



FFB brake motors A flexible concept

Using the IMfinity® platform

Leroy-Somer™


EMERSON™
Industrial Automation

FFB brake motor

Pure know-how and experience

An integral part of Emerson Industrial Automation, Control Techniques and Leroy-Somer have been a familiar presence on the international scene for many years, each offering customized drives, motors, brake motors and gearboxes, as well as their expertise, to meet customers' expectations in all types of industry. Our proven high-quality products, automation expertise and technical support allow us to exceed our customers' expectations.

The new concept of FFB brake motors has benefited fully from the acquired experience and reputation of the Emerson Industrial Automation group in handling businesses such as cranes and elevators.

With a tried-and-tested design and flexible configuration, FFB brake motors are based on the new IMfinity® motors platform. They have optimum characteristics in terms of:

- **Reliability and robustness**

The robust construction and tried-and-tested design of IMfinity® induction motors can cope with the most demanding applications: conveyors, storage, traveling cranes, sectional doors, brake test benches, etc.

Its mechanical and electrical design are achieved with powerful calculation and simulation tools and a very high level of expertise.

- **Performance and safety**

Adaptability: to the majority of fixed and variable speed applications.

Operational safety: expert management of braking settings.

System longevity: compatibility of motion transmission devices.

- **Express Availability**

A wide variety of products and options are available on short delivery thanks to this flexible concept and organization of our production and distribution facilities to meet customers' requirements.

Brake motors for worldwide use: our multi-voltage, multi-frequency motors comply with the majority of energy regulations.



FFB brake motor

The flexibility within your applications

An application-oriented concept

The logistics industry is constantly developing, and these days requires systems that are more productive, scalable and energy-saving. The flexible concept of the FFB brake motor was developed to take account of higher expectations in terms of longevity, availability, safety, robustness and communications.

Its flexibility to adapt to requirements (wide modular range, ease of setup without adjustment in complete safety, motion control, information feedback) provides it with the necessary attributes to satisfy an extensive range of automation and logistics applications quickly and easily.

	Modularity and setup		Motion control	Information feedback	
	Choice of braking torque	Release system	Variable speed construction	Wear indicator	Application/release indicator
Conveyors	•	•	•	•	
Vertical stackers			•		•
Traveling cranes	•		•	•	
Roller table	•	•	•	•	
Sectional doors		•	•		•
Tumblers	•		•	•	
Transfer machine		•	•		
Stacking/Unstacking machine	•	•	•		
Elevating platforms	•		•		•
Indexers			•	•	
Tower cranes	•	•	•	•	•



FFB brake motor

Regulations and international compatibility

A response to changing regulations

The latest energy regulations set a minimum efficiency level for motors; new standards or directives are being drawn up around the world. It is therefore increasingly difficult to select and find a drive mechanism on the market that complies with all these regulations.

Another issue is the complexity of different voltages and frequencies throughout the world, associated with the same efficiency classes.

