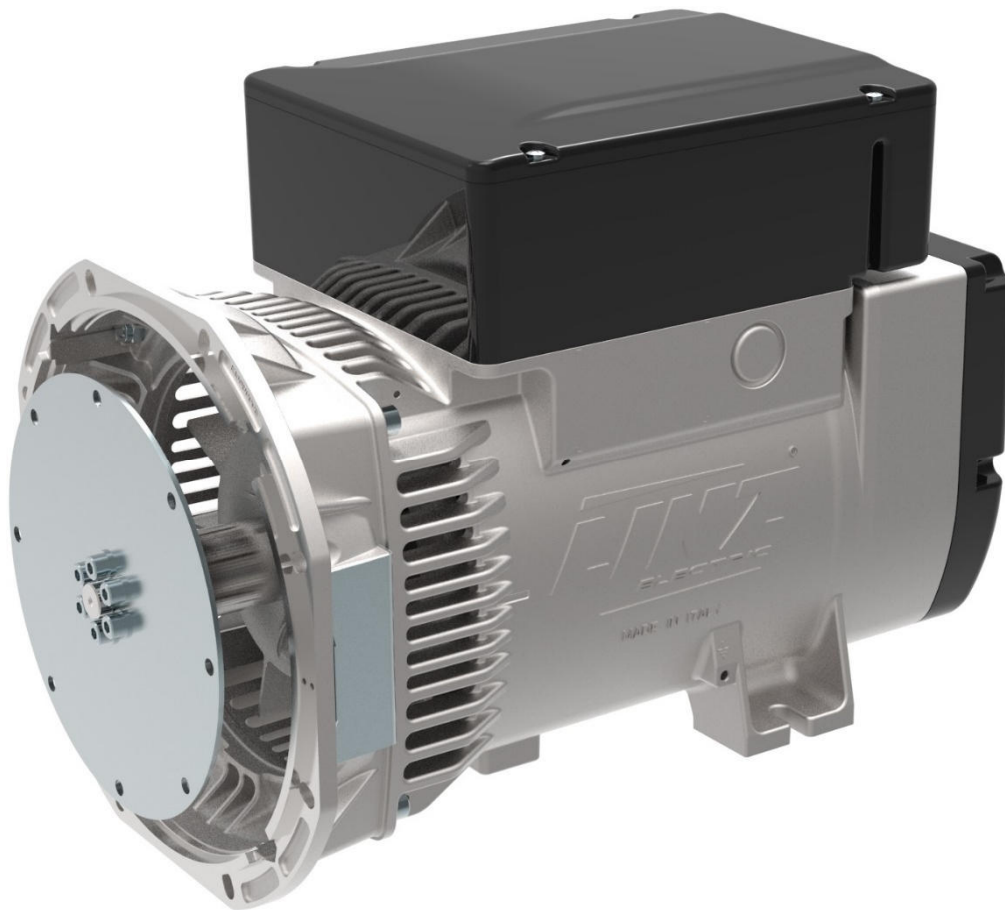


TECHNICAL DATA SHEET



**ALTERNATOR E1X13S A/4**

*Three-Phase brushless synchronous alternator with AVR - 4 poles*

## E1X13S A/4

### COMMON DATA

|                      |                     |  |             |
|----------------------|---------------------|--|-------------|
| Rated Power at 50Hz  | kVA                 | 6,5  |             |
| Rated Power at 60Hz  | kVA                 | 8,0  |             |
| Rated Power Factor   |                     | 0,8  |             |
| Nominal Temperature  | °C                  | 40   |             |
| Control System       |                     | self-excited   |             |
| Execution            |                     | brushless  |             |
| Regulation Type      |                     | AVR  |             |
| Insulation Class     |                     | H  |             |
| Protection           |                     | IP21   |             |
| Maximum Over speed   | rpm                 | 2250   |             |
| Overload             |                     | 110% of rated power for one hour in a cycle of 6 hours |             |
| Air Flow Requirement | m <sup>3</sup> /min | 2,6 at 50Hz  | 3,2 at 60Hz |
| R.F.I. Suppression   |                     | Standard EN55011                                       |             |

