Heat under control
SIPLUS HCS – I/O systems for industrial heating applications

Engineered with TIA Portal
SIPLUS HCS – pinpointed heating
For precise temperature control

From automobile painting and plastics molding to manufacturing PET bottles: reliable, pinpoint control and precise maintenance of temperatures are absolutely crucial to quality in many manufacturing processes and must be ensured at all times. SIPLUS HCS, the industrial heating control systems from Siemens for electrical heating elements, have been reliably providing this service for more than 25 years. And they’re getting smarter all the time.

Pinpointed heat
Almost all products require exact temperatures during the manufacturing process, precisely focused in terms of time and space. The SIPLUS HCS I/O system controls electrical heating elements, such as infrared, quartz, and flash heaters, exactly to suit individual requirements.

Intelligent efficiency
Heat needs power – and the less, the better, because energy is expensive, and both national and international standards are becoming increasingly stringent. This is where SIPLUS HCS helps with smart savings – through programmable heating programs, proportioning of the output power ratings, and optimization of production times.

Modular and compact
No matter how many heating elements are to be controlled, and how high the required output power rating: SIPLUS HCS is open to modular expansion, and is so versatile it can be adapted to suit specific requirements.

Simple integration
With SIPLUS HCS, heating processes are easy to integrate into Siemens’ industrial automation. Thanks to Totally Integrated Automation, all automation components work together perfectly. This means consistent data management, global standards, and standardized interfaces for hardware and software.
SIPLUS HCS – all integrated
All-in-one

SIPLUS HCS heating control systems already contain all the components needed to control heating elements: switching elements, fuses, communication system, intelligent power controlling, Totally Integrated Automation, and detailed diagnostics.

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**Less overhead**
Since all the most important components are integrated, cabling work is reduced by up to 70% in the control cabinet, and there are time savings of up to 20% with on-site commissioning compared to conventional solutions with individual components.

**Reduced footprint**
All-in-one also reduces the space requirements in the control cabinet by up to 80%, enabling much more compact machines.

**Intelligent diagnostics**
Pending faults are detected, localized, and reported within a single process cycle. This minimizes downtimes and optimizes plant productivity.

**Efficient engineering**
A key benefit is the incorporation of SIPLUS HCS heating controllers into the Totally Integrated Automation Portal (TIA Portal): this means that all automation components fall back on a shared database, a standardized operating concept and centralized services. You benefit from reduced engineering overhead and faster commissioning.

**Heating element cables individually fused**
The cables of every single heating element are fuse-protected with SIPLUS HCS. This makes it easy to replace fuses by simply removing the relevant plug-in fuse module.

**Highly versatile**
You can tailor the system’s capacity to your requirement. You can also combine different systems. As far as the control mode is concerned, you have a choice between half-wave, soft starting and phase angle control.

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From designing, commissioning, operation and maintenance, SIPLUS HCS not only saves time, costs, and resources by up to 70 percent compared with a heating solution comprising individual components. SIPLUS HCS also improves the heating process itself – for less downtimes and better product quality.

**All in one**
Integration of all components and functions for controlling electrical heating elements in a modular system.

**Less overhead**
Up to 70% less wiring in the control cabinet. Up to 20% shorter commissioning on site.

**Reduced footprint**
Up to 80 percent space savings in the control cabinet.

**Intelligent diagnostics**
Intelligent diagnostic functions detect and localize errors in the load circuit immediately with the support of the extensive TIA system diagnostics.

**Easy integration of the heating process**
Comprehensive block library and project example for simple integration of the heating process into the automation system.

**Efficient engineering**
Engineering with TIA Portal ensures maximum integration of all components with a shared database.

**Integrated load management**
Load is distributed evenly across the network as far as specified setpoint values allow.

Space savings of up to 80 percent in the control cabinet, as well as the reduction in cabling work...
The perfect solution for any application

There is a choice of three different heating control systems depending on the requirements of the heating process such as the output power of the heating elements, diagnostic depth and the degree of protection.

SIPLUS HCS3200 – the compact solution

- For controlling 400 V heating elements
- Can be used as a distributed solution with IP65 protection near the heating elements
- Ideal for the linear configuration of heater fields in the manufacture of PET bottles

SIPLUS HCS4200 – the flexible solution

- For controlling 45 V, 70 V, 110 V, 230/277 V, 400/480 V heating elements
- Exceptionally space-saving and cost-optimized heating solution with different output modules, I/O modules and racks

SIPLUS HCS4300 – the powerful solution

- For controlling 230/277 V, 400/480 V heating elements up to 60 A
- Up to 92 kW per power output module
- Highest level of production reliability thanks to detailed, intelligent diagnostics

... together with “Totally Integrated Automation”...

