

HIGH PERFORMANCE MOTORS
INTEGRAL DRIVE (HPI RANGE)
STAND ALONE MOTOR (HPS RANGE)





RANGE OF PRODUCTS

A RANGE OF SOLUTIONS TO MEET SPECIFIC DEMAND

- Integral construction (HPI range) or stand-alone drive (HPS range)
- Sensorless control or with speed transducer
- Serial isolated RS485 (eventually for "Cascade" connection) or serial isolated CANBus

GENERAL SPECIFICATIONS

- Power rating: 0.55 kW to 22 kW
 - single-phase 200-240V, 50/60Hz up to 2.2 kW
 - three-phase 380-480V, 50/60Hz
- Torque: 2 Nm to 100 Nm
- Speed: 1 rpm to 6000 rpm
- Frame size: 71 – 90 – 112 – 132

IE4

LAFERT PERMANENT MAGNET SYNCHRONOUS MOTORS (PM) SIGNIFICANTLY REDUCE ENERGY COSTS

A new high-performance motor intended for the OEM market that offers **significant savings on running costs and space** requirements that can be engineered to match customer applications has been introduced by Lafert. Savings on operating costs are substantial since the motor's are far superior compared to standard AC induction motors enables **significant frame size reductions plus weight savings**.

The new Lafert 'High Performance' motor (HP motor) combines the **technology of both brushless permanent magnet servo motors and conventional AC induction motors**. The ability to do this is facilitated by the fact the Lafert Group has both servo and AC induction motor know in-house.

By combining these technologies, substantial **efficiency** advantages over conventional AC induction

motors, including **IE4***, are achieved. The efficiency is superior across the whole speed range.

The enhanced performance characteristics of the HP motor also permit Lafert to offer smaller frame size solutions and weight savings of around 50%.

All these combined features enable engineers to achieve compact efficient motor solutions, particularly for such applications involving pumps, fans and compressors that are substantially more compact, lighter in weight and less expensive to run.

And all these benefits are provided from one development source due to Lafert's in-house technology and the ability to harness the best from proven components such as the **AC induction motor's standard stator and the surface-mounted**

permanent magnet rotor from the brushless servo motor.

The High Performance motor can be used with a standard drive when fitted with an appropriate transducer but, ideally, it should be used in conjunction with a sensorless drive to maximise the motors performance and superior efficiencies for the specific application.

Also, mechanical adaptation of the motor is often needed, so Lafert offer customisation to enable integration of the motor deeper into the application.

Lafert can deliver **drives controlling stand-alone PM motors (HPS range) or drives integrated into the PM motors (HPI range).**

* Pending approval by IEC



DRIVE SPECIFICATIONS

MAIN SUPPLY

Supply frequency	50 / 60Hz
Supply voltage	3 x 380/480V ± 10%

OUTPUT RATINGS

Output rated current	100% continuously @ 40°C
Overload capacity	150% for 60 sec 175% for 2 sec

DIGITAL INPUT

Programmable digital input	4
Voltage level	0-24VDC (user selectable npn/pnp)

ANALOG INPUT

Programmable analog voltage input	1
Voltage level	0:10VDC
Programmable analog current input	1
Current range	0:20mA

BUS COMMUNICATION

RS485 or CANbus	for cascade mode
RS485	serial communication
CANbus	CANopen

RELAY OUTPUT

Programmable relay output

PROGRAMMING

Keypad	Yes
PC	Yes

CONTROL SPECIFICATION

Frequency range	up to 400Hz
Control method	Sensorless AC Vector Control
Max PWM frequency	12KHz

EXTERNALS

Enclosure	IP55
Max operating ambient temperature (Full load)	0 - 40°C
Storage ambient temperature	÷ 25°C - 60°C

