

ELECTRONIC EQUIPMENT PRODUCTION

# LOW VOLTAGE DRIVES

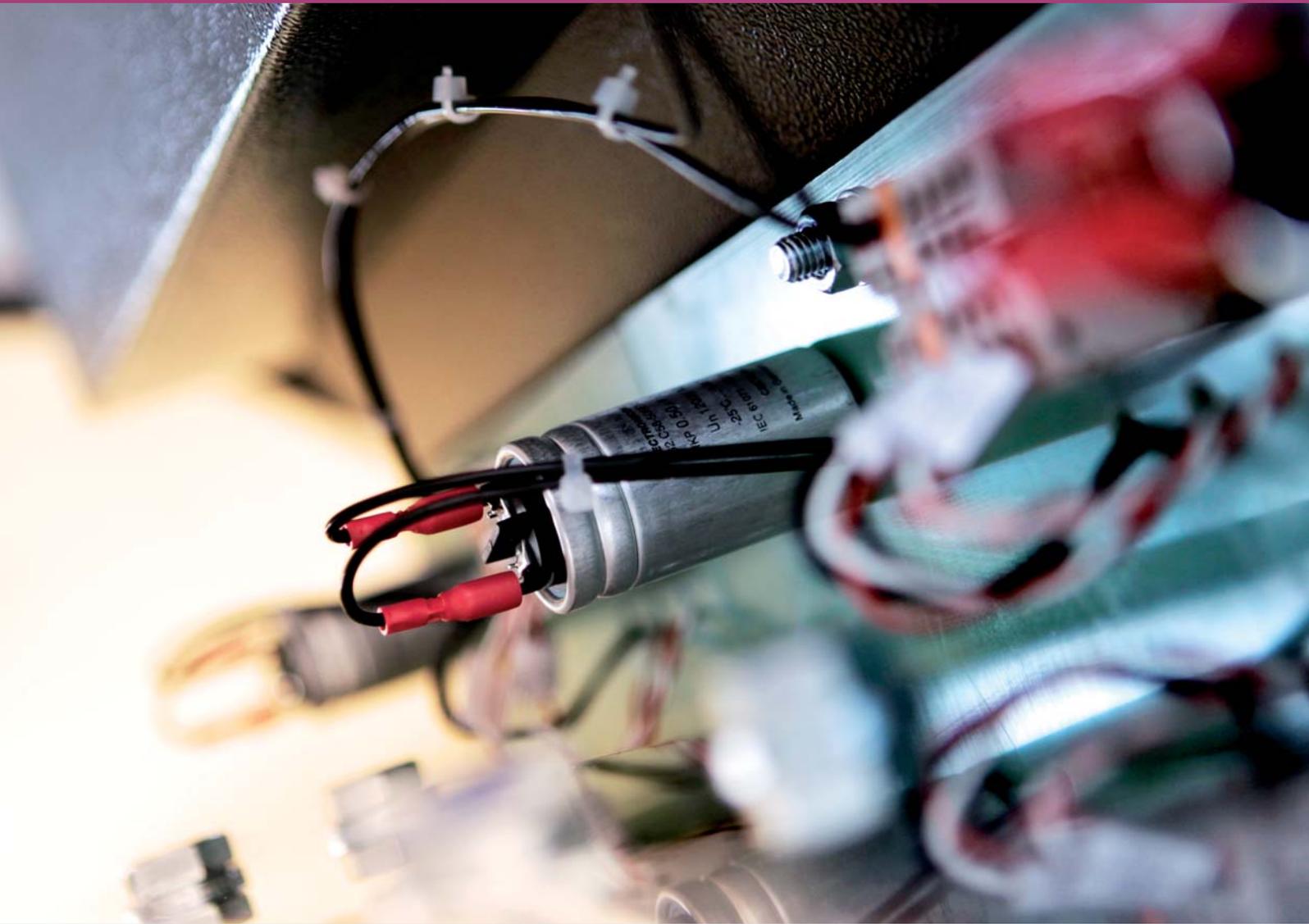
**SECOM**



Founded in 1975, SECOM is a leading distributor in the Power Electronic Components market. Over time the company evolved, becoming an important designer and manufacturer of power electronic devices for industrial automation manufacturing technologies for various industrial processes.

