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*Ingenuity for life*



Engineered with TIA Portal

# Heat under control

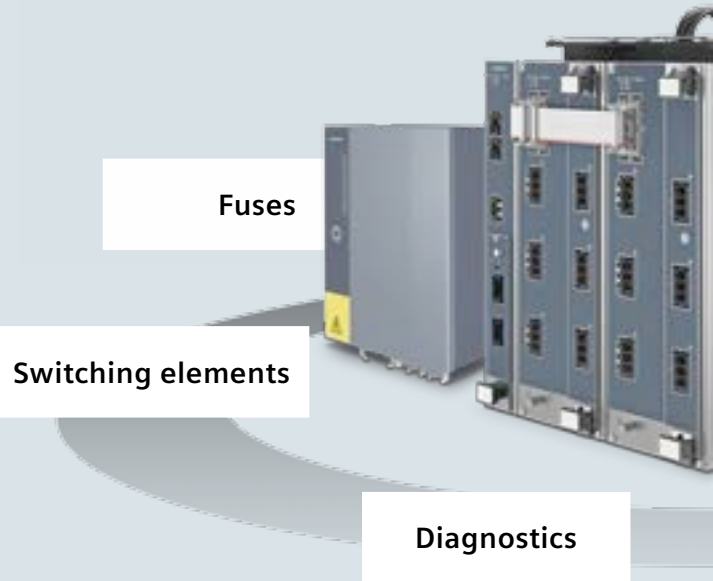
SIPLUS HCS – I/O systems for  
industrial heating applications

[siemens.com/siplus-hcs](https://www.siemens.com/siplus-hcs)

# 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.

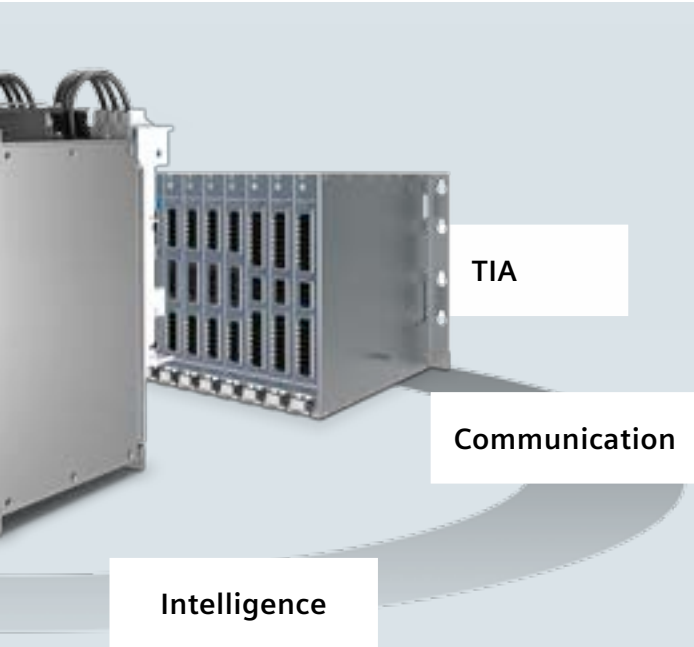
### Simple integration

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.



### Reduced line harmonic distortion

The power semiconductors switch at the zero crossing. Not only does this greatly reduce wear on the switching elements – EMC faults and line harmonic distortions are also reduced to a minimum.

### 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.

### PROFINET communication

Thanks to communication via PROFINET or PROFIBUS, setpoints and diagnostics messages can be exchanged quickly with other bus nodes.

### Engineered with TIA Portal

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.

### Intelligent routine

Integrated control routines reduce current peaks in the network supply because the heating elements are switched on with a time delay. Network voltage compensation enables variations in the input voltage to be equalized, thus ensuring the required output power.

