

ITALIAN GROUP, ITALIAN QUALITY 

# COMPLETE CHP PROGRAMME 7 – 2,000 KW

## ALTERNATORS FOR COGENERATION

soga  energyteam

 **sincro**<sup>®</sup>



# AN INDUSTRIAL GROUP SPECIALIZED IN ENERGY FROM OVER 55 YEARS

SOGA ENERGY TEAM is a **multi-brand Italian group** operating in energy, motion and control since **1966** by engineering and manufacturing rotating electric machines and electronic systems, standing out for performances and reliability.

Our **range of alternators** is one of the most complete available on the market ranging from **1 kVA to 2,6 MW**. The high-end fields of application extend from power generation to CHP, wind, automotive, railway, military, marine, hybrid systems.

We are **100% Pure European Manufacturers**.

Our production is based in our factories in Northern-Italy and Croatia, where we combine our industrial craftsmanship with equipment and systems at the cutting edge of technology.

- 5** Brands
- 6** Production sites, with lean system
- 58** Years of expertise
- 300** Collaborators
- 850** Over 850 models up to 2,6 MW/50Hz in our catalogues (alternators and motors)
- 250.000** Units as yearly production capacity



induction & permanent magnet motors



synchronous & asynchronous alternators



PTO generators



generators for special projects



controllers, servodrives, servomotors





## QUALITY IS AN ATTITUDE RELIABILITY IS A FACT SUSTAINABILITY IS A MUST

**SINCRO®** is our brand dedicated to the production of **synchronous and asynchronous alternators**.

Since **1986** we have been co-operating on a worldwide scale with OEMs manufacturers of generating sets and engine driven welders. **Today**, we believe that energy must be increasingly focused on maximizing efficiency, alongside with the larger use of clean fuel powered systems as alternative to fossil sources.

This is why, we have created a **business unit fully dedicated to CHP**.

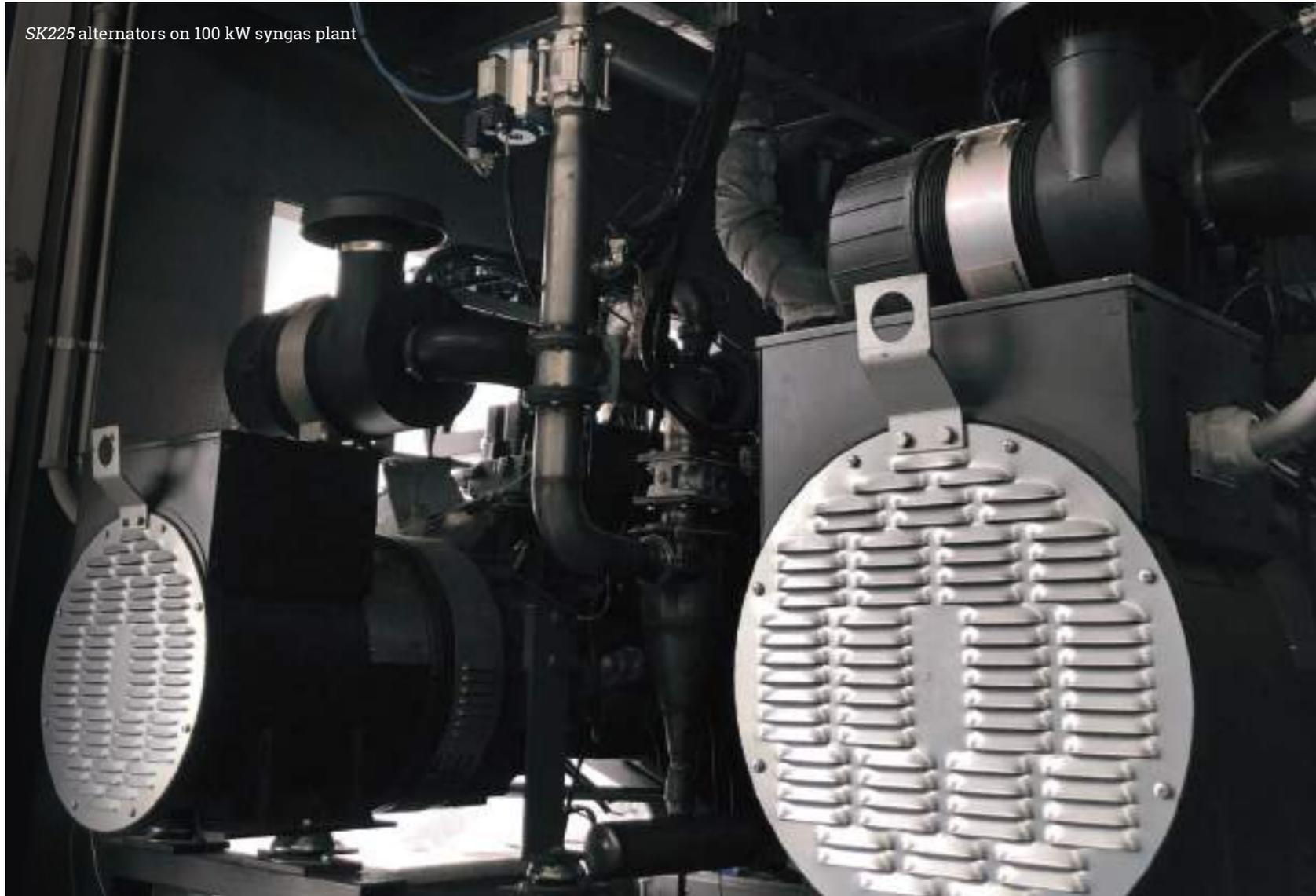
Our in-house **specialized technical & sales** team closely works with you in the development of alternators tailored upon your R&D guidelines, to meet your specific demands and match exactly your CHP needs. You can rely on our dedicated team for each stage of supply: from **first evaluation** and understanding of your requirements directly at your premises, to the **alternator engineering**, up to **after-sale** maintenance.

