



ALTERNATOR PRO28M F/4

three-phase brushless synchronous alternator with AVR - 4 poles

Technical Data Sheet

PRO28M F/4

COMMON DATA

| | | | |
|----------------------|---------------------|--|------------|
| Rated Power at 50Hz | kVA | 350 | |
| Rated Power at 60Hz | kVA | 420 | |
| 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 | 39.5 at 50Hz | 45 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 | 12 | |
| Stator Winding Resistance | 0.004 at 20°C | |
| Rotor Winding Resistance | 2.9 at 20°C | |
| Exciter Stator Resistance | 15 at 20°C | |
| Exciter Rotor Resistance | 0.25 at 20°C | |
| THD at full load | <3% | |
| THD at no load | <3% | |
| Excitation at no load | A _{dc} | 0.63 |
| Excitation at full load | A _{dc} | 2.2 |

STANDARD

| | |
|------------|-----------------------------|
| References | EN60034-1 ISO8528-3 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 |
| Rated Power in Class H (125°C/40°C) | kVA | 350 | 350 | 350 | 340 | 390 | 420 | 420 | 420 |
| | kW | 280 | 280 | 280 | 272 | 312 | 336 | 336 | 336 |
| Rated Power in Class F (105°C/40°C) | kVA | 300 | 300 | 300 | 290 | 335 | 360 | 360 | 360 |
| | kW | 240 | 240 | 240 | 232 | 268 | 288 | 288 | 288 |
| Rated Power Standby (150°C/40°C) | kVA | 365 | 365 | 365 | 354 | 400 | 435 | 435 | 435 |
| | kW | 292 | 292 | 292 | 283.2 | 320 | 348 | 348 | 348 |
| Rated Power Standby (163°C/27°C) | kVA | 375 | 375 | 375 | 365 | 415 | 450 | 450 | 450 |
| | kW | 300 | 300 | 300 | 292 | 332 | 360 | 360 | 360 |

EFFICIENCY IN CL. H

| | | | | | | | | |
|-----|--|-------|--|--|--|--|--|-------|
| 4/4 | | 93.7% | | | | | | 94.0% |
| 3/4 | | 93.9% | | | | | | 94.2% |
| 2/4 | | 93.0% | | | | | | 93.3% |
| 1/4 | | 90.0% | | | | | | 90.6% |

REACTANCES AND TIME CONSTANTS

| pcc | | 0.40 | | | | | | |
|--|--|--------|-------|-------|-------|-------|-------|-------|
| X _d - dir. axis synchronous | | 377% | 340% | 316% | 273% | 422% | 405% | 340% |
| X' _d - dir. axis transient | | 19.9% | 18.0% | 16.7% | 14.5% | 22.4% | 21.4% | 18.0% |
| X'' _d - dir. axis subtransient | | 9.4% | 8.5% | 7.9% | 6.8% | 10.6% | 10.1% | 8.5% |
| X _q - quad. axis reactance | | 235% | 212% | 197% | 170% | 263% | 252% | 212% |
| T' _{do} - O.C. field time constant | | 1870ms | | | | | | |
| T' _d - Transient time constant | | 115ms | | | | | | |
| T'' _d - Sub-transient time constant | | 13ms | | | | | | |

MECHANICAL DATA

| | | | |
|---------------------------------|-----------|-------------|-----|
| Bearing non drive end | | 6314-2RS-C3 | |
| Bearing drive end (B3/B14 form) | | 6316-2RS-C3 | |
| Weight of generator | in B2 | kg | 949 |
| | in B3/B14 | kg | 960 |
| | in B3/B9 | kg | \ |