### Integrated fault diagnostics

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








### 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.

# SIPLUS HCS

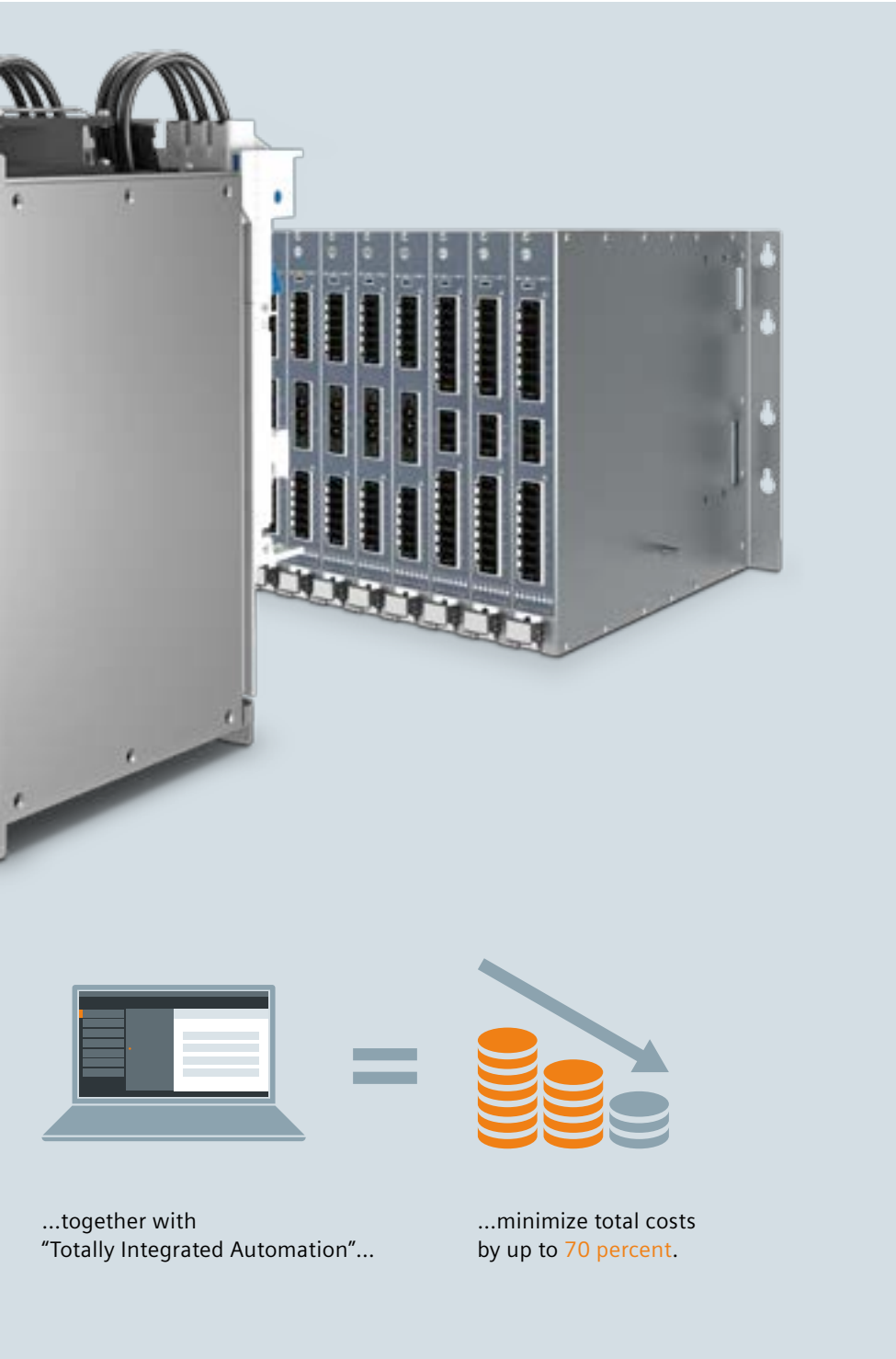
## The “hotspots” of the family

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.