**Simple assembly** on your chp system, **full accessibility** to the relevant parts of the alternators, a **dedicated service** in case of need: these are keywords for SINCRO alternators.

Giving you **unstoppable efficient power 24/7** and **easy maintenance** is our mission.



SK225 alternators on 100 kW syngas plant



## OUR COMPLETE PROGRAMME OF SOLUTIONS

MICRO CHP (up to 50 kW)

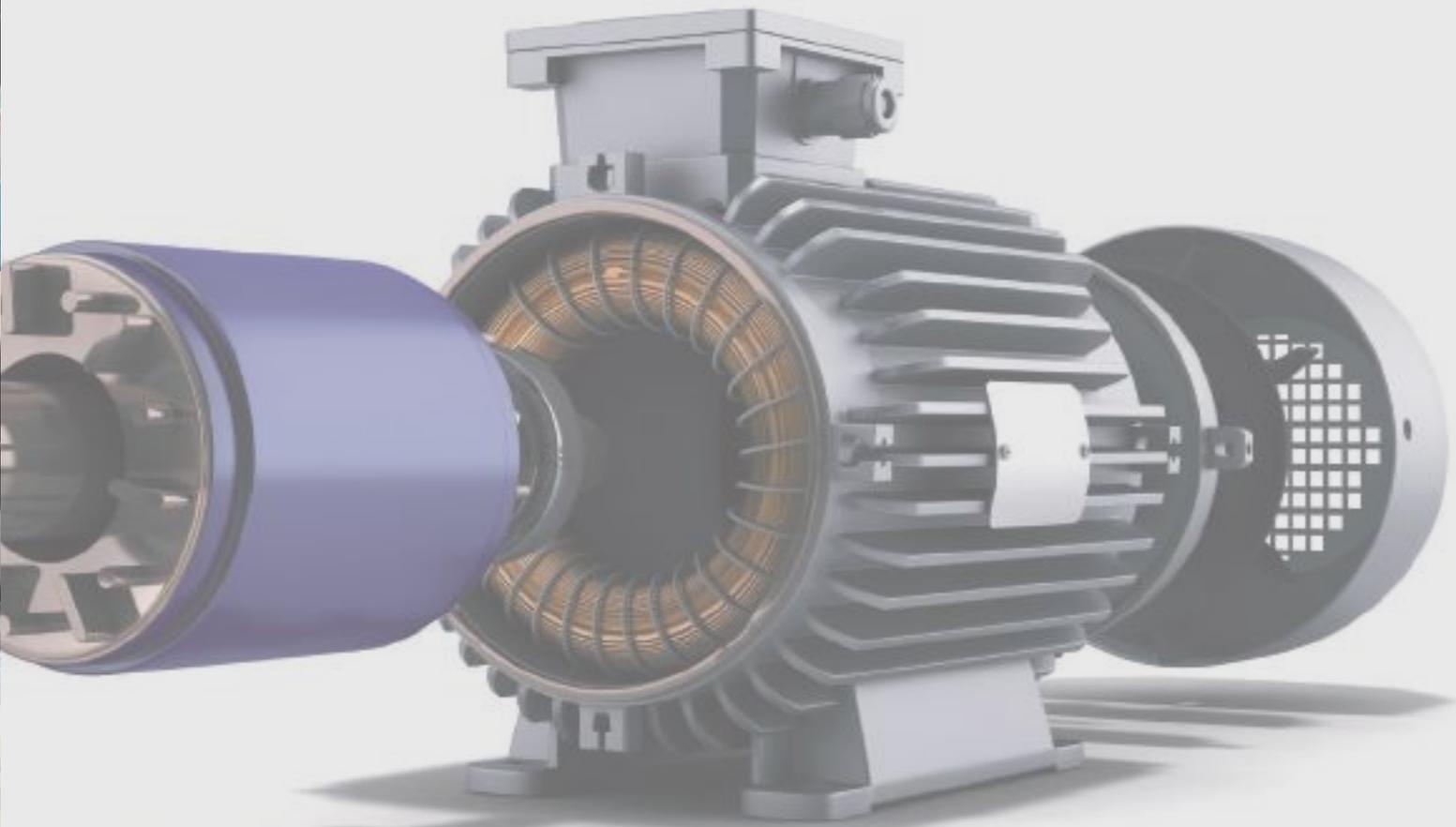


MINI & MEDIUM CHP (up to 2000 kW)



| ASYNCHRONOUS  |   | SYNCHRONOUS   |   |
|---|---|---|---|
| <p>1</p> <p>ASG</p>        | <p>2</p> <p>AWG</p>  | <p>3</p> <p>SWG</p>            | <p>4</p> <p>SK160</p>  |
| SYNCHRONOUS   |   | PMG   |   |
| <p>5</p> <p>IB   SK</p>  |   | <p>6</p> <p>PMG   PMG-K</p>  |   |

 Air cooled  Liquid cooled



# 1 ALTERNATORS FOR MICRO CHP ASYNCHRONOUS AIR COOLED

## ADVANTAGES IN CHP

- Easy parallel with the main
- Excellent wave form with low THD
- TEFC totally enclosed fan cooled housing ensuring strong protection against dust and water sprays
- Squirrel cage rotor: robust, stable, simple to maintain

