ABB – INTEGRATED MOTOR DRIVES (IMD)

LFH – High Performance

Direct drive solution for HVLS fans
High-volume, low-speed

ABB is your trusted advisor for sustainable, reliable and easy-to-use integrated motor drives.

ABB's high efficient LFH motors produce high torque at low speed making them one of the most reliable and sustainable technologies available in the market today.

Trust ABB to provide the latest and most innovative motor solutions to meet your needs.

LFH direct drive solution

High-volume, low-speed direct drive solution

High efficiency
- Highest system efficiency
- Innovative and practical way to turn a fan – without unnecessary components
- Performance data independently tested and verified

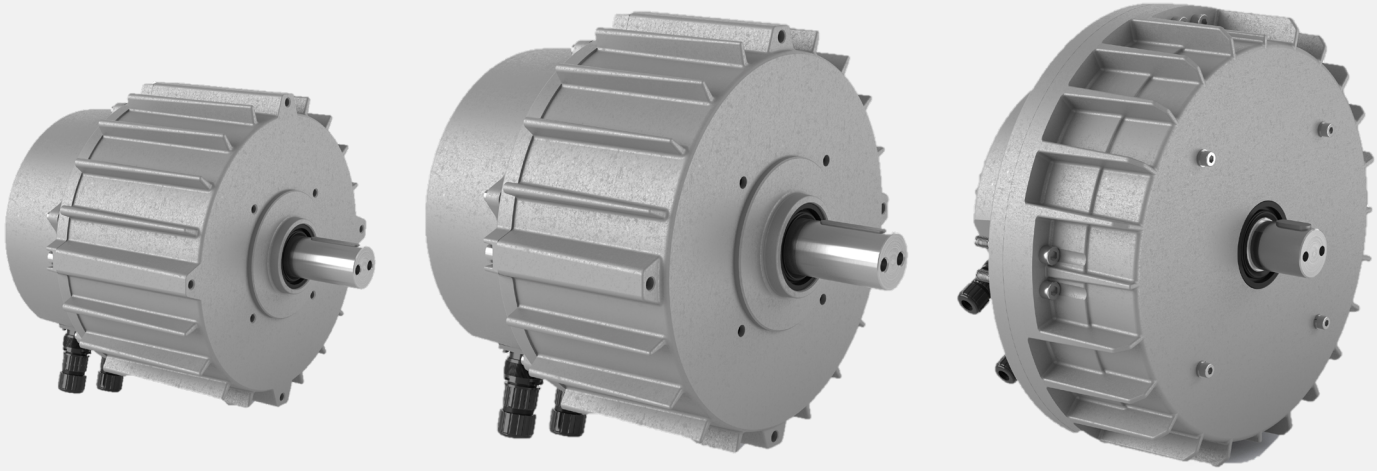
Eco-friendly design
- Removes seals and leaking oil required by gearing in traditional systems
- Eliminates high maintenance mechanical components

Variable speed operation
- Ideal for high-volume, low-speed fans
- Match motor to impeller speed for optimized performance
- Improved efficiency when running at partial speed

Easy to use
- Eliminate gearing and maintenance items
- Bearings are permanently sealed-for-life

Plug-and-play
- Minimal set-up required
- Start/stop configuration using speed potentiometer to for ease of control
- LED indicator for motor health

Reliable and quiet operation
- Reduced mechanical stresses with low starting current, increasing reliability
- Ultra-quite operation eliminating high speed noise



Reliability. Silent operation. Practicality. It all counts.

Large industrial and commercial buildings can benefit greatly from increased air circulation, and HVLS (high-volume, low-speed) fans are part of the solution. These fans are capable of efficiently circulating a high volume of air throughout large spaces, making them ideal for commercial buildings, warehouses and gyms.

If you are looking to improve air circulation, consider HVLS fans with ABB LFH direct drive. Say goodbye to the noisy, inefficient and high-maintenance fans of the past. Switch to a modern, reliable and efficient solution.

ABB: your timely, transformative and trusted provider of Integrated Motor Drive (IMD) solutions.

Sustainability

ABB is committed to providing innovative solutions that prioritize operational efficiency, enhance building comfort and contribute to sustainable practices. With that in mind, we are excited to introduce our latest motor solution – LFH. LFH is a practical design that is innovative, energy efficient and offers quieter operation. It's a game-changer for anyone looking to improve their building's performance and reduce their carbon footprint.