-  **Simple**  
Incorporation of heating processes in industrial automation from Siemens.
-  **Less overhead**  
Reduces cabling work by up to 80 percent.
-  **Intuitive**  
Engineered with TIA Portal.
-  **Intelligent and detailed**  
Diagnostics for rapid detection and localization of faults.
-  **Smaller**  
Up to 80 percent space savings in the control cabinet.
-  **More efficient**  
Optimum network utilization and avoidance of current peaks.
-  **Better**  
Process quality thanks to intelligent fault diagnostics and reproducibility of the heating process.



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 V/277 V and 400 V/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 400 V/480 V heating elements
- With an output power of up to 69.1 kW per output module
- Highest level of production reliability thanks to detailed, intelligent diagnostics

# SIPLUS HCS3200

## Super-compact

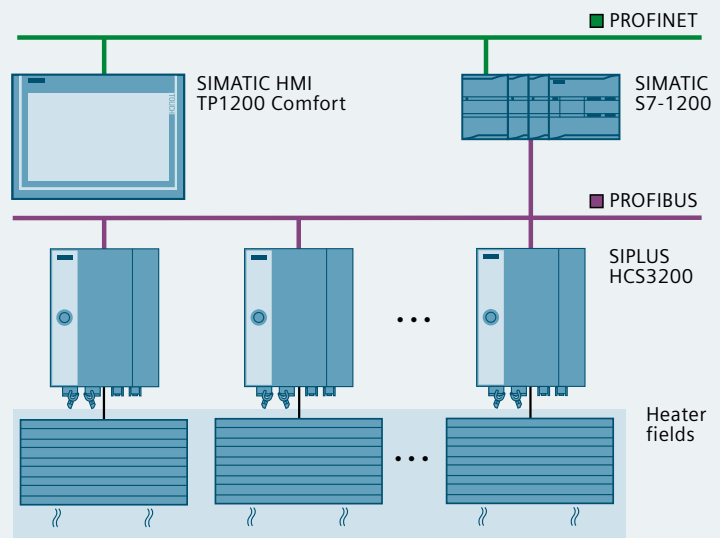
SIPLUS HCS3200 comes in IP65 degree of protection and can be used in the vicinity of the heating elements, significantly reducing the time and effort required for cabling.

### 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 fans 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 PROFIBUS DP without affecting the heating process



# SIPLUS HCS4200

## Extremely flexible



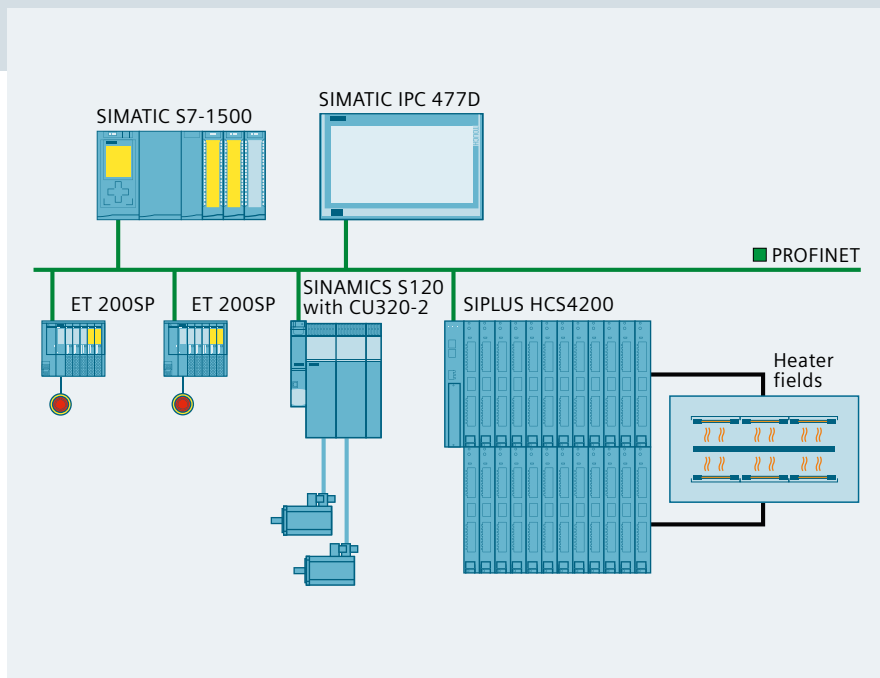
**Ideal for space-saving installation in the control cabinet – with up to 384 power outputs per PROFINET node and up to 20 A per output.**

### Special applications

Drying paints and coatings, thermoforming – for example, car door interiors, refrigerator door interiors and suitcases, welding plastics and baking of food.

