accessory or blower mounted in same location. There is no additional charge for any of these positions on custom configured RPM AC motors.

F-3 is not available on FL180 frames. Totally Enclosed (TENV, TEAO-BC, or TEFC) FL210 through FL440 Frames come standard with top-mounted conduit box. FL5800 frames come standard with F1 conduit boxes. Drip Proof Force Ventilated (DPFV) frames come standard with F-1 Mounted conduit box. Contact ABB sales support for drive end mounted conduit box.

In addition to location, the following options can be provided for conduit boxes at additional charge. Refer to the RPM AC configurator for pricing and availability by frame size.

One size larger C/B, Cast Iron C/B, Mill type C/, Oversize mill type C/B and Explosion proof C/B<sup>(1)</sup>.

- (1) Add to pipe-in, pipe-out separately ventilated motor. This modification is required to provide a motor in a Class I Group D, Div. I environment. Maximum size box is limited to 500 amps. All accessories must be listed and labeled for same Class 1 Group as the motor.

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### Couplings

Customer supplied coupling<sup>(1)</sup> can be mounted on a DPFV, TENV or TEBC custom configured RPM AC motor for an additional charge. Refer to the RPM AC configurator for pricing.

- (1) Finished bore coupling must be received at plant five weeks prior to shipment with customer property tag attached. Coupling to be mounted to motor shaft.

Insulated encoder couplings<sup>(1)</sup> can be supplied for an additional charge. Refer to the RPM AC configurator for pricing.

- (1) Provides protection from motor bearing currents reflected onto the encoder.

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### Covers – splash proof guarded (SPG) louvres

Allows for drip proof machines to meet NEMA MG1 - 1.25.2 requirements for splash proof enclosures. Provides protection against liquid drops or solid particles from entering the motor at any angle not greater than 100 degrees downward from the vertical. Available on RL210/RDL132 thru RL440/RDL280 and RL5800. Refer to the RPM AC configurator for pricing.

## RPM AC modification - E2

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### Documentation

When requested on the order, a certified dimension sheet and typical performance data will be furnished at no charge. Additional documentation including certified routine test report, certificate of compliance, custom 2D scaled dimension model<sup>(1)</sup>, or 3D solid model are available for an additional charge. Refer to the RPM AC configurator for pricing.

(1) Scaled drawings available for most stock model numbers at no charge.

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### Drain plugs

Drain plugs, in the form of a corrosion-resistant "T" drain, can be provided at the lowest point of the motor for an additional fee. Refer to the RPM AC configurator for pricing.

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### Enclosure modifications / enhancements

#### Separately ventilated (IC17 - IC37)

For applications where ventilated air is piped into the machine from an external source, basic DPFV enclosures may be separately ventilated at 3, 6, 9 and 12 o'clock for the below list price deductions, (FL180 ventilated at 12 o'clock only, exit atmosphere). The inlet pipe can be fastened to one end bracket, and, if required and specified, an outlet pipe can be fastened to the other end bracket. Price does not include blower or pipe. Locations of air entry and air exhaust, if used, should be specified on order. Motors must not be operated without the separate air supply. Available on FL180/FDL112 through FL&RL440/FDL&RDL320 frames and RL5800. Refer to 9AKK107328 for separate ventilating air requirements. (To insure adequate protection of a separately ventilated motor against loss of cooling air, an over temperature device for interlocking with the controller overload protection circuit is recommended and should be added as standard practice. An air pressure differential switch is also recommended.) **This modification will result in a pricing deduction.** Refer to the RPM AC configurator for pricing.

#### TEAO piggyback

For totally enclosed machines where blower motor must be on top or side of base motor housing, Available on FL180/FDL112 through FL&RL440/FDL&RDL320 and FL5800 frame TEAO inline motors. This includes top- or side-mounted blower and shroud for direct cooling air over base motor frame as well as 3-phase blower motor. Refer to the RPM AC configurator for pricing.

## RPM AC modification - E2

### XT features

The Baldor-Reliance XT features are designed for operation in damp locations where the motor will be subjected to corrosive conditions. Typical applications are paper, chemical, petroleum, fertilizer and plastics industries. XT construction and features are shown below. Available on FL180/FDL112 through FL&RL440/FDL&RDL320 and FL5800 frames. The FL180 with XT features will be nameplated IP54, since frame is aluminum. Refer to the RPM AC configurator for pricing.

Features (FL/RL210 - FL440 frames):

- IP54
- TENV, TEFC, TEAO. TEAO-BC will use an XT blower motor with longer blower housing than TEAO-BC standard
- Interior and exterior surface of frame painted with epoxy enamel
- Shaft (in-board of bearing caps) painted with epoxy
- Stainless steel or neoprene slinger mounted on external shaft extensions
- External fan on TEFC motors is plastic or epoxy coated cast iron
- Fan cover on TEFC motors is finished with epoxy enamel
- Corrosion resistant T-drains provided for positive drain
- Assembled motor with mounted accessories painted with epoxy enamel
- Conduit box has pipe tap lead outlet. Neoprene gaskets on cover and box frame
- Box construction is epoxy coated cast iron (Heavy duty epoxy coated mill type on FL400 & FL440 is standard)
- Bracket to frame rabbet fit sealed with special sealing compound
- All hardware is corrosion resistant
- Stainless steel nameplate
- All external bolts are sealed
- Unused lifting eye bolt sealed

#### Note:

- Motor accessories such as brakes must be specified and priced as totally enclosed construction for XT motors.
- Motors located in damp, moist environments must have space heaters to protect against condensation when the motor is not operating
- Motors operating in dirty areas with fine abrasive dirt such as taconite surrounding the motor should have dust-proof / taconite features that are added in addition to this modification



## RPM AC modification - E2

### Paper mill duty

The Baldor-Reliance paper mill duty motor is designed for operation at the wet end of a paper mill and in other harsh environments. This modification can be provided on separately-ventilated or totally enclosed motors in frames FL&RL210/FDL&RDL132 and up. For drip proof force ventilated motors in harsh environments, VPI insulation system is recommended in addition to this modification. Paper mill duty motor construction and features are listed below. Refer to the RPM AC configurator for pricing.

#### Features (FL210 - FL440):

- Interior and exterior surface of frame painted with epoxy enamel
- Shaft (in-board bearing caps) painted with epoxy enamel
- Stainless steel or neoprene slinger mounted on external shaft extensions
- External fan on TEFC motors is plastic or epoxy coated cast iron
- Fan cover on TEFC motors is finished with epoxy enamel
- Automatic breather drains provided for positive drain
- Assembled motor with mounted accessories painted with epoxy enamel
- Conduit box has neoprene gaskets on cover and box frame.
- Box construction is epoxy coated cast iron with pipe tap lead outlet (Epoxy Coated Mill type on FL400) and FL440 is standard
- Bracket to frame rabbet fit sealed with special sealing compound.
- All hardware corrosion resistant
- Stainless steel nameplate.
- All external bolts sealed
- Unused lifting eye bolts sealed
- Paper mill duty construction avoids the use of exposed aluminum parts
- Motor accessories such as brakes must be specified and priced as totally enclosed construction for paper mill duty motors
- Motors located in moist environments must have space heaters
- Splash proof covers should be added to drip-proof motors
- Totally enclosed motors operating in dirty areas with fine abrasive dust such as taconite surrounding the motor should have dust-proof/taconite features are in addition to this modification

### Outdoor duty / weather proof

The outdoor duty motor is suitable for operation outdoors subject to direct weather conditions. Outdoor duty motors include space heaters to protect against condensation when the motor is not operating. Motor accessories such as brakes must be specified and priced as suitable for outdoor use. Standard encoders are not recommended for outdoor duty. Motors operating in dirty areas with fine abrasive dust, such as taconite, surrounding the motor should have dustproof / Taconite features added in addition to this modification. Available on FL180/FDL112<sup>(1)</sup> to FL5800 frames and RL210/RDL130 to RL5800 frames. See below for outdoor duty/weather proof features. Refer to the RPM AC configurator for pricing.

- All features of XT features (IP54) for Totally Enclosed only
- Extended hoods over the fan inlets – minimizes water from being blown over the frame.
- Space heaters
- Shaft slinger

(1) Finned aluminum frame

## RPM AC modification - E2

### Washdown duty (IP56)

Includes all the features of outdoor duty / weather proof with the addition of lip seals on all exposed shaft extensions. Space heaters are included. Available on FL180/FDL112<sup>(1)</sup> to FL5800 frames and RL210/RDL130 to RL5800 frames. See below for feature details. Refer to the RPM AC configurator for pricing.

- IP55 is only available as Totally Enclosed motors (TENV, TEFC, TEAO, etc).
- All features shown for "outdoor duty / weather proof" are included
- Lip seal mounted on exposed external shaft extensions

(1) Finned aluminum frame

#### For FL/RL210 - FL/RL440 frames

Enclosure	TENV & TEFC	TEBC/TEAO-P/B	DPFV
IP55/washdown	Yes	Yes	No
Outdoor/weatherproof	No	No	Yes
100% epoxy insul.	Yes	Yes	Yes
VPI insulation	No	No	Yes
Lockwashers & Loctite on all external fasteners	Yes	Yes	Yes
Lip seals on exposed external shaft extensions	Yes	Yes	Yes
Internal lip seals (to protect bearings from water entry)	No	No	Yes
Space heaters	Yes	Yes	Yes
Extended hoods over blower inlets/outlets	N/A	Yes	Yes
High vibration blower	N/A	Yes	Yes
XT paint inside & out with extra corrosion protection on exposed machined fits	Yes	Yes	Yes
Corrosion resistant T-drains	Yes	Yes	No

### Crane & hoist duty

The Baldor-Reliance indoor/outdoor crane & hoist duty motor provides severe duty features for crane duty motors such as hoist, gantry and trolley motors. Totally enclosed motors are recommended for severe duty motors exposed directly to rain water or contentiously wet environments. Two options are available, totally enclosed with IP56 rating or DPFV with IP23 rating and VPI<sup>(1)</sup>. Refer to the RPM AC configurator for pricing. Crane & hoist duty motor construction and features can be seen below. Provides capability to 3 G's shock. Contact ABB sales support for higher shock values.

(1) VPI is standard on all FL440/FL5800 frames

### IP55

Use XT adder. Refer to the RPM AC configurator for pricing.

### IP56

Use washdown duty adder. Refer to the RPM AC configurator for pricing.

## **RPM AC modification - E2**

### **Class I Division II certification**

RPM AC Motors are available certified by CSA for installation in areas classified by the NEC as Class I Division II Groups A, B C or D.

As defined by the NEC, a Division II area represents an environment which is not normally hazardous but, under accidental or in unusual operating conditions, can become explosive. The frame size will be selected based on the considerations of meeting total temperature (motor temperature rise plus the motor ambient) internally and externally that are required to meet the NEC temperature code for the classified Division II area. This may require overframing of TENV, TEBC, and DPFV motors, and a reduction in Hp and/or reduced constant torque speed range on TEFC motors with shaft driven fans.

Note: It is the user responsibility to select the proper motor enclosure and to supply the correct NEC temperature code, Class, Group and Division. Motor frame selection can only be determined after we receive the user supplied NEC temperature code. The minimum T-code available for Class I Division II is T3A and maximum Hp available will depend on the T-code and motor enclosure selected. All accessories such as space heaters, encoders, and brakes must be selected to meet the class, group, and temperature code and division 2 requirements. This will limit the availability of some accessories.

Motors will be production motors so that the proper thermostat opening temperature can be installed to comply with the NEC T-code specified.

### **Pricing**

Consult RPM AC configurator or RPM AC wizard for frame selection specific to your application.

### **Encoders**

If an encoder is required, select an explosion proof encoder from the modification section.

### **Space heater**

If required, select the Division II space heater from mod section. Brake space heaters are not available.

### **Thermostats**

Will be selected based on the NEC temperature code required. No price addition.

### **Hollow shaft encoders**

Mounts on motor stub shaft with no coupling required. A tether-arm (Torque-Arm) mounts to the motor bracket and provides insulation from shaft currents. Standard output is two channels, quadrature. Refer to the RPM AC custom motor configurator for pricing. Price includes mounting.

### **Brake with encoder**

All encoders listed may be mounted outboard of brake. Price shown for encoder includes mounting on the brake. Brake is not included. Refer to the RPM AC custom motor configurator for brake pricing.

### **Pickle duty**

The Baldor-Reliance pickle line duty motor is designed to be resistant to pickling acid environments in the steel industry. This modification can be provided on drip proof forced-ventilated, separately-ventilated or totally enclosed motors. Pickle duty motor construction and features can be seen in the application section for pickle duty feature modification. Note: Frame size may increase on DPFV motors. Confirm frame size prior to quotation. Refer to the RPM AC configurator for pricing based on frame size and enclosure.

## RPM AC modification - E2

### High vibration / press duty

The RPM AC press duty motor is suitable for applications in which the motor is exposed to higher than normal mechanical stress and high vibration. This modification increases motor mechanical endurance for applications such as an automotive stamping press line. Press duty motor construction and features can be seen in the 9AKK107328. Requires engineering approval for greater than 3G's. Refer to the RPM AC configurator for pricing. <sup>(1)(2)(3)(4)</sup>

- (1) If belted duty required, add 5% of basic motor list price for higher tensile strength shaft (Class II shaft material) and add for roller bearing.
- (2) If an opposite drive end brake is required, it must be the direct acting type of brake.
- (3) If feedback device is required, contact marketing for recommended selection.
- (4) All 440-5800 frame RPM AC motors come standard with a single treatment of VPI insulation system.

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### End shields

NEMA C-face, D-flange or IEC DIN flange bracket with standard dimensions and feet. Special seals required when oil will be around the shaft. C-face available on frames FL180C thru FL/RL360C only. D-Flange or IEC B3/B5 flange only available up to RL&FL440/RDL&FDL280. Note: Since RPM AC motors are designed for maximum horsepower per frame size, it is important to state the specific NEMA C-face, D-flange or IEC DIN flange and shaft diameter required for mounting. Refer to the RPM AC configurator for pricing.

Important: Motor C-face is intended for mounting auxiliary equipment such as pumps, gears, etc. When mounted horizontally, frames FL280C thru FL360C & FL400D thru FL440D must be supported by the feet and not by the C-face or D-flange alone.

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### Feedback devices - encoders

#### Standard encoder mounting provisions

RPM AC Drip-Proof Force Ventilated (DPFV), Totally Enclosed Non-Ventilated (TENV) and Totally Enclosed Blower Cooled (TEBC) motors all come with standard encoder mounting provisions which include a machined O.D.E. bracket and hole drilled & tapped for stub shaft. All FL and RL frame prefix have 180T C-face as standard on O.D.E. bracket. See Page M-181 for accessory fits on all frames. RPM AC Totally Enclosed Fan Cooled (TEFC) motors come with standard encoder mounting provisions that includes only a hole drilled & tapped for stub shaft for mounting of hollow shaft encoder. Note: If a machined O.D.E. bracket is needed on a TEFC RPM AC motor, for a coupled or modular encoder, please see "provisions for mounting only" for proper price adder.

#### Hollow shaft encoders

Mounts on motor stub shaft with no coupling required. A tether-arm (Torque-Arm) mounts to the motor bracket and provides insulation from shaft currents. Standard output is two channels, quadrature. Refer to the RPM AC configurator for pricing. Price includes mounting.

## RPM AC modification - E2

### Brake with encoder

All encoders listed may be mounted outboard of brake. Price shown for encoder includes mounting on the brake. Brake is not included. Refer to the RPM AC configurator for brake pricing.

Encoder	PPR (specify)	Power VDC	Max operating temp.	Max operating speed (RPM)	Output <sup>(4)</sup>
Dynapar HS-20 <sup>(2)</sup>	Up to 2540	5-26v	70°C	6000 RPM	Single output
BEI HS35 <sup>(2)</sup>	Up to 5000	5-15v	70°C	6000 RPM	Single output
Dynapar HS-35R <sup>(2)</sup>	Up to 2500	5-26v	70°C	6000 RPM	Single output Dual output
Avtron HS-35M	1024, 2048, 4096	5-24v	85°C	4700 RPM	Single output
Lakeshore HSD35	Up to 2500	5-26v	70°C	6000 RPM	Single output
Avtron HS45	Up to 5000	5-26v	100°C	5000 RPM	Single output Dual output
Lakeshore HS-56	Up to 2048	5-15v	80°C	3600 RPM	Single output Dual output
Avtron HS-M4	Up to 1200	5-18v	85°C	5000 RPM	Single output Dual output
Avtron M685	Up to 2048	5-18v	70°C	5400 RPM	Single output Dual output

#### Dynapar HS-20

A photoelectric encoder. Enclosure meets IP65. Comes standard with a 10 pin mating MS connector.

#### BEI HS35

A photoelectric encoder suitable for applications involving robotics, oil service & web process control. Enclosure meets IP65. Comes standard with a 10 pin mating MS connector. Div. 2 available.

#### Dynapar HS-35R

A photoelectric encoder. Enclosure meets IP66. Comes standard with a 10 pin mating MS connector.

#### Avtron HS35M

A magnetoresistive, single output. Two channel quadrature (A and B) with complementary outputs with marker pulse (Z). Enclosure meets IP65; includes extra seals for longer life. Available with 10 pin MS connector with mating connector or epic industrial plug connector. Div 2/Zone 2 available.

#### Lakeshore HSD35

The HSD35 replaces the HS35M. It is an optical encoder suitable for applications involving grease, oil, water or dirt. Enclosure meets IP65. Comes standard with a 10 pin epic style industrial connector.

#### Avtron HS45 replaces HS-M3

A photoelectric encoder suitable for mill duty applications. Enclosure is sealed against dust & water ingress. Comes standard with a 10 pin industrial connector. Div. 2 / Zone 2 available.

#### Lakeshore HS-56

A magnetoresistive encoder suitable for applications involving grease, salt water, dust or other common contaminants. Enclosure is chemical resistant to salt spray, most solvents, mild acids & bases. Comes standard with a 10 pin epic style industrial connector.

#### Avtron HS-M4

A magnetoresistive encoder suitable for heavy mill duty applications. Enclosure is liquid & dust tight, and a stainless steel breather drain is supplied. Comes standard with a 10 pin industrial connector.

#### Avtron M685

A magnetoresistive encoder for severe duty applications. Div II/Zone 2 available.

(1) Encoder output voltage will be equal to the input voltage, unless specified otherwise.

(2) Suitable for 10,000 RPM for PPR not exceeding 1024.

(3) Disc resolutions of up to 72,000 are available.

(4) Requires piggyback blower for TEBC enclosure.

\* High speed capable

## RPM AC modification - E2

### Coupled encoders

Mounts to motor with the use of a stub shaft, flexible shaft coupling & flange adapter (flower pot). Standard output is two channels, quadrature. Refer to the RPM AC configurator for pricing. Price includes mounting and will vary based on enclosure type.

### Brake with encoder

All encoders listed may be mounted outboard of brake. Price shown for encoder includes mounting on the brake. Brake is not included. Refer to the RPM AC configurator for brake pricing.

Encoder	PPR (specify)	Power VDC	Max operating temp.	Max operating speed (RPM)	Output <sup>(4)</sup>
* Dynapar H20	1024 / 2048	5-15v	85°C	10,000 / 5000 <sup>(2)</sup>	Single output
* BEI H25	1 to 5000 <sup>(3)</sup>	5-15v or 5-28v	70°C	30,000	Single output
Avtron HS45	1024 / 2048	5-26v	100°C	5000	Single output <sup>(4)</sup> Dual output <sup>(4)</sup>
Dynapar H56	1024 / 2048	5-26v	80°C	3600	Single output <sup>(4)</sup> Dual output <sup>(4)</sup>
Avtron M4	1024 / 2048	5-18v	85°C	5000	Single output <sup>(4)</sup> Dual output <sup>(4)</sup>
Avtron AV485	512 / 1024	12-15v	70°C	3600	Single output <sup>(4)</sup> Dual output <sup>(4)</sup>

#### Dynapar H20

A photoelectric encoder suitable for industrial motion applications. Enclosure meets IP66. All Dynapar encoders are CE labeled. Div. 2 available.

#### Avtron HS-45 replaces M3

A photoelectric encoder suitable for mill duty applications. Enclosure is sealed against dust & water ingress. Comes standard with a 10 pin industrial connector. Div 2/Zone 2 available.

#### Dynapar H56

A direct replacement for the RD62 for mill duty applications. The H56 is a photoelectric encoder suitable severe duty applications. Enclosure meets IP66. All Dynapar encoders are CE labeled.