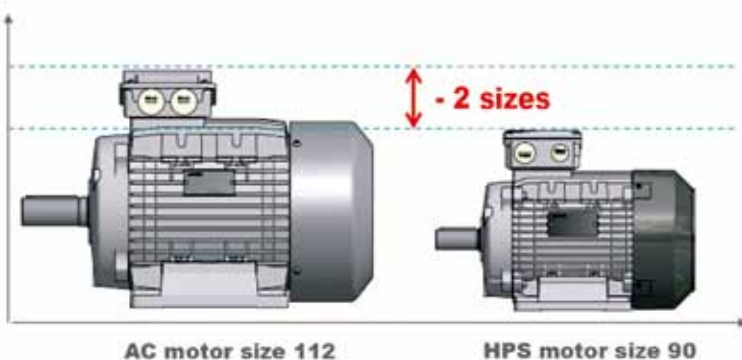
COMPLIANCE WITH STANDARDS

EN 61800-3:2004	Adjustable speed electrical power drive systems. EMC requirements
IEC 61800-5-1	Adjustable speed electrical drive systems - part 5-1: safety requirements - electrical, thermal and energy
EN 60204-1	Safety of machinery - electrical EMC equipment of machines - part 1: general rules

EFFICIENCY @ 3000RPM

Rated Output [kW]	IEC Motor frame	HP Motor frame	IE3 (IEC 60034-30)	HPS Efficiency [%]	IE3 + FC	HPI Efficiency [%]
0.75			80.7	89.7	77.5	85.5
1.1	80	71	82.7	90.5	79.4	86.9
1.5			84.2	91.2	80.8	87.4
2.2	90		85.9	91.4	82.5	87.7
3	100		87.1	92.1	83.6	88.4
4		90	88.1	92.6	84.6	88.9
5.5	112		89.2	93.1	85.6	89.4
7.5	132	112	90.1	93.7	86.5	90.0
11			91.2	94.1	87.5	90.3
15	160		91.9	94.2	88.2	90.5
18.5		132	92.4	94.6	88.7	90.8
22	180		92.7	94.9	89.0	91.1

REDUCTION OF WEIGHT & DIMENSIONS



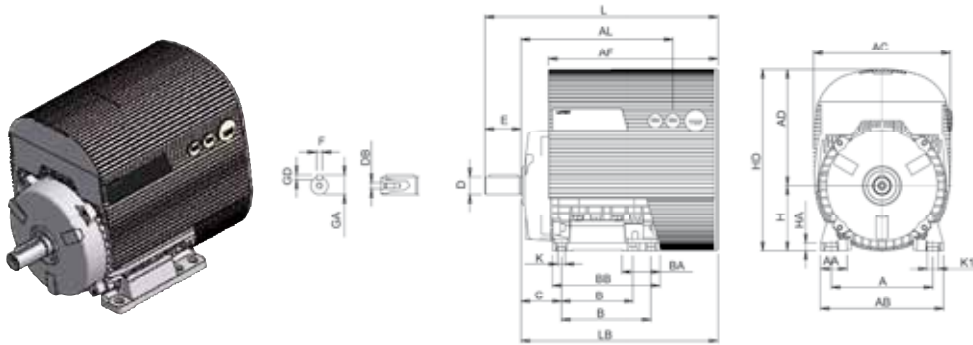
Weight IEC Motor
Size 112 - 5.5 kW - 34 Kg
Size 132 - 7.5 kW - 53 Kg
Weight HPS Motor
Size 90 - 5.5 kW - 16 Kg
Size 112 - 7.5 kW - 26 Kg