### Functionality

- For energy-efficient control of 45 V/70 V/110 V/230 V/277 V and 400 V/480 V heating elements
- 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 in PROFINET networks with the PRONETA diagnostics tool
- PROFINET/PROFIBUS communication
- I/O modules for additional functions



# SIPLUS HCS4300

## Powerful

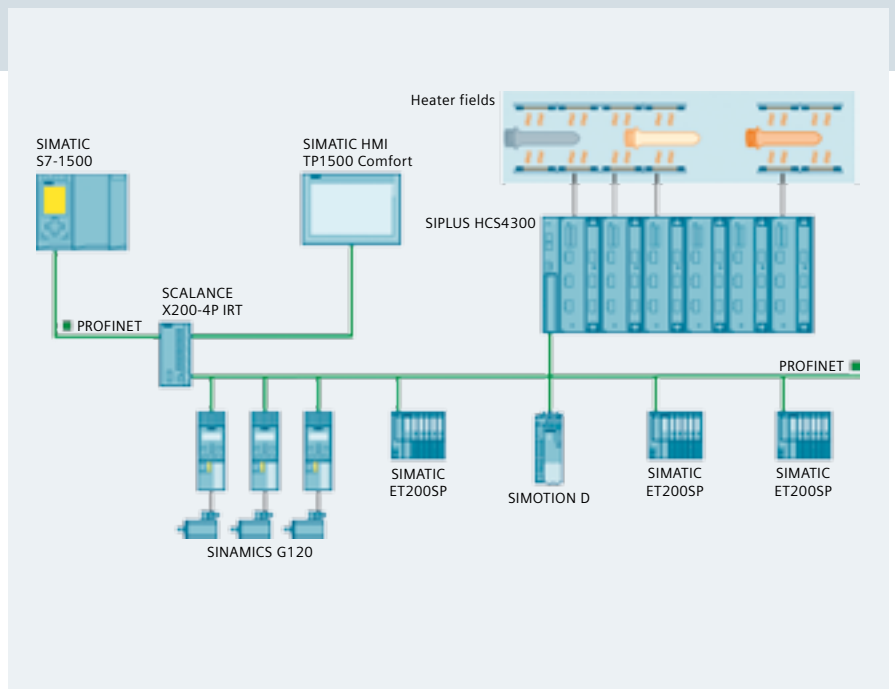
SIPLUS HCS4300 ensures maximum production reliability thanks to its detailed diagnostics which can detect problems like internal faults in the load circuit, blown fuses, and faulty heater cables. Monitoring includes parameters such as network voltage and internal temperature.

### Special applications

Manufacturing PET bottles, treating carbon materials and thermoforming of plastics

### Functionality

- For controlling 400 V/480 V heating elements
- Up to 69.1 kW output power per power output module (POM) at 480 V
- 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 in PROFINET networks with the PRONETA diagnostics tool
- I/O modules for additional functions





# Totally Integrated Automation

## Efficiency drives productivity

The SIPLUS HCS 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.

### Thermographic library:

#### Simple visualization of heater fields

With the "Thermographic" library for WinCC advanced, it is quick and easy to visualize heater fields in the TIA Portal. Using these library elements can reduce the engineering overhead by more than 90 percent.