#### Avtron M4

A magnetoresistive encoder suitable for heavy mill duty applications. Enclosure is liquid and dust tight. A stainless steel breather drain is supplied. Comes standard with a 10 pin industrial connector.

#### Avtron AV485

A magnetoresistive encoder suitable for severe duty applications. Enclosure is sealed against dust & water ingress. Comes standard with a 10 pin industrial connector. Div 2/Zone 2 available.

(1) Encoder output voltage will be equal to the input voltage, unless specified otherwise.

(2) Suitable for 10,000 RPM for PPR not exceeding 1024.

(3) Disc resolutions of up to 72,000 are available.

(4) Requires piggyback blower for TEBC enclosure

\* High speed capable

### Bearingless encoders

Mounts directly to the motor end bracket without bearings or couplings. The pulse wheel of this type of encoder mounts directly to the motor stub shaft, which is then encased by the bracket of the encoder. Refer to the RPM AC configurator for pricing. Price includes mounting and will vary based on enclosure type.

## RPM AC modification - E2

### Brake with encoder

The NorthStar SL85, RIM8500 and Avtron M85 and AV850 can be sandwiched between the motor and Stearns 87,000 brakes up to 105 ft.-lbs.; all include 8.5 inch C-face. The RIM1250 can be sandwiched between the motor and larger Stearns brakes up to 550 ft.-lbs. It mounts with a 12.5 inch C-face. Price includes mounting. Brake is not included. Refer to the RPM AC configurator for brake pricing.

Encoder	PPR (specify)	Power VDC <sup>(1)</sup>	Max oper. temp.	Max oper. speed RPM	Output <sup>(2)</sup>
Avtron AV85	Up to 2048	5-24v	100°C	5000	Single output Dual output
NorthStar/Lakeshore Slim Line ST85	Up to 2048	5-15v	90°C	5000	Single output Dual output
Avtron AV850	512 / 1024	12-15v	80°C	3600	Single output Dual output
NorthStar/Lakeshore RIM8500	512 / 1024	5-15v	80°C	7000	Single output Dual output
NorthStar/Lakeshore RIM1250	1024 / 2048	5-15v	80°C	7000	Single output Dual output

#### Avtron AV85

A magnetoresistive encoder for heavy mill duty with larger air gap for easier mounting and alignment and 10 pin epic connector or MS twist lock. Enhanced encoder to M85.

#### NorthStar/Lakeshore Slim Line ST85

A magnetoresistive encoder suitable for mill duty applications. Enclosure allows for heavy machine vibration and accidental impacts. The SL85 adds only 1.25" to overall motor length. Comes standard with 10 pin epic style industrial connector. Replaces SL85.

#### Avtron AV850

A magnetoresistive encoder suitable for heavy mill duty applications. Enclosure is made of a heavy duty cast housing. Comes standard with 10 pin epic style industrial connector. Replaces M285. M285 is no longer available.

#### NorthStar/Lakeshore RIM8500

A magnetoresistive encoder suitable for rugged mill duty applications. Enclosure is made of ductile cast iron. Comes standard with 10 pin epic style industrial connector.

#### NorthStar/Lakeshore RIM1250

A magnetoresistive encoder suitable for rugged mill duty applications. Enclosure is made of ductile cast iron. Comes standard with 10 pin epic style industrial connector.

(1) Encoder output voltage will be equal to the input voltage, unless specified otherwise.

(2) Requires piggyback blower for TEBC enclosure

### Explosion-proof encoders

A coupled encoder approved for National Electric Code (NEC) Class I & II, Divisions I & II, Groups C, D, E, F & G as UL listed, explosion proof. Refer to the RPM AC configurator for pricing. Price includes mounting and will vary based on enclosure type.

Encoder	PPR (specify)	Power VDC <sup>(1)</sup>	Max oper. temp.	Max oper. speed RPM	Output
Dynapar X25	512 / 5000 max	5-26v	70°C	5000	Single output <sup>(2)(3)</sup>

#### Dynapar X25

A photoelectric encoder suitable for explosion proof applications & environments. Enclosure meets IP56. Comes standard with terminal strip located inside encoder housing.

(1) Encoder output voltage will be equal to the input voltage, unless specified otherwise.

(2) Requires piggyback blower for TEBC enclosure.

(3) Cannot be used with opposite drive end brake.

## RPM AC modification - E2

### Special encoder mounting

Mounting of customer supplied encoder. Includes all mounting hardware and mounting.

Note: May require TEAO-piggyback blower on TEAO – in-line blower cooled designs. Contact ABB for assistance. Refer to the RPM AC configurator for pricing.

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### Provisions for mounting only

**Applicable to TENV, TEAO-piggyback, DPFV and DPSV enclosures and TEBC for those encoders that fit with in-line blower.** See previous encoder page. Requires specific brand and part number with order entry. There are 4 levels of provisions available as shown below. Refer to the RPM AC configurator for pricing.

- Level 1: Machined motor bracket and counter bore of opposite drive end shaft only.
- Level 2: Machined motor bracket and stub shaft with protective cover over stub shaft.
- Level 3: Machined motor bracket, adapter, and stub shaft for mounting encoders.
- Level 4: Machined motor bracket, adapter, stub shaft and coupling for mounting of encoders.

### Provisions only

**Applicable to TEFC enclosures in FL180 - FL250.** Requires specific brand and part number with order entry. There are 3 levels of provisions available as shown below. Refer to the RPM AC configurator for pricing.

Level 1: Counter bore of opposite drive end shaft.

Level 2: Stub shaft with protective cover over stub shaft. Use for hollow shaft encoder provisions.

Level 3: Adapter, stub shaft and coupling for future mounting of coupled 56 feedback device.



## RPM AC modification - E2

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### Resolvers

A resolver is a shaft angle sensing transducer. Interfacing with an input module, the resolver provides position and velocity feedback information to the control system. Resolvers are provided in industrial duty and heavy duty industrial enclosures and can be face or foot mounted. Heavy duty resolvers with double shaft extensions can be supplied when a second feedback device such as an overspeed switch is required to be mounted in line.

**(Induction)** As shown below, there are 6 resolver mounting options based on speed and enclosure. Refer to the RPM AC configurator for pricing. The price includes mounting of the resolver to the motor.

- Resolver 800123-2R, used with 1750 RPM motors (TS2014N). Avail. TEBC in-line FL210-FL400 flange mtg. (AJ=2.913)
- Resolver 800123-2S, used with motor with top speeds of 1150 RPM and less. Avail. TEBC in-line L210-L400 flange mtg. (AJ=2.913)
- Resolver 800123-2T, sometimes used with motors with top speeds of 500 RPM and less. Avail. TEBC in-line FL210-FL400 flange mtg. (AF=2.913)
- Resolver 800123-R, used with 1750 RPM motors. Foot and 56 C-face mounting. Requires piggyback blower for TEAO-BC designs.
- Resolver 800123-S, used with motor with top speeds of 1150 RPM and less. Requires piggyback blower for TEAO-BC designs.
- Resolver 800123-T, sometimes used with motors with top speeds of 500 RPM and less. Requires piggyback blower for TEAO-BC designs.

Resolver part no. 800123	2R	2S	2T	R	S	T
1X (360O electrical = 360O mechanical)	-	-	-	X	-	-
2X (360O electrical = 180O mechanical)	X	X	-	-	X	-
5X (360O electrical = 72O mechanical)	-	-	X	-	-	X
Flange mount	-	X	X	-	-	-
Foot mount & C-face	X	-	-	X	X	X
Single shaft	-	X	X	X	X	X
Double shaft	X	-	-	-	-	-
General industrial duty	-	X	X	-	-	-
Heavy industrial duty	X	-	-	X	X	X
Use with flange type mounting adapter	-	X	X	X	X	X
Use with scoop mount	X	-	-	-	-	-

**(Permanent Magnet)** There is one standard resolver used on permanent magnet RPM AC designs; it utilizes a 12-pin screw type connector. Refer to the RPM AC custom motor configurator for pricing. The price includes mounting of the resolver to the motor.

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### Filters

Filter addition for DPFV motor with motor mounted blower. Disposable filters are recommended when filterable contaminants are present. Three types of filters are available: disposable, washable canister<sup>(1)</sup> and washable polyester<sup>(1)</sup>. Refer to the RPM AC configurator for pricing.

Totally enclosed construction rather than blower motor with filter (DPFV) is recommended for extremely dusty, dirty environments.

(1) Not available on FL&RL440/FDL&RDL280.

## RPM AC modification - E2

### Grounding

A shaft grounding brush can be added to all frame sizes to protect motor bearings from failure caused by circulating shaft currents. Refer to the RPM AC configurator for pricing.

### High speed capability

For high speed motor applications refer to the high speed tables in the 9AKK107328 RPM AC application guide to obtain the proper high speed phase construction required based upon motor type (induction or IPM), enclosure and frame size.

The RPM AC configurator will select these features and corresponding list prices based upon the maximum speed selection. Note, for Phase 2 construction and higher a keyless shaft or double key (180 degrees apart) is recommended. Use the keyless shaft modification adder. This adder will NOT be automatically selected in the RPM AC configurator as it is subject to customer discretion.

The table below is the maximum allowable speed by frame size. Operation above these speeds even for intermittent or short periods of time is not permitted as it may ultimately lead to catastrophic motor failure over time. However, operation at maximum speeds in compliance with the phase construction speed charts are suitable for continuous operation at these speeds. The precision balance, precision bearings, high speed grease and shaft adders are published in the appropriate modification sections. Refer to the RPM AC configurator for pricing.

Frame	Maximum speed with phase 4 construction features - induction	PM
FL180	12000 RPM	7600 RPM
FL & RL210	8900 RPM	6200 RPM
FL & RL250	8000 RPM	4800 RPM
FL & RL280	6800 RPM	4800 RPM
FL & RL320 <sup>(1)</sup>	5800 RPM	4200 RPM
FL & RL360 <sup>(1)</sup>	5000 RPM	3700 RPM
FL & RL400	3700-4000 RPM <sup>(2)</sup>	3800-4400 RPM <sup>(2)</sup>
FL & RL440	3800 RPM	3100-3800 RPM <sup>(2)</sup>
FL5800 (phase 0 only) <sup>(3)</sup>	2100 RPM	1800 RPM
RL5000	2600 RPM <sup>(1)</sup>	N/A
RL5800	2600 RPM	N/A

(1) RL frames not available in PM

(2) Depends on core length

(3) Max speed for FL5800 TEBC is 1200 RPM

### High speed summary table - listing of all high speed features by phase.

Refer to the RPM AC configurator for pricing by frame size.

Phase 0	Standard
Phase 1	Precision balance
	Precision balance
Phase 2	Precision bearings
	High speed grease
	Precision balance
Phase 3	Precision bearings
	High speed grease
	Phase 3 rotor
	Precision balance
	Precision bearings
Phase 4	High speed grease
	Phase 3 rotor
	Phase 4 rotating assembly

## RPM AC modification - E2

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### Insulation system

The standard insulation system is a full NEMA Class H insulation system, rated at 180°C with a heavy epoxy varnish. All RPM AC motors utilize an advanced insulation system that provides excellent protection against fungus and high humidity as found in tropical climates. The standard motor is suitable for operation in tropical climates without additional treatment. A single treatment of tropical protection<sup>(1)</sup>, Vacuum Pressure Impregnation (VPI)<sup>(2)</sup>, or VPI suitable for IEEE429 without test is available for an additional fee. Refer to RPM AC configurator for pricing.

- (1) For additional protection, especially during shipment and prolonged storage, this modification provides a fungicidal air dry varnish treatment per MIL-V-173C (type I treatment). Applied over all motor windings. Note: motors applied in highly corrosive, moist and dirt-laden environments should have an enclosure with XT features to limit the entrance of contaminants into the motor.
- (2) All 440-5800 frame RPM AC motors come standard with a single treatment of VPI insulation system.

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### Leads

The standard lead length is 6" for NEMA motors without terminal blocks. Leads longer than standard 6" are available on single voltage motors only up to a maximum length of 96" (8 feet). Refer to RPM AC configurator for pricing.

### Lead lugs

"YA" crimp type (compression lugs) or Burndy Hylug lugs are available on RPM AC motors. Refer to RPM AC configurator for pricing.

### Terminal block / strips for NEMA frame motors

Insulated terminal blocks / strips may be provided for 3 lead single voltage motors. These terminal blocks / strips are designed to accept single hole lugs from the customer. (Terminal blocks / strips are included as standard in all IEC frame motors for main power leads and thermostats). FL180 terminal block accepts non-lugged leads. Main terminal blocks<sup>(1)(2)</sup> and Accessory terminal blocks are available. Refer to RPM AC configurator for pricing.

- (1) Provides terminal block in main conduit box for connection of RPM AC motor power leads, instead of the standard leads. Thermostat leads will be connected to an auxiliary terminal block.
- (2) Conduit box dimensions will change on FL/RL 440 and FDL/RDL 280 and above. See conduit box dimension sheet shown in dimension sheet index for details.

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### Lubrication

#### Grease

Ball bearings are standard on RPM AC motors and are lubricated with Exxon Polyrex grease. FL280 and up RPM AC motors have ABB's exclusive "PLS" system. FL180 - FL250 Frame RPM AC motors come standard with "lubed-for-life" bearing system. Alternative greases are available. Options include: High Temp Dow 44, Food Grade (USDA) Chevron FM CSC EP2, Mobilith SHC 100, Low Temp Aero Shell #7, High Speed Kluber as well as others. Refer to RPM AC configurator for pricing.

#### Fittings

Alemite fittings are provided as standard on FL280 and up frames.

#### Automatic grease relief fittings

Two automatic relief fittings can be furnished if desired. Keystone at grease entry is standard. Refer to RPM AC configurator for pricing.

## RPM AC modification - E2

### Extended grease drains

Refer to RPM AC configurator for pricing.

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### Nameplates

Refer to RPM AC configurator for pricing of auxiliary nameplates<sup>(1)</sup> or special marks on main nameplate<sup>(2)</sup>.

(1) Aux N/P required if more than 24 characters are required.

(2) Every attempt will be made to add mark to the main N/P up to 24 characters. If any aux plate is required it is supplied at a charge.

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### Noise silencer

Optional addition to DPFV or TEAO-PB for 5-7% dbA noise reduction from published levels. Further information on noise silencers can be found in the 9AKK107328. Available on all RPMAC DPFV or TEAO-BC Motors except FL180. Refer to RPM AC configurator for pricing.

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### Packaging

Provides crating of motor for overseas shipping. (Does not provide for any overseas fees, documentation, etc.). Standard pallet is no charge. Open slat (hog) crates<sup>(1)</sup> or enclosed crates<sup>(2)</sup> are available for an additional charge. Refer to RPM AC configurator for pricing.

(1) Provides additional protection for air and land shipment.

(2) Provides enhanced protection and required for ocean shipment.

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### Paint

#### Special paint finish

Special color or type of paint compatible with our standard air dry primer. Standard finish is Med. Gray Charcoal Metallic (Munsell color system 8.45BG 3.14/0.05) high-grade modified epoxy, air dry enamel with non-toxic rust inhibitor. Optionally available paint types include: Special Colors-International (C2); Special Colors-Custom (C2); Two coat epoxy (C3); Extreme (C5-N). Refer to RPM AC configurator for pricing. Other paint options may be available. Consult ABB.

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### Service factor

Greater than 1.0 service factors are available. Consult RPM AC configurator or RPM AC Wizard for sizing and pricing.

## RPM AC modification - E2

### Shaft seals

Seals can be added to RPM AC motors of all frame sizes. Options include lip seals<sup>(1)</sup>, Inpro seals<sup>(2)</sup> in a horizontal or vertical mounting configuration, taconite/dust proof<sup>(3)</sup>, and slinger V-ring. Refer to RPM AC configurator for pricing. Pricing is per bearing.

- (1) This modification provides a lip seal on the drive end to protect the bearing when operated with oil splashing against the shaft. Typical application is on a horizontal motor mounted to a gear case where the stationary oil level is below the motor shaft. CAUTION: Seals operated dry for extended periods will be damaged.
- (2) This bearing isolator is a non-contact bronze compound - labyrinth seal suitable in washdown and high dust atmospheres.
- (3) For totally enclosed machines only for protection against fine, abrasive dust such as taconite. Provides non-magnetic labyrinth-path seal on all exposed shafts.

### Shaft modifications

The shafts of RPM AC motors in all frame sizes can be modified to meet customer needs. Modifications available include: shaft guarding<sup>(1)</sup>; double shaft extension<sup>(2)</sup>; special shaft (DE or ODE)<sup>(3)(4)</sup>; shaft taper<sup>(5)</sup>; shaft threads<sup>(6)</sup>; keyless shaft; and Class I or Class II stainless shaft<sup>(7)</sup>. Refer to RPM AC configurator for pricing.

- (1) Provides a protective cover over front end shaft extensions. WARNING: To prevent injury, shaft guard must be specified or supplied by customer for exposed shaft extensions. Failure to observe this precaution could result in bodily injury.
- (2) Provides opposite drive end extension having standard shaft dimensions per the standard dimension sheets.
- (3) Non-standard shaft having dimensions less than standard diameter or larger than standard with the maximum diameter as listed in table below for special shaft diameters.
- (4) Non-standard length for either drive end or opposite drive end shaft (use twice modification price for non-standard length on both ends). Maximum length limited to two times standard length. CAUTION: Belted drives using smaller than standard diameter shaft and/or longer than standard shafts must be referred to sales support with complete belt data for analysis.
- (5) Provides standard NEMA AC shaft tapered 1-1/4 inches per foot. May be added for either drive end or opposite drive end shaft extension. Includes threads, washer and locknut. Specify "U" or "FU" required.
- (6) Class 2A right hand thread of size compatible with shaft diameter.
- (7) Class I shaft material - AISI 1040 Class II shaft material - AISI 4150

### Maximum allowable shaft diameters

Frame (IEC)	Encl <sup>(1)</sup>	Drive end				Opposite drive end				Remarks
		Brg	U std.	U max. <sup>(2)</sup>	V	Brg	U std.	U max. <sup>(2)</sup>	FV	
FL180 (FD112)	All	209	1.375	1.750	3.13	207	1.375	1.500	2.75	Coupled or belted duty <sup>(3)</sup>
FL/RL210 (FDL/RD16)	All	310	1.875	1.875	3.50	209	1.625	1.750	3.00	Coupled or belted duty <sup>(3)</sup>
FL/RL250 (FDL/RDL160)	All	313	2.125	2.500	4.00	310	1.875	1.875	3.50	Coupled or belted duty <sup>(3)</sup>
FL/RL280 (FDL/RDL180)	All	215	2.625	2.875	5.00	211	2.125	2.125	4.00	Coupled or belted duty <sup>(3)</sup>
UFL/URL280 (UFDL/URDL180)	All	NU215	2.625	2.875	5.00	211	2.125	2.125	4.00	Belted duty only
FL/RL320 (FDL/RDL200)	All	217	2.875	3.250	5.50	313	2.375	2.500	4.50	Coupled or belted duty <sup>(3)</sup>
UFL/URL320 (UFDL/URDL200)	All	NU217	2.875	3.250	5.50	313	2.375	2.500	4.50	Belted duty only
FL/RL360 (FDL/RDL225)	All	219	2.875	3.625	5.50	316	2.875	3.125	5.50	Coupled or belted duty <sup>(3)</sup>
UFL/URL360 (UFDL/URDL225)	All	NU219	3.250	3.625	5.50	316	2.875	3.125	5.50	Belted duty only
FL/RL400 (FDL/RDL250)	All	219	3.625	3.625	7.00	316	2.875	3.125	5.50	Coupled or belted duty <sup>(3)</sup>
UFL/URL400 (UFDL/URDL250)	All	NU222	3.875	4.250	8.25	316	2.875	3.125	5.50	Belted duty only
FL/RL440 (FDL/RDL280)	All	222	4.250	4.250	8.50	222	4.250	4.250	8.50	Coupled or belted duty <sup>(3)</sup>
UFL/URL440 (UFDL/URDL280)	All	NU224	4.500	4.625	8.50	222	4.250	4.250	8.50	Belted duty only
RL5000	DPFV	224	4.500	4.625	9.75	224	4.500	4.625	9.75	Coupled or belted duty <sup>(3)</sup>
URL5000	DPFV	NU224	4.500	4.625	9.75	224	4.500	4.625	9.75	Belted duty only
FL5800	TE	228	4.875	5.375	11.38	NU226	4.875	5.000	11.38	Coupled duty only
UFL5800	TE	NU228	4.875	5.375	11.38	226	4.875	5.000	11.38	Belted duty only
RL5000	DPFC	228	4.875	5.375	11.38	226	4.875	5.000	11.38	Coupled duty only
RL5800	DPFV	NU228	4.875	5.375	11.38	226	4.875	5.000	11.38	Belted duty only

- (1) All bearing and shaft data is based on foot mounted, coupled motor enclosures (i.e. DPFV, TENV, TEFC & TEBC).
- (2) Maximum "FU" and "U" dimension, is the largest shaft diameter that can be supplied with a standard bearing. A price addition must be made to obtain this maximum diameter or any diameter between the standard and the maximum.
- (3) These frames are suitable for belted duty provided the radial load capacity (see application data), is not exceeded. Contact ABB Sales Support for application assistance.