Furthermore SECOM continuously carries out new research and technical proposals in conjunction with important clients, providing technical support to meet their specific needs. Flexibility and short delivery time have become pillars to SECOM's company policy.

Headquartered near Milan in Sesto San Giovanni, Italy, SECOM is recognized around the world for manufacturing high quality products. SECOM's technically advanced products combine with our organization's solid field service, committed to providing prompt and reliable support.



SECOM DC power converters have been distributed worldwide since 1990. They cover a large range from small to large converters with a current capability higher of several thousands amps.



Different converter families are recognized as milestones of the company history: products such as GR89, GR91, GR93 and GR95 have been developed and installed by SECOM's clients for more than twenty years with superb results.

DC power converters are produced with all the cooling systems present in the industrial market.

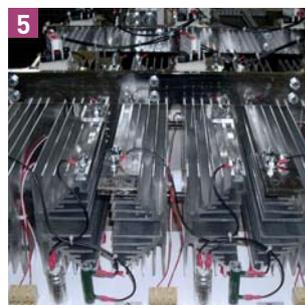
SECOM is particularly attentive of matters such as simple installation, high reliability and maintenance especially when compared to other products on the market.

Natural cooled converters up to 2000 Amps at more than 1000 V specially developed for excitation systems with different solutions such parallel configuration.

Air forced cooled converters up to 4400 Amps at 990 VAC and 6000 Amps at 500 VAC in a single frame for industrial application such as motor drive and dc bus feeder.

Water cooled converters up to 12000 Amps at low voltage for industrial applications such as galvanic or welding.

- 1** GR93 Thyristor stack
- 2** GR93 Power converter
- 3** GR93 Unidirectional
- 4** Air forced cooled power converter
- 5** Natural cooled power converter
- 6** Water cooled power bridge





SECOM developed a brand new DC power converter named the GR6. It is the answer to the important issue of saving space pertinent to many modern companies and for simplifying maintenance activities.



The new converter brand covers in a single frame the whole range from 1000 Amps up 6000 Amps and from 500 VAC up 990 VAC input line voltage.

GR6 converter has been developed as a standard solution for all sizes reducing installation space needs and offering at the same time a simpler replacement method with a withdrawable solution on wheels.

Parallel operation is much simpler and reliable due to the geometrical configuration. A wide spread of input connections can be chosen by the client obtaining a perfect power distribution inside each electrical cabinet.

GR6 converters have been developed in three different configuration but with the same frame: unidirectional (rectifier), bidirectional (DC motors) and regenerative (DC Bus feeder).

A water cooled version is also available for all the applications that require high power with a very compact solution either high or low voltage range.

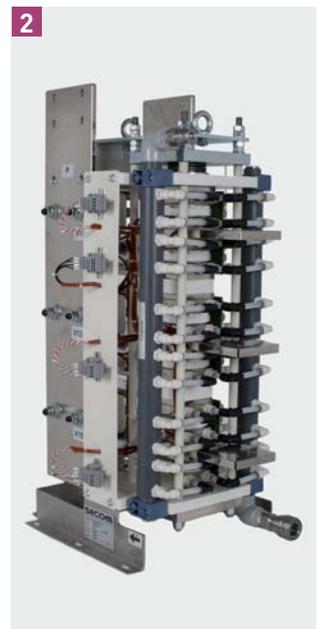
GRW6 family can use diodes or thyristors, topology depending on the kind of use if not controlled or total controlled convert.

**1** GR6 Unit front view

**2** GRW6 Converter

**3** GR6 Bidirectional module

**4** GR6 Fan and wheels





SECOM developed a new DC power converter called GR8. The GR8 series of converters has been developed with the aim of offering a product that could guarantee high performance in a small size and giving a real reduction in commissioning and maintenance.



In the new converter GR8 using new developed components was possible to produce a new version of converter available in different configurations, with current range between 1000 Ampa and 3300 Amps and supply voltage ranging between 400 VAC and 850 VAC.

The three-phase converters Series GR8 are offered in different configurations:

- Rectifier (6 diodes)
- Fully controlled unidirectional (6 thyristors)
- Bidirectional
- Regenerative (double bars CA).

The rectifier mounts six diodes in configuration Graetz bridge and is provided with internal protections against overcurrent (fuses branch installed on the AC side) and overvoltage (snubber filters in parallel to each semiconductor).