A truly international concept

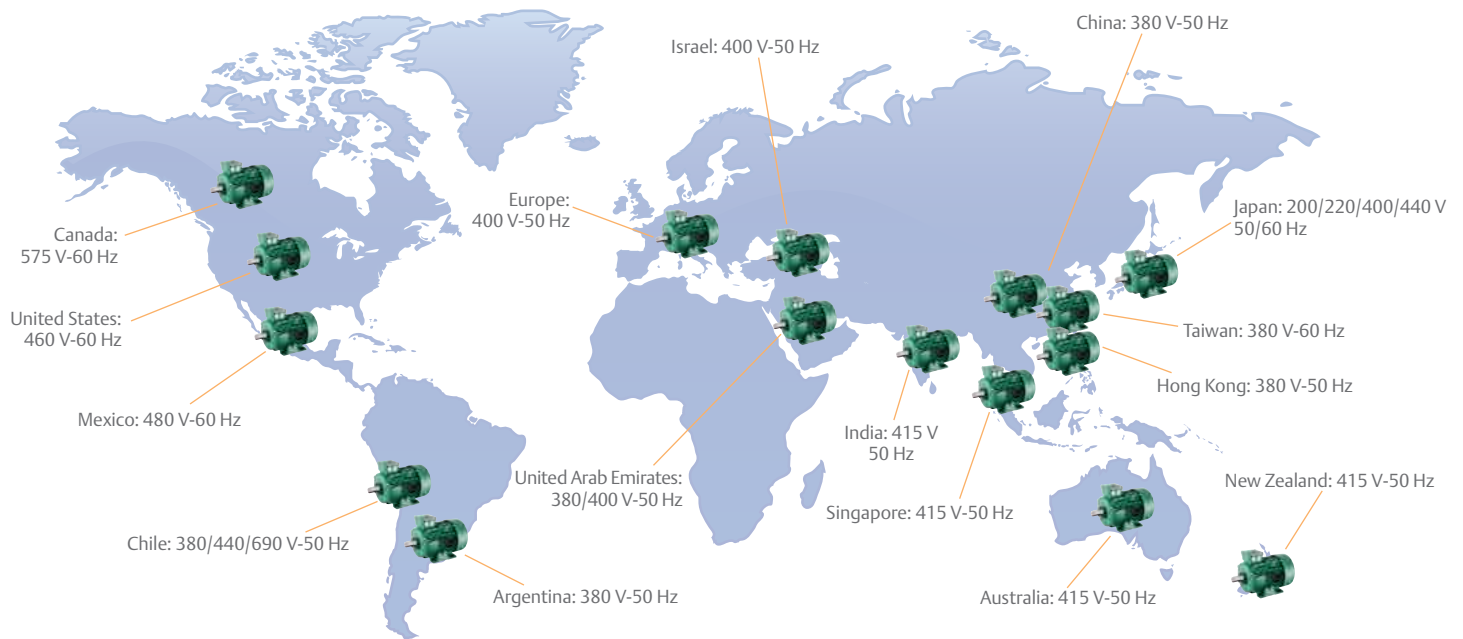
The new concept of FFB brake motors rolled out using the IMfinity® induction motors platform is one of the very few on the market that can guarantee efficiency levels with the main voltages and frequencies. They cover at least 80% of supplies worldwide while complying with existing or impending energy regulations.

Thanks to this new generation of drive mechanisms, just one product reference now takes the place of the 4 or 5 previously needed.

- **Simple to select**
- **Easy to procure and available on short delivery**
- **Easy to use**
- **Integrators can greatly reduce their stock**



Expand your horizons at a stroke



FFB brake motor

The future of energy and the benefits of variable speed

A truly strategic vision

Integration of variable speed solutions at the heart of systems is part of a truly strategic vision from industrial companies. On top of the flexibility, productivity and scalability a variable speed drive has to offer, it also contributes to significantly reduced energy consumption.

A global system approach is increasingly considered to be the architecture that generates the greatest energy savings.

A new concept

The new FFB brake motor concept is in line with this trend through its capacity to offer the simple addition of components such as encoders, forced ventilation units and release levers. Rotor inertia, close to that of a motor without a brake, provides the essential dynamic capacities to improve performance and optimize productivity in numerous industries.

With different versions of the IMfinity® platform, FFB brake motors are available with different efficiency levels, from non-IE to IE3. Ideally suited to variable speed operation with Emerson Industrial Automation drive ranges, they respond to developments in industrial drive systems.

Our motor, brake, gearbox and drive ranges are designed to work together, to provide excellent reliability and efficiency, while offering customers a choice of solutions that are simple to select and install.



- Designed to work together
- Focused on energy savings

Non IE
IE1
IE2
IE3

FFB brake motor

Reliability, Safety, Robustness

Robust mechanism

- Parts designed using finite element analysis
- Use of cast iron foundry parts (end shield, yoke, bracket, back plate)
- Machining of cast iron parts without reworking (5-axis machine tool) for perfect concentricity
- Careful balancing for a reduced noise level
- Steel cover proven to withstand the most demanding environments
- Encoder mounted on stainless steel shaft, ensures easy disassembly at a later date
- Special anti-corrosion screws, guaranteed longevity in harsh environments
- Stainless steel brake spring maintains performance
- Friction backing material with anti-stick and anti-corrosion treatment

Certified seal

- IP55 sealing system approved by a qualified independent laboratory
- Shaft seal with low energy losses
- High-quality static seal