Old HVLS system

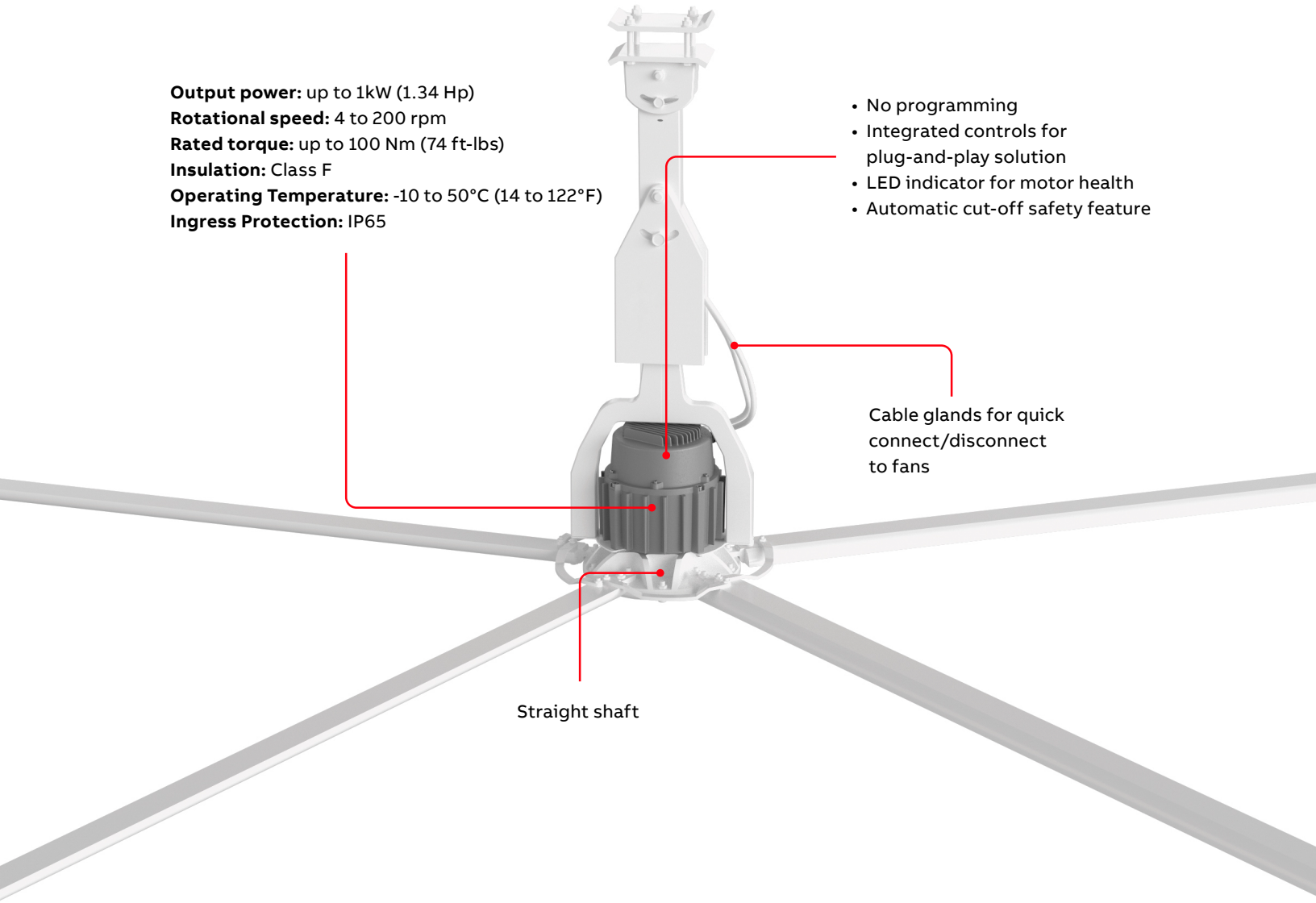
- Not as efficient
- More wear components
- Oil and environmental contaminants
- Higher and vibration

New direct drive system

- Efficient design
- No gearbox
- No maintenance components
- No oil
- Less structural support
- Quieter operation
- Compact design

LFH solution
Details make a difference

This cutting-edge technology is built and designed for practical operation, making it the perfect solution for HVLS industrial fans ranging from 6.5 - 23ft (2-7m) in blade diameter. With an IP65 rating for durability, it can operate in a variety of environments. Get ready to experience a more efficient and reliable solution with the LFH integrated motor and drive.