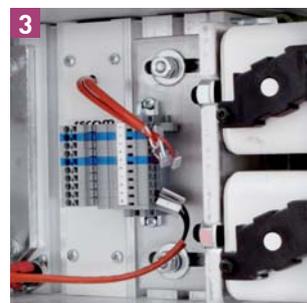
To simplify the maintenance of the drive, the bridge was divided into three identical modules and removable.

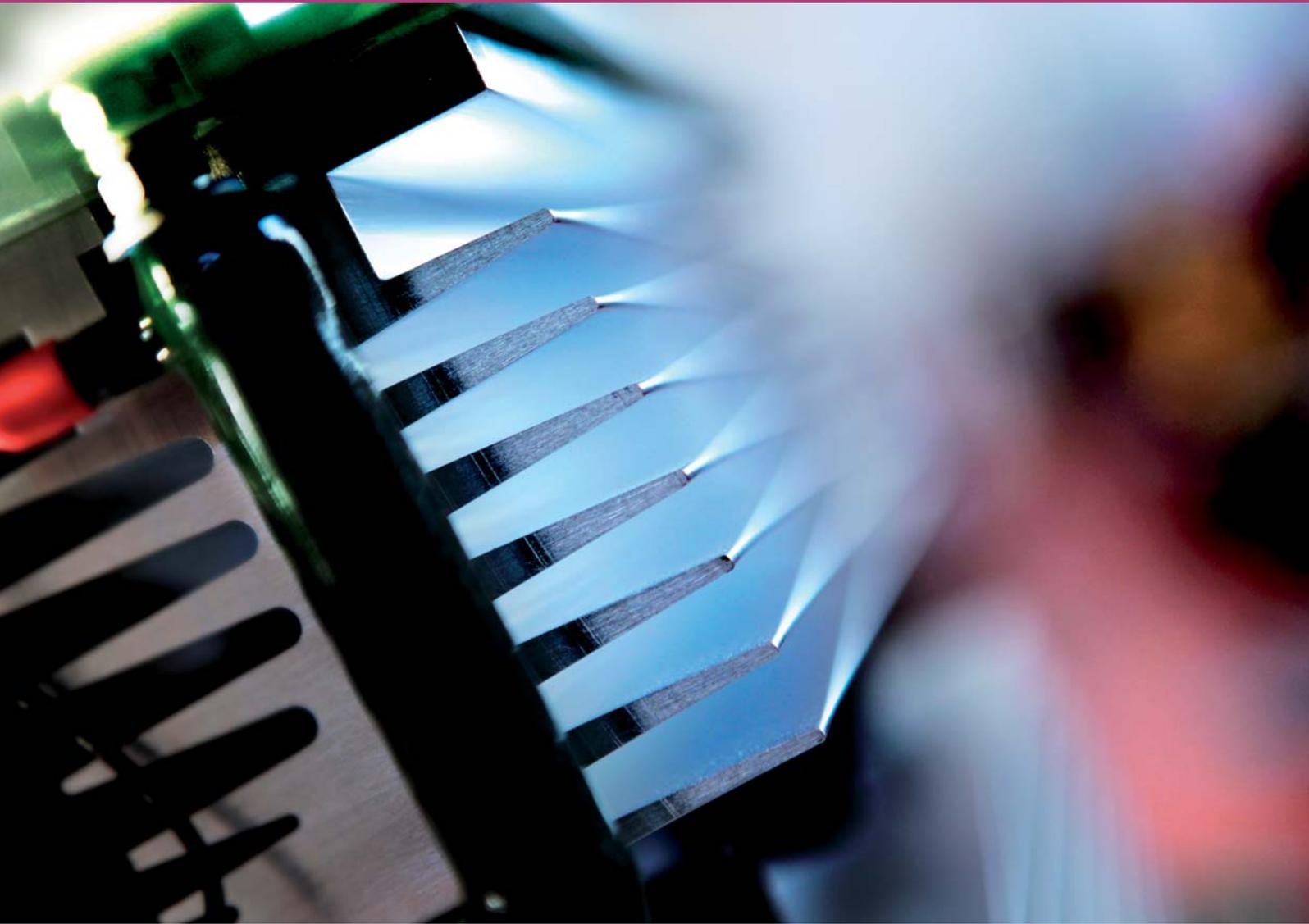
**1** GR8 Inside view

**2** GR8 Module

**3** GR8 Thyristor terminal block

**4** GR8 Fan and wheels





GR9 is the last AC/DC power converter developed by SECOM.