Increased bearing life

- Bearings large enough to take heavy loads on the shaft
- High-quality grease for a long service life and longer greasing intervals



Electrical and mechanical safety

- Expert management of the minimum and maximum braking torque (running-in of friction parts) guaranteeing the safety coefficients for sizing the transmission chain
- Failsafe braking (brake engaged in the event of a power cut)
- Large terminal box for easier access and safer connections

Thermal protection

- PTC sensors included for frame sizes ≥ 160 mm
- Other types of sensors available on short delivery

Motor and brake supervision

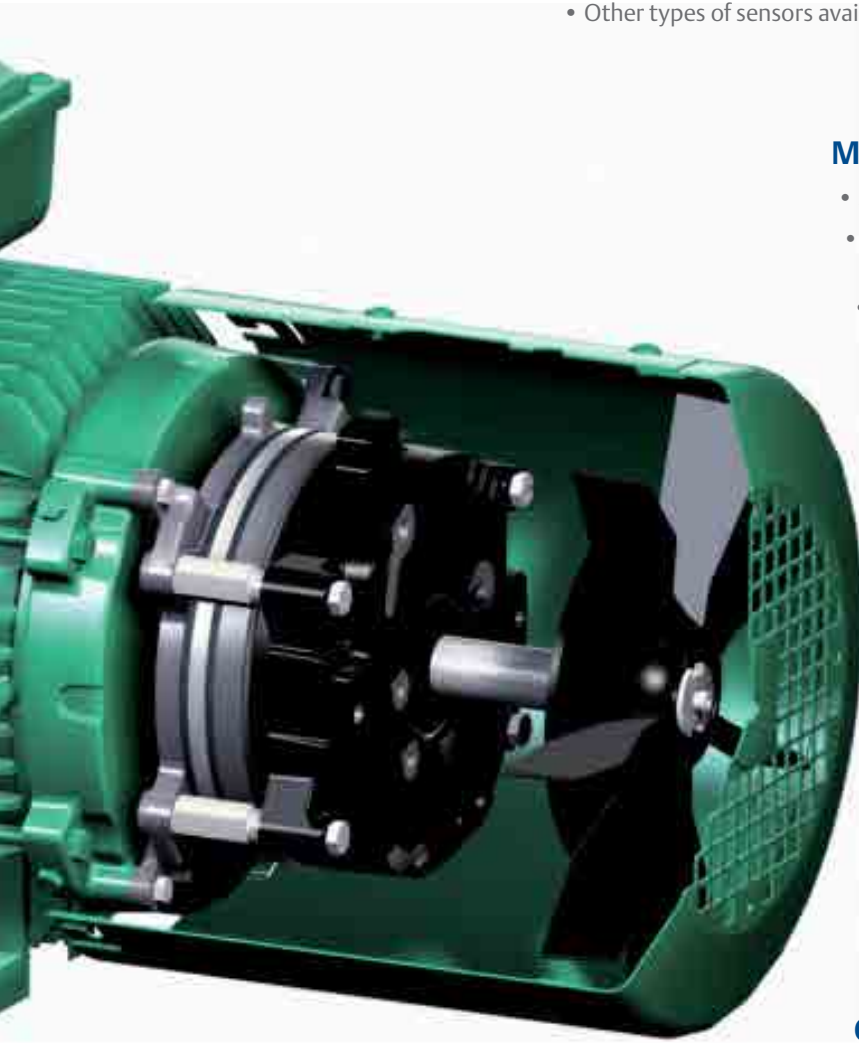
- Standard encoder adaptation system
- Wear indicator available for frame sizes from 71 to 180 mm
- Application/release indicator available on frame sizes from 71 to 180 mm

Expert electrical design

- Optimized magnetic circuit for different efficiency classes: IE3, IE2 and non-IE
- Options dedicated for use with variable speed:
 - RIS (Reinforced Insulation System)
 - Insulated bearings
- Impregnation with solvent-free varnish
- Designed with a 25 K thermal reserve

Optimum maintainability

- Brake cover with bayonet fittings (the cover can be removed without completely undoing the screws)
- Brake block independent of the motor (quick change with 4 fixing screws – no need to adjust the air gap)
- Manual release system with auto-return



FFB brake motor

Simple, safe customization

A wide range of options available on short delivery

The expectations of applications in terms of braking torque, release system, motion control (encoder feedback) or information about the brake condition (wear and/or release/engage status) represent numerous combinations that the FFB brake motor is quickly able to satisfy.