LFH solution
Ordering Information

Product Series	Frame	Product Code								
LFH	**110**	**E**	**0**	**H**	**0P8**		**H**	**E**	**D**	
		1	2	3	4	5	6	7	8	

Product Series		
LF		Low speed fan = LFH
H		Industry = HVAC
Frame		**Description**
11x		Aluminum
xx0		Standard Version
Position 1		**Version**
E		Axial Mount (TEAO)
Position 2		**Voltage**
0	230/460 V	3-Phase
6	115/230 V	1-Phase
Position 3		**Power Type**
H		Horsepower
Position 4,5		**Power Rating (HP)**
0P4		0.4
0P7		0.7
0P8		0.8
0P9		0.9
1P1		1.1
Position 6		**Frame**
F		220 LFH
G		360 LFH
H		360 H60 HP
Position 7		**Frame**
E		Axial Mount (TEAO)
Position 8		**Base Speed (r/min)**
A		250
B		200
C		160 or 163
D		90 or 95
E		81 or 84

Environmental	
Enclosure	IP65
Operating Temperature (Full Power)	-15 to 40 °C (5 to 104 °F)
Operating Temperature (Reduced Power)	-20 to 60°C (-4 to 140 °F)
Storage Temperature	-20 to 80°C (-4 to 176 °F)
Max shaft axial load	50kg (110lbs)
Bearings	Permanently sealed

Temperature Limits: Motor	
Motor insulation class	F
Maximum motor temperature	125°C (120°C before derating)
	257°F (248°F before derating)

Temperature Limits: Electronics	
Power module maximum temperature	85°C (80°C before derating)
	185°F (176°F before derating)
PCB maximum temperature	80°C (75°C before derating)
	176°F (167°F before derating)

LFH Ordering Information

LFH220 catalog numbers and ratings

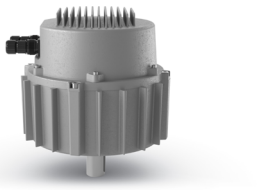


ABB Catalog Number	Frame Size	Stack Height	Impeller Diameter m (ft.)	Motor Power kW (Hp)	Max Speed (RPM)	Torque nm (lb-ft)	Voltage (V/Phase)	Eff.(%)
LFH110E0H0P3FEA	LF220	H30	2m (6.5ft)	0.22 (0.3)	170	12.4 (9.3)	460 3PH	72.2
							230 3PH	76.6
LFH110E6H0P3FEA	LF220	H30	2m (6.5ft)	0.22 (0.3)	170	12.4 (9.3)	115 1PH	75.4
							230 1PH	73.3
LFH110E0H1P1FEA	LF220	H50	2.5m (8.2ft)	0.8 (1.1)	250	31 (23.1)	460 3PH	81.2
				0.7 (0.9)	250	26 (18.9)	230 3PH	84.3
				0.37 (0.5)	150	24 (17.5)	460 3PH	75.2
				0.30 (0.4)	150	19 (14)	230 3PH	79.5
			3m (9.84ft)	0.5 (0.7)	200	25 (18.4)	460 3PH	79.7
				0.45 (0.6)	200	21 (15.8)	230 3PH	83.3
				0.22 (0.3)	110	19 (14.3)	460 3PH	71.7
				0.15 (0.2)	110	13 (9.5)	230 3PH	76.9
			4m (13.12ft)	0.37 (0.5)	140	25 (18.8)	460 3PH	74.2
				0.30 (0.4)	140	20 (15)	230 3PH	78.8
				0.15 (0.2)	75	19 (14)	460 3PH	63.8
				0.15 (0.2)	75	19 (14)	230 3PH	71.5
LFH110E6H0P9FEA	LF220	H50	2.5m (8.2ft)	0.7 (0.9)	250	26 (18.9)	115/230 1PH	84.3
				0.30 (0.4)	150	19 (14)	115/230 1PH	79.6
			3m (9.84ft)	0.45 (0.6)	200	21 (15.8)	115/230 1PH	83.3
				0.15 (0.2)	110	13 (9.5)	115/230 1PH	76.9
			4m (13.12ft)	0.30 (0.4)	140	20 (15)	115/230 1PH	78.8
				0.15 (0.2)	75	19 (14)	115/230 1PH	71.5
LFH110E0H0P8FEC	LF220	H70	4m (13.12ft)	0.6 (0.8)	160	36 (26.3)	460 3PH	80.9
				0.5 (0.7)	160	31 (23)	230 3PH	83.2
				0.30 (0.4)	95	30 (22.1)	460 3PH	75.1
				0.22 (0.3)	95	23 (16.6)	230 3PH	77.9
LFH110E6H0P7FEC	LF220	H70	4m (13.12ft)	0.5 (0.7)	160	31 (23)	115/230 1PH	83.2
				0.22 (0.3)	95	23 (16.6)	115/230 1PH	77.9