### REGULATION DATA

|                         |                         |             |
|-------------------------|-------------------------|-------------|
| AVR                     | HVR11                   | HVR30       |
| Sensing                 | single-phase            | three-phase |
| Voltage Regulation      | ±1%                     | ±1%         |
| Sustained Short Circuit | > 300% of rated current |             |

### WINDING DATA

|                           |                                     |              |
|---------------------------|-------------------------------------|--------------|
| Stator Winding            | Double layer with auxiliary winding |              |
| Rotor Winding             | with damping cage                   |              |
| Winding Pitch             | 2/3                                 |              |
| Number of Leads of Stator | 12                                  |              |
| Stator Winding Resistance | Ω                                   | 2,36 at 20°C |
| Rotor Winding Resistance  | Ω                                   | 5,73 at 20°C |
| Exciter Stator Resistance | Ω                                   | 16,5 at 20°C |
| Exciter Rotor Resistance  | Ω                                   | 2,15 at 20°C |
| THD at full load          | <3%                                 |              |
| THD at no load            | <3%                                 |              |
| Excitation at no load     | A <sub>dc</sub>                     | 0,48         |
| Excitation at full load   | A <sub>dc</sub>                     | 1,5          |

### STANDARD

|            |                             |
|------------|-----------------------------|
| References | EN60034-1 ISO8528-3 EN55011 |
|------------|-----------------------------|

### ON REQUEST

UL 1446, Systems of Insulating Materials - General CSA-C22.2 No. 0, Appendix B, General Requirements - Canadian Electrical Code, Part I  
 CAN/CSA - C22.2 No. 100-14 (R2009) Motors and Generators, UL1004-1 2nd ed. Rotating Electrical Machines - General Requirements, UL1004-4 2nd ed. Electric Generators

## E1X13S A/4

### ELECTRICAL DATA

| Frequency                              |     | 50Hz - 1500rpm |                                     |                    |                    |                    | 60Hz - 1800rpm                      |                    |                    |                    |                    |
|--|-----|----------------|-------------------------------------|--------------------|--------------------|--------------------|-------------------------------------|--------------------|--------------------|--------------------|--------------------|
| Voltage                                | V   | Double Delta   | Series High Wye<br>Parallel Low Wye |                    |                    | Double Delta       | Series High Wye<br>Parallel Low Wye |                    |                    |                    |                    |
|  |     | 115/230        | 380/220<br>190/110                  | 400/230<br>200/115 | 415/240<br>208/120 | 440/254<br>220/127 | 120/240                             | 415/240<br>208/120 | 440/254<br>220/127 | 460/266<br>230/133 | 480/277<br>240/138 |
| Rated Power in Class H<br>(125°C/40°C) | kVA | 4,3            | 6,5                                 | 6,5                | 6,5                | 6,0                | 4,4                                 | 7,4                | 8,0                | 8,0                | 8,0                |
|  | kW  | 3,44           | 5,2                                 | 5,2                | 5,2                | 4,8                | 3,52                                | 5,92               | 6,4                | 6,4                | 6,4                |
| Rated Power in Class F<br>(105°C/40°C) | kVA | 4,0            | 6,0                                 | 6,0                | 6,0                | 5,5                | 4,0                                 | 6,7                | 7,3                | 7,3                | 7,3                |
|  | kW  | 3,2            | 4,8                                 | 4,8                | 4,8                | 4,4                | 3,2                                 | 5,36               | 5,84               | 5,84               | 5,84               |
| Rated Power Standby<br>(150°C/40°C)    | kVA | 4,7            | 7,0                                 | 7,0                | 7,0                | 6,5                | 4,8                                 | 8,0                | 8,5                | 8,8                | 8,8                |
|  | kW  | 3,76           | 5,6                                 | 5,6                | 5,6                | 5,2                | 3,84                                | 6,4                | 6,8                | 7,04               | 7,04               |
| Rated Power Standby<br>(163°C/27°C)    | kVA | 5,0            | 7,4                                 | 7,4                | 7,4                | 6,8                | 5,0                                 | 8,4                | 9,0                | 9,2                | 9,2                |
|  | kW  | 4,0            | 5,92                                | 5,92               | 5,92               | 5,44               | 4,0                                 | 6,72               | 7,2                | 7,36               | 7,36               |