All the options can be combined without affecting the lead time, thus offering a truly customizable range of brake motors available on short delivery.

	Options available						
	DLRA	DLM	DMD	Encoder	FV	Wear indicator	R/A indicator
FFB1	•	•		•	•	•	•
FFB2	•	•	•	•	•	•	•
FFB3	•	•	•	•	•	•	•
FFB4	•	•	•	•	•	•	•
FFB5	•	•	•	•	•	•	•

DLRA: auto-return hand brake release

DLM: brake release lock off

DMD: remote brake release

FV: forced ventilation unit

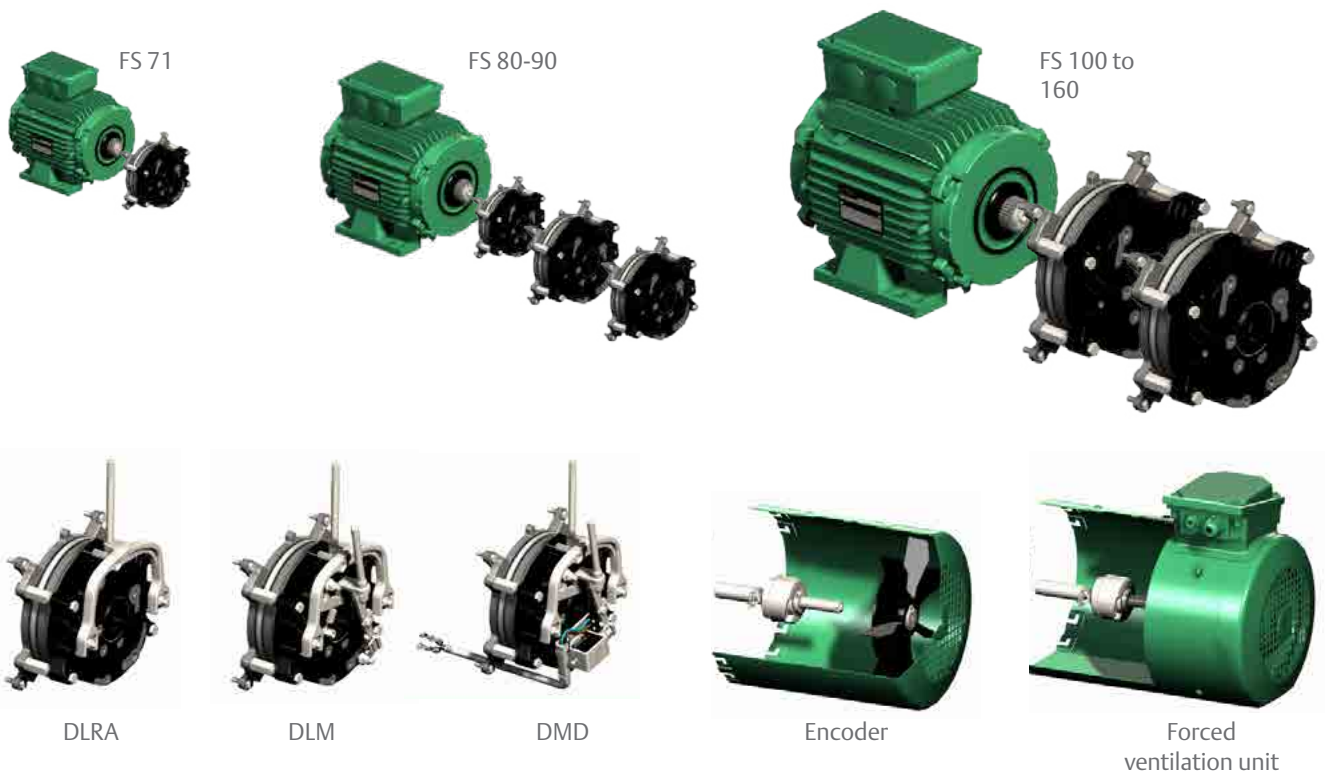
R/A: release/application

FS	Possible brake/motor assembly				
	FFB1	FFB2	FFB3	FFB4	FFB5
71	•				
80	•	•	•		
90	•	•	•		
100		•	•		
112		•	•		
132				•	•
160				•	•

FS: motor frame size



Flexibility of the FFB concept



FFB brake motor

Performance, power and versatility

A standard and customizable range

The FFB brake motor versions comply with IEC standards; it is also available in more customized versions to meet the demands of high-level specifications.