LFH Ordering Information

LFH360 catalog numbers and ratings

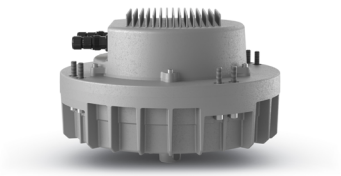


ABB Catalog Number	Frame Size	Stack Height	Impeller Diameter m (ft.)	Motor Power kW (Hp)	Max Speed (RPM)	Torque nm (lb-ft)	Voltage (V/Phase)	Eff.(%)
LFH110E0H0P8GEB	LF360	H20	2.5m (8.2ft)	0.6 (0.8)	200	28 (21)	460 3PH	75.6
				0.5 (0.7)	163	31 (22.6)	230 3PH	74.7
			3m (9.84ft)	0.6 (0.8)	190	30 (22.1)	460 3PH	74.9
				0.5 (0.7)	163	31 (22.6)	230 3PH	74.7
				0.45 (0.6)	160	27 (19.7)	460 3PH	73.7
				0.45 (0.6)	160	27 (19.7)	230 3PH	76.0
			4m (13.12ft)	0.15 (0.2)	110	13 (9.5)	460 3PH	67.9
				0.15 (0.2)	110	13 (9.5)	230 3PH	72.1
				0.37 (0.5)	100	36 (26.3)	460 3PH	62.1
				0.37 (0.5)	100	36 (26.3)	230 3PH	64.0
LFH110E0H0P4GED	LF360	H40	5m (16.5ft)	0.30 (0.4)	95	30 (22.1)	460 3PH	78.2
				0.30 (0.4)	84	34 (25)	230 3PH	81.4
				0.6 (0.8)	80	71 (52.5)	460 3PH	73.6
				0.5 (0.7)	72	69 (51.1)	230 3PH	72.9
			6m (19.69ft)	0.30 (0.4)	75	38 (28)	460 3PH	76.4
				0.30 (0.4)	75	38 (28)	230 3PH	79.9
				0.45 (0.6)	65	66 (48.5)	460 3PH	69.5
				0.45 (0.6)	65	66 (48.5)	230 3PH	71.6
			7m (22.97ft)	0.22 (0.3)	45	47 (35)	460 3PH	65.7
				0.22 (0.3)	45	47 (35)	230 3PH	69.8
				0.30 (0.4)	40	71 (52.5)	460 3PH	58.8
				0.30 (0.4)	40	71 (52.5)	230 3PH	61.6

LFH Ordering Information

LF360 catalog numbers and ratings (continued)

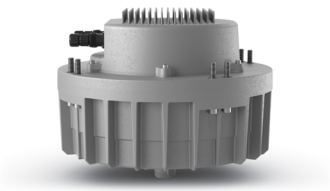


ABB Catalog Number	Frame Size	Stack Height	Impeller Diameter m (ft.)	Motor Power kW (Hp)	Max Speed (RPM)	Torque nm (lb-ft)	Voltage (V/Phase)	Eff.(%)
LFH110E0H0P8GED	LF360	H60	6m (19.69ft)	0.6 (0.8)	90	63 (46.7)	460 3PH	82.0
				0.5 (0.7)	81	62 (45.4)	230 3PH	82.9
				0.6 (0.8)	75	76 (56)	460 3PH	78.8
				0.6 (0.8)	75	76 (56)	230 3PH	80.6
			7m (22.97ft)	0.37 (0.5)	60	59 (43.8)	460 3PH	76.7
				0.37 (0.5)	60	59 (43.8)	230 3PH	79.4
				0.45 (0.6)	50	85 (63)	460 3PH	72.6
				0.45 (0.6)	50	85 (63)	230 3PH	74.8
LFH110E0H0P8HED	LF360	H60-HP	6m (19.69ft)	0.6 (0.8)	90	63 (46.7)	460 3PH	83.0
				0.45 (0.6)	73	59 (43.2)	230 3PH	83.8
				0.6 (0.8)	75	76 (56)	460 3PH	80.6
				0.6 (0.8)	70	81 (60)	230 3PH	82.0
			7m (22.97ft)	0.37 (0.5)	60	59 (43.8)	460 3PH	78.5
				0.37 (0.5)	60	59 (43.8)	230 3PH	80.9
				0.5 (0.7)	50	100 (73.5)	460 3PH	72.9
				0.5 (0.7)	50	100 (73.5)	230 3PH	75.4

