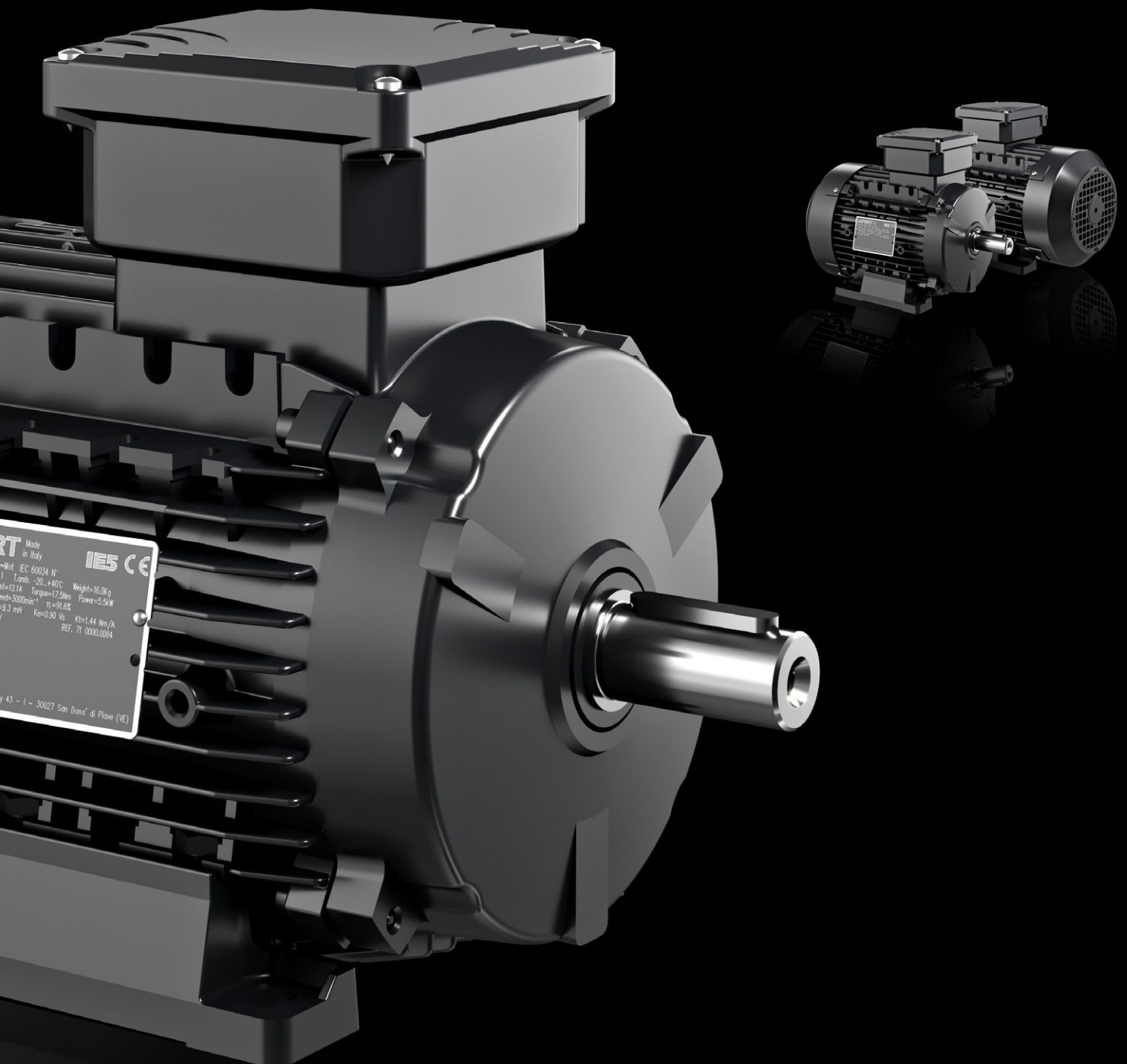


HPS RANGE

HIGH PERFORMANCE MOTORS
STAND-ALONE MOTOR





High Performance (HP) is a generation of **permanent magnet (PM) synchronous motors** that achieve **Super Premium IE4 and Ultra Premium IE5 Efficiency level**, combining the electrical design of brushless servo motors with the mechanical design of AC induction motors.