Its intrinsic performance means it can be used in all the traditional handling and processing applications with ease.

Standard motor specification	
Frame size	71 to 180
Power	0.12 to 22 kW
Number of poles	2, 4, 6 poles
Efficiency class	Non-IE, IE2, IE3
Mounting forms	IEC: B3, B5, B14, B34, B35 Gearbox integral mounting
Ingress protection	IP55
Insulation class	F
Ambient temperature	-20°C/+40°C
Thermal protection	PTC as standard from FS 160
Frame material	Aluminum or cast iron
External finish	RAL6000
Voltage range	230-380-400-415 460 V
Frequency range	50 or 60 Hz
Standards	UL, CE, cCSAus

	Brake technical characteristics					
	Braking torque (N.m)	Pick-up time (ms)	Brake engage time AC (ms)	Brake engage time DC (ms)	Noise level AC break (dBa)	Noise level DC break (dBa)
FFB1	4.5 to 12	30	130	<5	54	62
FFB2	11 to 30	60	230	<5	33	50
FFB3	37 to 74	95	110	<20	50	65
FFB4	41 to 110	95	280	<10	58	70
FFB5	120 to 200	120	360	<20	61	72

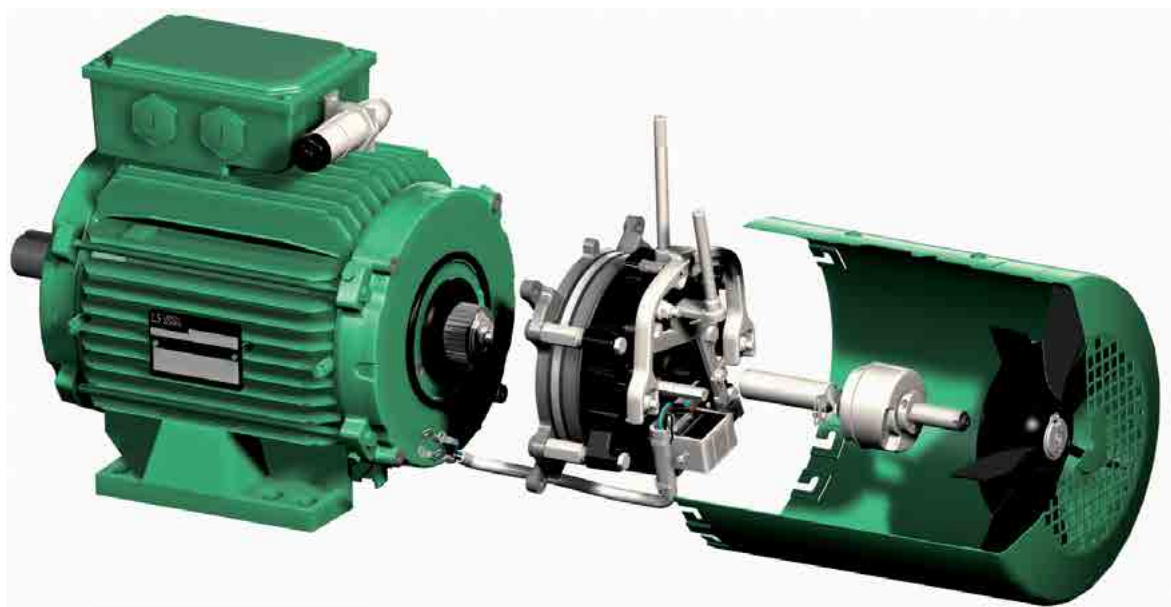
Available with 180 Vdc or 20 Vdc coil (power supply via half or full wave rectifier block, integral or separate depending on the configuration)

AC: alternating current

DC: direct current



Technical sophistication of the FFB concept



FFB brake motor

At the heart of industry

A well-thought-out offer for a wide variety of requirements

FFB brake motors are an integral part of the Emerson Industrial Automation drive system offer.

