# TECHNICAL DATA SHEET


# ALTERNATOR PRO35M F/4

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

# 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 Over speed | 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 | | 6 |
| Stator Winding Resistance | Ω | 0,0148 at 20°C |
| Rotor Winding Resistance | Ω | 1,42 at 20°C |
| Exciter Stator Resistance | Ω | 12,5 at 20°C |
| Exciter Rotor Resistance | Ω | 0,095 at 20°C |
| THD at full load | | <3% |
| THD at no load | | <3% |
| Excitation at no load | Adc | 0,56 |
| Excitation at full load | Adc | 2,41 |

## 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

# PRO35M F/4

## 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** |
| Rated Power in Class H (125°C/40°C) | kVA | 655 | 670 | 670 | 625 | 715 | 760 | 804 | 804 |
| | kW | 524 | 536 | 536 | 500 | 572 | 608 | 643,2 | 643,2 |
| Rated Power in Class F (105°C/40°C) | kVA | 600 | 615 | 615 | 570 | 650 | 690 | 730 | 730 |
| | kW | 480 | 492 | 492 | 456 | 520 | 552 | 584 | 584 |
| Rated Power Standby (150°C/40°C) | kVA | 680 | 700 | 700 | 660 | 750 | 790 | 840 | 840 |
| | kW | 544 | 560 | 560 | 528 | 600 | 632 | 672 | 672 |
| Rated Power Standby (163°C/27°C) | kVA | 715 | 735 | 735 | 675 | 780 | 830 | 880 | 880 |
| | 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 | 407% | 376% | 349% | 290% | 447% | 423% | 409% | 376% |
| X'd | - dir. axis transient | 20,5% | 18,9% | 17,6% | 14,6% | 22,5% | 21,3% | 20,6% | 18,9% |
| X''d | - dir. axis subtransient | 12,9% | 11,9% | 11,1% | 9,2% | 14,2% | 13,4% | 13,0% | 11,9% |
| $X_q$ | - quad. axis reactance | 249% | 230% | 214% | 177% | 274% | 259% | 250% | 230% |
| $T'_{do}$ | - O.C. field time constant | 2350ms | | | | | | | |
| $T'_d$ | - Transient time constant | 120ms | | | | | | | |
| $T''_d$ | - Sub-transient time constant | 10ms | | | | | | | |

## MECHANICAL DATA

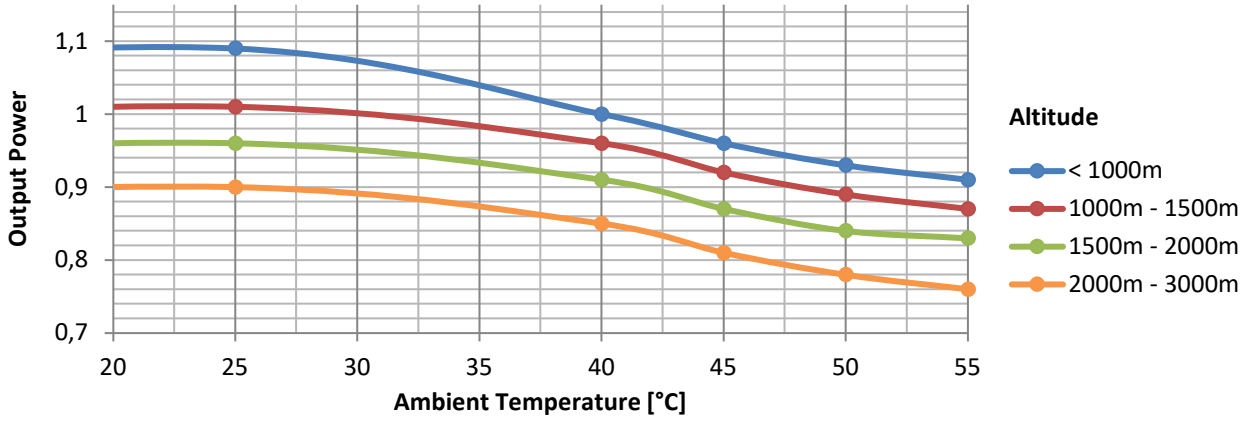
| | | | |
|---|---|---|---|
| Bearing non drive end | | | 6316-2RS-C3 |
| Bearing drive end (B3/B14 form) | | | 6319-2RS-C3 |
| Weight of generator | in B2 | kg | 1500,5 |
| | in B3/B14 | kg | 1524,5 |
| | in B3/B9 | kg | \ |