Type	Rated speed n 1/min	Rated power P _n kW	Rated torque M _n Nm	Peak torque M _{pk} Nm	Motor Rated current I _n Arms	Motor Peak current I _{pk} Arms	Efficiency HPI η %	Rated input current 380 Vac I _{in} Arms	Rated input current 480 Vac I _{in} Arms	Torque constant Kt Nm/A	Weight HPI Kg
3000 min-1											
HPI71 3000 16	3000	0.75	2.4	3.6	1.6	2.4	85.5%	1.7	1.3	1.5	7.3
HPI71 3000 23	3000	1.10	3.5	5.3	2.3	3.5	86.9%	2.4	1.9	1.5	7.9
HPI71 3000 32	3000	1.50	4.8	7.2	3.2	4.8	87.4%	3.3	2.6	1.5	8.5
HPI71 3000 47	3000	2.20	7.0	10.5	4.7	7.0	87.7%	4.8	3.8	1.5	9.1
HPI90 3000 47	3000	2.20	7.0	10.5	4.7	7.0	86.9%	4.8	3.8	1.5	13.5
HPI90 3000 64	3000	3.00	9.6	14.4	6.4	9.6	88.4%	6.4	5.1	1.5	15.5
HPI90 3000 85	3000	4.00	12.7	19.1	8.5	12.7	88.9%	8.5	6.8	1.5	17.5
HPI90 3000 117	3000	5.50	17.5	26.3	11.7	17.5	89.4%	11.7	9.3	1.5	19.5
HPI112 3000 117	3000	5.50	17.5	26.3	11.7	17.5	88.4%	11.9	9.4	1.5	28.5
HPI112 3000 159	3000	7.50	23.9	35.9	15.9	23.9	90.0%	15.9	12.5	1.5	31.5
HPI112 3000 233	3000	11.00	35.0	52.5	23.3	35.0	90.3%	23.2	18.4	1.5	35.5
HPI112 3000 318	3000	15.00	47.8	71.7	31.8	47.8	90.5%	31.5	25.0	1.5	38.5
HPI132 3000 318	3000	15.00	47.8	71.7	31.8	47.8	90.2%	32.1	25.4	1.5	57.5
HPI132 3000 393	3000	18.50	58.9	88.4	39.3	58.9	90.8%	38.8	30.7	1.5	64.5
HPI132 3000 467	3000	22.00	70.0	105.0	46.7	70.0	91.1%	46.1	36.5	1.5	71.5

* For rated speeds 1500 - 1800 - 3600 - 4500 rpm, please refer to the catalogue

HPI FRAME SIZE 71 - 90 - 112 - 132 IM B3* ALUMINIUM ALLOY FRAME



IEC	H	A	B	C	K ¹⁾	AB	BB	AD ²⁾	HD ²⁾	AC	HA
71	71	112	90	45	7	144	109	140	211	160	9
90S	90	140	100	56	10	170	150	183	273	196	11
90L	90	140	125	56	10	170	150	183	273	196	11
112M	112	190	140	70	12.5	220	175	230	340	246	15
132M	132	216	178	89	12	256	218	243	375	280	17

IEC	K1	L	LB	AL	AF	BA	AA	D	E	F	GD	GA	DB ³⁾
71	17	280	250	200	200	22	30	14	30	5	5	16	M5
90S	15	369	319	254	280	28/53	37	24	50	8	7	27	M8
90L	15	369	319	254	280	28/53	37	24	50	8	7	27	M8
112M	19	457	397	332	350	46	48	28	60	8	7	31	M10
132M	20	545	465	380	415	45	59	38	80	10	8	41	M12

1) Clearance hole for screw 2) Maximum dimension 3) Centering holes in shaft extensions to DIN 332 part 2

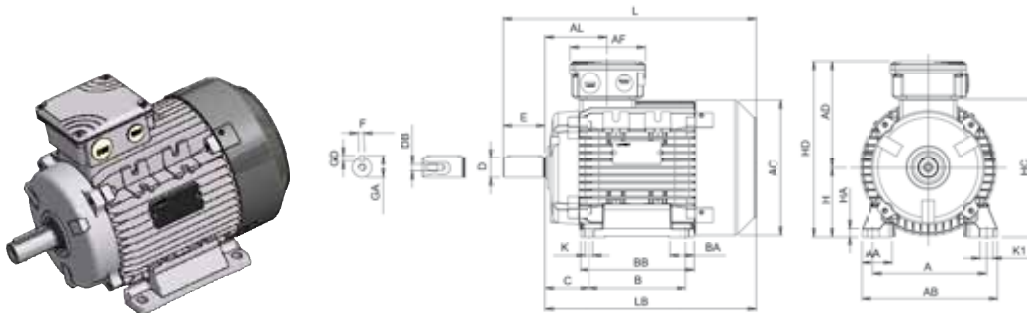
* For mounting arrangements IM B5 - IM B14, please refer to the catalogue