RPM AC modification - E2

Tests

Routine test report shows production test data with Hypot and resistances<sup>(1)</sup>. Complete tests<sup>(2)</sup> are also available. Both can be witnessed for an additional fee<sup>(1)(2)</sup> In addition to a complete witnessed test, ABS or DNV Certification<sup>(3)</sup> can also be provided for a fee. Refer to RPM AC configurator for pricing.

(1) For a certified routine test report per IEEE 112 as modified by ABB for inverter power.  
(2) Provides complete performance test and heat run on PWM inverter power per IEEE 112 as modified by ABB for operation on inverter.  
(3) Design approval documents required for 100 kW and larger

Testing on inverter supplied by customer  
Contact sales support for assistance and pricing.

Thermal protection

All RPM AC motors are equipped with three winding thermostats, one per phase, as standard. Numerous other options for thermal protection are available.

- Bearing RTD's<sup>(1)</sup> one per bearing
- Winding RTD's<sup>(2)</sup>
- Thermistors<sup>(3)</sup>
- KTY84 thermistors (Siemens) - Qty 3
- Control module for use with thermistors<sup>(4)</sup>
- Thermostats<sup>(5)</sup>

Thermocouples winding, 2 per phase	Type
Chromel Alumel	K
Chromel Constantan	E
Copper Constantan	T
Iron Constantan	J

(1) This modification is available for all frames. The standard bearing has two leads for 180-280 frames and has three leads for 320-440 frames. Each RTD is provided with a conduit box and terminal block for easy connection. Resistance value (10, 100, 120 ohm) must be included on the order write up. Note: The temperature readout device is not supplied by ABB and must be ordered separately.  
(2) Includes six (2 per phase) coil head mounted 100 ohm platinum resistance temperature detectors. Available in all frames with maximum winding voltage of 600 volts. Lead will be brought to terminal board in conduit box. For 1 RTD per phase use List Price of \$2,528.  
(3) Consists of three PTC thermistors embedded in the motor windings, with leads brought into the main conduit box. Note: Price does not include control module.  
(4) Part number 418033-14B (S/N 115101-2) supplied in NEMA 12 enclosure for separate mounting. Requires 120 volt, 50/60Hz single-phase – 5 ampere input. Provides two Triac outputs– one normally energized and one normally off – each rated 5 amperes continuous. Note: Control module unmounted.  
(5) RPM AC motors include three N.C. thermostats (one per phase) as standard; leads are brought into main conduit box. This modification includes a second set of warning thermostats (3 N.C. thermostats - one per phase).

Vertical lifting

Vertical lifting lugs can be added to most frame sizes. Please contact ABB for quotation.

Sheaves

Mounting of customer’s finished bore sheave on motor drive end shaft extension. Maximum sheave weight not to exceed 200 pounds. Sheave must be finish bored and balanced. Sheave must be received at plant eight weeks prior to motor shipment with customer property tag attached. Available on frame sizes up to FL&RL440/FDL&RDL280. Refer to RPM AC configurator for pricing.

**RPM AC modification - E2**

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**Slide base**

Adds slide base to motor for adjusting belt tension. Neither bases nor rails are suitable for wall or ceiling mounting. Available on all frames. Refer to RPM AC configurator for pricing.

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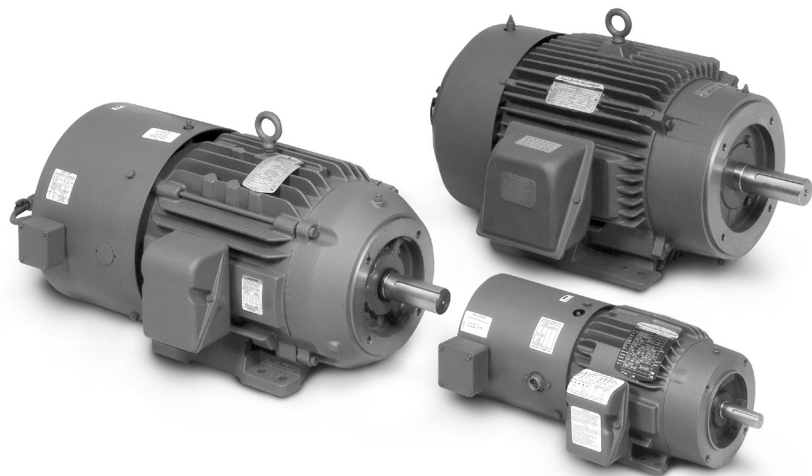
**Space heaters and modifications**

Space heaters can be added to RPM AC motors of all frame sizes. They are mounted inside the motor and recommended to prevent condensation of moisture for motors remaining unenergized for long periods of time. Standard heater is single phase 120, 230, or 460 volts, 50/60 Hz. Leads are terminated in motor conduit boxes. For non-classified area only.

T3 temp code space heater is optionally available on all frames.

If desired, a separate conduit box can be provided for space heater leads and accessories. The aux conduit box is not available on FL180/FDL112 frame motors. Refer to RPM AC configurator for pricing.

# V\*S Master



- Constant torque Inverter Duty AC Motors that can provide 100% torque down to zero speed
- TEFC enclosures in standard NEMA frame ratings
- 2 to 500 Hp

V\*S Master, inverter duty and vector duty motors are designed to provide full load torque continuously from 0 to base speed. These motors are in standard NEMA frame sizes. Enclosures are TENV, TEFC and TENV.

V\*S Master (Inverter Duty, Vector Drive) AC motors are specifically designed for operation on inverter power. These motors have Baldor-Reliance inverter duty insulation system which exceeds NEMA's recommendation for inverter-fed AC motors. This unique insulation system eliminates the formation of corona which can greatly shorten the insulation life of an AC motor that is connected to a PWM inverter. Baldor-Reliance's corona-free insulation system provides much longer motor insulation life.

## Features:

- Ratings (Hp) in NEMA standard frame sizes - TENV, TEFC and TEBC
- Continuous constant rated torque from 0 to base speed
- TEFC enclosures provide class B rise over the 4:1 constant torque speed range
- Large selection of different types of encoders available on production orders
- Many modifications available through production or stock modification
- Encoder mounting kits available from stock for hollow shaft encoders
- 200% overload torque for 1 minute below base speed
- Standard base speeds available: 900, 1200 and 1800 RPM.
- Constant horsepower operation to 1.5 times base speed
- Three normally closed thermostats
- Hole drilled and tapped in shaft for encoder mounting
- Opposite drive end insulated bearing on all 440T frames
- Stocked ratings from 2 Hp to 300 Hp
- C-face with feet stocked from 2 Hp to 20 Hp
- Inverter Duty insulation system
- Optimized electrical design for inverter power, not for "across the line" power
- Class F insulation
- 40°C ambient temperature
- Continuous duty
- 1.0 service factor on inverter power
- Re-greaseable bearings
- Stainless steel nameplates
- Hex head hardware

## Applications:

Inverter duty applications that require variable or constant torque over 2:1, 4:1, 10:1 speed ranges or full torque down to zero speed. Best solution for extruders, web processing, paper machines, paper converting, metal processing and other applications that require a large constant torque speed range.



## Electrical design characteristics

### V\*S Master

#### Electrical design characteristics (for all configurations)

Specifications	Description	Frames	
		56C-320T	360T-449T
Voltage	230, 460 or 575 volts	S	S
	380, 415 volts - 50 Hz	O	O
Frequency	60 Hz standard, 50 Hz optional	S	S
Service factor	1.0 standard	S	S
Ratings	NEMA design A, B	S	N/A
	NEMA design A	S	S
Duty cycle	Continuous duty	S	S
	Special duty cycles	O	O
Ambient temperature	40°C ambient temperature	S	S
	Higher or lower ambient temperature	O	O
Temperature rise	Class F rise at 1.0 rated load on PWM power	S	S
Laminations	Low-loss electrical grade steel	S	S
	Low-loss electrical grade steel, C-5 core plate	S	N/A
Insulation class	Class F or H	S	S
Stator insulation	Nomex class H, F uses DMD	S	S
Phase insulation	DMD phase insulation, or NMN	S	S
Lead material	Cross-linked polyethylene leads	S	S
Insulation system	Meets NEMA standards MG 1 - 2016, part 31	S	S
Thermal protection	Winding thermostats (normally closed contacts)	S	S
	Thermistors	O	O
Space heaters	120 volt standard, other voltages optional	O	O
Feedback devices	1024 PPR electrically isolated through-shaft BEI optical encoder standard on vector drive motors (other PPR available)	S	S
	NorthStar (Lakeshore) or Avtron pulse generators available	O	O
	Short commercial test (no-load amps, speed, balance and hi-pot test per NEMA MG 1	S	-
Testing	Standard routine test (no-load amps, speed, balance and hi-pot test) per NEMA MG 1 single phase locked is standard at RAG	-	S
	Heat run and complete efficiency testing at temperature	O	O
	Either of above tests as witnessed	O	O
Approvals	CSA recognized components (file LR2262)	S	-
	CSA recognized components (file LR7861)	-	S

Specifications and dimensions are subject to change without notice, please contact ABB for certified information.

S= Standard, O= optional.

## Mechanical design characteristics

### V\*S Master

Specifications	Description	Frames				
		56C	143T-215	254T-365T	404T-447T	449T
Nameplate	Includes base volts and frequency, correction diagram, blower rating (volts, hertz, phase, and amps), maximum motor speed, rotor inertia, and magnetization	S	S	S	S	S
Frame dimensions	NEMA	S	S	S	S	S
	IEC	O	O	O	O	O
Frame construction	Steel band	S	-	-	-	-
	Cast iron	-	S	S	S	S
Multiple mounting holes in base	Multiple mounting holes standard	S	S	S	S	S
Endplates	Die cast aluminum with steel bearing inserts	S	-	-	-	-
	Cast iron	-	S	S	S	S
Flange mounting	C-face	O	O	O	O	O
	D-flange	O	O	O	O	O
Conduit box & cover	Die cast aluminum	S	-	-	-	-
	Cast iron	-	S	S	S	S
Ground provisions	Inside conduit box for convenience	S	S	S	S	S
Lifting provisions	Eyebolt in frame	S	S	S	S	-
	Integrally-cast lifting lugs	-	-	-	-	S
Enclosure	Totally-enclosed non-vented (TENV)	O	S	S	O	O
	Totally-enclosed blower-cooled (TEBC)	-	S	S	S	S
	Totally-enclosed fan-cooled (TEFC)	O	O	O	O	O
Cooling fan	Non-sparking	S	S	S	S	S
Rotor construction	Special high pressure aluminum die cast with low loss electrical steel and special slot configuration	S	S	S	S	S
Balance	Dynamically balanced better than NEMA MG 1-2016 specifications	S	S	S	S	S
Shaft material	C1035 high strength steel	S	S	-	-	-
	C1137 high strength steel	-	-	S	S	-
	1045 high strength steel	-	-	-	-	S
Paint	Blue green lacquer over primer coat	S	S	S	S	S
Bearings	Premium grade, ball bearings, double shielded	S	S	-	-	-
	Premium grade, ball bearings, open w/lube lock	-	-	S	S	S
	Roller bearing on drive end	O	O	O	O	O
Bearing retention	Locked bearings for universal mounting	S	S	S	S	S
Bearing lubrication	Mobil Polyrex EM polyurea grease	S	S	S	S	S
Shaft grounding brush	SGS shaft grounding brush (stock motors)	O	O	O	O	S
Bearing isolation	Ceramic outer race, ceramic balls or insulated insert in endplate available based on application	O	O	O	O	O
Grease provisions	Regreaseable without removal of fan cover	S	S	S	S	S
Limited warranty	3 years warranty from date of manufacture	S	S	S	S	S

S= Standard, O= optional

## Totally enclosed fan cooled (TEFC) & non-ventilated (TENV) – induction

V\*S Master



- 1000:1 constant torque<sup>(1)</sup>
- 2 - 500 Hp
- 3-phase,
- 460V<sup>(2)</sup>

### Features

- Continuous duty
- Inverter duty - not for “across the line” operation
- Standard 200% overload for 1 minute below speed and 150% above base speed
- Class F insulation
- 40°C ambient / 1.0 S.F.
- Constant horsepower speed range - 1.5 times base speed<sup>(3)</sup>
- Three thermostats (1 N.C. per phase)
- F-1 mounting as standard
- Cast iron frame & end brackets
- Encoder provisions<sup>(4)</sup>
- Insulated O.D.E. bearing as standard on all 440 frames
- Optimum pole designs

Hp	Synch. RPM	Frame	Enclosure	FLA <sup>(5)</sup> @ 460V
2	1200	184T	TENV	3.4
	1200	184T	TEFC	3.4
	900	213T	TEFC	3.4
3	1800	182T	TENV	4.1
	1800	182T	TEFC	4.1
	1500	182T	TEFC	4.1
	1200	215T	TENV	3.9
	1200	213T	TEFC	4.8
	900	215T	TEFC	4.8
5	1800	184T	TENV	6.6
	1800	184T	TEFC	6.6
	1500	184T	TEFC	7.0
	1200	215T	TENV	6.2
	1200	215T	TEFC	7.6
	900	254T	TEFC	7.6
7.5	1800	215T	TENV	10.1
	1800	213T	TEFC	9.5
	1500	213T	TEFC	10.0
	1200	254T	TEFC	10.7
	900	256T	TEFC	12.4
	1800	254T	TENV	13.0
10	1800	215T	TEFC	12.5
	1500	215T	TEFC	14.0
	1200	256T	TEFC	14.2
	900	284T	TEFC	13.4
	1800	256T	TENV	18.5
	1800	254T	TEFC	18.0
15	1500	254T	TEFC	23.7
	1200	284T	TEFC	19.7
	900	286T	TEFC	21.6
	1800	284T	TENV	24.3
	1800	256T	TEFC	24.0
	1500	284T	TEFC	26.3
20	1200	286T	TEFC	26.0
	900	324T	TEFC	28.1
	1800	324T	TENV	30.6
	1800	284T	TEFC	30.0
	1500	284T	TEFC	32.9
	1200	324T	TEFC	32.9
25	900	326T	TEFC	35.0

Hp	Synch. RPM	Frame	Enclosure	FLA <sup>(5)</sup> @ 460V
30	1800	326T	TENV	36.4
	1800	286T	TEFC	36.0
	1500	324T	TEFC	39.8
40	1200	326T	TEFC	39.0
	900	364T	TEFC	41.6
	1800	364T	TENV	48.2
	1800	324T	TEFC	49.0
	1500	324T	TEFC	50.7
	1200	364T	TEFC	49.6
50	900	365T	TEFC	52
	1800	404T	TENV	57.9
	1800	326T	TEFC	62.0
	1500	364T	TEFC	64.1
	1200	365T	TEFC	60.7
	900	404T	TEFC	65
60	1800	364T	TEFC	71.4
	1500	364T	TEFC	74
	1200	404T	TEFC	71.1
	900	405T	TEFC	77
	1800	365T	TEFC	89.4
	1500	405T	TEFC	91
75	1200	405T	TEFC	85.1
	900	444T	TEFC	89
	1800	405T	TEFC	116
	1500	444T	TEFC	118
	1200	444T	TEFC	115
	900	445T	TEFC	124
100	1800	444T	TEFC	151
	1500	445T	TEFC	152
	1200	445T	TEFC	142
	900	447T	TEFC	156
	1800	445T	TEFC	178
	1500	445T	TEFC	178
150	1200	447T	TEFC	180
	900	449T	TEFC	180
	1800	447T	TEFC	226
	1500	447T	TEFC	231
	1200	449T	TEFC	224
	900	L449T	TEFC	240
200	1800	449T	TEFC	279
	1500	449T	TEFC	288
	1200	449T	TEFC	283
	900 <sup>(6)</sup>	L449T	TEFC	302

Hp	Synch. RPM	Frame	Enclosure	FLA <sup>(5)</sup> @ 460V
300	1800	449T	TEFC	339
	1500	L449T	TEFC	348
	1200	L449T	TEFC	341
350	1800	L449T	TEFC	398
	1500	L449T	TEFC	398
	1800	L449T	TEFC	446
400	1500 <sup>(7)</sup>	L449T	TEFC	458
	1800	L449T	TEFC	502
	1500 <sup>(7)</sup>	L449T <sup>(6)</sup>	TEFC	515
500	1800 <sup>(7)</sup>	L449T	TEFC	551

(1) All V\*S Master TEFC and TENV motors are designed to operate continuously at zero speed without over heating.

(2) Standard voltages available: 230, 380, 460 & 575V.

(3) For constant horsepower speed ranges greater than 1.5 times the motor base speed, please contact sales team.

(4) Encoder provisions as standard  
182T - 326T frames:  
TENV and TEFC – solid state shaft (non removable) with shaft cover.  
364T - L449T frames:  
TEFC – hole drilled and tapped for stub shaft  
TENV – machined O.D.E. bracket in addition to hole drilled and tapped for stub shaft.

(5) For estimating purposes only.

(6) Class H insulation.

(7) Rated only for 4:1 constant torque speed range, F rise.

## Totally enclosed fan cooled (TEFC) 4:1 B rise

### V\*S Master



- 4:1 constant torque<sup>(1)</sup> with Class B rise (80°C)
  - Full torque down to zero speed<sup>(2)</sup> with Class F rise (105°C)
  - 2 - 400 Hp
  - 3-phase
  - 460V<sup>(3)</sup>
  - Standard 200% overload for 1 minute below base speed and 150% above base speed
  - Class F insulation
  - 40°C ambient / 1.0 S.F.
  - Constant horsepower speed range – 1.5 times base speed<sup>(4)</sup>
  - Three thermostats (1 N.C. per phase)
  - F-1 mounting as standard
  - Cast iron frame & end brackets
  - Encoder provisions<sup>(5)</sup>
  - Insulated O.D.E. bearing as standard on all 440 frames
- Features**
- Continuous duty
  - Inverter duty – not for “across the line” operation

Hp	Synch. RPM	Frame	FLA <sup>(6)</sup> @ 460V
2	1200	184T	3.4
	1800	182T	4.1
3	1200	213T	4.8
	1800	L184T	6.6
5	1200	L215T	7.6
	1800	213T	9.5
7.5	1200	254T	10.7
	1800	L215T	12.5
10	1200	256T	14.2
	1800	254T	18.0
15	1200	284T	19.7
	1800	256T	24.0
20	1200	286T	26.0
	1800	284T	30.0
25	1200	324T	32.9
	1800	286T	36.0
30	1200	326T	39.0
	1800	324T	49.0
40	1200	364T	49.6
	1800	326T	60.0
50	1200	365T	60.7
	1800	364T	71.4
60	1200	404T	71.1
	1800	365T	89.4
75	1200	405T	85.1
	1800	405T	116
100	1200	444T	115

Hp	Synch. RPM	Frame	FLA <sup>(6)</sup> @ 460V
125	1800	444T	151
	1200	445T	142
150	1800	445T	178
	1200	447T	180
200	1800	447T	226
	1200	449T	224
250	1800	449T	279
	1200	L449T	283
300	1800	449T	339
	1200	L449T	341
350	1800	L449T	398
400	1800	L449T	446

- (1) 4:1 constant torque with Class B rise means that the V\*S Master motors listed above, will operate with a Class B rise over at least a 4 to 1 speed range (for example 450 to 1800 RPM). Many customers request Class B rise for increased insulation and bearing life or have safety specifications with regard to motor skin temperature.
- (2) The V\*S Master TEFC and TENV motors are designed to operate continuously at zero speed.
- (3) Standard voltages available: 230, 380, 460 & 575V. For any other special voltage, please see voltage in modification section.
- (4) For constant horsepower speed ranges greater than 1.5 times the motor base speed, please contact variable speed product marketing for pricing.
- (5) Encoder provisions as standard:  
 182T - 326T frames:  
 TENV and TEFC – (non removable) stub shaft with shaft cover.  
 364T - L449T frames:  
 TEFC – hole drilled and tapped for stub shaft  
 TENV – machined O.D.E. bracket in addition to hole drilled and tapped for stub shaft.
- (6) For estimating purposes only.