### EFFICIENCY IN CL. H

|     |  |  |       |  |  |  |  |  |  |       |
|-----|--|--|-------|--|--|--|--|--|--|-------|
| 4/4 |  |  | 80,9% |  |  |  |  |  |  | 81,0% |
| 3/4 |  |  | 81,0% |  |  |  |  |  |  | 81,3% |
| 2/4 |  |  | 79,0% |  |  |  |  |  |  | 79,3% |
| 1/4 |  |  | 74,0% |  |  |  |  |  |  | 74,5% |

### REACTANCES AND TIME CONSTANTS

|                  |                               |       |       |       |       |  |       |       |       |       |
|------------------|-------------------------------|-------|-------|-------|-------|--|-------|-------|-------|-------|
| pcc              |                               | 0,76  |       |       |       |  |       |       |       |       |
| X <sub>d</sub>   | - dir. axis synchronous       | 265%  | 239%  | 222%  | 182%  |  | 296%  | 284%  | 260%  | 239%  |
| X' <sub>d</sub>  | - dir. axis transient         | 23,3% | 21,0% | 19,5% | 16,0% |  | 26,0% | 25,0% | 22,9% | 21,0% |
| X'' <sub>d</sub> | - dir. axis subtransient      | 11,1% | 10,0% | 9,3%  | 7,6%  |  | 12,4% | 11,9% | 10,9% | 10,0% |
| X <sub>q</sub>   | - quad. axis reactance        | 139%  | 125%  | 116%  | 95%   |  | 155%  | 149%  | 136%  | 125%  |
| T' <sub>do</sub> | - O.C. field time constant    | 296ms |       |       |       |  |       |       |       |       |
| T' <sub>d</sub>  | - Transient time constant     | 26ms  |       |       |       |  |       |       |       |       |
| T'' <sub>d</sub> | - Sub-transient time constant | 5ms   |       |       |       |  |       |       |       |       |

### MECHANICAL DATA

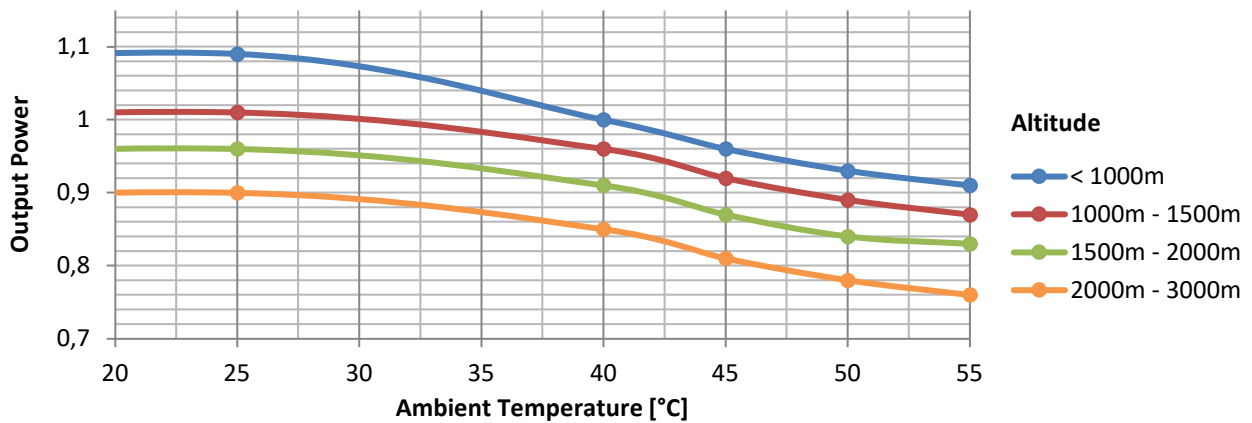
|                                 |           |    |            |
|---------------------------------|-----------|----|------------|
| Bearing non drive end           |           |    | 6305-2Z-C3 |
| Bearing drive end (B3/B14 form) |           |    | 6208-2Z-C3 |
| Weight of generator             | in B2     | kg | 63,5       |
|                                 | in B3/B14 | kg | 59,4       |
|                                 | in B3/B9  | kg | \          |