## FEATURES

- Die-cast aluminium housing
- IM B34, SAE, J609a, J609b couplings
- IP54

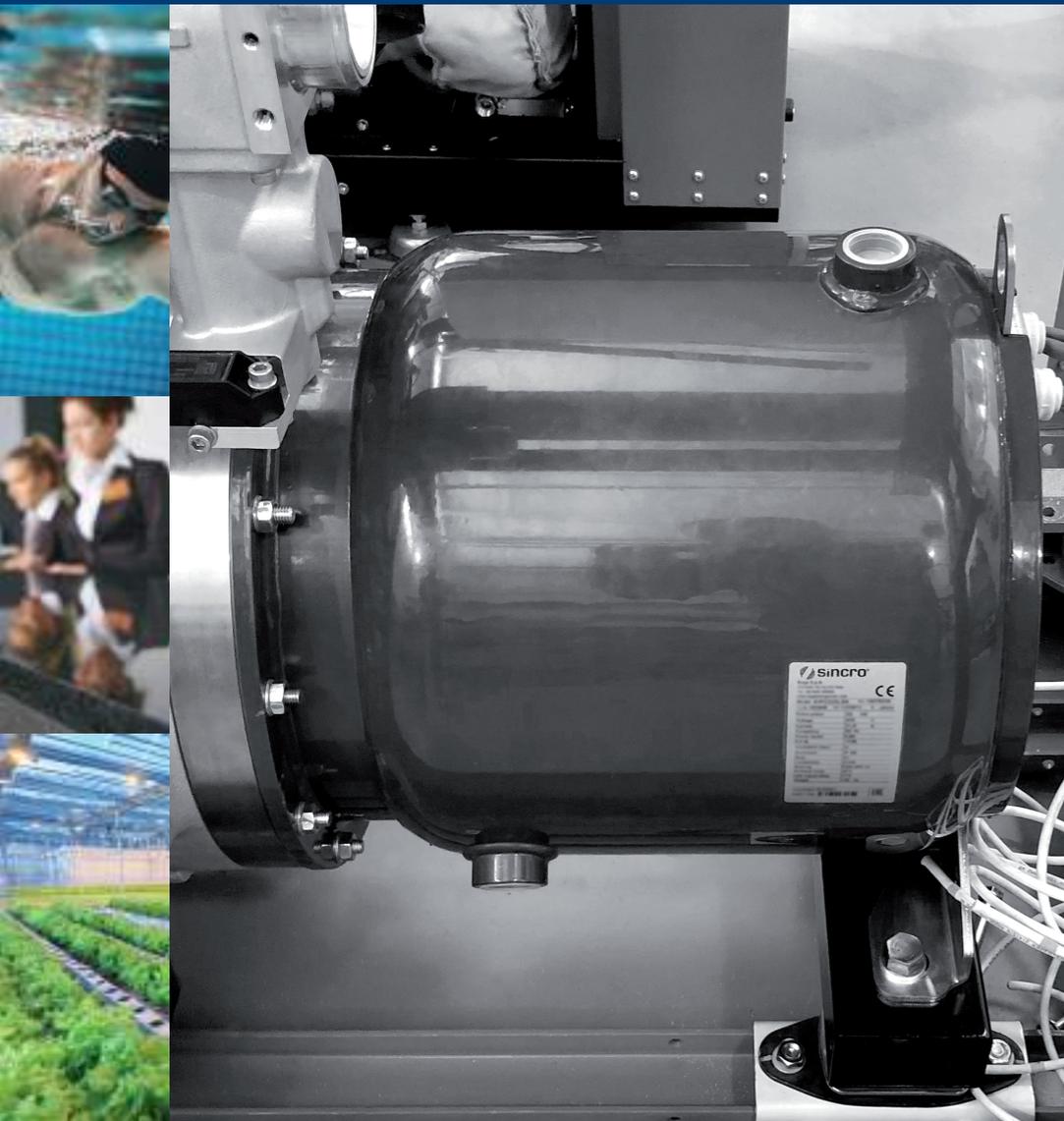
## OPTIONS

- Customized executions
- 60Hz
- CSA/UL

## 4 POLES 3 PHASE

| S1 40/105°C cl F |                   |       |      |      |
|------------------|-------------------|-------|------|------|
| model            | kWe<br>400V 50 Hz | eff % | RPM  | p.f. |
| ASG132 MA4-T     | 5,5               | 84    | 1532 | 0,78 |
| ASG132 MB4-T     | 7,5               | 85    | 1530 | 0,78 |
| ASG160 LA4-T     | 11                | 89    | 1530 | 0,8  |
| ASG160 LB4-T     | 15                | 90    | 1528 | 0,8  |
| ASG180 LA4-T     | 20                | 90,5  | 1528 | 0,81 |
| ASG180 LB4-T     | 25                | 91    | 1527 | 0,82 |





## 2 ALTERNATORS FOR MICRO CHP ASYNCHRONOUS LIQUID COOLED

### ADVANTAGES IN CHP

- Easy parallel with the main
- Liquid jacket for highest cooling result
- High efficiency
- Strong construction
- Easy assembling
- Low maintenance
- Durability