TEMPERATURE RISE TO CLASS B

Type	Rated speed	Rated power	Rated torque	Peak torque	Voltage constant	Torque constant	BEMF at rated speed	Rated current	Efficiency HPS	Weight Kg
	n 1/min	P _n kW	M _n Nm	M _{pk} Nm	K _e Vs	K _t Nm/A	E _n Vrs	I _n Arms	η %	
3000 min⁻¹										
HPS71 3000 16	3000	0.75	2.4	7.2	0.87	1.5	272	1.6	89.7%	4.8
HPS71 3000 23	3000	1.1	3.5	10.5	0.87	1.5	272	2.3	90.5%	5.4
HPS71 3000 32	3000	1.5	4.8	14.3	0.87	1.5	272	3.2	91.2%	6
HPS71 3000 47	3000	2.2	7.0	21.0	0.87	1.5	272	4.7	91.4%	6.6
HPS90 3000 47	3000	2.2	7.0	21.0	0.87	1.5	272	4.7	91.5%	10
HPS90 3000 64	3000	3.0	9.6	28.7	0.87	1.5	272	6.4	92.1%	12
HPS90 3000 85	3000	4.0	12.7	38.2	0.87	1.5	272	8.5	92.6%	14
HPS90 3000 117	3000	5.5	17.5	52.5	0.87	1.5	272	11.7	93.1%	16
HPS112 3000 117	3000	5.5	17.5	52.5	0.87	1.5	272	11.7	92.9%	23
HPS112 3000 159	3000	7.5	23.9	71.6	0.87	1.5	272	15.9	93.7%	26
HPS112 3000 233	3000	11.0	35.0	105.1	0.87	1.5	272	23.3	94.1%	30
HPS112 3000 318	3000	15.0	47.8	143.3	0.87	1.5	272	31.8	94.2%	33
HPS132 3000 318	3000	15.0	47.8	143.3	0.87	1.5	272	31.8	93.8%	51
HPS132 3000 393	3000	18.5	58.9	176.7	0.87	1.5	272	39.3	94.6%	58
HPS132 3000 467	3000	22.0	70.0	210.1	0.87	1.5	272	46.7	94.9%	65
HPS132 3000 636	3000	30.0	95.4	286.0	0.87	1.5	272	63.6	95.0%	72

* For rated speeds 1500 - 1800 - 3600 - 4500 rpm, please refer to the catalogue

HPS FRAME SIZE 71 - 90 - 112 IM B3* ALUMINIUM ALLOY FRAME



IEC	H	A	B	C	K ¹⁾	AB	BB	CA	AD ²⁾	HD ²⁾	AC	HC	HA
71	71	112	90	45	7	144	109	83	112	183	142	142	9
90S	90	140	100	56	10	170	150	116	148	238	180	181	11
90L	90	140	125	56	10	170	150	91	148	238	180	181	11
112M	112	190	140	70	12.5	220	175	126	171	283	225	226	15

IEC	K1	L	LB	LC	AL	AF	BA	AA	D/DA	E/EA	F/FA	GD	GA/GC	DB ³⁾
71	17	245	215	278	75	93	22	30	14	30	5	5	16	M5
90S	15	317	267	372	85	110	28/53	37	24	50	8	7	27	M8
90L	15	317	267	372	85	110	28/53	37	24	50	8	7	27	M8
112M	19	388	328	456	91.5	110	46	48	28	60	8	7	31	M10

1) Clearance hole for screw 2) Maximum dimension 3) Centering holes in shaft extensions to DIN 332 part 2

* For mounting arrangements IM B5 - IM B14, please refer to the catalogue

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