# PRO35M F/4

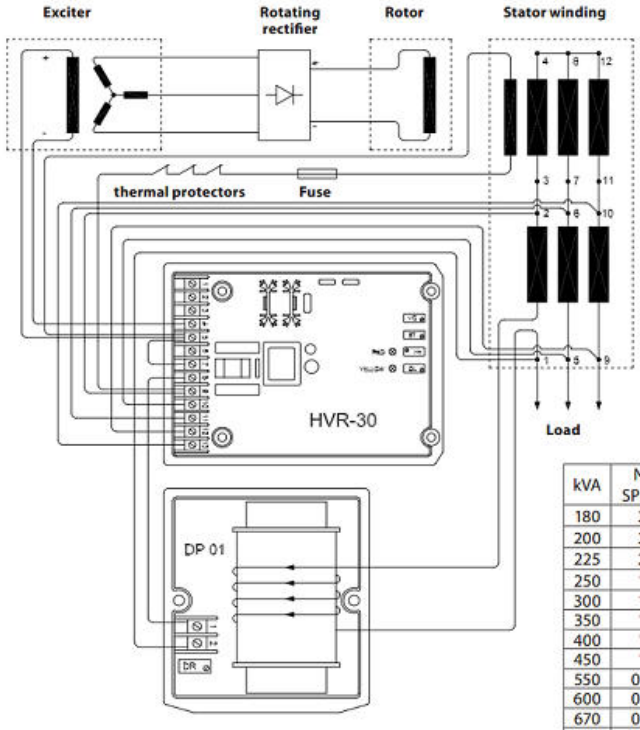
## MOMENT OF INERZIA

| | | |
|---|---|---|
| B3/B9 | kg·m² | \ |
| SAE 7½ | kg·m² | \ |
| SAE 8 | kg·m² | \ |
| SAE 10 | kg·m² | \ |
| SAE 11½ | kg·m² | \ |
| SAE 14 | kg·m² | 11,352 |
| SAE 18 | kg·m² | 11,692 |
| B3/B14 | kg·m² | 10,838 |

