# ALTERNATOR PRO35M F/4

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

Technical Data Sheet

# PRO35M F/4

## COMMON DATA

| | | | |
|---|---|---|---|
| Rated Power at 50Hz | kVA | 670 | |
| Rated Power at 60Hz | kVA | 804 | |
| Rated Power Factor | | 0.8 | |
| Nominal Temperature | °C | 40 | |
| Control System | | Self excited | |
| Execution | | brushless | |
| Regulation Type | | AVR | |
| Insulation Class | | H | |
| Protection | | IP23 | |
| Maximum Overspeed | rpm | 2250 | |
| Overload | | 110% of rated power for one hour in a cycle of 6 hours | |
| Air Flow Requirement | $m^3$/min | 56 at 50Hz | 67.2 at 60Hz |
| R.F.I. Suppression | | Standard EN55011 | |

## REGULATION DATA

| | |
|---|---|
| AVR | HVR30 |
| Sensing | Three phase |
| Voltage Regulation | ± 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 Winding | | 6 |
| Stator Winding Resistance | | 0.0041Ω at 20°C |
| Rotor Winding Resistance | | 1.42Ω at 20°C |
| Exciter Stator Resistance | | 12.5Ω at 20°C |
| Exciter Rotor Resistance | | 0.095Ω at 20°C |
| THD at full load | | <3% |
| THD at no load | | <3% |
| Excitation at no load | $A_{dc}$ | 0.56 |
| Excitation at full load | $A_{dc}$ | 2.41 |

## STANDARD

| | |
|---|---|
| References | EN60034-1, ISO8538, EN55011 |

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## ELECTRICAL DATA

| Frequency | | 50Hz - 1500rpm | | | | 60Hz - 1800rpm | | | |
|---|---|---|---|---|---|---|---|---|---|
| Voltage Series Star | V | 380/220 | 400/230 | 415/240 | 440/254 | 415/240 | 440/254 | 460/266 | 480/277 |
| Voltage Parallel Star | V | 190/110 | 200/115 | 207/120 | 220/127 | 207/120 | 220/127 | 230/133 | 240/138 |
| Voltage Series Delta | V | 220 | 230 | 240 | 254 | 240 | 254 | 266 | 277 |
| Rated Power in Class H | kVA | 655 | 670 | 670 | 625 | 715 | 760 | 804 | 804 |
| (125°C/40°C) | kW | 524 | 536 | 536 | 500 | 572 | 608 | 643.2 | 643.2 |
| Rated Power in Class F | kVA | 600 | 615 | 615 | 570 | 650 | 690 | 730 | 730 |
| (105°C/40°C) | kW | 480 | 492 | 492 | 456 | 520 | 552 | 584 | 584 |
| Rated Power Standby | kVA | 680 | 700 | 700 | 660 | 750 | 790 | 840 | 840 |
| (150°C/40°C) | kW | 544 | 560 | 560 | 528 | 600 | 632 | 672 | 672 |
| Rated Power Standby | kVA | 715 | 735 | 735 | 675 | 780 | 830 | 880 | 880 |
| (163°C/27°C) | kW | 572 | 588 | 588 | 540 | 624 | 664 | 704 | 704 |

## EFFICIENCY IN CL. H

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4/4 | | 94.7% | | | | | | 95.4% |
| 3/4 | | 95.0% | | | | | | 95.8% |
| 2/4 | | 93.8% | | | | | | 95.0% |
| 1/4 | | 92.6% | | | | | | 93.8% |

## REACTANCES AND TIME CONSTANTS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ρcc | | 0.31 | | | | | | |
| Xd - dir. axis synchronous | | 376% | | | | | | 376% |
| X'd - dir. axis transient | | 18.9% | | | | | | 18.9% |
| X''d - dir. axis subtransient | | 11.9% | | | | | | 11.9% |
| $X_q$ - quad. axis reactance | | 230% | | | | | | 230% |
| $T'_{do}$ - O.C. field time constant | 2350 ms | | | | | | | |
| $T'_d$ - Transient time constant | 120 ms | | | | | | | |
| $T''_d$ - Sub-transient time constant | 10 ms | | | | | | | |

## MECHANICAL DATA

| | | | |
|---|---|---|---|
| Bearing non drive end | | | 6316-2RS-C3 |
| Bearing drive end (B3/B14 form) | | | 6319-C3 |
| Weight of generator | in B2 | kg | 1485 |
| | in B3/B14 | kg | 1495 |