# E1X13S A/4

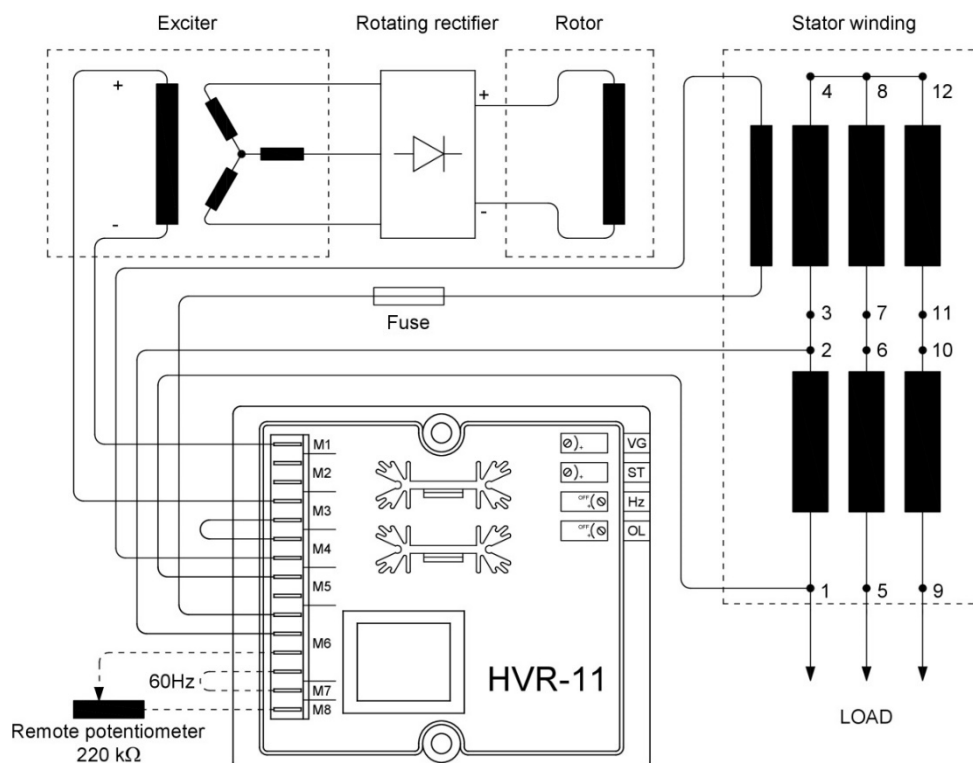
## MOMENT OF INERZIA

|        |                   |      |
|--------|-------------------|------|
| B3/B9  | kg·m <sup>2</sup> | \    |
| SAE 7½ | kg·m <sup>2</sup> | 0,06 |
| B2     | kg·m <sup>2</sup> | 0,06 |