### FEATURES

- Liquid-cooled technology
- Class H insulation
- Environment temperature 90°C max
- Liquid entry temperature 80°C max
- SAE coupling
- IP44

### OPTIONS

- Customized executions
- 60Hz
- CSA/UL
- Windings encapsulation
- Greaser



### 2 POLES 3 PHASE

| model      | SI cl H           |       |      |      |
|------------|-------------------|-------|------|------|
|            | kWe<br>400V 50 Hz | eff % | RPM  | p.f. |
| AWG160 LB2 | 20                | 93    | 3066 | 0,83 |
| AWG160 LC2 | 25                | 93,6  | 3064 | 0,84 |

### 4 POLES 3 PHASE

| model      | SI cl H           |       |      |      |
|------------|-------------------|-------|------|------|
|            | kWe<br>400V 50 Hz | eff % | RPM  | p.f. |
| AWG160 SB4 | 7                 | 90    | 1543 | 0,77 |
| AWG160 MB4 | 10                | 91    | 1540 | 0,78 |
| AWG160 LB4 | 15                | 91,4  | 1537 | 0,78 |
| AWG225 SB4 | 20                | 92    | 1532 | 0,8  |
| AWG225 MB4 | 25                | 93    | 1530 | 0,8  |
| AWG225 LB4 | 30                | 94    | 1527 | 0,81 |
| AWG225 WB4 | 35                | 94    | 1525 | 0,82 |



Encapsulation of windings for higher performance



Greaser for easy maintenance



3

## ALTERNATORS FOR MICRO CHP SYNCHRONOUS LIQUID COOLED

**NEW**  
UP TO  
80 KVA

### ADVANTAGES IN CHP

- High IP protection IP44
- Highly silent
- Low maintenance
- Durability

### FEATURES

- Liquid cooled technology
- Digital AVR
- Environment temperature 80° C max
- Liquid entry temperature 80°C max
- SAE or IM B34 couplings

### OPTIONS

- Customized executions
- 60Hz



### 4 POLES 3 PHASE

| model      | S1 cl F           |      |      |
|------------|-------------------|------|------|
|            | kVA<br>400V 50 Hz | RPM  | p.f. |
| SWG225 MA4 | 45                | 1500 | 0,8  |
| SWG225 MB4 | 55                | 1500 | 0,8  |
| SWG225 LA4 | 65                | 1500 | 0,8  |
| SWG225 LB4 | 80                | 1500 | 0,8  |



## 4 ALTERNATORS FOR MICRO CHP SYNCHRONOUS AIR COOLED



4 POLES 3 PHASE | BRUSHLESS/AVR

| model    | 400V 50 Hz |      |       | 480V 60 Hz |      |       |
|----------|------------|------|-------|------------|------|-------|
|          | kWe        | KVA  | eff % | kWe        | KVA  | eff % |
| SK160 CB | 8,8        | 11   | 83,4  | 10,6       | 13,2 | 84,4  |
| SK160 MA | 11         | 13,8 | 84,6  | 13,2       | 16,5 | 85,6  |
| SK160 MB | 12,6       | 15,7 | 86,1  | 15,1       | 18,9 | 87,3  |
| SK160 LA | 15,8       | 19,7 | 87,5  | 18,9       | 23,6 | 88,1  |
| SK160 LB | 18,9       | 23,7 | 87,7  | 22,7       | 28,4 | 88,3  |
| SK160 WA | 22,7       | 28,4 | 87,9  | 27,2       | 34,1 | 88,5  |
| SK160 WB | 25,2       | 31,5 | 88    | 30,2       | 37,8 | 88,7  |

### ADVANTAGES IN CHP

- CHP OPTIMIZED for continuous duty
- Supercompactness
- Strong construction
- Easy assembly
- Full reliability
- Simple maintenance
- Durability

### FEATURES

- Class H insulation, Class F temperature rise
- Digital regulator
- Auxiliary AVR power supply
- APD Advanced Parallel Device + Transformer
- 3 x PT100
- 2/3 winding pitch
- Single bearing
- Tropicalization
- IP23