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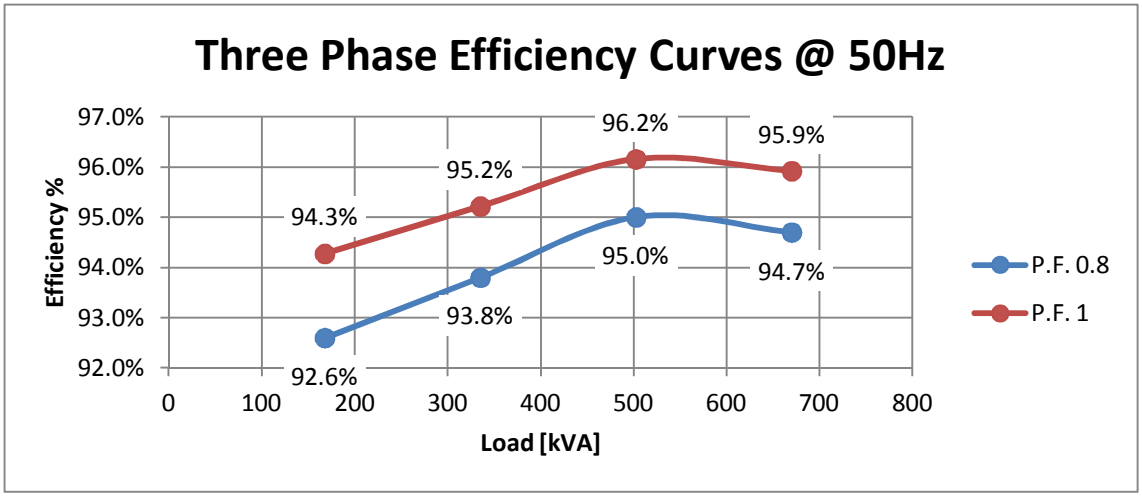
## MOMENT OF INERZIA

| | | |
|---|---|---|
| SAE 14 | $kg \cdot m^2$ | 11.352 |
| SAE 18 | $kg \cdot m^2$ | 11.692 |
| B3/B14 | $kg \cdot m^2$ | 10.838 |

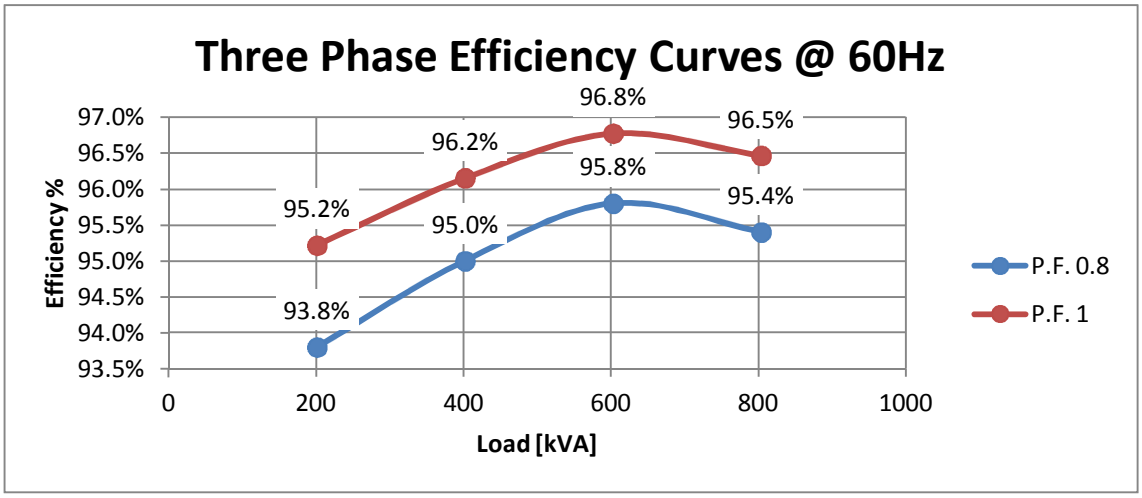
## POWER VARIATION ACCORDING TO TEMPERATURE AND ALTITUDE

| | Ambient temperature | | | | |
|---|---|---|---|---|---|
| **Altitude** | 25°C | 40°C | 45°C | 50°C | 55°C |
| < 1000m | 1.09 | 1 | 0.96 | 0.93 | 0.91 |
| 1000m - 1500m | 1.01 | 0.96 | 0.92 | 0.89 | 0.87 |
| 1500m - 2000m | 0.96 | 0.91 | 0.87 | 0.84 | 0.83 |
| 2000m - 3000m | 0.9 | 0.85 | 0.81 | 0.78 | 0.76 |