## IEC Totally Enclosed Fan Cooled (TEFC)

V\*S Master



- IP44 - IC411
- Full torque down to zero speed
- 1.5 - 335KW
- 3-Phase
- 415V<sup>(1)</sup>

### Features

- S1 duty (continuous)
- Inverter duty - not for “across the line” operation
- Standard 1 minute overload
- 200% overload below base speed and 150% above base speed
- Class F insulation
- 40°C ambient / 1.0 S.F.
- Three thermostats (1 N.C. per phase)
- Constant horsepower speed range - 1.5 times base speed<sup>(2)</sup>
- IEC standard conduit box (NEMA F-2)
- Cast iron frame & end brackets
- Encoder provisions<sup>(3)</sup>
- Insulated O.D.E. bearing as standard on all 280 frames
- Terminal strips for main power leads in conduit box
- B-3 mounting
- “CE” label

kW	Synch. RPM	Frame	FLA <sup>(4)</sup> @ 415V
1.5	1500	112S	3
2.2	1500	112S	4.4
4	1500	L112M	7.7
5.5	1500	132S	10.5
7.5	1500	L132M	16.7
11	1500	160M	20.3
15	1500	160L <sup>(5)</sup>	28
		180M	28
18.5	1500	180M	34.7
22	1500	200M	42
30	1500	200M	56.2
37	1500	225S	71
45	1500	225S	81
55	1500	250M	100
		250M <sup>(5)</sup>	130
75	1500	280S	130
90	1500	280S	163

kW	Synch. RPM	Frame	FLA <sup>(4)</sup> @ 415V
110	1500	280M	192
132	1500	280K	224
150	1500	280K	256
186	1500	280H	319
224	1500	L280H	390
250	1500	L280H	423
300	1500	L280H <sup>(6)</sup>	502
335	1500	L280H <sup>(6)(7)</sup>	567

(1) Standard voltages available: 380, 400 & 415V. For any other special voltage, please see voltage in modification section.

(2) For constant horsepower speed ranges greater than 1.5 times the motor base speed, please contact variable speed product marketing for pricing.

(3) Encoder provisions as standard, TEFC - hole drilled and tapped for stub shaft

(4) For estimating purposes only.

(5) Rated for 10:1 constant torque speed range for given frame sizes.

(6) Rated for 4:1 constant torque. Contact variable speed product marketing for quotation on a TEBC for 1000:1 constant torque.

(7) Class H insulation

For modification pricing, please use the following IEC-to-NEMA frame size cross reference chart for proper pricing additions.

IEC frame	NEMA frame
112	180
132	210
160	250
200	320
225	360
250	400
280	440

## Performance data



**Totally-enclosed blower-cooled (TEBC)**  
20 Hp TEBC Vector Drive motor catalog # ZDM4102T

Baldor-Reliance VS Master Inverter Duty and Vector Duty motors are suited for operation on conveyors, pumps fans, metal processing, compressors, test stands and material handling equipment. These motors are designed for adjustable speed applications where full torque down to zero speed may be required.

### Performance data 230 / 460 volt ratings - TENV enclosure

60 Hz		Base speed	Max. speed	NEMA frame	Catalog no.		"C" dim.	460V amps		Output torque lb.-ft.				% eff.	Wk <sup>2</sup> lb.-ft. <sup>2</sup>	Approx. weight lbs.	Bearings	
Hp	kW				Inverter	Vector		Idle	F.L.	F.L.	L.R.	B.D.	DE				ODE	
0.33	0.25	1725	6000	56C	IDNM3534	Custom	13.84	0.45	0.6	1	3.4	3.8	76	.0771	29	6205	6203	
0.5	0.37	1725	6000	56C	IDNM3538	Custom	13.84	0.5	0.8	1.5	5.2	6.5	75.5	.0949	32	6205	6203	
0.75	0.56	1725	6000	56C	IDNM3542	Custom	13.84	0.65	1.1	2.3	6.5	8.3	80	.1420	35	6205	6203	
1	0.75	1725	6000	143TC	IDNM3581T	ZDNM3581T	14.65	0.92	1.6	3	9.5	11	81.5	.1420	59	6205	6203	
1.5	1.1	1725	6000	145TC	IDNM3584T	ZDNM3584T	14.65	1.05	2.0	4.5	14	17	82.5	.1900	65	6205	6203	
2	1.5	1740	6000	145TC	IDNM3587T	Custom	14.65	1.4	2.7	6	24	25	84	.2080	64	6205	6203	
2	1.5	1725	6000	182TC	IDNM3669T	ZDNM3669T	17.21	1.7	2.9	6	25	30	84	.2630	94	6206	6205	
3	2.2	1750	6000	184TC	IDNM3661T	ZDNM3661T	17.21	2.0	4.0	9	22.9	37.1	88.5	.3190	108	6206	6205	
5	3.7	1760	6000	184TC	IDNM3665T	Custom	17.21	3.6	6.6	15	43	60	89.5	.3700	115	6206	6206	
5	3.7	1760	6000	213TC	IDNM3767T	ZDNM3767T	20.4	3.4	6.5	14.9	48	52	89.5	.7340	167	6207	6208	
7.5	5.6	1760	5000	254TC	IDNM2237T	ZDNM2237T	24.05	5.3	9.8	22.2	63	85	89.5	1.400	250	6309	6208	
10	7.5	1770	5000	256TC	IDNM2238T	ZDNM2238T	24.05	5.6	13.0	29.8	71.1	133	91.7	2.100	289	6309	6208	
15	11.2	1765	5000	254TC	IDNM2333T	ZDNM2333T	24.05	8.9	18.5	45	102	176	94.1	.2630	286	6309	6208	
20	14.9	1780	5000	284T	IDNM2334T	ZDNM2334T	27.36	15.5	25.5	60	143	256	94.5	4.460	437	6311	6309	

## Performance data

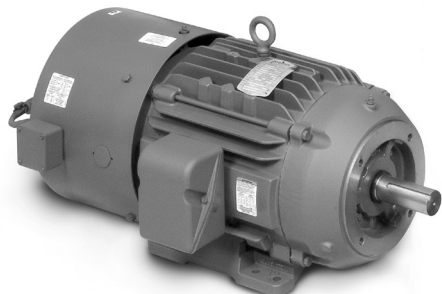
Performance data 230 / 460 volt ratings - TEBC enclosure

60 Hz		Base speed	Max. speed	NEMA frame	Catalog no.		"C" dim.	460V amps		Output torque lb.-ft.				% eff.	Wk <sup>2</sup> lb.-ft. <sup>2</sup>	Approx. weight lbs.	Bearings	
Hp	kW				Inverter	Vector		Idle	F.L.	F.L.	L.R.	B.D.	DE				ODE	
1	0.7	1750	6000	143TC	IDM3581T	ZDM3581T	19.15	0.76	1.4	3	10	14.5	86.5	.1420	65	6205	6203	
1	0.7	1150	6000	145TC	IDM3582T	ZDM3582T	19.15	1.2	1.8	4.5	9.2	12	82.5	.1660	69	6205	6203	
1.5	1.1	1750	6000	143TC	IDM3584T	ZDM3584T	19.15	1.16	2.1	4.5	14	22	87.5	.1660	68	6205	6203	
1.5	1.1	1160	6000	182TC	IDM3667T	ZDM3667T	21.71	1.8	2.6	6.8	12	18.5	86.5	.3000	110	6206	6205	
2	1.5	1750	6000	145TC	IDM3587T	ZDM3587T	19.15	1.2	2.5	6	21	24	86.5	.2080	72	6205	6203	
2	1.5	1160	6000	184TC	IDM3664T	ZDM3664T	21.71	2.5	3.6	9	15.4	29	87.5	.3800	123	6206	6205	
3	2.2	1760	6000	182TC	IDM3661T	ZDM3661T	21.71	2.2	4.0	9	22	31	89.5	.2600	109	6206	6205	
3	2.2	1160	6000	213TC	IDM3764T	ZDM3764T	29.14	3.3	5.0	13.5	23	45	89.5	.7460	174	6307	6206	
5	3.7	1750	6000	184TC	IDM3665T	ZDM3665T	21.71	3.4	6.5	15	32	50	90.2	.3700	125	6206	6205	
5	3.7	1160	6000	215TC	IDM3768T	ZDM3768T	29.14	4.9	8.0	22.6	57	83	88.5	.9950	200	6307	6206	
7.5	5.6	1760	6000	213TC	IDM3770T	ZDM3770T	29.14	4.3	9.9	22.5	35	83	89.5	.7410	177	6307	6206	
7.5	5.6	1180	5000	254TC	IDM2276T	ZDM2276T	33.07	5.52	10.7	33.3	58.4	99.5	91.7	4.340	282	6309	6208	
10	7.5	1760	6000	215TC	IDM3774T	ZDM3774T	29.14	5.5	12.5	30	56	121	91.7	1.230	196	6307	6206	
10	7.5	1180	5000	256TC	IDM2332T	ZDM2332T	33.07	7.15	14.2	44.4	75	144	91.7	4.820	324	6309	6208	
15	11.2	1765	5000	254TC	IDM2333T	ZDM2333T	33.07	8.33	18.5	44.6	79.1	165	92.4	1.570	236	6309	6208	
15	11.2	1180	4000	284T	IDM4100T	ZDM4100T	36.48	8.39	18.7	66.7	198	209	92.4	6.650	426	6311	6309	
20	14.9	1765	5000	256TC	IDM2334T	ZDM2334T	33.07	9.79	24.0	59.5	116	199	93	2.100	286	6309	6208	
20	14.9	1175	4000	286T	IDM4102T	ZDM4102T	36.48	10.12	25.0	89.3	278	272	92.4	7.360	476	6311	6309	
25	18.7	1770	4000	284T	IDM4103T	ZDM4103T	36.48	11.43	30.0	74.2	125	238	93.6	3.660	432	6311	6309	
25	18.7	1180	3900	324T	IDM4111T	ZDM4111T	39.24	12.6	32.0	111	292	323	93	9.210	619	6312	6311	
30	22.4	1780	4000	286T	IDM4104T	ZDM4104T	36.48	14.5	36.0	90	143	256	94.1	4.460	458	6311	6309	
30	22.4	1180	3900	326T	IDM4117T	ZDM4117T	39.24	16	38.0	134	359	416	93	10.40	654	6312	6311	
40	29.8	1775	3900	324T	IDM4110T	ZDM4110T	39.24	16.01	47.0	118	207	385	94.5	7.460	578	6312	6311	
40	29.8	1185	3600	364T	Custom*	-	-	-	-	-	-	-	-	-	-	-	-	
50	37.3	1775	3900	326T	IDM4115T	ZDM4115T	39.24	19.13	57.0	148	290	451	94.5	8.260	679	6312	6311	
50	37.3	1185	3600	365T	Custom*	-	-	-	-	N/A	N/A	N/A	N/A	-	-	-	-	
60	45.0	1785	2675	364T	IDVSM4314T*	-	38.31	-	71.2	N/A	N/A	N/A	N/A	14.52	869	6313	6313	
60	45.0	1185	2800	405T	Custom*	-	-	-	-	N/A	N/A	N/A	N/A	-	-	-	-	
75	56.0	1785	2675	365T	IDVSM4316T*	-	33.44	-	89.2	N/A	N/A	N/A	N/A	15.89	873	6313	6313	
75	56.0	1185	2800	404T	Custom*	-	-	-	-	N/A	N/A	N/A	N/A	-	-	-	-	
100	74.6	1785	2680	405T	IDVSM4400T-4*	-	38.31	-	115	N/A	N/A	N/A	N/A	-	1218	6316	6316	
100	74.6	1180	2400	444T	Custom*	-	-	-	-	N/A	N/A	N/A	N/A	-	-	-	-	
125	93.3	1790	2685	444T	IDVSM4410T-4*	-	44.62	-	150	N/A	N/A	N/A	N/A	-	1637	6318	6318	
150	112	1790	2685	445T	IDVSM4406T-4*	-	44.62	-	177	N/A	N/A	N/A	N/A	-	1789	6318	6318	
200	150	1790	2685	447T	IDVSM4407T-4*	-	48.24	-	226	N/A	N/A	N/A	N/A	-	2189	6318	6318	
250	187	1790	2685	449T	IDVSM4408T-4*	-	53.24	-	277	N/A	N/A	N/A	N/A	85.29	2511	6318	6318	
300	224	1790	2685	449T	IDVSM44304T-4*	-	53.24	-	338	N/A	N/A	N/A	N/A	-	2816	6318	6318	

\* TEFC enclosure

## 575 volt - performance data

### VS Master TEBC motors



Baldor-Reliance 575V VS Master TEBC motors are suited for operation on conveyors, pumps, fans, metal processing, compressors, test stands, and material handling equipment. These motors are designed for adjustable speed applications where full torque down to zero speed may be required.

Performance data 575 volt ratings - TEBC enclosure

60 Hz		Base speed	Max. speed	NEMA frame	Catalog no.		"C" dim.	460V amps		Output torque lb.-ft.			% eff.	Wk <sup>2</sup> lb.-ft. <sup>2</sup>	Approx. weight lbs.	Bearings	
Hp	kW				Inverter	Vector		Idle	F.L.	F.L.	L.R.	B.D.				DE	ODE
1	0.75	1750	6000	143TC	IDM3581T-5	ZDM3581T-5	19.15	0.61	1.1	3	10	14.5	86.5	0.1420	64	6205	6203
1.5	1.1	1750	6000	145TC	IDM3584T-5	ZDM3584T-5	19.15	0.93	1.7	4.5	14	22	87.5	0.1660	68	6205	6203
2	1.5	1750	6000	145TC	IDM3587T-5	ZDM3587T-5	19.15	0.96	2.0	6	21	24	86.5	0.2080	73	6205	6203
3	2.2	1750	6000	182TC	IDM3661T-5	ZDM3661T-5	21.71	1.8	3.2	9	22	31	89.7	0.2600	109	6206	6205
5	3.7	1750	6000	184TC	IDM3665T-5	ZDM3665T-5	21.71	2.7	5.2	15	32	50	90.2	0.3700	123	6206	6205
7.5	5.6	1750	6000	213TC	IDM3770T-5	ZDM3770T-5	30.07	3.9	7.8	22.4	39	69.9	90.2	0.8400	169	6307	6206
10	7.5	1750	6000	215TC	IDM3774T-5	ZDM3774T-5	30.07	4.4	10.0	30	56	121	91.7	1.230	196	6307	6206
15	11.2	1750	4000	254TC	IDM2333T-5	ZDM2333T-5	34.15	6.6	14.8	44.5	79	165	92.4	1.570	310	6309	6208
20	14.9	1750	4000	256TC	IDM2334T-5	ZDM2334T-5	34.15	7.6	19.0	59	114	195	93	2.100	286	6309	6208



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## V\*S Master modification - E2

### Inverter Duty and Vector Duty

To access the "Medium AC motor configurator" visit [motorbuilder.abb.com](http://motorbuilder.abb.com).

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#### Altitude

V\*S Master motor ratings are suitable for operation in or at a maximum altitude of 3,300 feet (1,000 meters). For constant torque zero to base speed operation, V\*S Master motors with altitudes between 3,300 feet and 9,900 feet may be priced by using the frame size and the list price of the next larger rating. Ratings up to 16,000 feet may be available; contact ABB for assistance.

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#### Ambient temperature

V\*S Master ratings are suitable for operation in or at a maximum ambient temperature of 40°C (104°F). For V\*S Master applications in ambient temperatures greater than 40°C contact ABB for proper motor sizing.

#### Low ambient temperature below -25°C

V\*S Master motor ratings are suitable for operation in ambient temperatures down to -25°C. For ambient temperatures below -25°C, arctic duty motors should be specified.

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#### Arctic duty - non-explosion-proof

This modification also requires the addition of CP/XT features or IEEE 841 mechanical construction. Refer to medium motor configurator for pricing and low temperature options on 360-L449 frames. Contact ABB for assistance on 180-320 frames.

#### Arctic duty - explosion-proof Division I

This modification also requires the addition of CP/XT features or IEEE 841 mechanical features and covers temps of -25°C to -60°C ambient. Refer to medium motor configurator for pricing on 360-L449 frames. Contact ABB for assistance on 180-320 frames.

- Breather/drains are not available on explosion-proof arctic duty motors.
- These motors are ductile iron construction (except for fan covers which are cast iron) and are built in the longer frames of each diameter only (i.e. – all 280 frames will be 286T frame).
- Ductile iron will cause extended delivery cycles. Contact ABB for further details.
- Oversize conduit box not available on 440T frame XP arctic duty motors.

## V\*S Master modification - E2

Inverter Duty and Vector Duty

### Balance

All motors are dynamically balanced with vibration measured in accordance with NEMA MG1-1. Modified motors can be built to exceed standard limits as outlined below. Available in 180-L449 frames. Refer to medium AC motor configurator for pricing.

### Motor vibration (maximum) when measured per NEMA MG1-1

#### Frame sizes 180 to L440

Vibration category	Velocity inches/sec (peak)	Displacement inches (peak to peak) <sup>(3)</sup>
Standard	0.15	0.0015
Ultra-standard <sup>(1)</sup>	0.08	0.0008
Precision <sup>(4)</sup>	0.04	0.0004
Ultra precision <sup>(2)(4)(5)(6)</sup>	0.02	0.0002

(1) This vibration level standard on motors with 841XL mechanical construction modification - complies with IEEE 841 (1994).

(2) Ultra-precision balance not available on two pole motors.

(3) Displacement based on 4 pole, 60Hz motors.

(4) Not available on motors built with roller bearings or on LP (medium thrust and extended thrust) vertical P-base motors.

(5) Usually requires special bearings and extended lead times. For delivery cycles, contact manufacturing plant.

- Vibration levels of motors in the field are usually higher than when measured per the NEMA procedure.
- Vibration is measured on all three axes using five separate locations.
- Vibration at frequencies other than running speed will be less than values noted above.
- Motors with roller bearings are not available with vibration limits at the precision or ultra-precision levels.

### Bases

Bases are not mounted to motors – they are shipped loose. Refer to medium AC motor configurator for pricing.

#### Slide bases

Frame	Part number	Frame	Part number
182T	042384000U <sup>(1)</sup>	364T	042384004U <sup>(2)</sup>
184T	042384000V <sup>(1)</sup>	365T	042384004V <sup>(2)</sup>
213T	042384000W <sup>(1)</sup>	404T	042384004F <sup>(2)</sup>
215T	042384000X <sup>(1)</sup>	405T	042384004G <sup>(2)</sup>
254T	042384004E <sup>(2)</sup>	444T	042384004H <sup>(2)</sup>
256T	042384004P <sup>(2)</sup>	445T	042384004J <sup>(2)</sup>
284T	042384004M <sup>(2)</sup>	447T	702694003R <sup>(2,3)</sup>
286T	042384004T <sup>(2)</sup>	449T	702694003R <sup>(2,3)</sup>
324T	042384004R <sup>(2)</sup>	L449T	702694001R <sup>(2,3)</sup>
326T	042384004D <sup>(2)</sup>		

Transition bases (U to T) see the 501 catalog.

(1) Single adjustment

(2) Double adjustment

(3) Two-piece slide rails

Unlisted slide bases and transition bases may be obtained direct from

Overly-Hautz Motor Base Co.,

215 South West St., Lebanon, OH 45306, PH: 513-932-0025.

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

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**Bearings****Bearing isolator (see “seals”)****Insulated bearings**

- Available only on horizontal 180 - L449 frames. Contact ABB for vertical applications.
- Only one bearing needs to be insulated to break the electrical path of currents caused by shaft voltages.
- ABB's standard practice is to insulate the O.D.E. bearing only.
- In addition the D.E. ball bearing may also be insulated for best protection. Double the adder below to get both bearings insulated (except for 440 frame).
- Motors with a drive end roller bearing will always have only the O.D.E. insulated.
- Insulated bearings not available as sealed or shielded, not available in roller or angular contact construction, not available if special balance limits are required.

Insulated ball bearing<sup>(1)</sup>

Standard on V\*S Master 440-L449 frames.

Refer to medium AC motor configurator for pricing on other frame sizes.

- (1) If a bearing thermal temperature device (i.e., Bearing RTD) is to be installed in an insulated bearing, a special insulated version of the thermal device will be required in addition to the insulated bearing adder. Refer to the medium AC motor configurator for pricing per insulated thermal device in addition to the Bearing RTD adder.