...minimize total costs by up to 70 percent.
SIPLUS HCS3200
Super-compact

IP65 type of protection enables use near the heating elements, significantly reducing the time and effort required for cabling.

Special application
PET blow molding

Functionality
• For controlling 400 V heating elements
• Compact design with IP65 type of protection
• 9 power outputs up to a maximum of 4 kW per output
• Up to 25 kW output power per device
• External fan up to 500 W can be connected
• Can be used in ambient temperatures up to 50 °C
• Two integrated and automatically monitored fuses per power output, for user-friendly fault diagnostics and increased process reliability
• Diagnostics via PROFINET DP without affecting the heating process
SIPLUS HCS4200

Extremely flexible

Ideal for space-saving installation in the control cabinet – with up to 384 power outputs per PROFINET node and up to 20 A per output.

Special applications
Drying paints and coatings, thermo-forming – for example, car door interiors, refrigerator door interiors and suitcases, welding plastics and baking of food.

Functionality
• For energy-efficient control of heating elements with various voltages: 45 V, 70 V, 110 V, 230 / 277 V, 400 / 480 V
• Up to 48 kW output power per power output module (POM)
• Max. 16 power outputs per POM
• Max. 24 POMs per PROFINET node
• Quick installation and flexible expansion thanks to variety of POMs and rack sizes
• Installation of racks directly on rear panel of control cabinet
• Intelligent and detailed diagnosis of heating elements even connected in parallel
• Convenient commissioning with the PRONETA diagnostics tool
• PROFINET / PROFIBUS communication
• I/O modules for additional functions
SIPLUS HCS4300
High performance up to 60 A

Offers maximum output power and production reliability thanks to its detailed diagnostics. Enables detection of internal faults in the load circuit, tripped fuses and defective heating element cables. Monitoring includes parameters such as network voltage and internal temperature.

Special applications
Manufacturing PET bottles, treating carbon materials and thermoforming of plastics

Functionality
• For controlling 230/277 V, 400/480 V heating elements
• Up to 92 kW output power per power output module (POM) at 480 V
• Max. 60 A per output
• Max. 9 power outputs per POM
• Max. 24 POMs per PROFINET / PROFIBUS node
• Quick mounting on busbar or onto rear control cabinet panel
• Integrated network voltage compensation
• Supply and return circuit of every heating element protected by individual fuses
• Convenient commissioning with the PRONETA diagnostics tool
• I/O modules for additional functions
The I/O systems are an integral part of Totally Integrated Automation (TIA), Siemens’ industrial automation. The open system architecture stands for the efficient interaction of all automation components.

Engineered with TIA Portal
A decisive benefit is the incorporation of the SIPLUS HCS heating control system into the TIA Portal: this means that all automation components thus fall back on a shared database, a standardized operating concept and centralized services. You benefit from reduced engineering overhead and faster commissioning.

Configuration control
With the configuration control, stations can be easily modified or extended without engineering effort.

PRONETA
The PRONETA configuration and diagnostics tool simplifies commissioning and configuration in PROFINET networks. The topology of a network is read automatically. SIPLUS HCS can be parameterized, controlled and tested easily with the aid of PRONETA. It enables a wiring test during installation – with clearly arranged documentation of test results.

SIPLUS HCS program library:
Easy integration of heating processes
Using the SIPLUS HCS program library and a detailed project example, heating processes can be easily integrated into the automation system. Individual program blocks only need to be adapted to the respective application.
## Technical specifications at a glance

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<thead>
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<th>Article No.</th>
<th>HCS3200 – The compact solution</th>
<th>HCS4200 – The flexible solution</th>
</tr>
</thead>
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<tr>
<td>Max. output power per output</td>
<td>10 A</td>
<td>20 A</td>
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<tr>
<td>Load voltage</td>
<td>400 V</td>
<td>45 V, 70 V, 110 V, 230/277 V, 400/480 V</td>
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<td>Number of outputs per POM</td>
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<td>Max. output power per device/POM</td>
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<td>27.7 kW at 277 V, 48 kW at 480 V</td>
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<tr>
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<td>384</td>
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<tr>
<td>Bus topology</td>
<td>PROFIBUS DP</td>
<td>PROFINET, PROFIBUS DP</td>
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<td>Diagnostics</td>
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<td>I/O modules (PM) optional</td>
<td>–</td>
<td>PM for temperature measurement, DI/DO, current and voltage measurement</td>
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### Electrical data

| Line supply | 4-pin connector at the bottom | 3-pin connector on the front |
| Power supply | 400 V AC Line frequency: 47 to 63 Hz Integrated line voltage compensation | 45 / 70 / 110 / 230 / 277 / 400 / 480 V AC Line frequency: 47 to 63 Hz Optional line voltage compensation with PM U/I |
| Load types | Ohmic loads | Ohmic loads |
| Wiring of the heaters | Phase-Phase | Phase-Phase, Phase-Neutral, Economy Circuit (wye connection) |
| Control mode | Half-wave control with solid-state relay that switches at zero crossing | Half-wave control, soft start or phase angle control |