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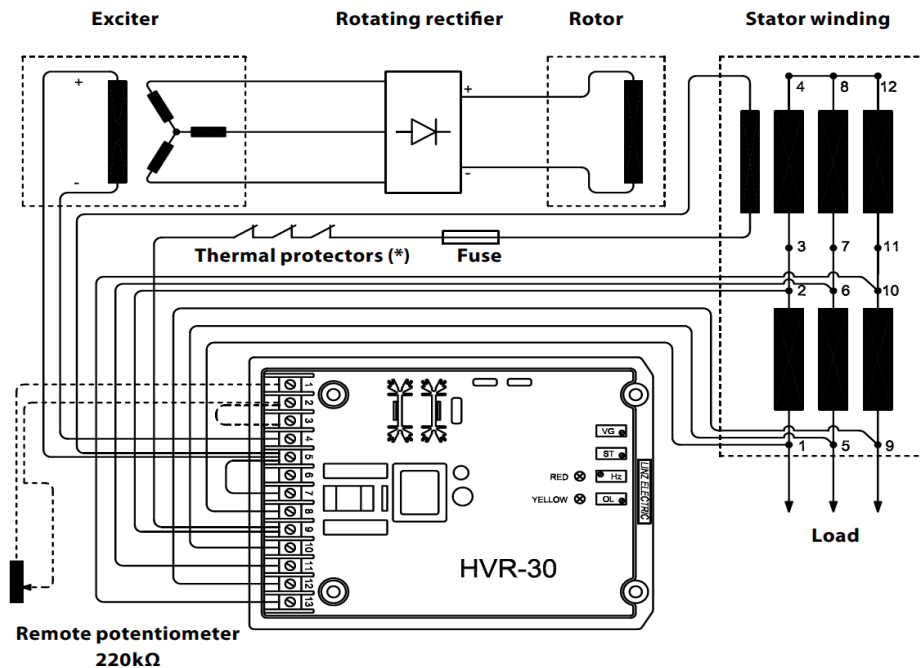
MOMENT OF INERZIA

| | | |
|---------|-------------------|-------|
| B3/B9 | kg·m ² | \ |
| SAE 7½ | kg·m ² | \ |
| SAE 8 | kg·m ² | \ |
| SAE 10 | kg·m ² | \ |
| SAE 11½ | kg·m ² | 4.408 |
| SAE 14 | kg·m ² | 4.524 |
| SAE 18 | kg·m ² | \ |
| B3/B14 | kg·m ² | 4.229 |

POWER VARIATION ACCORDING TO TEMPERATURE AND ALTITUDE

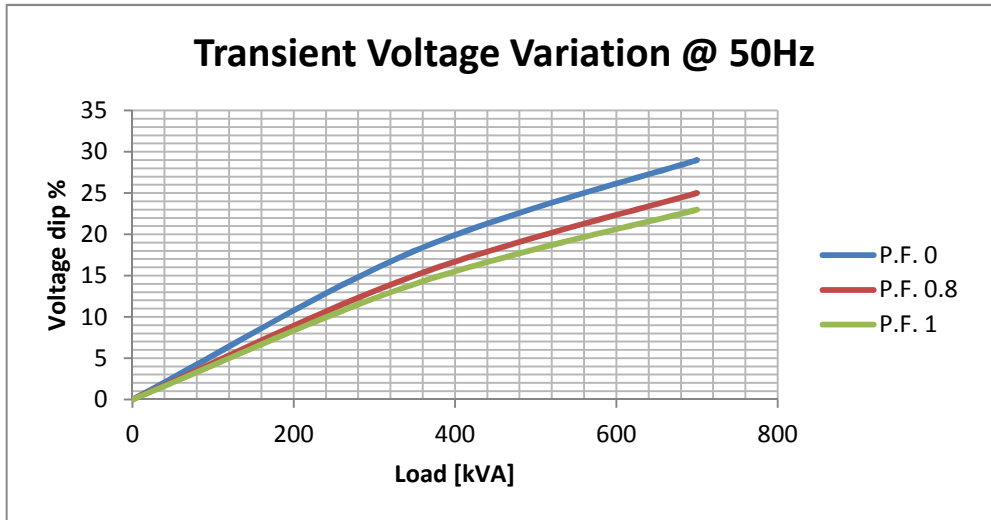
| Altitude | Ambient temperature | | | | |
|---------------|---------------------|------|------|------|------|
| | 25°C | 40°C | 45°C | 50°C | 55°C |
| < 1000m | 1.09 | 1 | 0.96 | 0.93 | 0.91 |
| 1000m - 1500m | 1.01 | 0.96 | 0.92 | 0.89 | 0.87 |
| 1500m - 2000m | 0.96 | 0.91 | 0.87 | 0.84 | 0.83 |
|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