**Roller bearings**

A motor equipped with a roller bearing on the drive end must be used with a belt drive and is not suitable for coupled service. Roller bearings are available on the drive end of modified motors on 1800 RPM or slower, 250 frames and up, for use on higher-than-standard overhung loads. 3600 RPM ratings are not available for use on belt drives. Available on 210-L449 frames. Refer to medium AC motor configurator for pricing.

**Sealed/shielded/open bearings**

Bearing location must be specified on order. Indicate whether O.D.E., D.E., or BOTH. Available for standard ball bearings only and not applicable to thrust, roller bearings, or insulated bearings.

Shielded bearings are available at no charge on 180-280 frame. Refer to medium AC motor configurator for pricing on other frame sizes and for sealed bearings<sup>(1)</sup>

- (1) Sealed and shielded bearings are only available with our standard grease and standard construction features.

**Bearing cavity sealed construction**

- This modification may be used in lieu of sealed bearings when sealed bearings are not available, impractical or undesirable.
- This modification is available on 180 - L440 frame CP/XT motors only, and includes the following features:
  - Bearing cavities on both sides of bearing are packed with grease and sealed by inner cap.
  - Shielded bearings are used wherever possible, but open bearings are also available in 360 frames and larger.
  - Normal grease entry and outlet openings are plugged, and plugs are staked in place.
  - A nameplate is mounted on the motor reading “do not lubricate.”
- This construction makes more grease available to the bearing raceway than does a sealed for life bearing and is available for all bearing types including roller and thrust bearings. Order must specify which bearing(s) to be sealed – “drive end,” “opp. drive end” or “both.”
- This modification also requires the addition of CP/XT features or the use of 841XL mechanical construction.
- Available on all frame sizes; refer to the medium AC motor configurator for pricing.

## V\*S Master modification - E2

Inverter Duty and Vector Duty

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### Brakes

#### Disc type A-C magnetic, electric release - mechanical set

ABB does not specify the type or size of brake to be used on any application. It is recommended that designs and requirements be reviewed wherever product applications require a high level of performance, where operating conditions are difficult, or where there is a potential abnormal hazard involved.

This modification may affect the motor's operating efficiency. In applications where efficiency levels must meet specific requirements, the addition of this modification may result in efficiencies lower than those of published non-modified designs.

The following information is required at time of order entry:

- Brake make, series or model number
- Torque rating
- Enclosure
- Brake voltage, frequency
- Mounting position - horizontal or vertical
- Brake modification requirements (e.g., space heaters)
- The type brake application "holding or stopping"

The static torque is calculated by  $[(5252 \times \text{Hp})/\text{RPM}] \times \text{brake service factor}$ .

#### General brake descriptions

ABB currently uses Dodge and Stearns brakes. Please refer to following tables for availability by frame. Pricing is available in the medium AC motor configurator. Both brake types will be supplied with splined hubs and equipped with a manual release. The operating range of the normal brake is -25°C.

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### Brake enclosure

#### Standard

Suitable for indoor or semi-protected outdoor installations involving chips, or nonabrasive, non conductive, and non-explosive dusts and coolants.

#### Dust-tight

Suitable for enclosed motors used under conditions of extreme abrasive or conductive dusts, acid or alkali fumes, or for outdoor installations. Not suitable for washdown or hosedown applications.

#### Explosion-proof

Available for Class I, Groups C and D and Class II, Groups E, F and G, Division I, hazardous conditions. The brake must be approved for the same class and group of hazardous conditions as the motor. Refer to variable speed AC products for quotation if not listed.

## V\*S Master modification - E2

Inverter Duty and Vector Duty

### Washdown/hosedown

Designed to meet NEMA standard MG1-1.26.5 “water-proof” machines. This brake has been subjected to a hose test. (This test consists of spraying the brake with a stream of water through a 1.0" dia. nozzle at the rate of 65 gallons per minute at a distance of 10 feet from all directions for a minimum of 5 min.)

### Marine duty

Suitable for marine environments described under the area of classification of IEEE 45. Also suitable for harsh environments.

### Provisions for brake mounting only

These provisions are for mounting Dings, Dodge or Stearns brakes only with the torque ratings as listed by frame size for mounted brakes. (Provisions for mounting Warner brakes are no longer available) All other brake types may require additional charges for special mounting dimensions, shaft sizes or greater torque. At time of quotation and order entry, please provide the brake make, model, torque and brake dimension sheet.

Standard provisions<sup>(1)</sup> are available on 180-L449 frames. Alternate provisions<sup>(1)</sup> are available on 180-360 frames. Refer to the medium AC motor configurator for pricing.

(1) Critical C-face and shaft dimensions for “standard” and “alternative” provisions are shown in the chart below. For brake mounting provisions, other than those shown in the chart, contact ABB sales support for quotation.

### Definition of standard & alternative mounting provisions

Frame size	Standard provisions			Alternative provisions		
	FAK	FAH	FU	FAK	FAH	FU
180	4.5	1.62	0.875	8.5	2.22	0.875
210	8.5	1.75	1.125	4.5	1.38	1.125
250	8.5	2.06	1.375	4.5	2.18	1.375
280	8.5	3.83	1.625	10.5	3.68	1.625
320	12.5	2.94	1.875	8.5	4.44	1.625
	-	-	-	10.5	4.44	1.625
360	12.5	3.1	1.875	8.5	2.5	1.625
	-	-	-	10.5	2.5	1.625
400	12.5	5.39	2.125	-	-	-
440	12.5	4.5	2.375	16	4.5	2.375
447 - L449	16	4.5	2.375	-	-	-

### Special voltage for brakes

If the motor requires a special voltage adder, or the voltage of the brake is different than the motor an adder is required. Refer to the medium AC motor configurator for pricing.

### Vertical mounting for brakes

Stearns brakes require modifications for vertical operation when greater than 15° off horizontal. Specify whether motor has shaft extension up or down. This is available in NEMA 2 or NEMA 4 enclosure. Refer to medium AC motor configurator for pricing.

## V\*S Master modification - E2

Inverter Duty and Vector Duty

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### Space heater for brakes

Stearns brakes requiring a space heater, refer to medium AC motor configurator for pricing. Space heaters are available for 115 or 230 volts only.

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### Brakes mounted

These brakes are mounted using a 56 C-face (4.5"") only and are not available in any other frame size. Dodge washdown brakes are constructed with an aluminum housing, and may not be suitable in some environments. Refer to medium AC motor configurator for pricing.

These footnotes apply to brakes on the next page

- (1) Available for single-phase power only.
- (2) Maritime series.
- (3) Brake O.D. will extend beyond the foot mounting plate.
- (4) All Division 2 applications must be a UL labeled Division 1 brake.
- (5) The operating range of these brakes is from -60°C to 40°C.
- (6) Non-XP applications: Stearns 56,000 / XP application: Stearns 65,000 series.
- (7) Brakes are limited to 3600 RPM or slower horizontal; 2400 RPM or slower vertical.
- (8) This modification includes the brake and mounting provision for the brake.
- (9) Brake cannot be mounted on TEFC enclosures in this frame size due to mechanical limitations of fan cover mounting bolts. Brakes in these cases limited to TENV
- (10) Two main brake applications include stopping and holding. Brake manufacturers recommend that in holding application that the brake not be supplied at less than a 1.0 SF nameplate Hp (without review by the manufacturer). Stopping application requires a 1.4 SF. Be advised that the application or industry standards may require as much as a 2.0 or more SF. Make sure to cover all applicable standards.
- (11) Crane & Hoist applications require a separate redundant brake system not dependent on the motor shaft to stop or hold the load.
- (12) This brake is limited to 1200 RPM and slower. Not available in a vertical application.
- (13) XP encoder can not be added to an XP brake

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

**Stearns brakes** <sup>(1) (8) (10) (11)</sup> Available in Standard; Dust-Tight (XT); Explosion proof <sup>(1) (4) (13)</sup> CLI GR C, D; CLII GR E, F, G; Washdown <sup>(1)</sup> BISSC #29 IP55 and Marine Duty <sup>(1) (2) (5)</sup> IEEE#45 unless noted. Refer to medium AC motor configurator for pricing.

Frame	Brake torque (lb.-ft.)	Availability
180	10 <sup>(6)</sup>	-
	15 <sup>(6)</sup>	-
	25 <sup>(6)</sup>	-
	35 <sup>(6)</sup>	-
210	10	-
	15	-
	25	-
	35	-
	50	-
250	35	-
	50	-
	75	-
	105	-
280	50	Washdown not available
	75	Washdown not available
	105	Washdown not available
	125 <sup>(7)</sup>	Washdown not available
	175 <sup>(7)</sup>	Washdown not available
320	75	Washdown not available
	105	Washdown not available
	125 <sup>(7)</sup>	Washdown not available
	175 <sup>(7)</sup>	Washdown not available
360	230 <sup>(7)</sup>	Washdown not available
	105	Washdown not available
	125 <sup>(7)</sup>	Washdown not available
	175 <sup>(7)</sup>	Washdown not available
400	230 <sup>(7)</sup>	Washdown not available
	330 <sup>(7)</sup>	Washdown not available
	440 <sup>(7)</sup>	Washdown and Explosion proof not available
	230 <sup>(7)</sup>	Washdown not available
440	330 <sup>(7)</sup>	Washdown and Explosion proof not available
	440 <sup>(7)</sup>	Washdown and Explosion proof not available
	550 <sup>(12)</sup>	Washdown and Explosion proof not available
447 & 449	440 <sup>(7)</sup>	Washdown and Explosion proof not available
	550 <sup>(12)</sup>	Washdown and Explosion proof not available
	750 Marine Duty <sup>(12)</sup>	Washdown and Explosion proof not available

For all footnotes, see page 93.

**CE label (see “markings”)****CSA monogram (see “markings”)****Cable glands (see “leads”)****Close coupled pump construction (see “mounting”)**

## V\*S Master modification - E2

Inverter Duty and Vector Duty

### Conduit box

Stearns brakes requiring a space heater, refer to medium AC motor configurator for pricing. Space heaters are available for 115 or 230 volts only.

### Standard

For frames		
Enclosure	180-210	250-449T
TEFC	Aluminum	Cast iron
TENV	Aluminum	Cast iron
TEBC	Aluminum	Cast iron
FC CP/XT	Cast iron	Cast iron

NPT threads are standard in cast iron conduit boxes – for other threads, contact ABB sales support for quotation assistance.

### Cast iron

#### List price addition by frame size

Material	180	210	250	280	320	360	400	440	447 - L449
Cast iron					Standard	\$182	\$182	\$182	\$304

Cast iron conduit box standard on CP/XT & 841XL mechanical construction motors.

### Oversize

Standard conduit boxes are sized with internal volumes greater than NEMA standards. List price adders from the table below provide one size larger conduit box for motors in frame sizes 180-445.

#### List price addition by frame size <sup>(1)(2)</sup>

Material	180	210	250	280	320	360	400	440	447 - L449
Steel	-	-	-	-	-	-	-	\$159	-
Cast iron (non-XP)	\$96	\$96	\$126	-	\$139	-	-	\$196	-

(1) If both cast iron and oversize are required, make the individual adders from both tables.

(2) In some cases, conduit boxes with larger or smaller conduit openings are available. Contact ABB sales support.

Motors with IEEE 841 mechanical features are provided with a cast iron conduit box larger than the NEMA standard volume requirement

### Location

Standard conduit box location is side mounted on frames 180-449. Conduit box mounted on top of O.D.E. bracket is available on TE motors in frames 180-449. (Specify F-1, F-2 or other mounting arrangement to signify desired lead orientation) Top mounted conduit boxes are not available on Division I enclosures. Refer to medium AC motor configurator for pricing for top mount conduit box.



**V\*S Master modification - E2**

Inverter Duty and Vector Duty

**Auxiliary / separate**

Two types of auxiliary conduit boxes are available for the termination of accessory device leads. Type 1<sup>(1)(2)</sup> auxiliary boxes are mounted on the side of the main box, opposite the drive end; therefore the main box must be of cast iron construction. Type 2<sup>(3)</sup> auxiliary boxes are mounted on the motor end bracket(s), typically on the O.D.E., on the opposite side of the motor from the main box.

XP motors are not available with Type 1 auxiliary boxes. Maximum number of leads that can be routed to auxiliary boxes and the maximum number of boxes that can be mounted on motors varies by frame size and enclosure. If more than two auxiliary conduit boxes are specified and/or if number and location of boxes is critical, contact ABB for assistance. Refer to the medium AC motor configurator for pricing.

(1) Not available on XP motors.

(2) Also requires adder for cast iron main box, CP/XT features or 841XL mechanical features.

(3) XP boxes limited to 2 leads each on 180-210 frames, 4 leads each on 250-449 frames.

Thermostats and space heaters have two leads per set while stator thermistors have two leads per set of three. Stator thermocouples have 12 leads per set of six, and stator RTD's have 12 leads per set of six (two-wire) devices.

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**Connections****Neutral leads**

Neutral leads can be furnished on any modified motor. Wye connected motors, single- or dual-voltage, require a price addition. Refer to the medium AC motor configurator for pricing.

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**Direction of rotation****Phase sequence**

V\*S Master TEFC motors utilize bi-directional cooling fans. When rotation direction is required to be called out on the motor, a phase sequence nameplate can be supplied. Refer to the medium AC motor configurator for pricing. Direction of rotation shall be referenced facing the O.D.E. of the motor.

If a rotation arrow is required in addition to the phase sequence nameplate, specify "rot. arrow req'd" in special features and it will be provided at no additional charge. A rotation arrow alone is not available.

## V\*S Master modification - E2

Inverter Duty and Vector Duty

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### Documentation

When specified with the motor order, the following documentation is available for an additional fee. Refer to the medium AC motor configurator for pricing. All data submittals include standard data transmittal and certification sheet in standard format.

- Standard tabulated outline dimension sheet
- Standard wiring/connection diagram
- Standard installation, operation and maintenance bulletins
- Standard renewal parts bulletins for standard construction
- Standard tabulation (typical) performance data sheets – apply addition for each specific voltage condition
- Completion of customer performance tabular data sheets – using typical performance data only
- Special tagging or special marks on software not a part of Baldor-Reliance's standard format will be charged on a per sheet basis
- UL certificate

The data available is provided as quality black print on white paper, suitable for reproduction. AS AN ALTERNATIVE to paper copies, any engineering data, curve and drawing can be supplied in electronic format (.tif or .pdf file only) via e-mail – specify e

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### Dowel pins - provisions

Standard is (2) two holes only. For (4) four holes (one on each foot) the adder will be double. Refer to medium AC motor configurator for pricing.

Alignment holes are 30° off vertical, one in a D.E. foot and one in an O.D.E. foot diagonal to each other. This modification is only available for 254-449 frame motors.

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### Drains

#### Drain plugs and breathers

Standard horizontal TEFC or TENV motors with F-1 or F-2 mounting are provided with drain holes that are plugged. For vertical motors or special automatic drains, refer to the medium AC motor configurator for pricing. Stainless steel T-drains<sup>(1)</sup> are available for TENV and TEFC enclosures. Automatic drain for any Div I motor (Crouse-Hinds)<sup>(2)</sup> will be required for XP enclosures.

(1) T-drains are standard on CP/XT non-XP motors. Breather drains may be added to Division 1 motors. See table above.

(2) XP CP/XT enclosures do not include drains as standard: if required, add from table. XP breather drain is stainless steel..

#### Drain or weep hole in conduit box

A 7/32" hole can be provided in a cast iron conduit box. Refer to medium AC motor configurator for pricing. (Not available on XP Division I motor or in non-cast iron boxes).

#### Drip cover – for foot mounted motors only

Drip covers can be furnished (and are recommended) on standard TEFC horizontal motors for extra protection from dripping liquids and falling objects when the motor is mounted in vertical shaft down position. Contact ABB for quotation on motors with encoders.

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

**Drip cover – vertical lifting provisions provided (shaft down only)**

Drip covers can be provided with vertical lifting provisions. Refer to the medium AC motor configurator for pricing.

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**Ductile iron**

For remote locations, where an extra degree of reliability and protection is required, ductile iron components for enclosed motors are available. Includes ductile iron frame, end brackets and conduit box. Refer to medium AC motor configurator for pricing.

Ductile Iron modifications will cause extended lead times. For delivery cycles, contact ABB. Oversize ductile iron conduit boxes are not available for XP motors in 440 frames.

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**Enclosures**

IP54 – CP/XT chemical processing/extra tough enclosure for IP54<sup>(1)(2)</sup>. For modified TEFC, TENV and Division I motors in frames 180 to L449, refer to the medium AC motor configurator for pricing.

(1) XP CP/XT motors are not equipped with drains as standard

(2) XT adder does not include 1.15 service factor

**IP55 – CP/XT with lip seals**

Available in 180-to L449 frame motors.<sup>(1)(2)</sup> Refer to medium AC motor configurator for pricing.

(1) XP CP/XT motors are not equipped with drains as standard

(2) XT adder does not include 1.15 service factor

**IP56 – CP/XT with lip seals, O-rings and XP breather drain**

Available in 180-to L449 frame motors.<sup>(1)(2)</sup> Refer to medium AC motor configurator for pricing.

(1) XP CP/XT motors are not equipped with drains as standard

(2) XT adder does not include 1.15 service factor

**841XL mechanical features / IP55**

- This modification provides mechanical features to inverter duty AC motors in accordance with IEEE841 specification as far as possible. Inverter duty AC motors are not covered by the IEEE841 specification. This modification will add such 841XL features as two Inpro seals, foot flatness tolerance, vibration standards, lead lugs, XT features, etc. Inverter duty motors with this modification will not necessarily meet the winding and bearing temperature rise, noise levels, etc. of the fixed speed IEEE841 specification.
- The motor will be stamped, for example, V\*S Master with 841XL mechanical features on the blank line of the nameplate.
- Adders from the medium AC motor configurator must be made to the appropriate totally enclosed horizontal base unit. Contact ABB sales support for vertical mounting quotation for motors with 841XL mechanical features.
- IEEE 841 does not apply to Division I motors, therefore XP motors will not be nameplated “841XL.”

## V\*S Master modification - E2

Inverter Duty and Vector Duty

### Division II –V\*S Master

- This modification provides a Division II rated V\*S Master TEFC inverter duty motor, 1000:1 CT speed range.
- The CSA monogram will be supplied at no charge when requested.
- Depending on the constant torque speed range required, the base speed of the motor, the group, class, temperature code, etc. additional ratings are available. Nearly all TEFC V\*S Master Inverter Duty motors can be rated for Division II applications at some temperature codes, depending on the above application parameters. If an encoder is required, it also must be rated for Div I or Div II applications.
- The National Electric Code (NEC) defines Division II as an area in which the motor would not come in contact with hazardous material under normal operating conditions.
- V\*S Master Division II modification – refer to the medium AC motor configurator for pricing.
- The below ratings are for 1000:1 constant torque (zero speed), TEFC, 1800 RPM base speed V\*S Master motors with "standard" ambient, altitude, service factor, etc.
- Div II, Cass II, Group G also requires taconite seal to be selected separately in the medium AC motor configurator.

Enclosure	Base speed	Frame	T code <sup>(2)</sup>	Temp.
TEFC	1800	180 - 449	T3	200°C
TEFC <sup>(1)</sup>	1200	180 - 449	T3	200°C
TEFC	1800	L449	T2D	215°C
TEFC	1200	L449	T2D	215°C

(1) 400 - 440 built as 6 pole, 4 pole (1200 RPM) rated T2D.

(2) Other T codes may be available; contact ABB.

### Encoders (see “feed back devices”)

### End shields

#### End shields for NEMA frames only Single end C-face or D-flange

Enclosed end shield on the drive end only can be replaced with a C-face or D-flange end shield. Refer to medium AC motor configurator for pricing. This adder is available on 180-L449 frames and does not include drip cover.

- 180 and 210 frame footless motors will be provided in L180 and L210 frames.
- Footless L449 frames not available – mounting feet MUST be utilized on these motors.
- 180 frame TE motors can be built with a 140 frame C-face and shaft on the drive end. BA dimension will be non-NEMA.

#### C-face opposite drive end

This adder includes a standard double shaft as defined by NEMA as well as a C-face on the O.D.E. of the motor. For double C-face use both the C-face and O.D.E. C-face adders. This adder is available on 180-L449 frames. Refer to medium AC motor configurator for pricing.

- Footless L449 frames not available – mounting feet MUST be utilized on these motors.

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

**End shields for IEC frames only****B-5 mounting (available as a footless motor only)**

This adder is available on IEC 112-280<sup>(1)</sup> frames. Refer to the medium AC motor configurator for flange options and pricing.