### Mechanical design

| Dimensions (W x H x D) | 300 x 430 x 200 mm |  |
| Fans | 1 output for external 230 V AC fan | Fan module for 4 POMs each (optional) |
| Ambient temperature (operation) | 0 to +50 °C | 0 to +55 °C |
| Type of protection | IP65 | IP20 |
| Certifications | CE, cULus, KC, EAC, C-Tick, PROFIBUS | CE, cULus, KC, EAC, RCM, PROFINET, PROFIBUS |

1) You can find up-to-date ordering data as well as our terms of sale and delivery on the Internet at siemens.com/industrymall
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**Bus topology**

PROFINET, PROFIBUS DP

Implicit voltage diagnostics for detecting internal and external faults, e.g. wire break, tripped fuse, defective heating elements, current diagnosis

PM for temperature measurement, DI/DO, current and voltage measurement

**Diagnostics**

Implicit voltage diagnostics for detecting internal and external faults, e.g. wire break, tripped fuse, defective heating elements, current diagnosis

**I/O modules (PM) optional**

– PM for temperature measurement, DI/DO, current and voltage measurement

**Electrical data**

**Line supply**

4-pin connector at the bottom
3-pin connector on the front

**Power supply**

400 V AC

Line frequency: 47 to 63 Hz

Integrated line voltage compensation

230 / 277 / 400 / 480 V AC

Line frequency: 47 to 63 Hz

Optional line voltage compensation with PM U/I

**Load types**

Ohmic loads

Phase-to-phase, phase/neutral, closed delta

Half-wave control, soft start or phase angle control

**Mechanical design**

Dimensions (W x H x D)

300 x 430 x 200 mm

• CIM: 43 x 285 x 136 mm, POM: 36 x 285 x 281 mm

• CIM Compact incl. Rack + Fan for 2 POM: 104 x 339 x 296 mm

• Rack for 12 POM: 488 x 285 x 293 mm

• Rack for 4 POM: 204 x 285 x 293 mm

• Fan module for 4 POMs each (optional)

• Fan integrated

• CIM: 56 x 285 x 136 mm

• POM busbar mounting: 104 x 340 x 250 mm

• POM rear-panel mounting: 104 x 344 x 217 mm

• Fans

1 output for external 230 V AC fan

Fan module for 4 POMs each (optional)

**Environmental conditions/standards**

Ambient temperature

(operating)

0 to +50 °C

0 to +55 °C

**Type of protection**

IP65

IP20

**Certifications**

CE, cULus, KC, EAC, C-Tick, PROFIBUS CE, cULus, KC, EAC, RCM, PROFINET, PROFIBUS

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### References

- **Geiss AG** – more precise thermoforming machines thanks to an industrial solution from Siemens
  - Metrik Sondermaschinenbau e. K. – efficient use of space and maximum precision in plastics welding

- **Dieffenbacher GmbH** – fastest tape laying system in the world achieves high product quality through consolidation
  - Vesper GmbH & Co. KG – hot solution for cool automotive interiors: laminating-edge-folding system without sliders

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Turn up the heat:
SIPLUS HCS

- All in one
- Less overhead
- Reduced footprint
- Intelligent diagnostics
- Easy integration of the heating process
- Efficient engineering
- Integrated load management

Find out more:
siemens.com/hcs

Published by
Siemens AG 2020

Digital Factory
P.O. Box 48 48
90026 Nuremberg, Germany

For the U.S. published by
Siemens Industry Inc.
100 Technology Drive
Alpharetta, GA 30005
United States

Article No.: DFIA-B10103-03-7600
Printed in Germany
Dispo 46371
75624 WS 03200.2

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For the secure operation of a plant/machine, it is also necessary to take suitable protective measures (e.g. cell protection concept), and to integrate the automation and drives components into a holistic, state-of-the-art industrial security concept for the entire plant/machine. Products used from other manufacturers should also be taken into account here.
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