Available with several different configurations and finishes, they meet the requirements of a variety of industrial applications.

Whether for building machines or equipment with severe operating constraints, increased productivity requirements, or for use in harsh operating conditions, there is a combination to meet the need perfectly.

Types of industry

Food and beverage

Packaging

Printing

Plastics and rubber

Port logistics

Test stands

Textiles



Glass

Industrial refrigeration

Marine

Metals

Mines, quarries,
cement

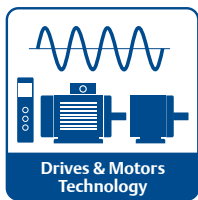
Nuclear power

Water

Oil and gas



Main industries requiring a brake motor



Motors and drives technology

Emerson Industrial Automation offers an extensive range suitable for the diverse needs of different industries and applications

FFB brake motors, based on the IMfinity® motors platform, allow a wide variety of configurations and derivatives. They are ideal for integration into variable speed systems in combination with the Unidrive M drive family.

Geared motors



Compabloc
up to 14,500 Nm



Orthobloc
up to 23,000 Nm



Manubloc
up to 14,500 Nm

Brake motors



FFB from 0.12 to 22 kW



FCPL from 37 to 400 kW

Drives



Unidrive M/0.25 to 2.8 MW



Powerdrive F300
1.1 to 200 kW



Powerdrive MD2
45 kW to 2.8 MW



Varmeca
Built-in variable
speed drive
0.25 to 11 kW

IMfinity® motors



LS and LSES
Non-IE - IE2 - IE3
Aluminum IP55
Frame size from 80 to 315 mm
2, 4 and 6 poles
IE2-IE3: 0.75 to 200 kW
Non-IE: 0.12 to 45 kW



FLSES
IE2 - IE3
Cast iron* IP55
Frame size from 80 to 355 mm
2, 4 and 6 poles
0.75 to 400 kW
**Cast iron: up to 675 kW with the FLS model*



PLSES
IE3
IP23**
Frame size from 225 to 315 mm
2 and 4 poles
55 to 450 kW
***IP23: up to 900 kW with the PLS model*

Drives and Motors Services

Local, continuous, customized support



- Audit and consultancy
- Standard installation audits by an industry expert
- Optimized energy savings and return on investment
- System customization and upgrading
- Installation and commissioning
- Full training
- Maintenance
- Installations and resources throughout the world



An enhanced global presence that benefits all our customers

Through our integrated organization, we have an extensive global presence that provides comprehensive local support and services. This includes:



5,500 employees



40+ Automation Centers

Providing excellent customer support for any product, automation solutions or service requirements



23 Manufacturing sites

Producing a comprehensive range of high quality products, optimized for industry-specific customer requirements



8 Engineering and Design facilities

Develop market leading products and feature-sets using the latest design technology



3 Regional dispatch hubs

For quick delivery of products

Our extensive sales and service networks in Europe, Asia Pacific and the Americas are backed-up by hundreds of carefully selected distributors and service partners, often in remote locations, all over the world.



Note that several countries have more than one of the facilities represented by the icons.

Services are optimized independently for each country. Please contact your local representative for more details of our offer in your country.

Express Availability

Improved, guaranteed productivity

Assured product availability

The new FFB brake motors concept benefits from our international logistics organization, resulting in very short delivery times for numerous products and their derivatives. *Express Availability* ensures an immediate response to customer needs, allowing improved and guaranteed productivity:

- By ensuring continuity of production
- By benefiting quickly from energy savings
- By minimizing the stock of spare parts on site

The majority of FFB brake motors can be dispatched on the same day as order receipt. A wide variety of options are available in 2 to 10 working days such as:

- Electrical and mechanical customization: release systems, wear indicator and application/release indicator, drip cover, PTC or PTO sensors, etc
- Variable speed options: incremental or absolute encoders, forced ventilation unit, etc
- A wide range of geared motors: helical bevel, bevel gear, parallel or concentric shaft, and associated options

The huge variety of products, options and combinations available for *Express Availability* (brake motors, gearboxes and drives) covers the majority of requirements for different industries and applications.