### OPTIONS

- Customized executions
- Remote voltage potentiometer
- PT100 on bearing
- Space heaters
- Winding protection for harsh environments and relative humidity over 95%
- Special voltage
- CSA/UL

IB alternators on 50 kW syngas plant



MICRO CHP UP TO 50 kW



## 5 ALTERNATORS FOR MINI & MEDIUM CHP SYNCHRONOUS AIR COOLED



### ADVANTAGES IN CHP

- CHP OPTIMIZED for continuous duty
- Great compactness for space saving
- Easy assembly
- Full reliability
- Simple maintenance
- Durability

### FEATURES

- Class H insulation, Class F temperature rise
- Digital regulator
- APD Advanced Parallel Device + Transformer
- 3 x PT100
- 2/3 winding pitch
- Single bearing
- Tropicalization
- IP23

### OPTIONS

- Customized executions
- Double bearing
- Remote voltage potentiometer
- PT100 on bearing
- Regreasable bearings
- Space heaters
- Filters on air inlet (5% derating)
- IP44 on air inlet and outlet (10% derating)
- Winding protection for harsh environments and relative humidity over 95%
- Special voltage
- CSA/UL

Digital DBL AVR + APD



### 4 POLES 3 PHASE | BRUSHLESS/AVR

| model    | S1 40/105°C cl F |      |       |            |      |       | AVR POWER SUPPLY |
|----------|------------------|------|-------|------------|------|-------|------------------|
|          | 400V 50 Hz       |      |       | 480V 60 Hz |      |       |                  |
|          | kWe              | KVA  | eff % | kWe        | KVA  | eff % |                  |
| IB4 SA   | 15,8             | 19,7 | 84,8  | 18,9       | 23,6 | 88,1  | AUX              |
| IB4 SB   | 18,9             | 23,7 | 87,7  | 22,7       | 28,4 | 88,3  | AUX              |
| IB4 MA   | 22,7             | 28,4 | 87,9  | 27,2       | 34,1 | 88,3  | AUX              |
| IB4 MB   | 28,5             | 35,6 | 87,6  | 34,2       | 42,7 | 88,3  | AUX              |
| IB4 LA   | 31               | 38,7 | 90,7  | 37,2       | 46,4 | 91,3  | AUX              |
| SK225 SM | 48               | 60   | 89,6  | 57,5       | 72   | 90,1  | PMG ON REQUEST   |
| SK225 MS | 59               | 74   | 90,3  | 70,5       | 88   | 90,8  | PMG ON REQUEST   |
| SK225 MR | 62,5             | 78   | 90,7  | 74,5       | 93   | 91,3  | PMG ON REQUEST   |
| SK225 MM | 68,8             | 86   | 91,1  | 82,5       | 103  | 91,6  | PMG ON REQUEST   |
| SK225 MN | 73,5             | 92   | 91,5  | 88         | 110  | 92    | PMG ON REQUEST   |
| SK225 ML | 80,8             | 101  | 91,5  | 96,8       | 121  | 92    | PMG ON REQUEST   |
| SK225 LS | 92               | 115  | 91,9  | 110,5      | 138  | 92,4  | PMG ON REQUEST   |
| SK225 LM | 103              | 129  | 91,9  | 125        | 156  | 92,5  | PMG ON REQUEST   |
| SK250 SL | 117              | 146  | 91,6  | 141        | 176  | 91,6  | PMG ON REQUEST   |
| SK250 MS | 132              | 165  | 92    | 157,5      | 197  | 91,9  | PMG ON REQUEST   |
| SK250 MM | 146,5            | 183  | 92,6  | 176        | 220  | 92,4  | PMG ON REQUEST   |
| SK250 ML | 168,8            | 211  | 92,6  | 201,5      | 252  | 92,7  | PMG ON REQUEST   |
| SK250 LS | 183,2            | 229  | 92,8  | 220        | 275  | 92,8  | PMG ON REQUEST   |
| SK250 LM | 201              | 251  | 92,9  | 241,5      | 302  | 92,9  | PMG ON REQUEST   |