## EFFICIENCY 50Hz




## EFFICIENCY 60Hz



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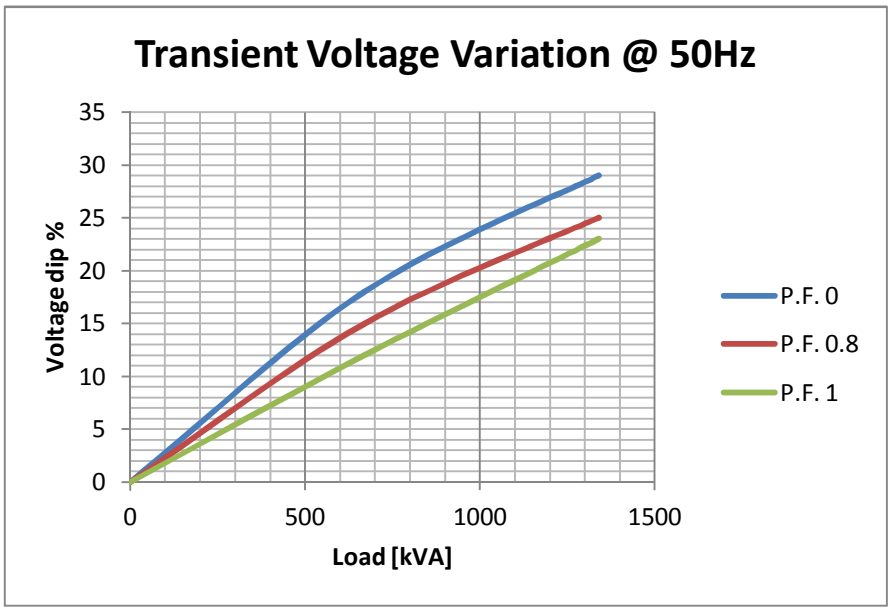
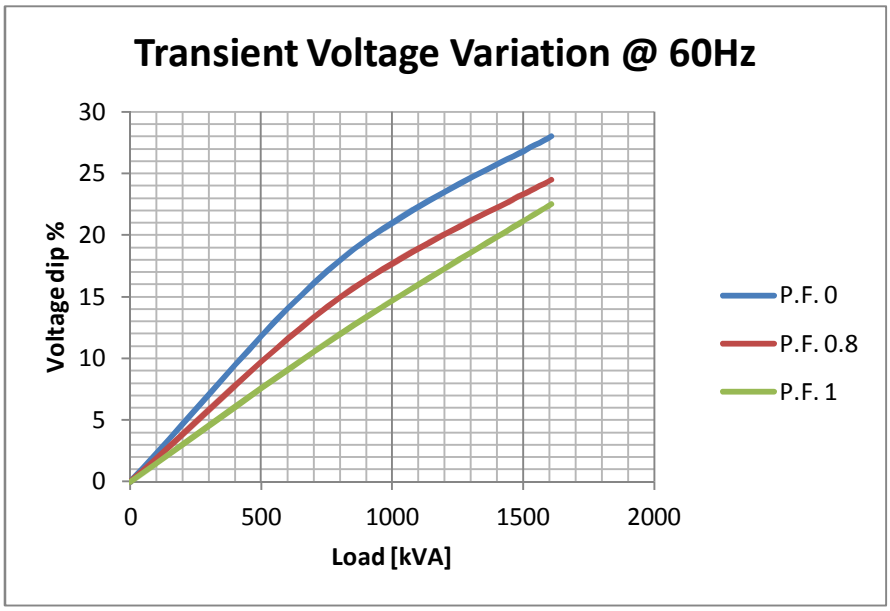
**TRANSIENT VOLTAGE VARIATION 50Hz**