Extract from our online catalogue:

Express Availability - Induction motors and brake

FFB IMfinity® brake motors

Not classified IFT/NIE - U.G.

IP 55 - Incorporated power supply - Braking torque regulated in factory

AVAILABILITY TIMES EX WORKS (FRANCE), IN WORKING DAYS

Orders received, within the maximum quantity limit, by the factory on day D before 12:00 pm Central European Time, will have the following Availability.

For products with options, availability will be that of the longest lead-time item i.e. the product or its options.

If the order is received after 12:00 pm 1 working day on the mentioned availability will be added.

The maximum quantity is per line of order. Above this maximum quantity, please consult your Sales Office.

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Sizing and configuring

With support from experts

Sizing the product

The variety of motorized movements using a brake requires precise input data, operating constraints and expected results to be taken into account.

Our teams of specialists will guide you through selection and sizing of products.

Input data		Types of movement				
Need	Unit	Displacement	Hoisting	Rotation	Stirring	Winding/ Unwinding
Speed	m/s rd/s rpm	•	•	•	•	•
Radial force	N	•	•	•	•	•
Axial force	Traction (N) Thrust (N)	•	•	•	•	
Starting torque	N.m	•	•	•	•	
Constant power	W or kW					•
Variable power	W or kW	•	•	•	•	
Constant torque	N.m	•	•	•		
Variable torque	N.m	•	•	•	•	•
Hold zero speed	N.m	•	•	•		

The Configurator is a powerful tool to help with the selection of motors or geared motors used in conjunction with Leroy-Somer variable speed drives. Continuous upgrading of this software has reached a new level with IMfinity® motors and geared motors, offering the user the option of linking their motor selection to the drive.

The screenshot displays the 'Motor type - V8.030' configuration interface. The top section features the Emerson logo and a background image of a motor. Below this, a list of parameters is shown on the left, with their corresponding values and status icons on the right. The parameters include Preselection, Generation code, Efficiency class, Motor serie, Polarity - Speed, Rated power (kW), Frame size (mm), and Motor winding (V). The values are: General applications - 400V 50Hz, IFT, IE2, LSES, 4P 1500tr/min, 22, 180, and 400VD respectively. Status icons (green for OK, red for error) are present for most parameters.

Parameter	Value	Status
Preselection	General applications - 400V 50Hz	
Generation code	IFT	OK
Efficiency class	IE2	OK
Motor serie	LSES	OK
Polarity - Speed	4P 1500tr/min	OK
Rated power (kW)	22	Error
Frame size (mm)	180	OK
Motor winding (V)	400VD	OK

[illegible]



EMERSON
Industrial Automation

Variable speed drive selection V8.150

Selection

- Variable speed drive (6 pulses)

Branding

Leroy-Somer

Série

Unidrive M

Model

M200 (1 Slot)

Overload

Heavy duty

Integrated control interface

Local controls and access to the basic parameters

Onboard Comms

Optional comms (1 option slot)

Onboard safety

-

Onboard intelligence

-

Product cooling version

Air cooling (A)

IP level

IP20 / NEMA 1

Motor nominal current (A)

42.4

Maximum ambient temperature (°C)

40

Switching frequency (kHz)

3.00

Size

06

Braking transistor

Brake

Model

M200-064-00470A

Continuous output current (A)

46.00

Selected motor

4P LSES180LR 22kW

Available power (kW)

22.50

Rated Torque motor & drive (N.m)

143.00

Maximum torque / rated torque (N.m)

1.66

Overload (Drive peak current / Motor nominal current)

166.20%

Characteristics
AP 1.5SE180R 22kW & Undrive M200-064-00470A
Open loop control mode

Available power (kW)	22.50
Rated Torque/motor & drive (N.m)	143.50
Maximum torque motor & drive (N.m)	237.50
Maximum torque / rated torque (N.m)	1.66
Normal current/motor & drive (A)	47.80
Maximum current motor & drive (A)	70.50
Efficiency motor & drive at 4/4 of the load (%)	90.10

Characteristics for:

- Power supply voltage (V ± 2.0%) = 400
- Switching frequency (kHz) = 2.00
- Maximal altitude (m) = 1000

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