(1) L280 frames only available as vertical shaft down.

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**Export boxing and air freight packaging****Air freight packaging**

A wood slatted crate specifically designed, and recommended, for air shipments. Refer to medium AC motor configurator for pricing.

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**Fans**

Standard fan material is a reinforced corrosion resistant plastic that is highly resistant to chemical attack. Bronze fans are available in 180-L449 frames. Aluminum fans<sup>(1)</sup> are available in 250-L449 frames. Motors in 400-L449 frames with metal fans are equipped with steel or cast iron fan cover. Lead times will be extended – contact ABB for cycle details.

(1) Not available for motor speeds above 1800 RPM.

## V\*S Master modification - E2

Inverter Duty and Vector Duty

### Feedback devices (encoders)

See the medium AC motor configurator for a complete list of available encoders and encoder specifications as well as pricing.

Encoders					
Type	PPR	Power VDC*	Max oper. temp.	Max oper. speed	Hollow shaft encoders
					Output
BEI HS-35	Up to 5000	5-15v	70°C	6000 RPM	Single
Dynapar HS35R	Up to 5000	5-26v	85°C	3600 RPM	Single and dual
NorthStar HSD35	Up to 5000	5-26v	85°C	6000 RPM	Single and dual
Avtron HS35M	1024, 2048, 4096	5-24v	85°C	3600 RPM	Single
Avtron HS-45	Up to 5000	5-26v	100°C	5000 RPM	Single and dual
NorthStar HS-56	Up to 1024	5-15v	80°C	3600 RPM	Single and dual
Avtron HS-M4	Up to 1200	5-18v	85°C	5000 RPM	Single and dual
Avtron M685	Up to 2048	5-18v	70°C	3600 RPM	Single and dual

#### Hollow shaft encoders

Mount on motor stub shaft with no coupling required. A tether-arm mounts to the motor bracket and provides insulation from shaft currents. Standard output is two channels (A & B), quadrature. Div 2 available.

#### BEI HS-35

A photoelectric encoder suitable for applications involving robotics, oil service & web process control. Enclosure meets IP65. Comes standard with a 10 pin mating MS connector. Ratings with 5-26 VDC available, specify on order.

#### Dynapar HS35R

A photoelectric encoder. Enclosure meets IP66. Comes standard with a 10 pin mating MS connector, available 5-15 VDC. Extended temp of 100°C available.

#### NorthStar HSD35

A photoelectric sealed hollow shaft encoder. The industrial duty latching connector is standard. Extended temp of 100°C available. Meets IP67.

#### Avtron HS35M

Magnetic hollow shaft encoder with a 10 pin mating MS connector. Div 2/Zone 2 available.

#### Avtron HS-45 replaces HS-M3

A photoelectric encoder suitable for mill duty applications. Enclosure is sealed against dust & water ingress. Comes standard with a 10 pin industrial connector.

#### NorthStar HS-56

A magnetoresistive encoder suitable for applications involving grease, salt water, dust or other common contaminants. Enclosure is chemical resistant to salt spray, most solvents, mild acids & bases. Comes standard with an epic style industrial connector.

#### Avtron HS-M4

A magnetoresistive encoder suitable for heavy mill duty applications. Enclosure is liquid & dust tight, and a stainless steel breather drain is supplied. Comes standard with a 10 pin industrial connector.

\* Encoder output voltage will be equal to the input voltage, unless specified otherwise. See V\*S Master configurator for other voltage and PPR options.

**V\*S Master modification - E2**

## Inverter Duty and Vector Duty

					Coupled encoders
Type	PPR	Power VDC*	Max oper. temp.	Max oper. speed	Output
Avtron M3	1024/2048	5-18v	85°C	5000 RPM	Single Dual
Avtron M4	1024/2048	5-18v	85°C	5000 RPM	Single Dual
Dynapar H56	1024/2048	5-26v	80°C	3600 RPM	Single Dual
Avtron M485	512/1024	5-15v	70°C	3600 RPM	Single Dual

**Coupled encoders**

Mounts to motor with the use of a stub shaft, flexible shaft coupling & flange adapter (flower pot). Standard output is two channels (A & B), quadrature. May not be suitable for TEBC motors.

**(1) Avtron M3**

A photoelectric encoder suitable for mill duty applications. Enclosure is sealed against dust & water ingress. Comes standard with a 10 pin epic industrial connector.

**(2) Avtron M4**

A magnetoresistive encoder suitable for heavy mill duty applications. Enclosure is liquid & dust tight, and a stainless steel breather drain is supplied. Comes standard with a 10 pin epic industrial connector.

**(3) Dynapar H56**

A direct replacement for the RD62 for mill duty applications. The H56 is a photoelectric encoder suitable for severe duty applications. Enclosure meets IP66. All Dynapar encoders are CE labeled.

**(4) Avtron M485**

A magnetoresistive encoder suitable for severe duty applications. Enclosure is sealed against dust & water ingress. Comes standard with a 10 pin industrial connector.

\* Encoder output voltage will be equal to the input voltage, unless specified otherwise. See V\*S Master configurator for other voltage and PPR options.

					Bearingless encoders
Type	PPR	Power VDC*	Max oper. temp.	Max oper. speed	Output
NorthStar Slim Line ST85	Up to 2048	5-15v	90°C	8000 RPM	Single
Avtron AV85	Up to 5000	5-24v	100°C	5000 RPM	Single Dual
Avtron AV285	512, 1024	5-15v	80°C	3600 RPM	Single Dual
NorthStar RT 8	Up to 2400	5-26v	100°C	7000 RPM	Single Dual

**Bearingless encoders**

Mounts directly to the motor stub shaft without bearings or couplings. The pulse wheel of this type of encoder mounts directly to the motor stub shaft, which is then encased by the bracket of the encoder.

**NorthStar Slim Line ST85**

A magnetoresistive encoder suitable for mill duty applications. Enclosure allows for heavy machine vibration and accidental impacts. The SL85 adds only 1.25" to overall motor length. Comes standard with 10 pin epic style industrial connector. Extended temp of 120°C available.

**Avtron AV85**

Magnetic, heavy mill duty, 8.5 inch C-face fit with a 10 pin industrial connector. Suitable down to -40°C. Enhanced version of M85.

**Avtron AV285**

A magnetoresistive encoder suitable for heavy mill duty applications. Enclosure is made of a heavy duty cast housing. Comes standard with 10 pin epic style industrial connector.

**NorthStar RT8**

A magnetoresistive encoder suitable for rugged mill duty applications. Enclosure is made of ductile cast iron. Comes standard with 10 pin epic style industrial connector. Extended temp of 125°C available.

\* Encoder output voltage will be equal to the input voltage, unless specified otherwise. See V\*S Master configurator for other voltage and PPR options.

V\*S Master modification - E2  
Inverter Duty and Vector Duty

Feedback devices (encoders) (continued)

Explosion-proof encoders					
Type	PPR	Power VDC*	Max oper. temp.	Max oper. speed	Output
Dynapar X25	Up to 2500	5-26v	70°C	5000 RPM	Single

**Explosion-proof encoders**  
A coupled encoder approved for National Electric Code (NEC) Class I & II, Division I & II, Groups C, D, E, F & gas UL listed, explosion-proof

**Dynapar X25**  
A photoelectric encoder suitable for explosion proof applications & environments. Enclosure meets IP 56. Comes standard with terminal strip located inside encoder housing. Cannot be used with opposite drive end brake.

\* Encoder output voltage will be equal to the input voltage, unless specified otherwise. See V\*S Master configurator for other voltage and PPR options.

Provisions for mounting only

Applicable to TENV & TEFC enclosures. Requires specific brand and part number with order entry. Refer to the medium AC motor configurator for pricing of the following provision options.

- Machined motor bracket, adapter, stub shaft and coupling for mounting of 56 C-face or other encoders.
- Standard shaft extension for hollow shaft encoders, includes cover for shaft extension
- Complete provisions only for bearingless encoder. Includes machined motor bracket, adapter if required, shaft and cover.

Grease and grease fittings (see “lubrication”)

Grounding

All motors 182-L449 have provisions for grounding.  
Explosion-proof motors are permitted to have a frame ground, but electrical ground in conduit box must also be connected.

- 180-210 motors with CP/XT features are provided with a mounted clamp-type grounding lug in the conduit box.
- All other 180-210 motors (including XP/XT) will be provided with a green ground lead.
- All 250-449 motors including standard CP/XT and XP will be provided with a clamp-type grounding lug in conduit box.
- The following provisions can be added on 180-440 frames. Refer to the medium AC motor configurator for pricing.

Modification	Description
Servit post <sup>(1)</sup>	In conduit box in lieu of one box mounting bolt
Hole in frame (foot)	3/8 - 6 drilled & tapped
Copper pad	1" thick, 3/8 -16 tapped hole
Stainless steel pad	1" thick, 3/8 -16 tapped hole

(1) Not available in XP enclosures  
(2) 447 - L449 frames have 1/2 - 13 drilled and tapped hole

Hardware, stainless steel

#304 stainless steel hardware, limited to external fasteners (holding brackets, conduit box, fan cover and inner caps) only. All fasteners will be hex head only. Non-XP available in 180-L449 frames. XP only available on 180-320 frames. Refer to medium AC motor configurator for pricing.



**V\*S Master modification - E2**

Inverter Duty and Vector Duty

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**Hydraulic pump mount construction (see “mounting”)**

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**Insulation**

V\*S Master Inverter and Vector Duty motors have Class F insulation as standard. Class H insulation is available<sup>(1)(2)</sup>. Refer to the medium AC motor configurator for pricing.

(1) For use in TEFC motors above 65°C ambient, contact ABB sales support.

(2) Division I motors may not show “H” in the insulation class block of the nameplate but may show “Class H materials” on the blank line of the nameplate

**Type of insulation**

Type FE<sup>(1)</sup> of Type FJ<sup>(2)</sup> insulation can be added to the standard Type F insulation. Refer to the medium AC motor configurator for pricing.

(1) Epoxy insulation dip-bake. Available on 360-L449 frames.

(2) Tropicalized/anti-fungal. Available on 180-L449 frames.

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**VPI encapsulated windings**

This insulation system is not suitable for ambient temperatures below -25°C. The following options are available for VPI on 180-L449 frames. Refer to the medium AC motor configurator for pricing.

- VPI
- VPI suitable for IEEE #429 w/o test<sup>(1)</sup>
- VPI suitable for IEEE #429 with non-witnessed and witnessed test

(1) IEEE #429 is water immersion test

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**IP54, IP55, IP56 (see “enclosures”)**

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**Labels (see “markings”)**

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**Leads****Leads – extra long**

Leads longer than standard 6" are available on (3) three lead (single voltage) motors only. Extra long leads are available up to a maximum length of 96" on 180-L449 frames. Refer to medium AC motor configurator for pricing (in 12" (or portion thereof) increments).

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

**Leads – sealed construction**

This modification provides for “potted” or “chicoed” lead opening between motor frame and conduit box. Available only on motors with XT features or 841XL mechanical construction in frame sizes 180-L449. Refer to the medium AC motor configurator for pricing. Oil-mist lubricated motors are designed as standard with sealed lead construction and do not require this adder (unless an auxiliary conduit box is specified – if aux. box is required on these motors, add per the medium AC motor configurator). If an aux. conduit box is required on grease lubricated motors, double the adder from the medium AC motor configurator to have both sets of leads sealed.

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**Lead lugs / terminals**

[Crimp type (compression) lugs]

Burndy Hylug or YA crimp type lead terminals can be supplied on 180-L449 frames. Refer to medium AC motor configurator for pricing.

**Terminal blocks / strips**

Terminal blocks<sup>(1)</sup> or strips<sup>(2)</sup> are available for TEFC or TENV 180-L449 frame motors. Insulated stud type terminal blocks/strips (screw type terminal blocks/strips on 180-210 frames) may be provided for 3 lead motors on single voltage in the standard conduit box. These terminal blocks/strips are designed to accept single hole lugs from the customer. Refer to the medium AC motor configurator for pricing.

(1) For power leads

(2) For accessory leads (aux. box only)

**Cable glands**

Metal industrial grade cable glands with a metric outlet opening are available for TEFC or TENV enclosures in frames 180-L449, both horizontal and vertical. Refer to the medium AC motor configurator for pricing. This adder is per conduit box; if an aux. conduit box is required, double the adder from the medium AC motor configurator to have both equipped with cable glands. This adder also requires the use of a cast iron conduit box – refer to the medium AC motor configurator for the adder from “conduit box” section in addition to the cable gland adder.

It is necessary to provide the cable size/type with orders to minimize improper cable gland size and type selection. If the cable size and type specified by the customer are incompatible with ABB’s standard configuration, additional price adders, delivery time and/or alternate specifications may be necessary. For example, ABB’s standard threads are “M” threads – for “Pg” or other non-standard threads, contact ABB for assistance.

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

**Lubrication****Grease**

Bearings furnished in 182 - L449 motors are lubricated with Exxon Polyrex EM grease, with the exception of roller bearing applications where Mobil Mobilith SHC-220 grease is used. Special greases for roller bearings must be reviewed by ABB prior to quotation. See medium AC motor configurator for other brands of grease and pricing. Below is a representative sample. If ambients will be above 40°C, refer to the high ambient section. If ambients will be below -25°C, refer to the high ambient section.

Type of grease	Manufacturer & type	Standard ambient range	
		Low	High
High temperature silicone	Dow Corning	-13°F	+194°F
	DC44	-25°C	+90°C
Low temperature petroleum	Aero Shell	-76°F	+104°F
	#7	-60°C	+50°C
High temperature petroleum	Exxon/Mobil	-13°F	+149°F
	Polyrex EM	-25°C	+65°C
USDA approved	Chevron	-13°F	+194°F
	FM-NLG1 #2	-25°C	+90°C
Lithium based	Mobil	-40°F	+194°F
	Mobilith SHC-100	-40°C	+90°C

**Grease fittings**

- Removable pipe plugs are furnished in grease inlets and outlets on most motors.
- Alemite type 1610 grease fittings for TEFC and XP enclosures can be furnished at no charge on modifiable 180-440 frame motors when specified. Buttonhead grease fittings can be provided for an additional charge.
- Two automatic Keystone grease relief fittings can be furnished on modified 180-440 frame motors for an additional charge.
- Two GITS cup grease relief fittings can be supplied for an additional charge. (Not available on XP Class II)
- Refer to medium AC motor configurator for pricing.

**Oil mist lubrication**

“Oil mist lubrication” is available for Class I Group C & D, Division I motors. Not available on Class II Division I motors. The motor modified using this adder will ship with inlet and outlet plugs installed, a special lubrication nameplate, sealed lead entry into the frame and an insulation system and leads that are compatible with most lubricating oils. (If an auxiliary conduit box is required, a separate adder for sealed leads for that box will also have to be made.) Lubrication nameplate reads “oil mist lubrication” – this will indicate the motor must immediately be used on an oil mist system or filled with grease because at time of shipment no lubricant will be provided. This modification also requires the addition of XT features or 841XL mechanical construction. See medium AC motor configurator for additional information and pricing.

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

**Suitable for field conversion to oil mist lubrication**

This modification is available for Class I Group C & D, Div. I motors Not available on Class II Div. I motors. The motor modified using this adder will ship with an alemite fitting in the inlet, a plug in the outlet, a special lubrication nameplate, sealed lead entry into the frame and an insulation system and leads that are compatible with most lubricating oils.

Lubrication nameplate and tag attached to motor read - "This motor is built with grease lubricated bearings. This motor is also constructed to permit field conversion to oil-mist lubrication at a later date. In order to make this conversion, bearings must be thoroughly cleaned of all grease (or replaced with new, ungreased bearings), alemite fittings removed and all oil-mist components must be installed. This conversion is the responsibility of the end-user."

This modification also requires the addition of XT features or 841XL mechanical construction.

See medium AC motor configurator for additional information and pricing.

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**Marine duty – (undocumented)****IEEE45/ABS – IP54**

This is standard for all motors equipped with CP/XT features. The nameplate of an XT motor will be stamped as standard IEEE45/ABS - IP54 and requires only the adder for CP/XT features. To have "marine duty" stamped on nameplate, apply "non-standard markings" adder in the "Nameplates" section of the medium AC motor configurator.

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**Markings****Labels**

This modification does not require a price addition, but must be specified on the order write up to ensure labels are mounted.

- CE European community
- CSA Canadian standards assn.
- C390 Canadian efficiency evaluation
- UR UL component recognition

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**Mounting****Close coupled pump construction**

This includes a C-face bracket and either a "JM", a "JP" or a "West Coast" (TCZ) shaft extension. NEMA does not define a "JM" above a 320 frame or a "JP" above a 360 frame. Available only on enclosed motors. Refer to the medium AC motor configurator for pricing.

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

**Hydraulic pump mount construction**

For TEFC ratings use the table below. These adders are based on provisions for mounting Eaton/Vickers 25V, 30V, 35V, 45V, PVB-20, or PVB-29 (see note below). This hydraulic pump adder includes the C-face(s) and type AD open adapter(s). A standard double shaft extension is also included on double end motors.

Advise make, model number, frame size, single or double end requirement. Pumps and/or couplings will not be supplied or mounted by ABB.

Other hydraulic pump configurations with SAE standard two and four bolt mountings may be available subject to ABB review. Provide the following: pump manufacturer, drawing of pump mounting and shaft detail, length and diameter.

Refer to the medium AC motor configurator for pricing.

**Vertical footless (for vertical foot-mounted motors, refer to “drip cover” mod.)**

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**Nameplates****Non-standard markings**

For non-standard markings on standard motor nameplates apply the following price addition to the basic modified motor price. The only character height available is 3/32 inches. All other special character heights or special fonts must be authorized by ABB sales support. Refer to the medium AC motor configurator for pricing.

**Additional motor nameplates**

Motor identification nameplates for remote mounting by customer will be furnished when specified on order write-up. Refer to the medium AC motor configurator for pricing. Adder is per nameplate.

**Foreign language nameplate**

Nameplates are available in a foreign language. Refer to the medium AC motor configurator for pricing. Adders are per nameplate per translation. A standard English motor nameplate will be provided on all motors in addition to the foreign nameplate.

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**Non-reverse ratchet / backstop**

This is a clutch mounted on the O.D.E. of the motor. At time of order entry the direction of rotation must be supplied, based on a reference point facing the O.D.E. of the motor. Delivery cycles will be extended for motors requiring this modification. Contact ABB for cycle details.

A direction of rotation arrow and phase sequence nameplate are included in this adder.

This modification is available for Class I Groups C & D; Class II Groups F & G Division I motors. This modification is not available for Group E Division I motors.

Refer to the medium AC motor configurator for additional information and pricing.

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**Oil mist lubrication (see “lubrication”)**

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

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**Paint**

The standard ABB paint system is a an epoxy system with 2 to 3 mils dry film thickness in Blue-Green color (Munsell No. 8.5 BG 3.57/2.0). Additional options include:

**Color change only**

This adder covers a special color of the standard Baldor-Reliance finish only.

- Black - (Federal standard 27038 for reference only)
- Yellow - (Federal standard 23655 for reference only)
- Gray - ANSI 61
- Blue - RAL 5010
- Orange - RAL 2010

**Other international paint color**

- ANSI (USA)
- AS 27005 (Australian)
- BS 381C (British)
- BS 4800 (British)
- RAL (European)
- FEDERAL 595B (USA)

**Custom color chip or Munsell number**

The following paint systems are also available.

- Omega (C3)
- Extreme (CSM)

Refer to the medium AC motor configurator for further details and pricing.

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**Phase sequencing (see “direction of rotation”)**

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**Rotation arrow (see “direction of rotation”)**

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**Seals**

- V-ring slingers are available on the D.E. or both D.E. and O.D.D. of 180-L449 frames. Refer to the medium AC motor configurator for pricing.
- V-ring slingers are standard on both ends of CP/XT and MC motors.

## V\*S Master modification - E2

### Inverter Duty and Vector Duty

#### Lip seals

Lip seals use a neoprene element to provide a rubbing shaft seal to exclude contaminants such as oil, water, and dust from entering the bearing cavity. Seals can be provided on one or both ends of the motor in 180-L449 frames. Refer to the medium AC motor configurator for pricing.

- Not available for applications below -40°C ambient.
- Not available for Division I applications listed below: Class II, Groups E, F or G, Division I (all frames)

#### Inpro seal – bearing isolator

This is a non-contact bronze compound labyrinth seal suitable for washdown and high dust atmospheres. Since this seal is a non-contact seal, it does not affect motor efficiency.