WIRING DIAGRAM

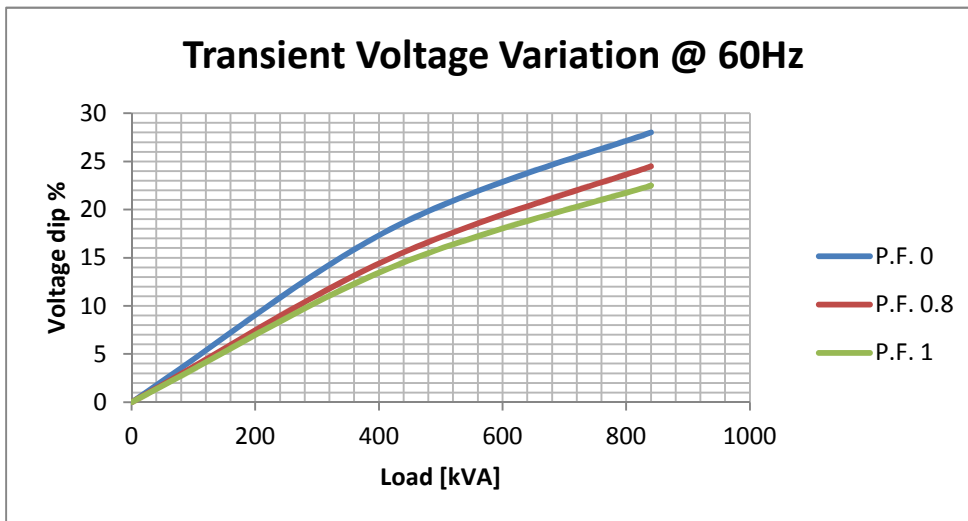


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TRANSIENT VOLTAGE VARIATION 50Hz