### SIPLUS HCS program library:

#### Easy integration of heating processes

Using the SIPLUS HCS program library and an detailed projekt 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



	HCS3200 – The compact solution	HCS4200 – The flexible solution
Article No.	6BK1932 <sup>1)</sup>	6BK1942 <sup>1)</sup>
Max. output power per output	10 A	20 A
Load voltage	400 V	45 V, 70 V, 110 V, 230/277 V, 400/480 V
Number of outputs per POM	9	16
Max. output power per device/POM	25.2 kW	27.7 kW at 277 V, 48 kW at 480 V
No. of max. possible power outputs	9	384
Bus topology	PROFIBUS DP	PROFINET, PROFIBUS DP, EtherNet/IP
Diagnostics	Implicit voltage diagnostics for detecting internal and external faults, e.g. wire break, tripped fuse, defective heating elements	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
<b>Electrical data</b>		
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 UII
Load types	Ohmic loads	Ohmic loads
Wiring of the heaters	Phase-Phase	Phase-Phase, Phase-Neutral
Control modes	Half-wave control with solid-state relay that switches at zero crossing	Half-wave control, soft start or phase angle control
<b>Mechanical design</b>		
Dimensions (W x H x D)	300 x 430 x 200 mm	<ul style="list-style-type: none"> <li>• CIM: 43 x 285 x 136 mm</li> <li>• POM: 36 x 285 x 281 mm</li> <li>• Rack for 12 POMs: 488 x 285 x 293 mm</li> <li>• Rack for 4 POMs: 204 x 285 x 293 mm</li> <li>• Rack with 3 fan modules and CIM: 502 x 347 x 309 mm</li> </ul>
Fans	1 output for external 230 V AC fan	Fan module for 4 POMs each (optional)
<b>Environmental conditions/standards</b>		
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

# References



## HCS4300 – The powerful solution

6BK1943 <sup>1)</sup>

16A

400V, 480V

9

69.1 kW at 480V

216

PROFINET, PROFIBUS DP, EtherNet/IP

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

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

Rear busbar or 3-pin terminal

400 V AC / 480 V AC (360 to 520V)  
Line frequency: 47 to 63 Hz  
Integrated line voltage compensation

Ohmic loads

Phase-Phase

Half-wave control or soft start

- 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

Fan integrated

0 to +55 °C

IP20

CE, cULus, KC, EAC, RCM, PROFINET, PROFIBUS



## Geiss AG – more precise thermoforming machines thanks to an industrial solution from Siemens

The market leader relies on Siemens technology when it comes to designing its new thermoforming machine series. Dynamics and precision in the new machines have been improved and shorter production times achieved. The SIMATIC S7-1500 fail-safe control with the CPU S7-1516F and the TIA Portal are the focus of the comprehensively upgraded automation concept. Communication is via PROFINET. Dynamic servomotors enable simultaneous processes and improve product quality, as does the SIPLUS HCS4200 I/O system. It controls the high-speed flash emitters – with extensive inherent HCS diagnostics. Geiss AG decided in favor of Siemens because the complete TIA solution enables a perfect interplay of all integrated components, thus making it possible to realize more efficient machines. Apart from the technological advantages, the customer was impressed by the fast commissioning and global Siemens service.



## Metrik Sondermaschinenbau e. K. – efficient use of space and maximum precision in plastics welding

The supplier to the automobile and plastics industries from the German town of Creussen placed its trust in a future-oriented machine concept with easy and uniform configuration in the TIA Portal. That enables more efficient engineering and reduces complexity – for 30% more productivity. The compact dimensions of the machines ensure greater clarity with up to 70% space savings in the control cabinet and 80% less wiring overhead. The HCS4200 ensures top precision during thermal riveting and enables exact temperature monitoring for optimum results thanks to channel-specific feedback from its diagnostics module. The Siemens solution at Metrik Sondermaschinenbau e. K. has resulted in an increase in productivity and quality with maximum efficiency.

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## Turn up the heat: SIPLUS HCS

- For precise temperature control
- All-in-one
- Engineered with TIA Portal
- Simple visualization of heater fields
- PROFINET/PROFIBUS communication
- Rapid detection of faults

Find out more:  
[siemens.com/siplus-hcs](http://siemens.com/siplus-hcs)