## DERATING CURVES



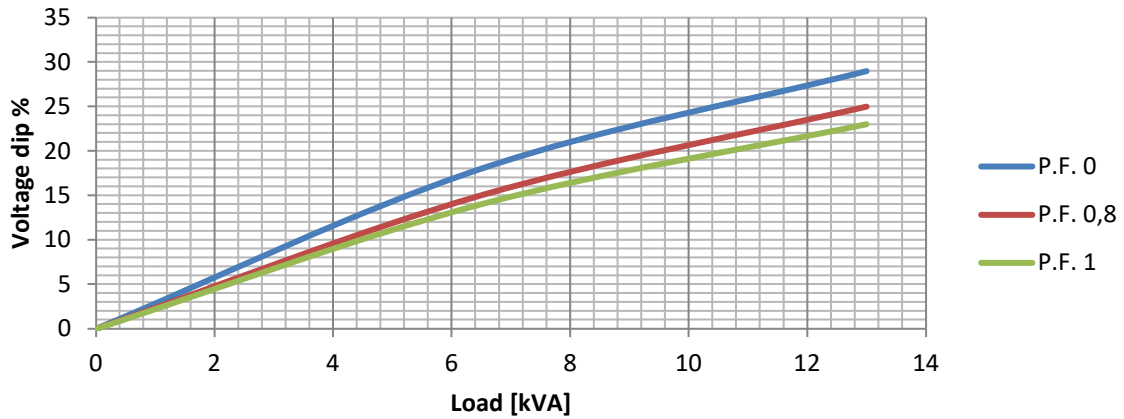
## WIRING DIAGRAM



# E1X13S A/4

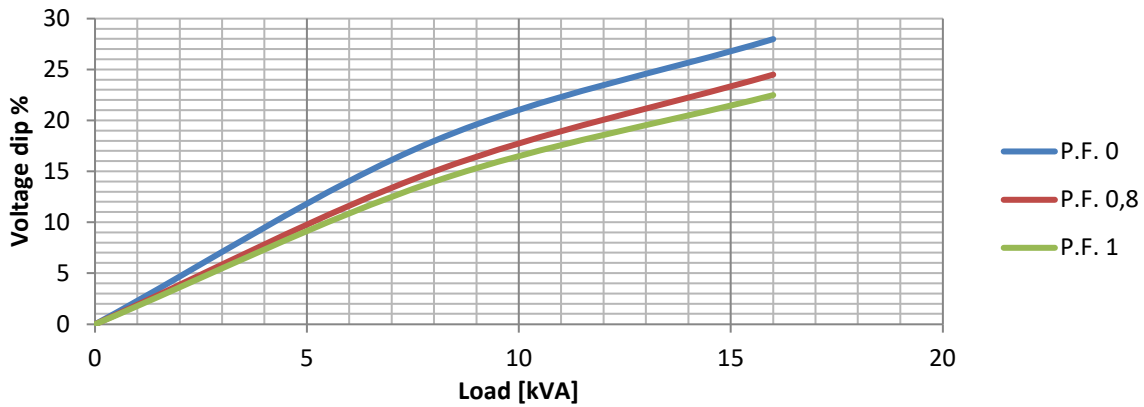
## TRANSIENT VOLTAGE VARIATION 50Hz

### Transient Voltage Variation @ 50Hz



## TRANSIENT VOLTAGE VARIATION 60Hz

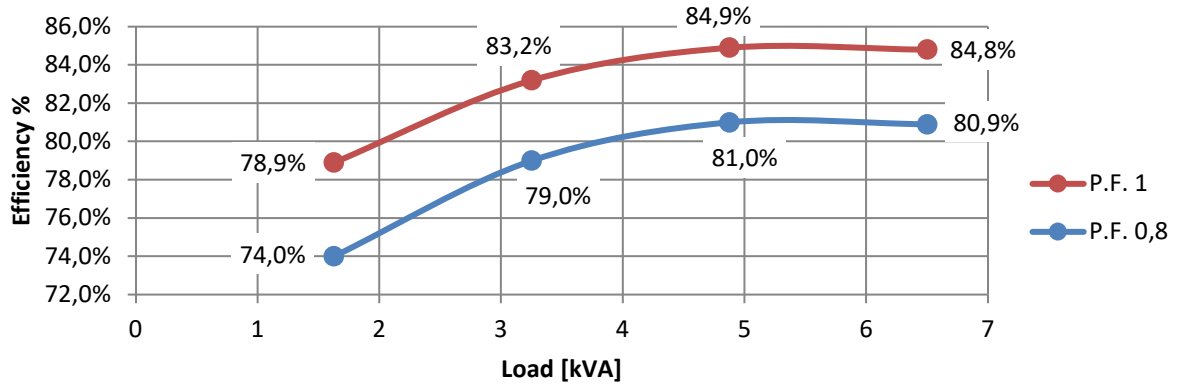
### Transient Voltage Variation @ 60Hz



# E1X13S A/4

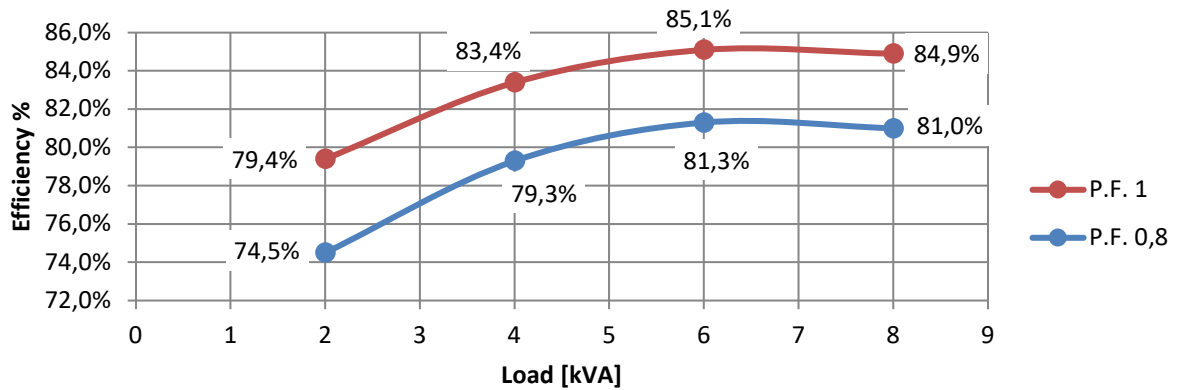
## EFFICIENCY 50Hz

### Efficiency Curves @ 50Hz



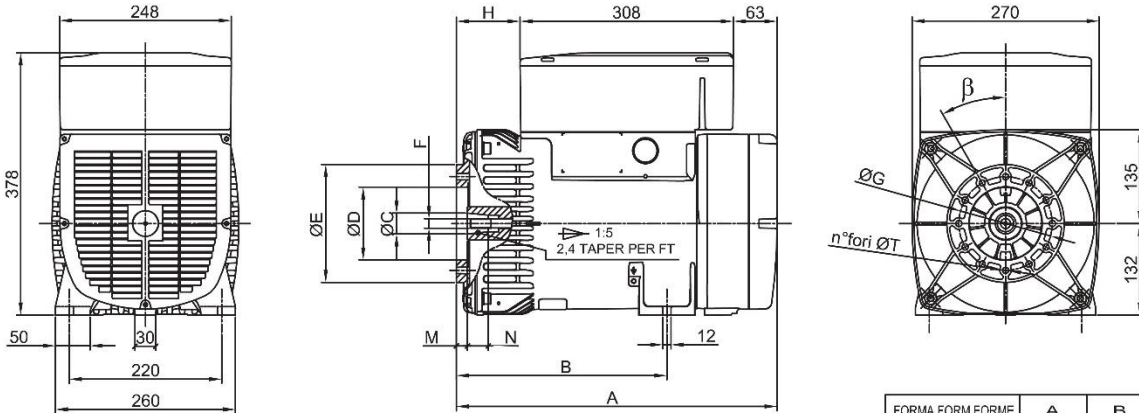