| model    | S1 40/105°C cl F |      |       |            |      |       | AVR POWER SUPPLY |
|----------|------------------|------|-------|------------|------|-------|------------------|
|          | 400V 50 Hz       |      |       | 480V 60 Hz |      |       |                  |
|          | kWe              | KVA  | eff % | kWe        | KVA  | eff % |                  |
| SK250 LL | 220              | 275  | 93,1  | 264        | 330  | 93,1  | PMG ON REQUEST   |
| SK315 SS | 256,8            | 321  | 93,2  | 308        | 385  | 93,8  | PMG ON REQUEST   |
| SK315 SM | 293,5            | 367  | 93,7  | 352        | 440  | 94,1  | PMG ON REQUEST   |
| SK315 SL | 329,5            | 412  | 94,1  | 396        | 495  | 94,5  | PMG ON REQUEST   |
| SK355 MS | 366,5            | 458  | 94,5  | 440        | 550  | 94,8  | PMG ON REQUEST   |
| SK355 MM | 418              | 522  | 94,6  | 501,5      | 627  | 94,9  | PMG ON REQUEST   |
| SK355 LS | 440              | 550  | 94,8  | 528        | 660  | 95,1  | PMG ON REQUEST   |
| SK355 LM | 477              | 596  | 94,9  | 572        | 715  | 95,2  | PMG ON REQUEST   |
| SK355WL  | 528              | 660  | 95,1  | 631        | 789  | 95,3  | PMG ON REQUEST   |
| SK400 SD | 589,5            | 737  | 95    | 703        | 879  | 95,4  | PMG              |
| SK400 SE | 663              | 829  | 95,2  | 791        | 989  | 95,6  | PMG              |
| SK400 SF | 737              | 921  | 95,4  | 879        | 1099 | 95,7  | PMG              |
| SK400 SG | 810,5            | 1013 | 95,5  | 967        | 1209 | 95,8  | PMG              |
| SK450 ME | 958              | 1197 | 95,9  | 1143       | 1429 | 96,2  | PMG              |
| SK450 MF | 1106             | 1382 | 96,1  | 1319       | 1649 | 96,4  | PMG              |
| SK450 MG | 1179             | 1474 | 96,2  | 1403       | 1753 | 96,5  | PMG              |
| SK450 LE | 1327             | 1658 | 96,4  | 1583       | 1979 | 96,7  | PMG              |
| SK500 MA | 1381             | 1727 | 95,8  | 1649       | 2061 | 96,2  | PMG              |
| SK500 MB | 1474             | 1842 | 96,3  | 1759       | 2198 | 96,7  | PMG              |
| SK500 MC | 1695             | 2118 | 96,5  | 2022       | 2528 | 96,8  | PMG              |
| SK500 MD | 1916             | 2395 | 96,7  | 2287       | 2858 | 97    | PMG              |



## 6 ALTERNATORS FOR MICRO CHP PERMANENT MAGNETS AIR COOLED

### ADVANTAGES IN CHP

- High efficiency
- Compact and light construction for space saving
- High power/weight ratio
- Easy assembly
- Low maintenance

### FEATURES

- Variable speed
- 16 / 18 poles
- NdFeB magnets radial flux
- SAE, J609b couplings
- IP20 / IP23

### OPTIONS

- Customized executions
- PT100 and thermal sensors
- Hall speed sensors
- Loose rectifier bridge
- CSA/UL

### 3 PHASE

| S1 40/125°C cl H |                 |       |                 |       |                 |       |
|------------------|-----------------|-------|-----------------|-------|-----------------|-------|
| model            | 1000 RPM<br>kWe | eff % | 2000 RPM<br>kWe | eff % | 3000 RPM<br>kWe | eff % |
| PMG140K/18-25    | 1,3             | 85,7  | 3,2             | 87,6  | 5               | 88,7  |
| PMG140K/18-40    | 2,4             | 90,3  | 5,7             | 91,2  | 9               | 91,7  |
| PMG140K/18-50    | 3               | 90,9  | 7               | 91,8  | 11              | 92,3  |
| PMG140K/18-80    | 4,3             | 91,9  | 10              | 92,5  | 16              | 92,9  |
| PMG160K/16-125   | 10              | 91,9  | 23              | 92    | 37              | 92    |
| PMG160K/16-205   | 17,5            | 92,4  | 41              | 92,6  | 65              | 93    |