Values shown are of LFH working at +40°C (104°F) environment temperature. In these operating conditions the units reach their maximum performance before derating occurs. Units are “air over” during operation; performance and typical operating conditions are strongly influenced by the cooling action of the impeller.

Some torque deratings could be necessary in application, depending on the ability of the impeller to effectively cool the electronic driver and the electric motor.

Maximum environment temperature expected in the application is to be carefully considered during tests, as it adds to the temperature of motor and driver influencing the maximum torque deliverable within acceptable temperature limits for motor and electronic driver.

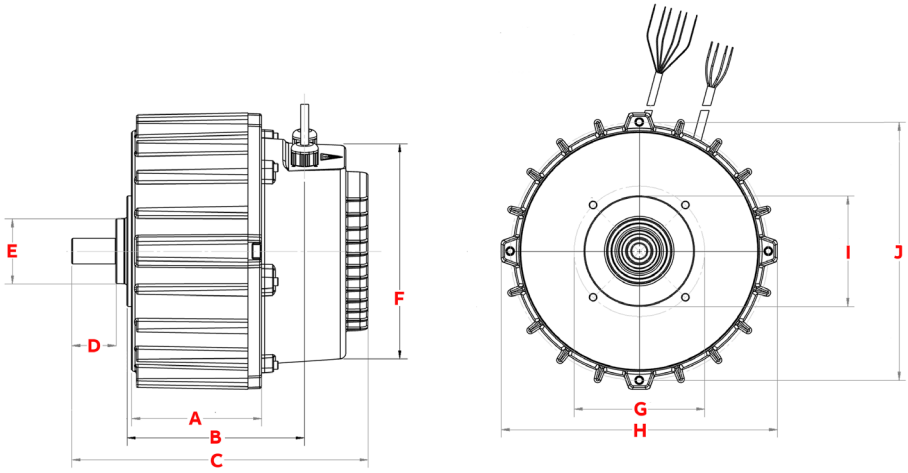
LFH solution
Technical Data

		Three phase	Single phase
Product name	**Number of phases**	3	1
	Nominal supply voltage	400 V rms	230 V rms
	Line voltage (absolute min-max)	180 V rms .. 500 V rms	85 V rms... 264 V rms
	Line frequency range	50 Hz... 60 Hz	50 Hz... 60 Hz
	Maximum line current	6 A rms	8 A rms
	Power factor correction	Not available	
	Ground leakage current	< 3.5 mA @400 V rms	< 3.5 mA @ 230 V rms
Driver output data	**Number of phases**	3	1
	Maximum current	6 A peak	6 A peak
	PWM pulse frequency	15 KHz	10 KHz
Interface signal wire data	**Wires number**	6	
	Analog input voltage	0... 10 Vdc	
	Analog output voltage	+10 Vdc (5 mA max current)	
	Input impedance	200 kOhm	
	Communication interface	EIA RS-485	
	Communication protocol	ModBus RTU	