## EFFICIENCY 60Hz

### Efficiency Curves @ 60Hz



# E1X13S A/4

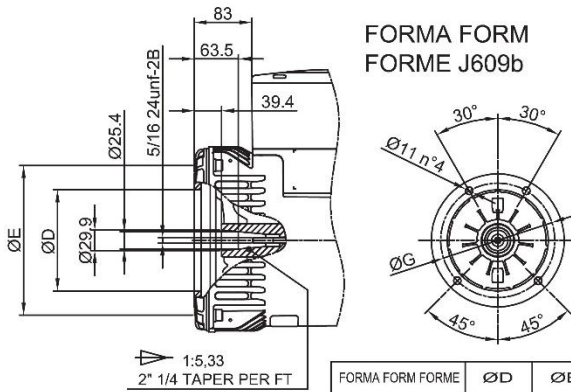
FORMA FORM FORME B3/B9



| FORMA FORM FORME | ØC  | ØD   | ØE   | F       | ØG   | H  | M  | N  | n°fori | ØT  | β       |
|------------------|-----|------|------|---------|------|----|----|----|--------|-----|---------|
| cono Ø30         | Ø30 | Ø105 | Ø170 | M14x1.5 | Ø135 | 92 | 16 | 30 | 12     | Ø9  | 30°     |
| cono Ø38         | Ø38 | Ø125 | Ø185 | M18x1.5 | Ø150 | 83 | 5  | 30 | 4      | Ø11 | β/2 45° |