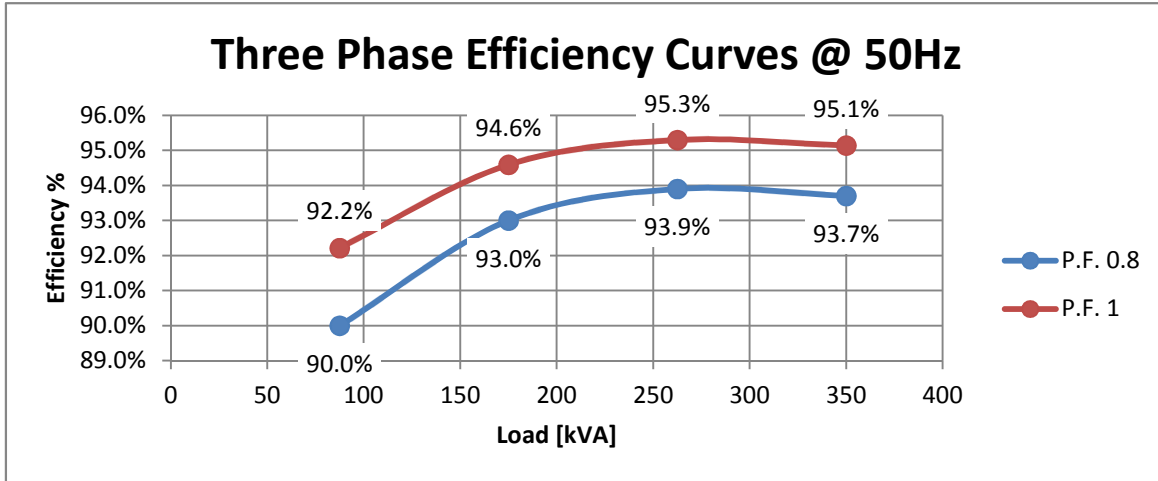


TRANSIENT VOLTAGE VARIATION 60Hz

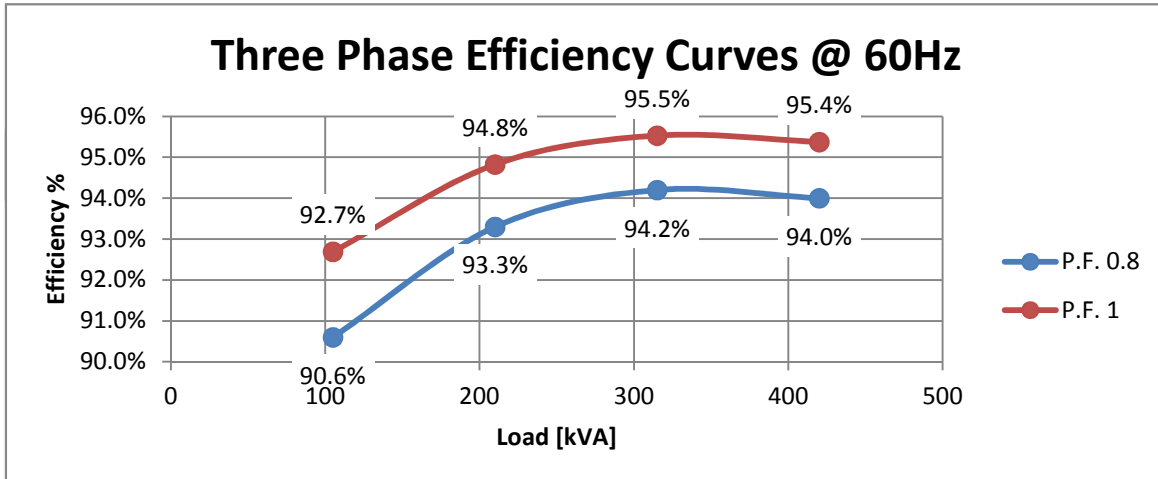


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EFFICIENCY 50Hz

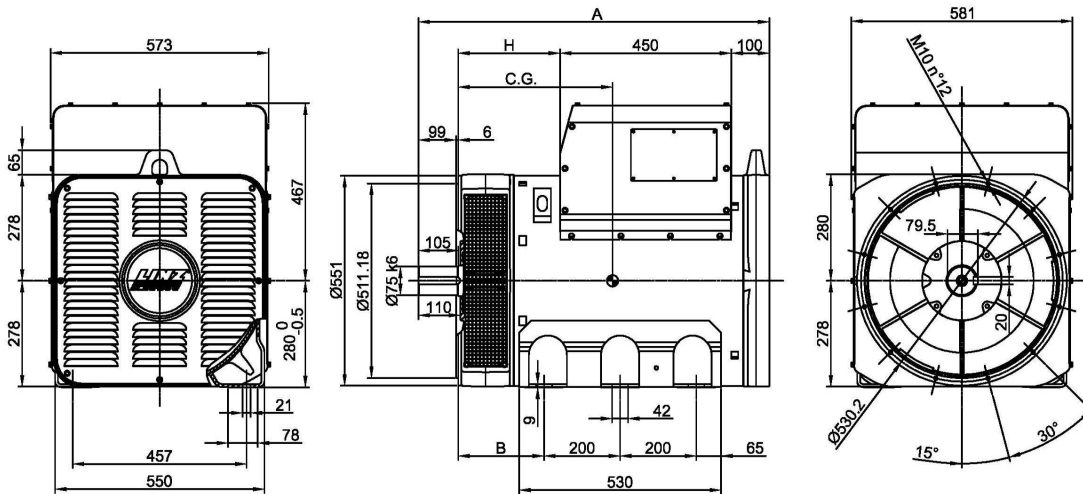


EFFICIENCY 60Hz

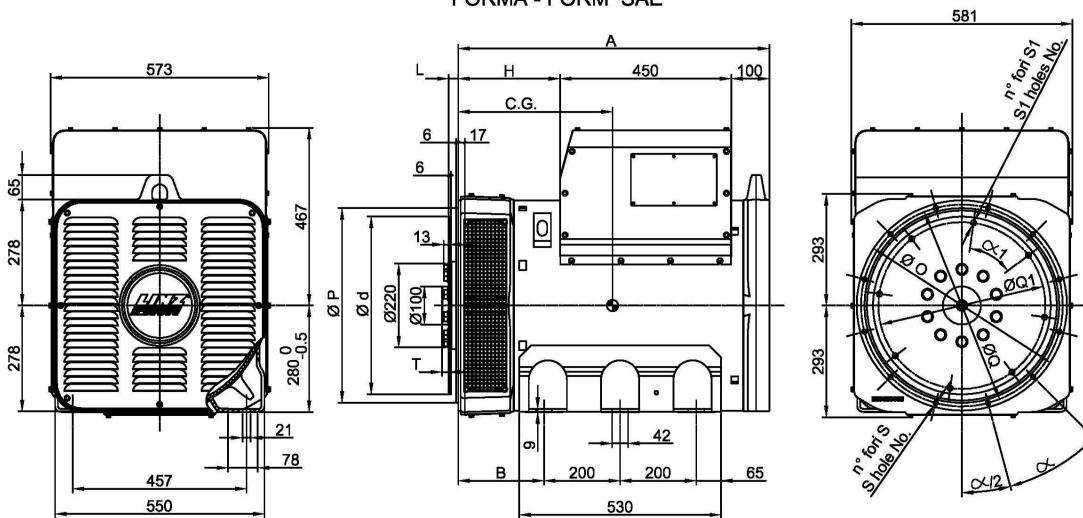


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FORMA - FORM B3/B14



FORMA - FORM SAE



| FORMA - FORM | A | B | H | TIPO - TYPE | C.G. | |
|--------------|---------|------|-----|-------------|------------|-----|
| B3/B14 | PRO 28S | 922 | 225 | 267 | PRO28S A/4 | 376 |
| | PRO 28M | 1072 | | 417 | PRO28S B/4 | 380 |
| | PRO 28L | 1137 | 325 | 482 | PRO28S C/4 | 394 |
| SAE | PRO 28S | 817 | 225 | 267 | PRO28S D/4 | 406 |
| | PRO 28M | 967 | | 417 | PRO28M E/4 | 452 |
| | PRO 28L | 1032 | 325 | 482 | PRO28M F/4 | 480 |
| | | | | PRO28L G/4 | 513 | |

| SAE N. | FLANGIE - FLANGES - BRIDAS | | | | | |
|--------|----------------------------|--------|-------|-------------------|----|-----|
| | Ø O | Ø P | Ø Q | n. fori holes No. | S | α |
| 3 | 451 | 409.6 | 428.6 | 12 | 12 | 30° |
| 2 | 490 | 447.68 | 466.7 | | | |
| 1 | 552 | 511.18 | 530.2 | | | |

| SAE N. | GIUNTI A DISCO - COUPLING DISCS - JUNTAS A DISCOS | | | | | | |
|--------|---|--------|--------|-------------------|------|-----|------|
| | L | Ø d | Ø Q1 | n. fori holes No. | S1 | α1 | T |
| 11 1/2 | 39.6 | 352.42 | 333.37 | 8 | 10.5 | 45° | 0 |
| 14 | 25.4 | 466.72 | 438.15 | 8 | 14 | 45° | 17.3 |