This device has been designed to cover the lower range of current in order to give an extremely compact and alternative solution to the other similar SECOM product (GR6 – GR8).

GR9 is very compact and has been designed to be upgraded using Secom electronic board as braking chopper.

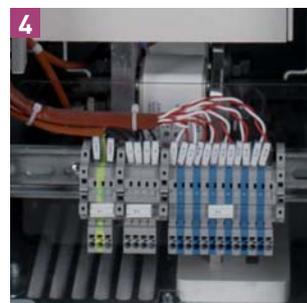


The GR9 converter is available in different configurations, with current range between 250 Amps and 1500 Amps and supply voltage range between 380 VAC and 850 VAC. Is an air cooled solution and all frames are equipped with internal fuses and thyristor snubber. As standard is supplied with IP20 protection degree (IP00 only by request).

The three-phase converters Series GR9 are offered in different configurations:

- Rectifier (6 diodes)
- Fully controlled (6 thyristors)
- Half controlled
- CHT chopper units.

- 1** GR9 Module overall view
- 2** GR9 Module front inside view
- 3** GR9 AC busbar
- 4** GR9 Thyristor terminal block
- 5** GR9 DC busbar





SECOM developed a brand new power stage inverter named SECOMDRIVE. Inverter family provides a different and new answer for all AC applications where an inverter must be used: driving ac motor, renewable power sources such as photovoltaic or winding applications, regenerative converter as Front End power supply (F3E, AFE).



Power stages are available in two main ranges: 400 VAC and 690 VAC input main line.

IGBT (Insulated Gate Bipolar Transistors) devices are used in two ranges: 1200 V and 1700 V.

Single frames 100 kVA @ 400 VAC and 185 kVA @ 690 VAC are the basic components for a stand-alone solution or parallel configuration where a total power of 4880 kVA @ 400 VAC and 3440 kVA @ 690 VAC can be obtained.

Integrated high voltage power supply and IGBT driver cards are included in the SECOMDRIVE optically insulated inverter.

Also integrated in the same frame are the input DC

capacitors and output inductances which allow a simpler and reliable parallel configuration.

Electrolytic or film capacitors are used for industrial and energy application such as motor drive, photovoltaic or winding applications.

Safe Torque Off (STO) is used in conjunction with the interface card when the optional function is requested by the Client. The STO is a safety function according the Machinery Directive 98/23/EC and will be used in electrical equipment such as power drives for sync/async AC motors (low voltage).