## DERATING CURVES

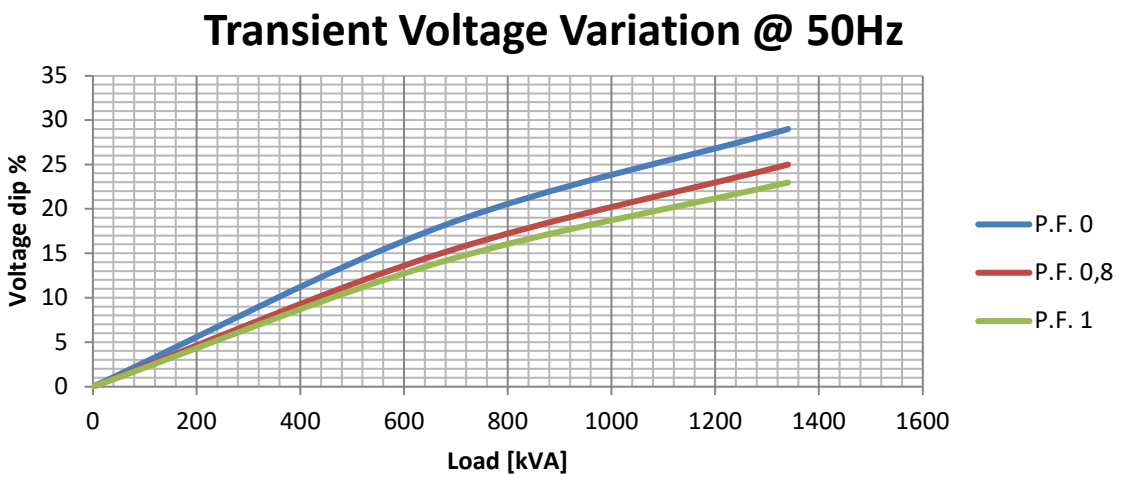



## WIRING DIAGRAM

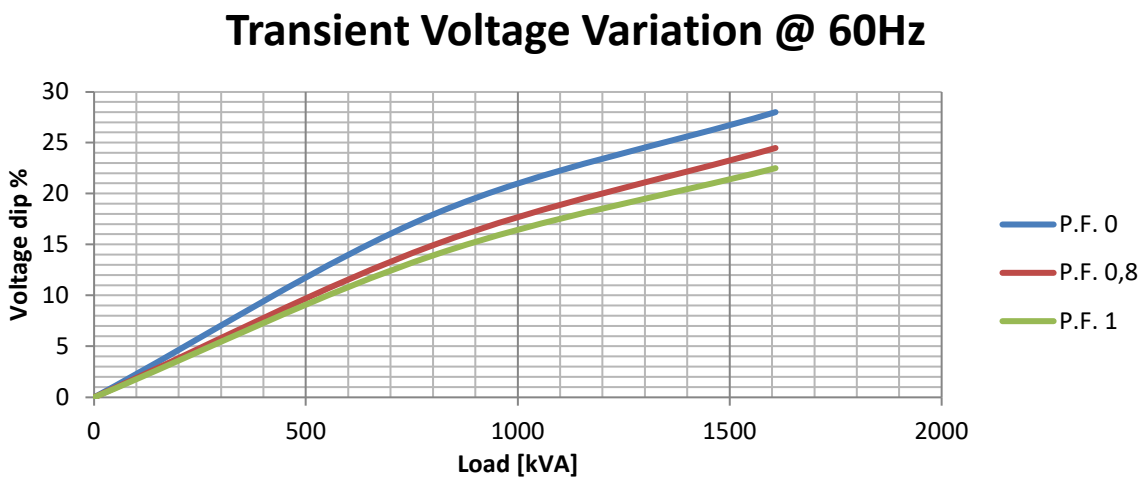



| kVA | N° SPIRE |
|---|---|
| 180 | 2 |
| 200 | 2 |
| 225 | 2 |
| 250 | 1 |
| 300 | 1 |
| 350 | 1 |
| 400 | 1 |
| 450 | 1 |
| 550 | 0.5 |
| 600 | 0.5 |
| 670 | 0.5 |
| 725 | 0.5 |