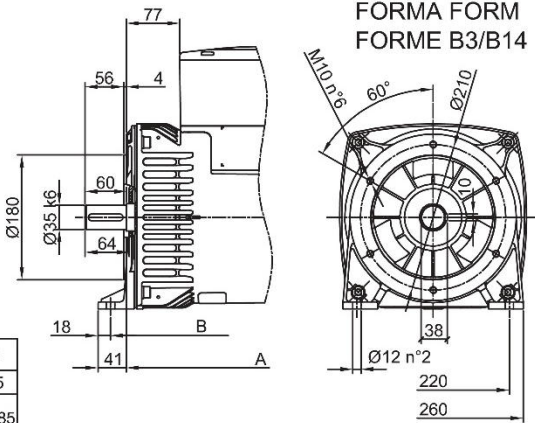
| FORMA FORM FORME | A   | B   |
|------------------|-----|-----|
| B3B9 cono Ø30    | 463 | 304 |
| B3B9 c.Ø38-J609b | 454 | 295 |
| B3/B14           | 448 | 312 |
| MD35 - LOMB. STD | 496 | 337 |

FORMA FORM FORME J609b

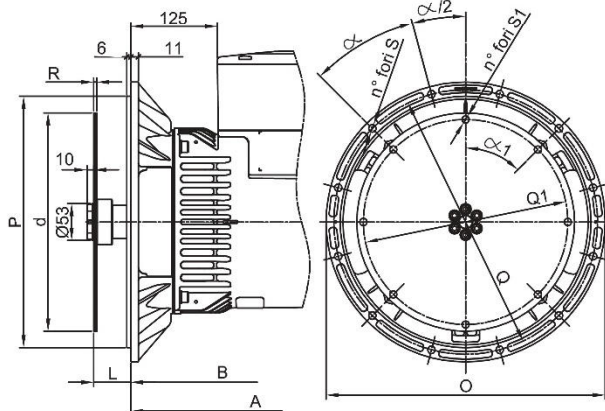


| FORMA FORM FORME | ØD     | ØE   | ØG      |
|------------------|--------|------|---------|
| J609b            | Ø146   | Ø192 | Ø165    |
|                  | Ø163.6 | Ø216 | Ø196.85 |
|                  | Ø177.8 |      |         |

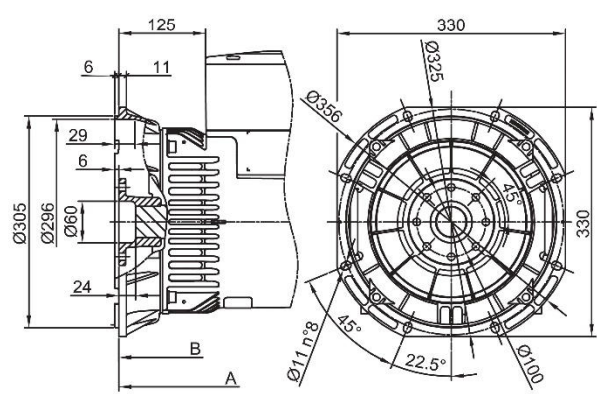
FORMA FORM FORME B3/B14



FORMA FORM FORME MD35



FORMA FORM FORME LOMBARDINI STD



| SAE N. | FLANGIE - BRIDE - FLANGE |       |       |         |    | α   |
|--------|--------------------------|-------|-------|---------|----|-----|
|        | O                        | P     | Q     | n. fori | S  |     |
| 5      | 356                      | 314.3 | 333.4 | 8       | 11 | 45° |
| 4      | 403                      | 362   | 381   | 12      |    | 30  |
| 3      | 451                      | 409.6 | 428.6 | 12      |    | 30  |

| SAE N. | GIUNTI A DISCO - DISC COUPLING - ACC. DISQUE |        |        |         |      |     |     |
|--------|--|--------|--------|---------|------|-----|-----|
|        | L  | d      | Q1     | n. fori | S1   | α1  | R   |
| 6 1/2  | 30.2   | 215.9  | 200    | 6       | 9    | 60° | 3   |
| 7 1/2  | 30.2   | 241.3  | 222.25 | 8       | 9    | 45° |     |
| 8      | 62   | 263.52 | 244.47 | 6       | 10.5 | 60  | 4.5 |
| 10     | 53.8   | 314.32 | 295.27 | 8       | 10.5 | 45° |     |
| 11 1/2 | 39.6   | 352.42 | 333.37 | 8       | 10.5 | 45° |     |