**TRANSIENT VOLTAGE VARIATION 60Hz**



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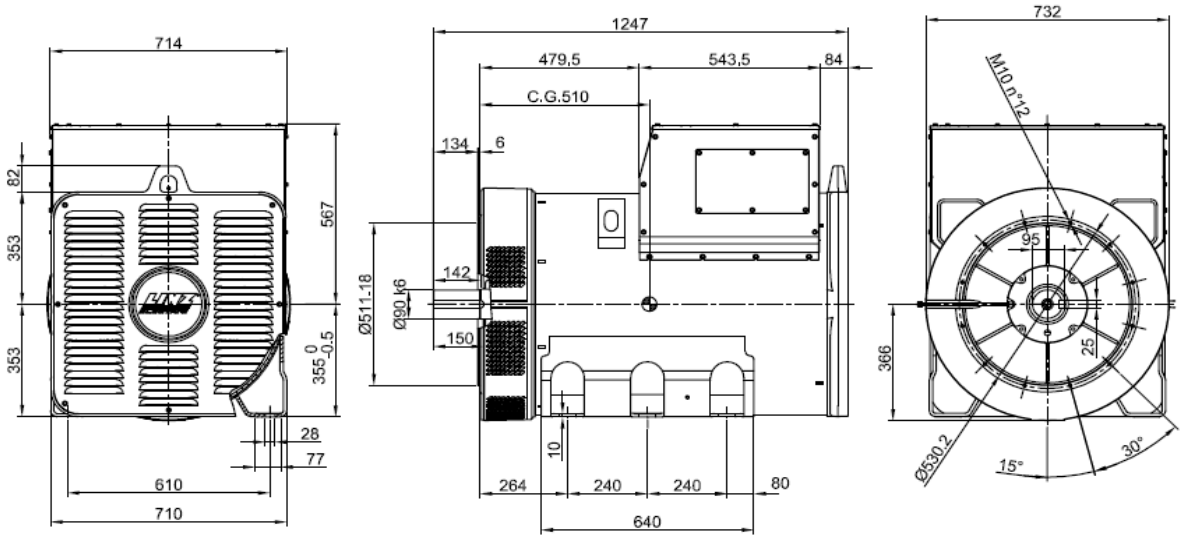
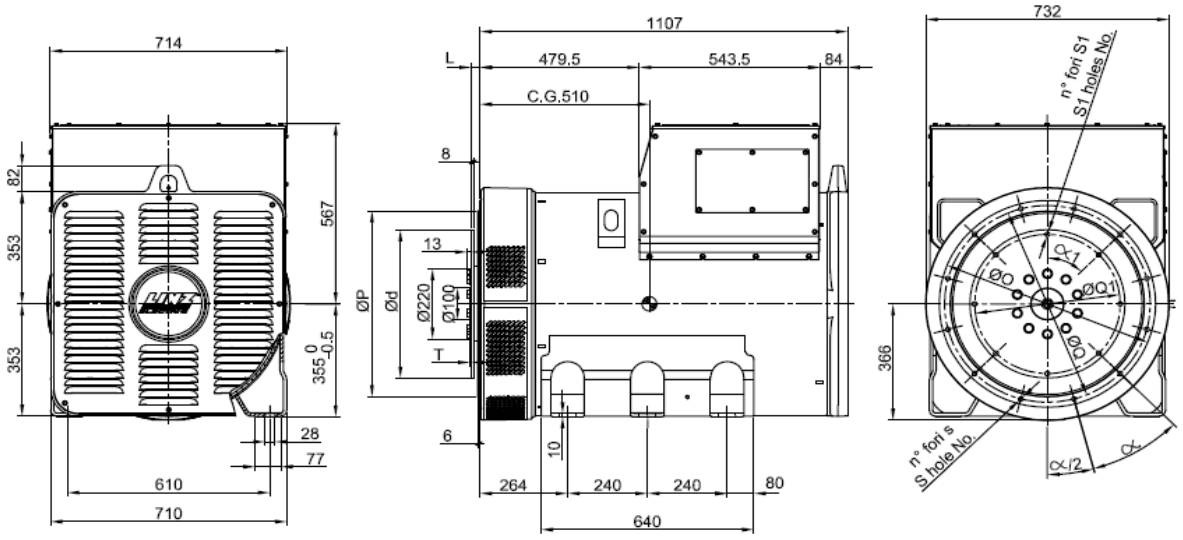
FORMA - FORM B3/B14




FORMA - FORM MD35




| SAE N. | FLANGIE - FLANGES - BRIDAS | | | | | |
|---|---|---|---|---|---|---|
| | Ø O | Ø P | Ø Q | n. fori holes No. | S | α |
| 0 | 710 | 647.7 | 679,5 | 16 | 14 | 22.5° |
| 1/2 | 650 | 584,2 | 619,2 | 12 | 14 | 30° |
| 1 | 552 | 511.18 | 530.2 | 12 | 12 | 30° |

| SAE N. | GIUNTI A DISCO -COUPLING DISCS- JUNTAS A DISCOS | | | | | | |
|---|---|---|---|---|---|---|---|
| | L | Ø d | Ø Q1 | n. fori holes No. | S1 | α1 | T |
| 14 | 25,4 | 466,72 | 438,15 | 8 | 14 | 45° | 4,3 |
| 18 | 15.7 | 571.5 | 542.92 | 6 | 17 | 60° | 14 |