## TRANSIENT VOLTAGE VARIATION 50Hz

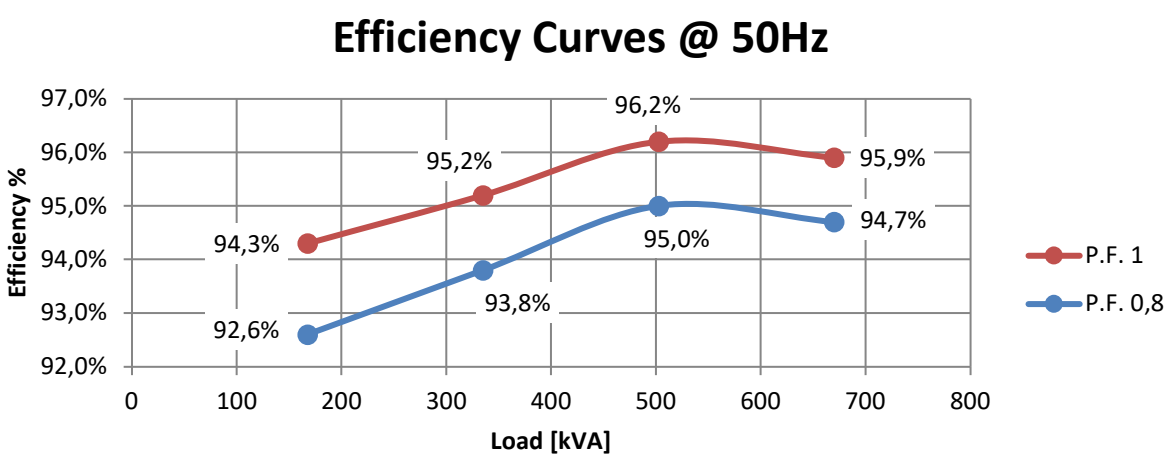



## TRANSIENT VOLTAGE VARIATION 60Hz

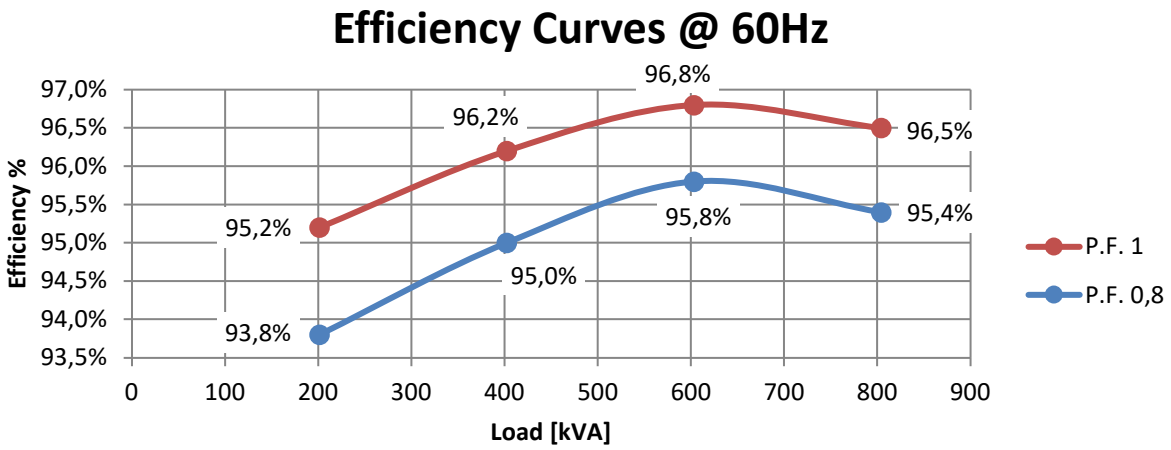


# PRO35M F/4

## EFFICIENCY 50Hz

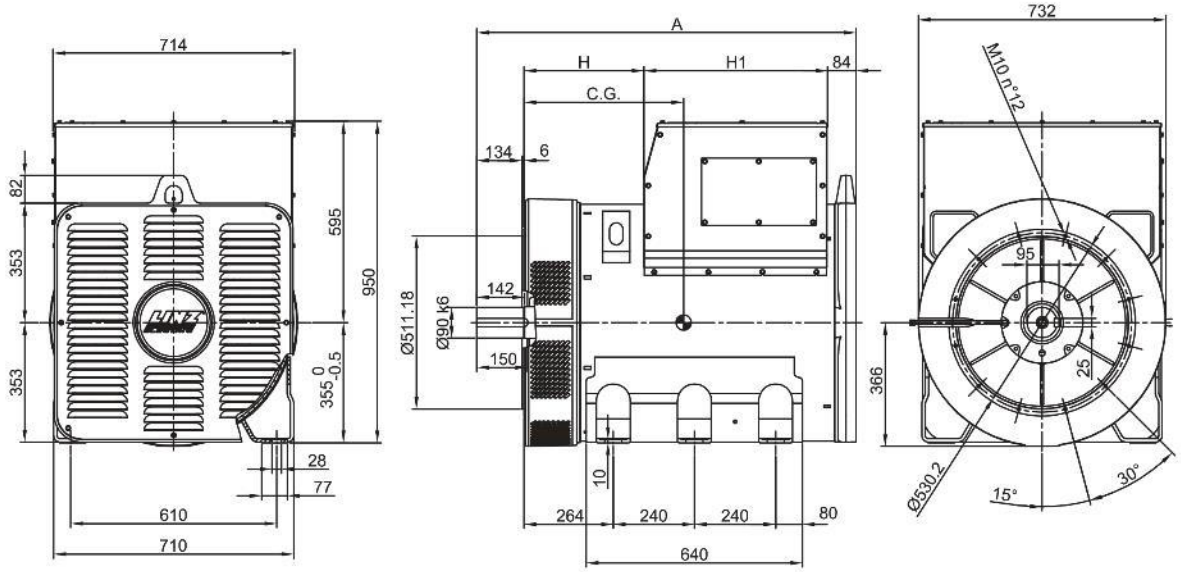



## EFFICIENCY 60Hz

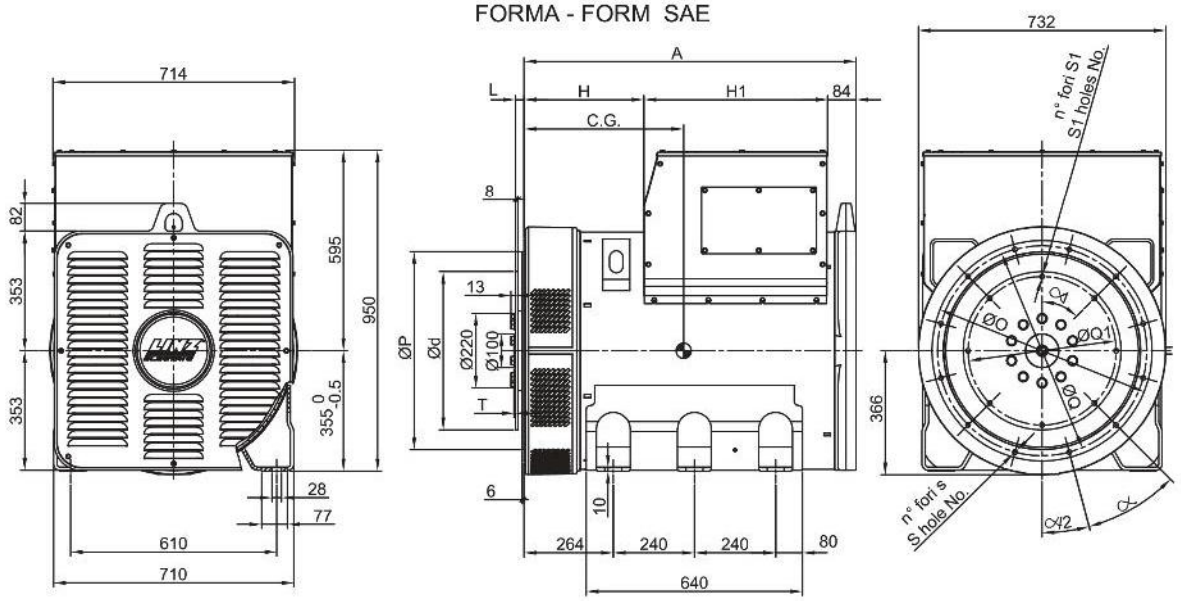


# PRO35M F/4

FORMA - FORM B3/B14




FORMA - FORM SAE




| FORMA - FORM | | A | H | H1 |
|---|---|---|---|---|
| B3/B14 | PRO35 S | 1122 | 454.5 | 443.5 |
| | PRO35 M | 1247 | 479.5 | 543.5 |
| | PRO35 L | 1347 | 579.5 | |
| SAE | PRO35 S | 982 | 454.5 | 443.5 |
| | PRO35 M | 1107 | 479.5 | 543.5 |
| | PRO35 L | 1207 | 579.5 | |

| TIPO - TYPE | C.G. |
|---|---|
| PRO35S B/4 | 456 |
| PRO35S C/4 | 466 |
| PRO35S D/4 | 478 |
| PRO35M E/4 | 516 |
| PRO35M F/4 | 516 |
| PRO35M G/4 | 539 |
| PRO35L H/4 | 588 |

| 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 |