With higher efficiencies than standard AC induction motors, the HP range also enhances the power/weight ratio, thereby allowing for **significant size and weight reductions down to 50%**.

Thanks to the torque and the high efficiency, available through the complete speed range, the HPS series is targeted to both **quadratic torque applications**, typically in HVAC, as well as to **constant torque applications** like material handling, air compressors and vacuum pumps.

These applications require high performances in continuous operation under variable speed, reducing the operating cost and weight/size of the system.

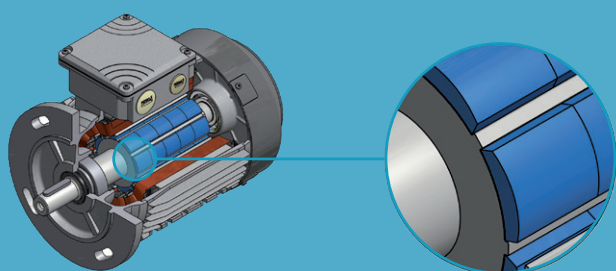
The HP motor range is based upon **Surface Mounted Permanent Magnet (SMPM)** design. PM motors typically use rare earth magnetic material such as Samarium and Neodymium in the construction of the magnet elements.

Furthermore, in order to address market challenges and multiple application needs, Lafert has introduced for specific projects a cost effective **Interior Permanent Magnet (IPM)** and **Surface Mounted Permanent Magnet (SMPM)** design and introduced different magnet elements more readily available, without applying rare earth magnets.

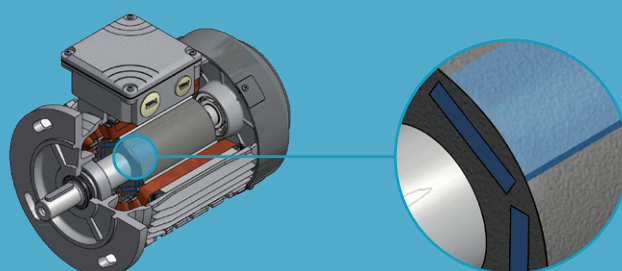
The complete range 0.37 kW to 37 kW are supplied as **stand-alone motors** (HPS range), as **motor-drive combined package** (HPC range), or as **motor-drive integrated unit** (HPI range), specifically designed for their energy saving potential.

Lafert also offer flexibility in terms of design, customising the active and mechanical parts of the motor to suit specific customer requirements.

DIFFERENT MOTOR DESIGN DEPENDING ON THE PERFORMANCE DEMAND



SMPM DESIGN
SURFACE MOUNTED PERMANENT MAGNETS



IPM DESIGN
INTERIOR PERMANENT MAGNETS

HPS RANGE STAND-ALONE MOTOR

A RANGE OF SOLUTIONS
TO MEET SPECIFIC DEMANDS

Power rating: 0.37kW to 37kW
0.50HP to 50HP

Torque: 2 Nm to 190 Nm

Speed: up to 4500 rpm

Frame size: 56 - 71 - 90 - 112 - 132 - 160

Design flexibility by customizing both active
and mechanical parts

IEC mechanical configurations (B14, B5 etc)
NEMA Mounting

IPM (Interior Permanent Magnets) or **SMPM**
(Surface Mounted Permanent Magnets) design

Ultra Premium Efficiency **IE5**

Target Applications: pumps, fans, air compressors,
vacuum pumps, conveyors, material handling



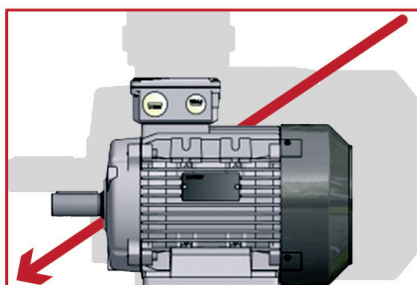
EFFICIENCY @ 3000RPM

| Rated Output [kW] | IEC Motor frame | HP Motor frame |
|-------------------|-----------------|----------------|
| 0.75 | 80 | 71 |
| 1.1 | | |
| 1.5 | | |
| 2.2 | | |
| 3 | | |
| 4 | 100 | 90 |
| 5.5 | | |
| 7.5 | | |
| 11 | 112 | 112 |
| 15 | | |
| 18.5 | | |
| 22 | 180 | 132 |
| 30 | | |