PMG160K



PMG140K

### ADVANTAGES IN CHP

- High efficiency
- Easy assembly
- Low maintenance

### FEATURES

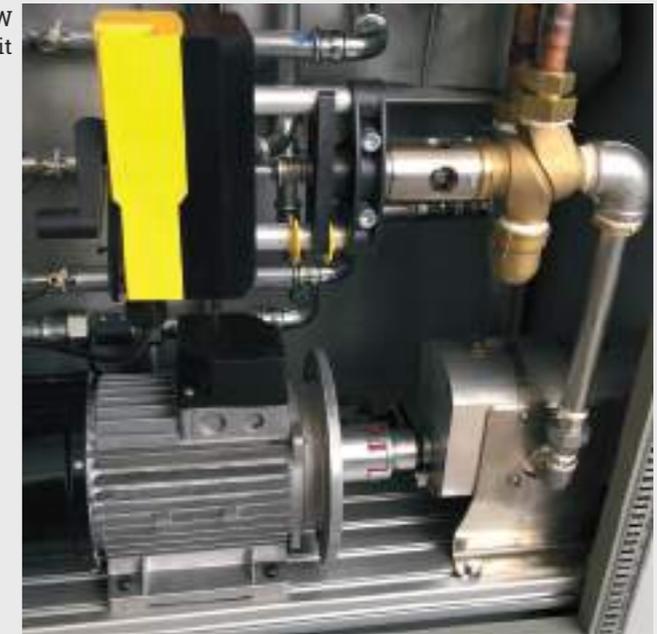
- Variable speed
- Modularity
- 8 / 12 / 18 poles
- NdFeB magnets radial flux
- B3, B5, B14, B3/B5, B3/B14, J609a, J609b couplings
- IP54 / IP55

### OPTIONS

- Customized executions
- CSA/UL



PMG90 on 3 kW  
micro-chp gas unit



### 3 PHASE

| S1 40/125°C cl H |         |                 |       |                 |       |                 |       |
|------------------|---------|-----------------|-------|-----------------|-------|-----------------|-------|
| model            | modules | 1000 RPM<br>kWe | eff % | 2000 RPM<br>kWe | eff % | 3000 RPM<br>kWe | eff % |
| PMG90 S          | 1       | 0,5             | 84,5  | 1,1             | 86,5  | 1,75            | 89,5  |
|                  | 2       | 1,1             | 85,5  | 2,4             | 87,5  | 3,8             | 90,5  |
| PMG90 L          | 3       | 1,7             | 86    | 3,7             | 88    | 5,8             | 91    |
| PMG112           | 1       | 1               | 89    | 2,5             | 90    | 3,7             | 91    |
|                  | 2       | 2               | 90    | 5               | 91    | 7,4             | 92    |
|                  | 3       | 3               | 91    | 7,5             | 92    | 11              | 93    |
|                  | 4       | 4               | 92    | 10              | 93    | 14,8            | 94    |

| S1 40/125°C cl H |         |                 |       |                 |       |                 |       |
|------------------|---------|-----------------|-------|-----------------|-------|-----------------|-------|
| model            | modules | 1000 RPM<br>kWe | eff % | 2000 RPM<br>kWe | eff % | 3000 RPM<br>kWe | eff % |
| PMG160 M         | 3       | 7,5             | 90    | 16,5            | 91    | 26              | 92    |
| PMG160 L         | 4       | 10              | 91    | 22              | 91    | 35              | 92    |
|                  | 5       | 13              | 91,5  | 28              | 92    | 44              | 92,5  |
|                  | 6       | 16              | 92    | 34              | 93    | 54              | 93,5  |
|                  | 7       | 18              | 93    | 40              | 93,5  | 64              | 94    |



ALTERNATORS FOR  
***COMBINED HEAT & POWER***  
OVERVIEW

**ISO 9001:2015 and ISO 14001:2015**  
We work for quality and sustainability every day



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