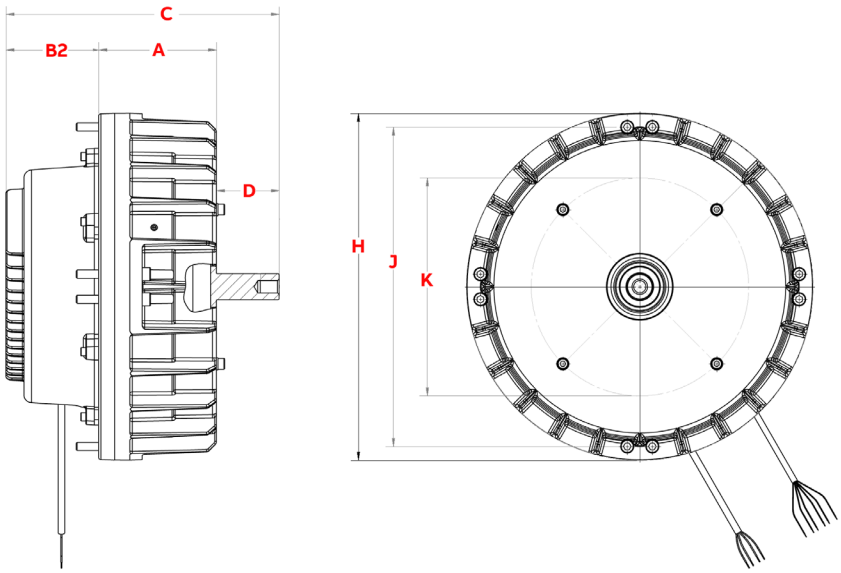
- Unit housing: die-cast aluminum
- Installation position: shaft on bottom
- Directionof rotation: configurable by Modbus (Default factory setup – clockwise, looking toward shaft)
- Max shaft axial load: 70 kg (154lbs)
- Shaft coupling through keyless locking device
- Balancing: rotor not balanced
- Bearings operation: maintenance-free
- Bearing seat material: die-cast aluminum
- Enclosure protection degree: IP65

LFH solution
Dimensional drawing

01 LF220
02 LF360



01

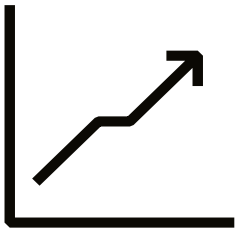


02

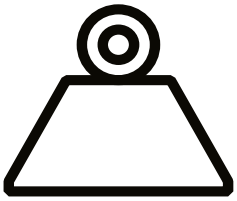
Frame size	Stack height	Dimensions (mm)											Weight kg (lbs)
		A	B	B2	C	D	E	F	G	H	I	J	
LF220	H30/H50	129.5	176.5	-	295	44	65	214	130	275	110	257	20 (44.1)
	H70	149.5	197.5	-	315	44.5	65	214	130	275	110	257	26 (57.3)
LF360	H20	123	-	112.5	311.7	76.2	-	-	264	420	-	386.8	35 (77.15)
	H40	143	-	112.5	311.7	76.2	-	-	264	420	-	386.8	45 (99.21)
	H60	163	-	112.5	311.7	76.2	-	-	264	420	-	386.8	55 (121.25)
	H60H	163	-	112.5	311.7	76.2	-	-	264	420	-	386.8	55 (121.25)

Operating Modes

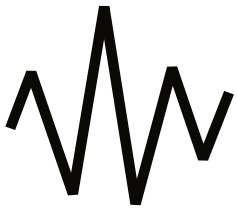
Modbus RPM speed control
Input Type: 0



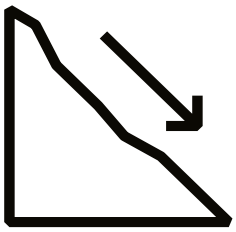
Analog 0-10 VDC speed control
Input Type: 1



Modbus fixed speed control
Input Type: 2



Modbus % speed control
Input Type: 3



Analog 10-0 VDC speed control
Input Type: 4

Type	Description
0	Motor runs at value in register 66 (speed value cleared with power cycle)
1	Default setting = 1 Sets motor speed proportional to analog input voltage
2	Motor runs at value in register 17 (speed set point remains with power cycle)
3	Motor runs at % speed defined register 66 (value cleared on power cycle)
4	Motor speed inversely proportional to analog input voltage (available three phase only models)

- Operating mode can be modified by setting the input type (holding register number 30)
- Default factory setting is input Type 1; Analog 0-10 VDC control.
- Note: Input type 4 only available for three phase versions

ABB, your global value partner

Partnering with ABB gives you access to some of the world's most innovative technology and thinking.

Global reach
ABB operates in over 100 countries with its own manufacturing, logistics and sales operations together with a wide network of local channel partners that can quickly respond to your needs. They bring our products and services straight to your front door. ABB channel partners have in-depth knowledge of local markets and are conversant with the defined ABB products and processes.

Energy efficiency
ABB has what it takes to help every industry and application reach new levels of efficiency and energy savings even under the most demanding conditions. Combining the best available materials with superior technology, our motors are designed to operate reliably no matter how challenging the process or application, and to have low life cycle costs.

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ABB Motors and Mechanical Inc.
5711 R.S Boreham, Jr. Street
Forth Smith, AR 72901
Ph: 1.479.646.4711

new.abb.com/motors-generators

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