| IE3 Efficiency [%] | HPS IE4 Efficiency [%] | HPS IE5 Efficiency [%] |
|--------------------|------------------------|------------------------|
| 80.7 | 81.5 | 84.6 |
| 82.7 | 83.3 | 86.2 |
| 84.2 | 84.8 | 87.4 |
| 85.9 | 86.4 | 88.9 |
| 87.1 | 87.7 | 89.9 |
| 88.1 | 88.7 | 90.7 |
| 89.2 | 89.7 | 91.6 |
| 90.1 | 90.6 | 92.4 |
| 91.2 | 91.6 | 93.2 |
| 91.9 | 92.4 | 93.7 |
| 92.4 | 92.8 | 94.2 |
| 92.7 | 93.2 | 94.4 |
| 93.3 | 93.7 | 94.9 |

REDUCTION OF DIMENSIONS & WEIGHT

AC motor
size 112



HPS motor
size 90

Weight AC 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

VALUES @ 400V

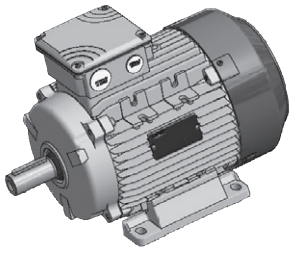
TEMPERATURE RISE TO CLASS B

| Type | Size | Rated speed n 1/min | Rated power P _n kW | Rated torque M _n Nm | Peak torque M _{pk} Nm | Voltage constant K _e Vs | Torque constant K _t Nm/A | BEMF at rated speed E _n Vrs | Rated current I _n Arms | Efficiency* IE5 η % | Weight Kg |
|------------------------------|------|---------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--|---|--|---|------------------------------|--------------|
| 1800 min⁻¹ | | | | | | | | | | | |
| HPS 56 1800 4 | 56 | 1800 | 0.18 | 1.0 | 2.9 | 1.45 | 2.5 | 272 | 0.4 | 76.3 | 3.0 |
| HPS 56 1800 5 | 56 | 1800 | 0.25 | 1.3 | 4.0 | 1.45 | 2.5 | 272 | 0.5 | 79.3 | 3.2 |
| HPS71 1800 12 | 71 | 1800 | 0.55 | 2.9 | 8.8 | 1.45 | 2.5 | 272 | 1.2 | 85.0 | 5.0 |
| HPS71 1800 16 | 71 | 1800 | 0.75 | 4.0 | 11.9 | 1.45 | 2.5 | 272 | 1.6 | 86.7 | 5.4 |
| HPS71 1800 23 | 71 | 1800 | 1.1 | 5.8 | 17.5 | 1.45 | 2.5 | 272 | 2.3 | 88.1 | 7.0 |
| HPS71 1800 32 | 71 | 1800 | 1.5 | 8.0 | 23.9 | 1.45 | 2.5 | 272 | 3.2 | 89.1 | 7.0 |
| HPS90 1800 32 | S-L | 1800 | 1.5 | 8.0 | 23.9 | 1.45 | 2.5 | 272 | 3.2 | 89.1 | 12 |
| HPS90 1800 46 | S-L | 1800 | 2.2 | 11.7 | 35.0 | 1.45 | 2.5 | 272 | 4.6 | 90.2 | 14 |
| HPS90 1800 64 | S-L | 1800 | 3 | 15.9 | 47.7 | 1.45 | 2.5 | 272 | 6.3 | 91.0 | 17 |
| HPS90 1800 84 | XL | 1800 | 4 | 21.2 | 63.7 | 1.45 | 2.5 | 272 | 8.4 | 91.8 | 18 |
| HPS112 1800 84 | M | 1800 | 4 | 21.2 | 63.7 | 1.45 | 2.5 | 272 | 8.4 | 91.8 | 23 |
| HPS112 1800 116 | M | 1800 | 5.5 | 29.2 | 87.5 | 1.45 | 2.5 | 272 | 11.6 | 92.5 | 23 |
| HPS112 1800 158 | M | 1800 | 7.5 | 39.8 | 119.4 | 1.45 | 2.5 | 272 | 15.8 | 93.2 | 30 |
| HPS112 1800 232 | XL | 1800 | 11 | 58.4 | 175.1 | 1.45 | 2.5 | 272 | 23.2 | 93.5 | 33 |
| HPS132 1800 232 | M | 1800 | 11 | 58.4 | 175.1 | 1.45 | 2.5 | 272 | 23.2 | 93.8 | 54 |
| HPS132 1800 317 | XXL | 1800 | 15 | 79.6 | 238.7 | 1.45 | 2.5 | 272 | 31.7 | 94.4 | 58 |
| HPS132 1800 391 | XXL | 1800 | 18.5 | 98.1 | 294.4 | 1.45 | 2.5 | 272 | 39.1 | 94.6 | 65 |
| HPS160 1800 232 | M | 1800 | 11 | 58 | 146 | 1.45 | 2.5 | 272 | 23.2 | 93.8 | 70 |
| HPS160 1800 317 | M | 1800 | 15 | 80 | 199 | 1.45 | 2.5 | 272 | 31.7 | 94.4 | 75 |
| HPS160 1800 391 | M | 1800 | 18.5 | 98 | 245 | 1.45 | 2.5 | 272 | 39.1 | 94.6 | 75 |
| HPS160 1800 465 | L | 1800 | 22 | 117 | 292 | 1.45 | 2.5 | 272 | 46.5 | 94.9 | 85 |
| HPS160 1800 634 | L | 1800 | 30 | 159 | 398 | 1.45 | 2.5 | 272 | 63.4 | 95.3 | 100 |