The standard bearing isolator is not recommended for high vibration applications. If a bearing isolator is needed for such an application, contact ABB sales support for assistance.

Class II Division I motors cannot be supplied with Inpro seals. A brass labyrinth (Taconite) seal is available.

#### Taconite seal

Motors for use in abrasive/dusty atmospheres require special construction to inhibit contamination of bearing cavities. The ABB Taconite construction consists of two special brass labyrinth seals (1 each end). This modification also requires the addition of CP/XT features or 841XL mechanical construction.

Inpro seals are available on the D.E or both the D.E. and O.D.E. of 180-L449 frames. Taconite seals are only available as a set on both the D.E. and O.D.E. of 180-L449 frames. Refer to medium AC motor configurator for pricing.

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#### Service factor

If zero to base speed operation is required on V\*S Master motors (in non-hazardous duty), a service factor rating of 1.15 on inverter power may be priced by using the frame size and the list price of the next larger rating.

For inverter-fed hazardous duty AC motors (operating with a service factor greater than 1.0), contact ABB.

Contact ABB if ambient temperature is also greater than 40°C or an altitude greater than 3300 feet is required.

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#### Shafts

##### Standard double shaft

If a standard double shaft is required, make a list price adder as shown in the medium AC motor configurator. Motors built in frame sizes larger or smaller than standard for the rating will be furnished with shaft extension dimensions standard for the as-built frame.

The shaft “T”<sup>(1)</sup> and “TS”<sup>(2)</sup> NEMA dimensions for the O.D.E. are not the same as the “T” and “TS” dimensions for the D.E.

(1) “T” shaft not available in 2 pole 440 frame motors

(2) “TS” shaft not available on 180-250 frames.

## V\*S Master modification - E2

Inverter Duty and Vector Duty

### “T” vs. “TS” on drive end

T and TS shafts are not considered companion products. To substitute a standard “T” <sup>(1)(2)</sup> shaft on a rating normally built with a “TS” shaft, or vice versa, specify in the medium AC motor configurator. Available only on 280-L449 frames.

(1) “T” shaft not available in 2 pole 440 frame motors

(2) “T” shaft on 2 pole 400 frame is suitable for coupled duty only.

### Special shaft extensions

Any deviation from the dimension of a single standard shaft extension or standard double shaft extension requires a price addition from the medium AC motor configurator. There is a basic addition for the special shaft as well as an addition for the special shaft features. Below is a representative sample of modifications available. Not all modifications are available on all frame sizes. Refer to the medium AC motor configurator for additional details and pricing.

#### Table 2 - special shaft features

- Additional length <sup>(1)</sup>
- Keyway <sup>(2)</sup>
- Drilled hole: diametrically through shaft
- Threads: Class 2 right hand thread of size appropriate to shaft diameter 1 end only <sup>(3)</sup>
- Tapered 1-1/4 or 1-1/2 inch per foot with threads, locknut and washer 1 end only <sup>(3)</sup>
- Hole drilled and tapped in end of shaft 1 end only. Std: English sizes 3/8 - 16 x 1.5 deep, 1/2 -13 x 1.50 dp, 5/8 -11 x 1.75 dp, 3/4 -10 x 2.00 dp. Metric sizes M10 - 1.5 x 20mm dp, M12 -1.75 x 25mm dp, M16-2 x 35mm dp, M20 - 2.5 x 40mm; for other sizes contact ABB. <sup>(3)</sup>
- Squared: Milled flats 1 end only <sup>(3)</sup>

#### Special material:

- #416 stainless steel or Class 2 material
- #304, 316 stainless steel
- 17-4PH shaft material

(1) Additional length greater than 4 times standard shaft diameter, contact ABB.

(2) Standard endmill keyway in English dimensions only here; for other types (sleddrunner or woodruff) and/or for metric dimensions, contact ABB.

(3) To make any of these modifications to both ends of a shaft, double the list adder.

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### Shaft seals (see “seals”)

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### Software (see “documentation”)

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### Space heater

The standard space heater is a strip type heater mounted around the coil head of the motor with a maximum sheath temperature of 140°C. The heater voltage will be 120 Volts single phase unless otherwise specified. Other single phase, single voltage ratings are available: 240V, 440V, or 575V with a + or – 10% variation, suitable for use on 50 or 60 HZ power source. Space heaters are available in four options; Standard <sup>(2)</sup> and Low <sup>(3)</sup> Sheath temps for use up to 600V and Standard <sup>(2)</sup> and Low <sup>(3)</sup> Sheath temps for use above 600V <sup>(1)</sup>. Refer to medium AC motor configurator for pricing.

(1) Includes a separate/auxiliary conduit box.

(2) “std.” sheath temp heaters are used on all non hazardous duty TEFC motors

(3) Div II applications require low temp. space heater.



**V\*S Master modification - E2**

Inverter Duty and Vector Duty

**Terminal blocks / strips (see “leads”)****Tests<sup>(1)</sup>**

Each V\*S Master motor is tested to assure conformance with electrical and mechanical specifications. Each motor is given a routine test per NEMA and IEEE Std. 112.

**Routine test (witnessed and non-witnessed)**

This is a test report per IEEE Std. 112 Appendix A and includes complete nameplate information. Locked rotor test included is single phase. For a three phase locked rotor test, request it on the configuration and manually add for it. The test report does not include vibration data. If vibration data is required, it must be requested in the configuration and manually added for.

**Complete Dynamometer test (witnessed or non-witnessed)**

A complete test uses a dynamometer to verify nameplate description and electrical design characteristics. After verification the test results are supplied on a test report per IEEE Std. 112 Appendix B.

**Calibration test (witnessed or non-witnessed)**

Consists of 0 to 125% rated load test measurement of speed, torque, current, power factor and efficiency at rated voltage. The data is provided as a curve plotted on Baldor-Reliance standard format.

**Noise test (witnessed or non-witnessed)**

This test verifies sound levels per procedures defined in IEEE - 85 under a no load condition.

**Polarization index test (witnessed or non-witnessed)**

This is the recommended procedure for the measurement of insulation resistance of rotating machinery rated 1 HP (1 kW) or greater. Testing is done per IEEE #43, latest revision. Polarization Index is the ratio of a 10 min. resistance to the 1 min. resistance with constant test potential applied.

**Reed Frequency Analysis<sup>(2)</sup>****Torsional Analysis<sup>(2)</sup>**

Refer to the medium AC motor configurator for test pricing. Adders are NET adders for one, rated voltage and speed only. For test at other than rated voltage or speed, the NET price of the test will need to be multiplied by the percentage in Table A and this will need to be manually added to the order.

(1) All tests are done with sinewave power.

(2) Not affected by multi-voltage adder. Do not apply percentage per table A.

<b>Table #2 - percentage for multispeed or multiple voltage conditions tested</b>	
<b>Conditions tested</b>	<b>Adders from medium AC motor configurator</b>
1	100%
2	150%
3	200%
4	250%

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

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**Textile motors**

Fan cover of the motor is upgraded to cast iron and the grill is removed. A drip cover is then added to the fan cover. This is available on 180-L449 frames. Refer to the medium AC motor configurator for pricing.

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**Thermal protection – windings**

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**Thermostats**

- V\*S Master motors have quantity three, one per phase, normally closed (N.C.) thermostats connected in series as a standard feature. The pair of leads, P1 and P2, is brought into the main conduit box. These leads are normally connected to the Inverter function loss circuit to remove power from the motor if an over temperature condition should occur and one of the thermostats opens.
- A second set of thermostats may be specified if required. Specify if the set of thermostats should be normally closed (N.C.) or normally open (N.O.). For an additional set of three (3) normally closed (N.C.) or normally open (N.O.) thermostats on 180-L449 frames, refer to the medium AC motor configurator for pricing.

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**Thermistors**

Thermistors are available for TEBC, TEFC & TENV, 182 - L449 frames per pricing in the medium AC motor configurator.

The thermistor system consists of three PTC thermistors embedded in the motor windings plus a solid state control relay. The solid state control relay is priced and shipped separately and is for customer mounting at a remote location.

**Stator RTD**

- RTD's embedded in the stator slot are not available.
- RTD's meet US Industrial Spec. (R100C/ROC:1.3911)
- Refer to the medium AC motor configurator for pricing (does not include the readout device.)

A set of six coil-head-mounted RTD's are available on 250 - L449 frames having a maximum winding voltage of 600V. Standard RTD is a 2 lead design. Also available if specified is a 3 lead design for an additional price. One of three resistance values (100 ohm (platinum), 120 ohm (nickel), 10 ohm (copper) must appear on the order write up.

On Division I motors, the RTD leads must be brought to the main conduit box. On non-Division I motors, leads can be brought into main or auxiliary conduit box. If auxiliary box is chosen, use list. Consult ABB for voltages greater than 600V.

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**Thermocouples**

A set of six will be furnished for winding temperature detection on frames 250 - L449 having a maximum winding voltage of 600 volts. Type of thermocouples, copper or iron, must be specified on the order. The price does not include the readout device. Add \$1,726 List.

On Division I motors, the RTD leads must be brought to the main conduit box. On non-Division I motors, leads can be brought into main or auxiliary conduit box. If auxiliary box is chosen, use list. Consult ABB for voltages greater than 600V.

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

**Thermal protection – bearings**

This modification is not available for Div. I or II applications.

**Bearing RTD**

This modification is available for frames 254 - L449 only. Our standard bearing RTD is a 3 lead single element design. Each RTD is provided with a conduit box and terminal block for easy connection. Resistance value (10, 100, 120 ohm) must be included on the order write up. Note: The temperature readout device is not supplied by ABB and must be ordered separately. Additional charges are required if a bearing thermal temperature device (i.e., Bearing RTD) is to be installed in an insulated bearing; a special insulated version of the thermal device will be required in addition to the insulated bearing adder. Refer to the medium AC motor configurator for more information and pricing.

**UL component recognition (see “markings”)****Vertical footless (see “mounting”)****Vertical P-base**

Can be applied to all standard horizontal totally enclosed motors to generate P-base motor (this adder includes vertical lifting provisions and a drip cover). Contact ABB for quotation on motors with encoders. Refer to medium AC motor configurator for pricing for all options (Normal, Medium and Extended).

**Normal thrust (Hp)****Hp frame downthrust capabilities by frame size (17,500 hrs. L-10)**

RPM	180	210	250	280	320	360	400	444/445	447/L449
1800	140 lbs.	200 lbs.	620 lbs.	710 lbs.	770 lbs.	980 lbs.	890 lbs.	740 lbs.	390 lbs.
1200	190 lbs.	260 lbs.	730 lbs.	840 lbs.	920 lbs.	1,160 lbs.	1,070 lbs.	910 lbs.	610 lbs.
900	220 lbs.	300 lbs.	840 lbs.	980 lbs.	1,080 lbs.	1,340 lbs.	1,250 lbs.	1,080 lbs.	600 lbs.

(1) 280 HPH (320 size flange) available for same adder

(2) 400 HPH (440 size shaft) available for same adder

**Hp frame upthrust capabilities by frame size (17,500 hrs. L-10)**

(add to downthrust capacities above)

RPM	180	210	250	280	320	360	400	440
1800-900	0	0	110 lbs.	170 lbs.	210 lbs.	290 lbs.	420 lbs.	530 lbs.

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

**Medium thrust (LP)****LP frame downthrust capabilities by frame size (17,500 hrs. L-10)**

RPM	180	210	250	280	320	360	400	444/445	447/L449
1800	720 lbs.	980 lbs.	1,500 lbs.	1,830 lbs.	1,760 lbs.	2,160 lbs.	3,510 lbs.	3,360 lbs.	3,010 lbs.
1200	850 lbs.	1,140 lbs.	1,720 lbs.	2,090 lbs.	2,020 lbs.	2,480 lbs.	4,020 lbs.	3,850 lbs.	3,550 lbs.
900	940 lbs.	1,250 lbs.	1,900 lbs.	2,320 lbs.	2,270 lbs.	2,750 lbs.	4,470 lbs.	4,300 lbs.	3,830 lbs.

**LP frame upthrust capabilities by frame size (17,500 hrs. L-10)**

(add to downthrust capacities above)

RPM	180	210	250	280	320	360	400	440
1800-900	-200 lbs.	-200 lbs.	110 lbs.	170 lbs.	210 lbs.	290 lbs.	420 lbs.	530 lbs.

**Extended thrust (LP)****Extended downthrust capabilities (17,500 hrs. L-10)**

RPM	250	280	320	360	400	444/445	447/L449
1800	2,460 lbs.	3,010 lbs.	2,940 lbs.	3,600 lbs.	5,930 lbs.	5,780 lbs.	5,430 lbs.
1200	2,810 lbs.	3,440 lbs.	3,370 lbs.	4,120 lbs.	6,790 lbs.	6,620 lbs.	6,320 lbs.
900	3,100 lbs.	3,810 lbs.	3,760 lbs.	4,560 lbs.	7,520 lbs.	7,350 lbs.	6,880 lbs.

**Vertical jacking provisions**

This modification is provided on foot mounted motors 250 - L449 only. It is used to assist the installer in the proper alignment of the motor shaft with the driven equipment for shimming purposes. ABB will provide a tapped hole (one per foot), four per motor. A 3/8"x16 UNC threaded hole will be provided on 250 - 360 frames, a 1/2"x13 UNC threaded hole on 400 - 449 frames. The customer is responsible for providing the bolts. Refer to medium AC motor configurator for pricing.

**Vertical lifting provisions (see "drip cover")****Vibration detector**

These detectors are uni-directional; for total coverage three detectors (horizontal, vertical and axial) are required. At time of order entry the monitoring plane per detector such as horizontal, vertical and axial must be specified. Available only on 250-L449 frames. Refer to medium AC motor configurator for pricing and model options.

**V\*S Master modification - E2**

Inverter Duty and Vector Duty

—

**Voltage**

The voltages in the following table are standard on the NEMA frame inverter duty V\*S Master and V\*S Master XP AC motors. Other voltages may be available for an additional charge. Refer to medium AC motor configurator for options and pricing.

**Standard NEMA voltage chart**

<b>Up to 100 Hp</b>	<b>Larger than 100 Hp</b>
230 VAC	-
230 / 460 VAC	-
460 VAC	460 VAC
575 VAC	575 VAC

The following voltages are standard on the IEC V\*S Master AC motors.

**Standard IEC voltage chart**

<b>Up to 132 kW</b>	<b>Larger than 132 kW</b>
220 VAC	-
380 VAC	380 VAC
400 VAC	400 VAC
415 VAC	415 VAC

**Special voltage**

All voltages 500V up to 1000V add the VPI adder (see "insulation")

—

**Washdown duty – IP55 (see "enclosures")**

—

**Wye start – delta run (see "connections")**

# FEEDBACK OPTIONS



Standard Vector Drive encoder feedback (BEI)

VS Master Inverter Duty motors are available for open loop applications where no feedback is required. Baldor-Reliance VS Master Inverter Duty motors can be easily upgraded; add feedback by using an encoder kit available from stock.

Baldor-Reliance standard VS Master Vector Duty motors use an industrial quality optical encoder. This encoder is mounted directly to the motor shaft without a coupling. This "hollow shaft" method ensures reliability, shortens overall length, and allows easy substitution with other feedback devices.

For very rugged and dirty applications such as paper mills, use of a magnetic pulse generator from Avtron, BEI or NorthStar (Lakeshore) Technologies is a simple bolt-on installation.

## Feedback device for Vector Drive motors

		56C	143TC-215TC	254TC-256TC	404TC-447TC	449TC
Type	Incremental optical encoder	S	S	S	S	S
Connection	M.S. connector (plug & receptacle supplied)	S	S	S	S	S
Encoder size	H25 hollow shaft	S	S	-	-	-
	H35 hollow shaft	-	-	S	S	S
Encoder bearings	ABEC-7	S	S	S	S	S
Frequency response	100 Kilohertz standard	S	S	S	S	S
Isolation	Encoder electrically isolated from motor to prevent motor noise interference	S	S	S	S	S
Pulses per revolution	1024 PPR standard	S	S	S	S	S
Signal	Dual quadrature channels with index and compliments	S	S	S	S	S
Voltage	5-15 VDC standard	S	S	S	S	S

S = Standard.

# FEEDBACK KITS



Avtron M4 magnetic pulse generator



Dynapar HS35 optical encoder



NorthStar HS35 magnetic pulse generator



Typical feedback mounting shaft opposite pulley end

## Encoder feedback kits for IDM, IDNM and IDWNM motors

Catalog number	Type enclosure	Description	Magnetic or optical	Connector type	Input voltage	Output voltage limited	NEMA frame	Ap'x. shpg. wgt.
ENC00NV-A2	TENV	HS35M Avtron	Magnetic	TL	5-24 VDC	24	213T-215T	1
ENC00NV-B1	TENV	HS25 BEI	Optical	TL	5-15 VDC	15	56-215T	2
ENC00NV-D2	TENV	HS35R Dynapar	Optical	TL	5-26 VDC	26	56-215T	4
ENC00NV-D1 <sup>(1)</sup>	TENV	HS35 Dynapar	Optical	TL	5-24 VDC	5	56-215T	4
ENC01BC-B1	TEBC	HS25 BEI	Optical	TL	5-15 VDC	15	143T-215T	3
ENC01BC-D2	TEBC	HS35R Dynapar	Optical	TL	5-26 VDC	26	56-215T	4
ENC01BC-D1 <sup>(1)</sup>	TEBC	HS35 Dynapar	Optical	TL	5-24 VDC	5	56-215T	4
ENC01NV-A2	TENV	HS35M Avtron	Magnetic	TL	5-24 VDC	24	254T-256T	1
ENC01NV-B2	TENV	HS35 BEI	Optical	TL	5-15 VDC	15	254T-284T	2
ENC01NV-D2	TENV	HS35R Dynapar	Optical	TL	5-26 VDC	26	254T-256T	4
ENC01NV-D1 <sup>(1)</sup>	TENV	HS35 Dynapar	Optical	TL	5-24 VDC	5	254T-256T	4
ENC02BC-A2	TEBC	HS35M Avtron	Magnetic	TL	5-24 VDC	24	254T-447T	1
ENC02BC-B2	TEBC	HS35 BEI	Optical	TL	5-15 VDC	15	254T-447T	2
ENC02BC-D2	TEBC	HS35R Dynapar	Optical	TL	5-26 VDC	26	254T-447T	4
ENC02BC-D1 <sup>(1)</sup>	TEBC	HS35 Dynapar	Optical	TL	5-24 VDC	5	254T-447T	4

Note: For 56 and 140 IDVSM frame sizes use the kits from the table above.

(1) Being phased out

## Encoder feedback kits for IDVS motors

Catalog number	Motor enclosure	Type	PPR	Frame size	Mfg.	Mag or optical	Conn type	Input voltage VDC	Ap'x. shpg. wgt.
K99G72	TENV	HS35	1024	180T-250T	BEI	O	MS-ST	5-15	6
K99G74	TENV	HS35-2048	2048	180T-250T	BEI	O	MS-ST	5-15	6
K99G76	TENV	HS35	1024	180T-250T	BEI	O	MS-ST	5-24	6
K99G70	TENV	RAHS35M	1024	180T-250T	Avtron	M	MS-ST	5-24	9
K99G82	TENV	HS35R	1024	180T-250T	Dynapar	O	MS-TL	5-26	6
K99G78	TENV	HSD35	1024	180T-250T	Dynapar	O	Latch	5-26	8
K99G73	TEFC	HS35	1024	180T-440T	BEI	O	MS-ST	5-15	6
K99G75	TEFC	HS35-2048	2048	180T-440T	BEI	O	MS-ST	5-24	6
K99G77	TEFC	HS35	1024	180T-440T	BEI	O	MS-ST	5-24	6
K99G71	TEFC	RAHS35M	1024	180T-440T	Avtron	M	MS-ST	5-24	9
K99G83	TEFC	HS35R	1024	180T-440T	Dynapar	O	MS-TL	5-26	6
K99G79	TEFC	HSD35	1024	180T-440T	Dynapar	O	Latch	5-26	8
K99G80	TENV	HS35	1024	180T-250T	BEI	O	MS-TL	5-28	6
K99G81	TEFC	HS35	1024	180T-440T	BEI	O	MS-TL	5-28	6

Note: For 56-320 IDVSM frame sizes use the kits from the IDM product table.

# ENCODER FEEDBACK KITS

## IDM, IDNM and IDWNM motors



ENC00NV-B1

Does not fit some legacy 180-440 EM, CP or ECP motors. Contact your local sales office.