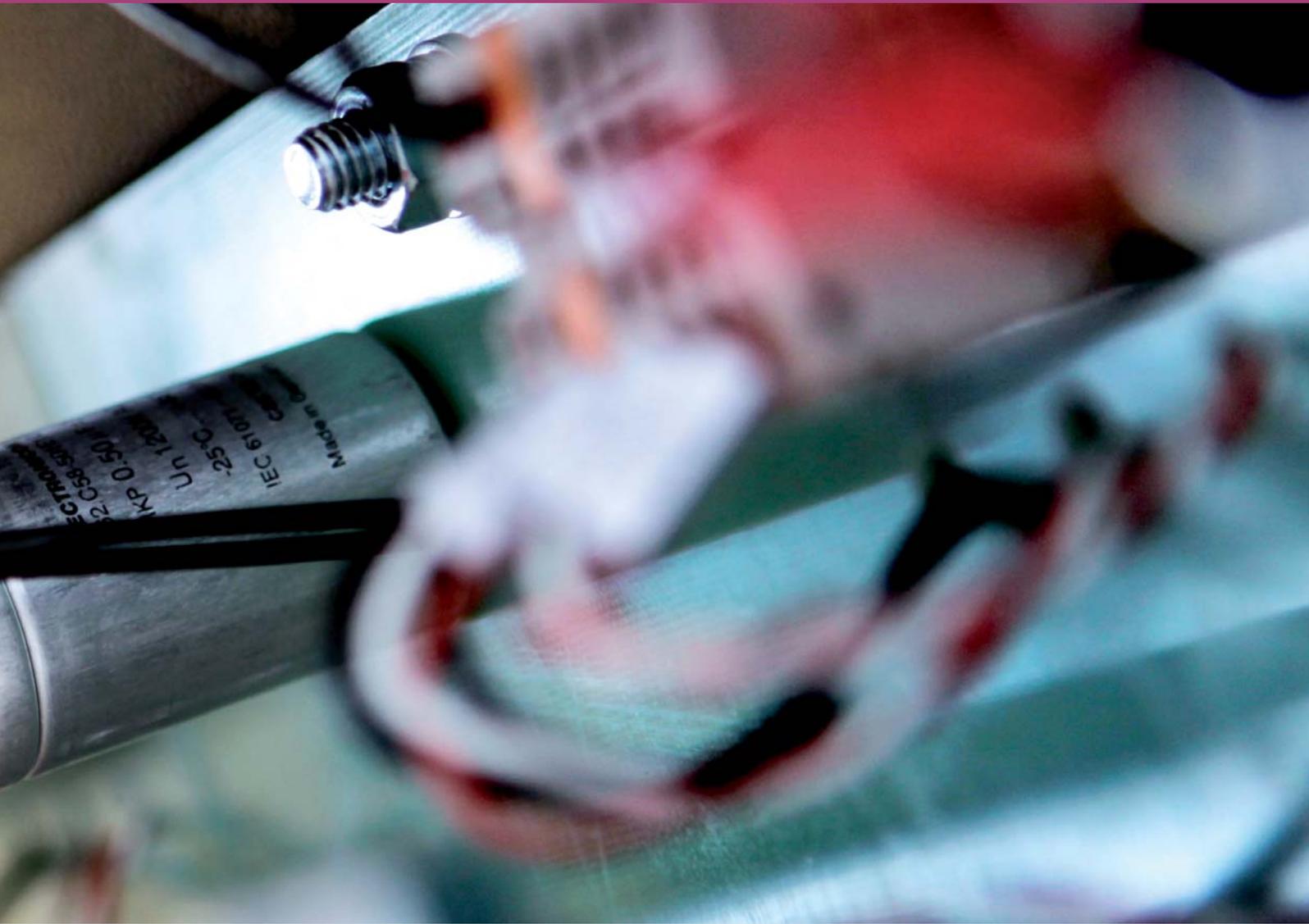
**1 Inverter module**

**2 Inverter inside view and busbar kit**

**3 Inverter inside view**

**4 Inverter wheel detail**





SECOM introduced in 2013 a new series of frequency converters designed to supply power to equipment that incorporates technology currently used in induction heating, hardening, smelting and/or other applications where a resonant circuit is required.



Strength point of this solution are:

- IGBT HF technology
- A drastically gas and smoke emission reduction typical of the old heating process
- A reduced energy consumption
- Immediate availability of the heating → no need long start or stop sequences, as with traditional reheating furnaces.

H bridge configuration is used in SECOM induction heating converters.

The HF and LF induction heating power stage converts the available utility line frequency power to single-phase at a appropriate frequency for the induction heating process. The power modules are water-cooled and the module solution ensure simplicity in terms of maintenance and service operations.

- 1** Deep purple LF input busbar
- 2** Deep purple LF front view
- 3** Violet HF Converter front view



**Available series (according different applications):**

<b>LF converters (Low operating Frequency):</b> [generally used for LONG processing]	H bridge output current up to 1,700 A Frequency up to 1 kHz $V_n = 380\text{ V} \div 690\text{ V}$ $P_n = 160\text{ kVA} \div 340\text{ kVA}$
<b>HF converters (High operating Frequency):</b> [generally used in FLAT processing]	H bridge output current up to 1,700 A Frequency up to 6 kHz $V_n = 380\text{ V} \div 690\text{ V}$ $P_n = 220\text{ kVA} \div 1170\text{ kVA}$
<b>UHF converters (High operating Frequency):</b> [generally used in FLAT processing]	H bridge output current up to 1200 A Frequency up to 20 kHz $V_n = 380\text{ V} \div 690\text{ V}$ $P_n = 150\text{ kVA} \div 820\text{ kVA}$
<b>GRW6 Water cooled rectifier:</b>	3ph rectifier output current from 1500÷4,500 Adc Frequency 50÷60 kHz $V_n = 380\text{ V} \div 690\text{ V}$

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Since 1995 SECOM has obtained  
an international quality certification

ISO 9001

BUREAU VERITAS  
Certification