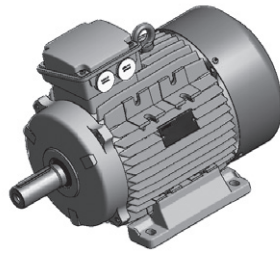
| Type | Size | Rated speed n 1/min | Rated power P _n kW | Rated torque M _n Nm | Peak torque M _{pk} Nm | Voltage constant K _e Vs | Torque constant K _t Nm/A | BEMF at rated speed E _n Vrs | Rated current I _n Arms | Efficiency* IE5 η % | Weight Kg |
|------------------------------|------|---------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--|---|--|---|------------------------------|--------------|
| 3000 min⁻¹ | | | | | | | | | | | |
| HPS 56 3000 5 | 56 | 3000 | 0.25 | 0.8 | 2.4 | 0.87 | 1.5 | 272 | 0.5 | 75.8 | 2.8 |
| HPS 56 3000 8 | 56 | 3000 | 0.37 | 1.2 | 3.5 | 0.87 | 1.5 | 272 | 0.8 | 79.5 | 3.0 |
| HPS 56 3000 12 | 56 | 3000 | 0.55 | 1.8 | 5.3 | 0.87 | 1.5 | 272 | 1.2 | 82.7 | 3.2 |
| HPS71 3000 16 | 71 | 3000 | 0.75 | 2.4 | 7.2 | 0.87 | 1.5 | 272 | 1.6 | 84.6 | 4.8 |
| HPS71 3000 23 | 71 | 3000 | 1.1 | 3.5 | 10.5 | 0.87 | 1.5 | 272 | 2.3 | 86.2 | 6.0 |
| HPS71 3000 32 | 71 | 3000 | 1.5 | 4.8 | 14.3 | 0.87 | 1.5 | 272 | 3.2 | 87.4 | 6.0 |
| HPS71 3000 47 | 71 | 3000 | 2.2 | 7.0 | 21.0 | 0.87 | 1.5 | 272 | 4.7 | 88.9 | 6.6 |
| HPS90 3000 47 | S-L | 3000 | 2.2 | 7.0 | 21.0 | 0.87 | 1.5 | 272 | 4.7 | 88.9 | 10 |
| HPS90 3000 64 | S-L | 3000 | 3 | 9.6 | 28.7 | 0.87 | 1.5 | 272 | 6.4 | 89.9 | 12 |
| HPS90 3000 85 | S-L | 3000 | 4 | 12.7 | 38.2 | 0.87 | 1.5 | 272 | 8.5 | 90.7 | 14 |
| HPS90 3000 117 | S-L | 3000 | 5.5 | 17.5 | 52.5 | 0.87 | 1.5 | 272 | 11.7 | 91.6 | 16 |
| HPS112 3000 117 | M | 3000 | 5.5 | 17.5 | 52.5 | 0.87 | 1.5 | 272 | 11.7 | 91.6 | 23 |
| HPS112 3000 159 | M | 3000 | 7.5 | 23.9 | 71.6 | 0.87 | 1.5 | 272 | 15.9 | 92.4 | 26 |
| HPS112 3000 233 | M | 3000 | 11 | 35.0 | 105.1 | 0.87 | 1.5 | 272 | 23.3 | 93.2 | 30 |
| HPS112 3000 318 | M | 3000 | 15 | 47.8 | 143.3 | 0.87 | 1.5 | 272 | 31.8 | 93.7 | 33 |
| HPS132 3000 318 | M | 3000 | 15 | 47.8 | 143.3 | 0.87 | 1.5 | 272 | 31.8 | 93.7 | 55 |
| HPS132 3000 393 | XL | 3000 | 18.5 | 58.9 | 176.7 | 0.87 | 1.5 | 272 | 39.3 | 94.2 | 59 |
| HPS132 3000 467 | XXL | 3000 | 22 | 70.0 | 210.1 | 0.87 | 1.5 | 272 | 46.7 | 94.4 | 67 |
| HPS132 3000 636 | XXL | 3000 | 30 | 95.4 | 286.0 | 0.87 | 1.5 | 272 | 63.6 | 94.9 | 72 |
| HPS160 3000 634 | L | 3000 | 30 | 95.4 | 239 | 0.87 | 1.51 | 272 | 63.4 | 94.9 | 90 |
| HPS160 3000 782 | L | 3000 | 37 | 118.0 | 294 | 0.87 | 1.51 | 272 | 78.2 | 95.2 | 95 |