### Features:

- 1024 Encoder with MS twist lock connector
- HS35, HS35M, HS35R and HS25

### Applications:

- For IDM, IDNM and IDWNM motors



ENC02BC-B2

Catalog number	Type enclosure	Description	Magnetic or optical	Connector type	Input voltage	Output voltage limited	NEMA frame	Ap'x. shpg. wgt.
ENC00NV-A2	TENV	HS35M Avtron	Magnetic	TL	5-24 VDC	24	213T-215T	1
ENC00NV-B1	TENV	HS25 BEI	Optical	TL	5-15 VDC	15	56-215T	2
ENC00NV-D2	TENV	HS35R Dynapar	Optical	TL	5-26 VDC	26	56-215T	4
ENC00NV-D1 <sup>(1)</sup>	TENV	HS35 Dynapar	Optical	TL	5-24 VDC	5	56-215T	4
ENC01BC-B1	TEBC	HS25 BEI	Optical	TL	5-15 VDC	15	143T-215T	3
ENC01BC-D2	TEBC	HS35R Dynapar	Optical	TL	5-26 VDC	26	56-215T	4
ENC01BC-D1 <sup>(1)</sup>	TEBC	HS35 Dynapar	Optical	TL	5-24 VDC	5	56-215T	4
ENC01NV-A2	TENV	HS35M Avtron	Magnetic	TL	5-24 VDC	24	254T-256T	1
ENC01NV-B2	TENV	HS35 BEI	Optical	TL	5-15 VDC	15	254T-284T	2
ENC01NV-D2	TENV	HS35R Dynapar	Optical	TL	5-26 VDC	26	254T-256T	4
ENC01NV-D1 <sup>(1)</sup>	TENV	HS35 Dynapar	Optical	TL	5-24 VDC	5	254T-256T	4
ENC02BC-A2	TEBC	HS35M Avtron	Magnetic	TL	5-24 VDC	24	254T-447T	1
ENC02BC-B2	TEBC	HS35 BEI	Optical	TL	5-15 VDC	15	254T-447T	2
ENC02BC-D2	TEBC	HS35R Dynapar	Optical	TL	5-26 VDC	26	254T-447T	4
ENC02BC-D1 <sup>(1)</sup>	TEBC	HS35 Dynapar	Optical	TL	5-24 VDC	5	254T-447T	4

Note: For 56 and 140 IDVSM frame sizes use the kits from the table above.

(1) Being phased out



# TEBC BLOWER MOTOR SPECIFICATIONS

For TEBC V*S Master IDM/ZDM motors						
Main motor frame	Blower Motor specifications					
	Hp	Poles	Volts	Ph	Hz	Amps full load
143 / 145TC	0.05	2	115 / 230	1	60	0.54 / 0.27
182 / 184TC	0.05	2	115 / 230	1	60	0.27 / 0.13
213 / 215TC	0.1	2	230 / 460 207 / 415	3	60	0.4 / 0.25 0.46 / 0.27
254 / 256TC						
284 / 286TC						
324 / 326TC						
364 / 365TC	0.2	-	230 / 460 207 / 415	3	60 50	0.68 / 0.33 0.7 / 0.38
404 / 405TC						
444 / 445TC						
447-449TC						

TENV motors do not require blower cooling.

Above blowers are standard on 230 / 460v stock motors.

575 volt motor ratings use a 115 / 230v, 1 phase blower motor

Blower motors may be changed from 3 phase to 1 phase using the blower kits shown below.

# BLOWER KITS / ACCESSORIES

## Blower kits - single phase

Blower kits include blower motor, housing, and mounting hardware. Designed for use as spares or when wanting to change blower input voltage.

Catalog no.	Voltage	Phase	Hz	Frame size	Approx. weight
BLWL05-L	115	1	50 / 60	143T-145T	7
BLWL06-L	115	1	50 / 60	182T-184T	8
BLWL07-L	115	1	50 / 60	213T-215T	13
BLWL09-L	115	1	50 / 60	254T-256T	15
BLWL10-L	115	1	50 / 60	284T-286T	35
BLWL12-L	115	1	50 / 60	324T-326T	46
BLWL14-L	115	1	50 / 60	364T-365T	55

## Blower kits - three phase

Blower Motor housing and mounting hardware for spare units or different power supplies

Catalog no.	Voltage	Phase	Hz	Frame size	Approx. weight
BLWM07-F	230 / 380-460	3	60 / 50-60	213T-215T	13
BLWM09-F	230 / 380-460	3	60 / 50-60	254T-256T	27
BLWM10-F	230 / 380-460	3	60 / 50-60	284T-286T	35
BLWM12-F	230 / 380-460	3	60 / 50-60	324T-326T	46
BLWM14-F	230 / 380-460	3	60 / 50-60	364T-365T	55
BLWM16-F	230 / 380-460	3	60 / 50-60	404T-405T	70
BLWM18-F	230 / 380-460	3	60 / 50-60	444T-447T	120

Contact ABB for information for blower information on 449T, 5000 and 5800 frames.

# ACCESSORY DIMENSION SHEETS

Motors with encoders	616779-55
Motors with brakes	616779-53
Motors with brakes and encoders	616779-52
Conduit box dimensions	616779-50

# NEMA FL AND RL FRAMES

## Dimension sheet index table

NEMA frame foot mounted		
Frame	Enclosure	Dimension sheet
FL1831	TENV	617226-1
	TEAO-BC	617227-1
	TEFC	617227-1
	TEAO-PB	617227-201
FL1838	DPFV	617528-1
	TENV	617228-1
	TEAO-BC	617229-1
	TEFC	617229-1
FL1844	TEAO-PB	617229-201
	DPFV	6175230-1
	TENV	617231-1
	TEAO-BC	617232-1
FL1852	TEFC	617232-1
	TEAO-PB	617232-201
	DPFV	6175233-1
	TENV	617234-1
FL2162	TEAO-BC	617235-1
	TEFC	617235-1
	TEAO-PB	617235-201
	DPFV	6175236-1
FL2168	TENV	617516-1
	TEAO-BC	6172517-1
	TEFC	617517-1
	TEAO-PB	617517-201
FL2173	DPFV	6175202-1
	DPSV	617203-1
	TENV	617520-1
	TEAO-BC	617521-1
FL2178	TEFC	617521-1
	TEAO-PB	617521-201
	DPFV	6175206-1
	DPSV	617207-1
FL2570	TENV	617524-1
	TEAO-BC	617525-1
	TEFC	617525-1
	TEAO-PB	617525-201
FL2578	DPFV	617210-1
	DPSV	617211-1
	TENV	617572-1
	TEAO-BC	617573-1
RL2578	TEFC	617573-1
	TEAO-PB	617573-201
	DFFV	617214-1
	DPSV	617215-1
FL2586	TENV	617576-1
	TEAO-BC	617577-1
	TEFC	617577-1
	TEAO-PB	617577-201
RL2586	DPFV	617218-1
	DPSV	617219-1
	TENV	617580-1
	TEAO-BC	617581-1
RL2586	TEFC	617581-1
	TEAO-PB	617581-201
	DPFV	617222-1
	DPSV	617223-1

NEMA frame foot mounted		
Frame	Enclosure	Dimension sheet
FL2882	TENV	617241-1
	TEAO-BC	617530-1
	TEFC	617242-1
	TEAO-PB	617530-201
RL2882	DPFV	617243-1
	DPSV	617617-1
	TENV	617244-1
	TEAO-BC	617531-1
FL2890	TEFC	617245-1
	TEAO-PB	617531-201
	DPFV	617246-1
	DPSV	617618-1
FL2898	TENV	617247-1
	TEAO-BC	617532-1
	TEFC	617248-1
	TEAO-PB	617532-201
RL2898	DPFV	617249-1
	DPSV	617619-1
	TENV	619688-001
	TEAO-BC	619689-001
FL3203	TEFC	619690-001
	TEAO-PB	619689-201
	DPFV	619691-001
	DPSV	619691-101
FL3213	TENV	619692-001
	TEAO-BC	619693-001
	TEFC	619694-001
	TEAO-PB	619693-201
RL3213	DPFV	619695-001
	DPSV	619695-101
	TENV	619677-001
	TEAO-BC	619678-001
FL3698	TEFC	619679-001
	TEAO-PB	619678-201
	DPFV	619680-001
	DPSV	619680-101
FL3614	TENV	619681-001
	TEAO-BC	619682-001
	TEFC	619683-001
	TEAO-PB	619682-201
RL3614	DPFV	619684-001
	DPSV	619684-101
	TENV	619649-001
	TEAO-BC	619650-001
FL4022	TEFC	619670-001
	TEAO-PB	619650-201
	DPFV	619651-001
	DPSV	619651-101
RL4022	TENV	619652-001
	TEAO-BC	619678-001
	TEFC	619671-001
	TEAO-PB	619678-201
FL4034	DPFV	619654-001
	DPSV	619654-101

NEMA frame foot mounted		
Frame	Enclosure	Dimension sheet
FL4046	TENV	619655-001
	TEAO-BC	619656-001
	TEFC	619672-001
	TEAO-PB	619656-201
RL4046	DPFV	619657-001
	DPSV	619657-101
	TENV	619658-001
	TEAO-BC	619659-001
FL4058	TEFC	619673-001
	TEAO-PB	619659-201
	DPFV	619660-001
	DPSV	619660-101
RL4058	TENV	617533-001
	TEAO-BC	617534-001
	TEFC	617535-001
	TEAO-PB	617534-201
FL4429	DPFV	617599-001
	DPSV	617599-101
	TENV	617565-001
	TEAO-BC	617566-001
RL4429	TEFC	617567-001
	TEAO-PB	617566-201
	DPFV	617600-001
	DPSV	617600-101
FL4440	TENV	617568-001
	TEAO-BC	617569-001
	TEFC	617570-001
	TEAO-PB	617569-201
RL4440	DPFV	617601-001
	DPSV	617601-101
	TENV	617546-001
	TEAO-BC	617547-001
FL4441	TEFC	617548-001
	TEAO-PB	617547-201
	DPFV	617602-001
	DPSV	617602-101
RL4441	TENV	619613-001
	TEAO-BC	619614-001
	TEFC	619615-001
	TEAO-PB	619614-201
FL4473	DPFV	617603-001
	DPSV	617603-101
	TEAO-BC	619723-001
	TEAO-BC	619722-001
RL4473	TEAO-BC	619721-001
	TEAO-BC	619720-001
	TEAO-BC	619718-001
	TEAO-BC	619717-001
FL5820	TEAO-BC	619723-001
	TEAO-BC	619722-001
	TEAO-BC	619721-001
	TEAO-BC	619720-001
FL5822	TEAO-BC	619721-001
	TEAO-BC	619720-001
	TEAO-BC	619718-001
	TEAO-BC	619717-001
FL5824	TEAO-BC	619721-001
	TEAO-BC	619720-001
	TEAO-BC	619718-001
	TEAO-BC	619717-001
FL5826	TEAO-BC	619721-001
	TEAO-BC	619720-001
	TEAO-BC	619718-001
	TEAO-BC	619717-001
FL5830	TEAO-BC	619721-001
	TEAO-BC	619720-001
	TEAO-BC	619718-001
	TEAO-BC	619717-001
RL5800	TEAO-BC	619721-001
	TEAO-BC	619720-001
	TEAO-BC	619718-001
	TEAO-BC	619717-001

# IEC FDL AND RDL FRAME

## Dimension sheet index table

IEC frame B3 (foot mounted)		
Frame	Cooling & enclosure	Dimension sheet
FDL1106	IP44 / IC410	617226-501
	IP44 / IC416-BC	617227-501
	IP44 / IC411-FC	617227-501
	IP44 / IC416-PB	617227-701
FDL1108	IP23 / IC06	617528-501
	IP44 / IC410	617228-501
	IP44 / IC416-BC	617229-501
	IP44 / IC411-FC	617229-501
	IP44 / IC416-PB	617229-701
FDL1110	IP23 / IC06	617230-501
	IP44 / IC410	617231-501
	IP44 / IC416-BC	617232-501
	IP44 / IC411-FC	617232-501
	IP44 / IC416-PB	617232-701
FDL1112	IP23 / IC06	617233-501
	IP44 / IC410	617234-501
	IP44 / IC416-BC	617235-501
	IP44 / IC411-FC	617235-501
	IP44 / IC416-PB	617235-701
FDL1307	IP23 / IC06	617236-501
	IP44 / IC410	617516-501
	IP44 / IC416-BC	617517-501
	IP44 / IC411-FC	617517-501
	IP44 / IC416-PB	617517-701
FDL1308	IP23 / IC06	617202-501
	IP44 / IC410	617520-501
	IP44 / IC416-BC	617521-501
	IP44 / IC411-FC	617521-501
	IP44 / IC416-PB	617521-701
FDL1310	IP23 / IC06	617206-501
	IP44 / IC410	617524-501
	IP44 / IC416-BC	617525-501
	IP44 / IC411-FC	617525-501
	IP44 / IC416-PB	617525-701
FDL1609	IP23 / IC06	617210-501
	IP44 / IC410	617572-501
	IP44 / IC416-BC	617573-501
	IP44 / IC411-FC	617573-501
	IP44 / IC416-PB	617573-701
FDL1611	IP23 / IC06	617214-501
	IP44 / IC410	617576-501
	IP44 / IC416-BC	617577-501
	IP44 / IC411-FC	617577-501
RDL1611	IP44 / IC416-PB	617577-701
	IP23 / IC06	617218-501
	IP44 / IC410	617580-501
FDL1613	IP44 / IC416-BC	617581-501
	IP44 / IC411-FC	617581-501
	IP44 / IC416-PB	617581-701
RDL1613	IP23 / IC06	617222-501
	IP44 / IC410	617241-501
	IP44 / IC416-BC	617530-501
FDL1811	IP44 / IC411-FC	617242-501
	IP44 / IC416-PB	617530-701
	IP23 / IC06	617243-501

IEC frame B3 (foot mounted)		
Frame	Cooling & enclosure	Dimension sheet
FDL1813	IP44 / IC410	617244-501
	IP44 / IC416-BC	617531-501
	IP44 / IC411-FC	617245-501
	IP44 / IC416-PB	617531-701
RDL1813	IP23 / IC06	617246-501
	IP44 / IC410	61747-501
FDL1815	IP44 / IC416-BC	617532-501
	IP44 / IC411-FC	617248-501
	IP44 / IC416-PB	617532-701
	IP23 / IC06	617249-501
FDL2010	IP44 / IC410	619688-501
	IP44 / IC416-BC	619689-501
	IP44 / IC411-FC	619690-501
	IP44 / IC416-PB	619689-701
RDL2010	IP23 / IC06	619691-501
	IP44 / IC410	619692-501
FDL2012	IP44 / IC416-BC	619693-501
	IP44 / IC411-FC	619694-501
	IP44 / IC416-PB	619693-701
	IP23 / IC06	619695-501
RDL2012	IP44 / IC410	619677-501
	IP44 / IC416-BC	619678-501
FDL2210	IP44 / IC411-FC	619679-501
	IP44 / IC416-PB	619678-701
	IP23 / IC06	619680-501
FDL2212	IP44 / IC410	619681-501
	IP44 / IC416-BC	619682-501
	IP44 / IC411-FC	619683-501
	IP44 / IC416-PB	619682-701
RDL2212	IP23 / IC06	619684-501
	IP44 / IC410	619649-501
FDL2508	IP44 / IC416-BC	619650-501
	IP44 / IC411-FC	619670-501
	IP44 / IC416-PB	619650-701
	IP23 / IC06	619651-501
FDL2510	IP44 / IC410	619652-501
	IP44 / IC416-BC	619653-501
	IP44 / IC411-FC	619671-501
	IP44 / IC416-PB	619653-701
RDL2510	IP23 / IC06	619654-501
	IP44 / IC410	619655-501
	IP44 / IC416-BC	619656-501
FDL2512	IP44 / IC411-FC	619672-501
	IP44 / IC416-PB	619656-701
	IP23 / IC06	619657-501
RDL2512	IP44 / IC410	619658-501
	IP44 / IC416-BC	619659-501
	IP44 / IC411-FC	619673-501
FDL2514	IP44 / IC416-PB	619659-701
	IP23 / IC06	619660-501
	IP44 / IC410	617533-501
FDL2808	IP44 / IC416-BC	617534-501
	IP44 / IC411-FC	617535-501
	IP44 / IC416-PB	617534-701
RDL2808	IP23 / IC06	617599-501

IEC frame B3 (foot mounted)		
Frame	Cooling & enclosure	Dimension sheet
FDL2810	IP44 / IC410	617565-501
	IP44 / IC416-BC	617566-501
	IP44 / IC411-FC	617567-501
	IP44 / IC416-PB	617566-701
RDL2810	IP23 / IC06	617600-501
	IP44 / IC410	617568-501
FDL2812	IP44 / IC416-BC	617569-501
	IP44 / IC411-FC	617570-501
	IP44 / IC416-PB	617569-701
	IP23 / IC06	617601-501
RDL2812	IP44 / IC410	617546-501
	IP44 / IC416-BC	617547-501
	IP44 / IC411-FC	617548-501
FDL2814	IP44 / IC416-PB	617547-701
	IP23 / IC06	617602-501
	IP44 / IC410	619613-501
FDL2816	IP44 / IC416-BC	619614-501
	IP44 / IC411-FC	619615-501
	IP44 / IC416-PB	619614-701
	IP23 / IC06	617578-501
RDL2816	IP23 / IC06	617603-501

# V\*S MASTER INVERTER DUTY MOTORS

## Dimension sheets table

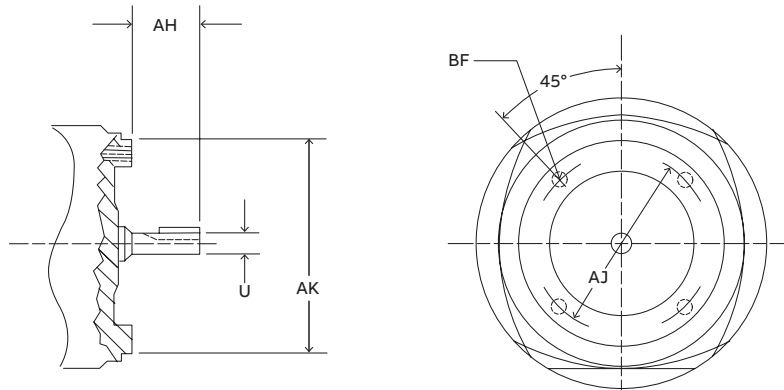
### TEFC (totally enclosed fan cooled), foot mounted

Frame	Enclosure	D/S number
56C	TENV	35LYT995
56C	TEFC	35LYY591*
143-5TC	TENV	05LYE534
143-5TC	TEFC	05LYG118*
143-5TC	TEBC	05LYE535
182-4TC	TENV	06LYF551
182-4TC	TEFC	06LYH926
182-4TC	TEBC	06LYF552
213-5TC	TENV	07LYJ135
213-5TC	TEFC	07LYM288
213-5TC	TEBC	07LYD515
254-6TC	TENV	09LYF278
254-6TC	TEFC	09LYK146
254-6TC	TEBC	09LYT110
284-6T	TENV	10LYF681
284-6TC	TEFC	10LYH810
284-6T	TEBC	10LYT004
324-6T	TEFC	12LYG534
324-6T	TEBC	12LYT107
364T	TEFC	617431-412
365T	TEFC	617431-412
G404T	TEFC	617429-200
G405T	TEFC	617429-200
G444T	TEFC	617427-507
G445T	TEFC	617427-507
G447T	TEFC	617435-140
G449T	TEFC	617427-714

\* C-face, footless

# MOTOR DIMENSIONS

## 56C - 365TC frames



Frame size	AH	AJ	AK	BF	No.	Depth	U	Key sq.	Key length
56C	2.06	5.88	4.5	3/8-16	4	0.56	0.625	0.188	1.25
140TC	2.12	5.88	4.5	3/8-16	4	0.56	0.875	0.188	1.25
182-184TC	2.62	7.25	8.5	1/2-13	4	0.75	1.125	0.25	1.75
213-215TC	3.12	7.25	8.5	1/2-13	4	0.75	1.375	0.312	2.38
254-256TC	3.75	7.25	8.5	1/2-13	4	0.75	1.625	0.375	2.88
284-286TC	4.38	9	10.5	1/2-13	4	0.75	1.875	0.5	3.25
324-326TC	5	11	12.5	5/8-11	4	0.94	2.125	0.5	3.88
364-365TC	5.62	11	12.5	5/8-11	4	0.94	2.375	0.625	4.25

Dimensions are for estimating purposes only



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