* In new IEC TS 60034-30-2, the IE class limit values are reduced by adding the additional harmonic losses caused by the drive: 15% additional losses for motors up to 90 kW.
For rated speeds 1500 - 3600 - 4500 rpm, please refer to the catalogue

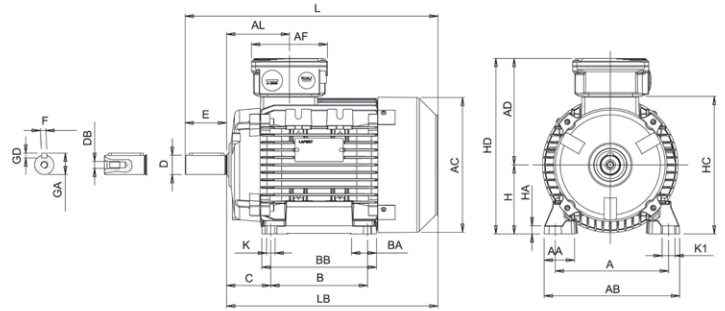
HPS FRAME SIZE 56 - 71 - 90 - 112 - 132 - 160 IM B3*



56 to 112 frame



132 to 160 frame



| IEC | H | A | B | C | K ¹⁾ | AB | BB | AD ²⁾ | HD ²⁾ | AC | HC | HA |
|--------|-----|-----|-----|-----|-----------------|-----|-----|------------------|------------------|-----|-----|----|
| 56 | 56 | 90 | 71 | 36 | 6 | 107 | 86 | 92 | 148 | 110 | 109 | 8 |
| 71 | 71 | 112 | 90 | 45 | 8 | 135 | 108 | 114 | 185 | 142 | 142 | 9 |
| 90S | 90 | 140 | 100 | 56 | 10 | 170 | 150 | 148 | 238 | 177 | 181 | 11 |
| 90L | 90 | 140 | 125 | 56 | 10 | 170 | 150 | 148 | 238 | 177 | 181 | 11 |
| 112M | 112 | 190 | 140 | 70 | 12.5 | 220 | 176 | 171 | 283 | 225 | 226 | 15 |
| 112XL | 112 | 190 | 140 | 70 | 12.5 | 220 | 176 | 171 | 283 | 225 | 226 | 15 |
| 132M | 132 | 216 | 178 | 89 | 12 | 256 | 218 | 195 | 327 | 248 | 261 | 17 |
| 132XL | 132 | 216 | 178 | 89 | 12 | 256 | 218 | 195 | 327 | 248 | 261 | 17 |
| 132XXL | 132 | 216 | 178 | 89 | 12 | 256 | 218 | 195 | 327 | 248 | 261 | 17 |
| 160M | 160 | 254 | 210 | 108 | 14 | 320 | 270 | 238 | 398 | 317 | 316 | 23 |
| 160L | 160 | 254 | 254 | 108 | 14 | 320 | 310 | 238 | 398 | 317 | 316 | 23 |

| IEC | K1 | L | LB | AL | AF | BA | AA | D | E | F | GD | GA | DB ³⁾ |
|--------|----|-----|-----|-----|-----|-------|----|------------------|-----|------------------|-----------------|------------------|------------------|
| 56 | 9 | 188 | 168 | 61 | 93 | 27 | 27 | 14 | 30 | 5 | 5 | 16 | M5 |
| 71 | 17 | 245 | 215 | 75 | 93 | 22 | 30 | 19 | 40 | 6 | 6 | 22 | M6 |
| 90S | 15 | 317 | 267 | 85 | 110 | 28/53 | 37 | 24 | 50 | 8 | 7 | 27 | M8 |
| 90L | 15 | 317 | 267 | 85 | 110 | 28/53 | 37 | 24 | 50 | 8 | 7 | 27 | M8 |
| 112M | 19 | 388 | 328 | 92 | 110 | 46 | 48 | 28 | 60 | 8 | 7 | 31 | M10 |
| 112XL | 19 | 410 | 350 | 92 | 110 | 46 | 48 | 28 | 60 | 8 | 7 | 31 | M10 |
| 132M | 20 | 485 | 405 | 122 | 133 | 45 | 59 | 38 | 80 | 10 | 8 | 41 | M12 |
| 132XL | 20 | 505 | 425 | 122 | 133 | 45 | 59 | 38 | 80 | 10 | 8 | 41 | M12 |
| 132XXL | 20 | 556 | 476 | 122 | 133 | 45 | 59 | 38 | 80 | 10 | 8 | 41 | M12 |
| 160M | 18 | 608 | 498 | 146 | 150 | 65 | 76 | 42 ⁴⁾ | 110 | 12 ⁴⁾ | 8 ⁴⁾ | 45 ⁴⁾ | M16 |
| 160L | 18 | 652 | 542 | 168 | 150 | 65 | 76 | 48 | 110 | 14 | 9 | 51.5 | M16 |

1) Clearance hole for screw 2) Maximum dimension 3) Centering holes in shaft extensions to DIN 332 part 2
4) For type HPS160M 18.5 kW, please refer to HPS160L

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

Lafert S.p.A.

J. F. Kennedy, 43
I-30027 San Donà di Piave (Venezia), Italy
Tel. +39 / 0421 229 611
Fax +39 / 0421 222 908
lafert.info@shi-g.com

www.lafert.com

Branches & Partners**Lafert GmbH**

Wolf-Hirth-Straße 10
D-71034 Böblingen
Germany
Phone +49 175 550 4526
lge.info@shi-g.com

Lafert Electric Motors Ltd.

Unit 17 Orion Way
Crewe, Cheshire CW1 6NG
United Kingdom
Phone +44 / (0) 1270 270 022
luk.info@shi-g.com

Lafert Moteurs S.A.S.

L'Isle d'Abeau Parc de Chesnes
75, rue de Malacombe
F - 38070 St. Quentin-Fallavier
France
Phone +33 / 474 95 41 01
lfr.info@shi-g.com

Lafert Motores Electricos, S.L.U.

Poligono Pignatelli, Nave 27
E - 50410 Cuarte de Huerva (Zaragoza)
Spain
Phone +34 / 976 503 822
les.info@shi-g.com

Lafert N.A. (North America)

5620 Kennedy Road - Mississauga
Ontario L4Z 2A9
Canada
Phone +1 / 800/661 6413 - 905/629 1939
lna.info@shi-g.com

Lafert Electric Motors (Australia)

Factory 3, 117-123 Abbott Road,
Hallam - VIC 3803
Australia
Phone +61 / (0)3 95 46 75 15
info@lafertaust.com.au

Lafert Singapore Pte Ltd

48 Hillview Terrace #06-06
Hillview Building - Singapore 669269
Phone +65 / 67630400 - 67620400
info@lafert.com.sg

Lafert (Suzhou) Co., Ltd.

No.3 Industrial Plant Building Yue Xi Phase 3,
Tian E Dang Lu 2011, 215104 Wuzong
Economic Development Zone, Suzhou
China
Phone +86 / 512 6687 0618
lsu.info@shi-g.com