Industrial Control SE-607

Controller and visualization combined as an automation solution with infrared touch operation

Trend-setting industrial controls for heat treatment plants

The controller is equipped with a high-contrast 10.4 inch TFT touch display. A 600MHz fast Pentium based 32bit processor ensures fast signal processing. A user friendly operation is achieved via the clearly arranged control dialogue and touch operating keys.

The operating system VxWorks provides an extremely high operational reliability. A IEC61131 PLC (CoDeSys) operates in the control which achieves the performance of a middle hardware PLC. The well-known advantages of CoDeSys such as fast setting, practical and user friendly handling and high performance can be benefited from. All data are stored on a Compact Flash Card (CF).

Field bus communication is made via STANGE remote CAN peripherals, optionally Profibus. The connection to a process control system is made via a TCP/IP interface (100Mbit). The integrated web server makes operation through remote control possible via the Internet browser.

The requirements of modern furnace engineering have influenced the development of software applications considerably. Up to 50 control zones are processed by the control. The alarm processing stores up to 500 messages and displays these in the alarm history. The integrated recipe manager enables a maximum of 250 recipes (programs) to be created. The programmer processes up to 50 set values and 64 control tracks.

8 login levels increase the working reliability. The access privileges are defined for configuration and operation. Process visualization and a 32 channel recorder (option) are integrated as well. The provided OPC server allows access to the internal data of the control.

Application fields:
- Furnace with C-diffusion calculation
- Nitriding furnaces with nitriding potential control
- Vacuum annealing furnaces
- Autoclaves
    … and much more

Functions

- Real-time operating system VxWorks for extremely high operating safety
- Freely programmable multitasking PLC according to IEC 61131 (CoDeSys)
- Program controller for up to 50 set values and 64 control tracks
- 8 program loop with 9999 repetitions maximum
- Recipe management for up to 250 recipes (programs)
- Up to 50 control zones
- Up to 500 alarms with alarm history
- Auto optimization function for optimal control parameters
- 8 login levels
- Online language switching with unicode language support (Russian, Chinese etc.)
- Freely configurable plant visualization
- Web server: Plant remote operation via Java compatible web browser, identification with user password
- Access to internal controller via the CoDeSys-POC server supplied
- Multi-programmer for up to 10 units
- Operating set value curve with representation of 3 set values and 4 actual values (configurable) with time bars and zoom function for the run off curve section
- Compact Flash 256 MB for configuration and program data
- Interfaces: COM (RS232/RS422), Ethernet (100MBit), CAN, PS/2 (PC keyboard), VGA, USB
- Remote control via smartphone and tablet (Windows / Android / iOS) by VNC client

Optional

- Profibus DP-master/slave interface
- Printer interface
- USB memory stick
- C-level calculation
- C-diffusion calculation with hardness curve
- Nitriding potential control
- Batch logging with recorder function, up to 15 loggers for 250 channels
- Modbus TCP / Modbus RTU

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Technical Data	SE-607
Display	
Technology	TFT LCD 10.4"
Resolution	640 x 480 pixels (VGA)
Number of colours	256 colours
Backlight	CCF
Front	Scratch-resistant mineral glass, coated
Operation	Infrared touch
Protection class front	IP 65
Protection class back	IP 20
EMC interference resistance	EN 61000-6-2
Electromagnetic radiation	EN 61000-6-3
Processor	Pentium based 32bit processor
Random access memory	256 MB DRAM
PLC retain memory	32 KB SRAM, battery backed
CF program storage	≥ 256 MB
I/O interfaces	CAN, Modbus, Profibus DP (option)
System LEDs	PLC, CAN, Alarm, Watchdog
PS/2 connection	1x
Ethernet 10/100	1x
USB 2.0	2x
RS232	1x
RS422	1x
CAN	1x
Power supply	24 VDC (18 ... 36V)
Undervoltage	10 ms according EN 61000-6-2
Reverse voltage protection	Yes
Fuse	Solder fuse, 4 A delay time
Potential separation	Yes
Current consumption	Typ. 1125mA at 24VDC
Power consumption	Typ. 27W
Battery back-up	Lithium battery
Real-time clock (RTC)	Date/time
Accuracy	50 ppm
Time leveling	Manual or over network time server
Operating temperature	0 ... 50°C
Operating system	WindRiver VxWorks
Visualization	ECS EPAM
PLC	IEC 61131 SPS CoDeSys, multitasking capable soft PLC
Dimension (W x H x D)	370 x 260 x 139 mm
Weight	4.5 kg

Functions	1x Unit	2x Unit	10x Unit
General			
Actual values	120	60	10
Digital inputs	960	480	96
Digital outputs	960	480	96
Analogue outputs	32	16	4
Limit values	40	35	4
Tolerances	40	35	4
Alarms	500	250	50
Controller			
Number of control zones	50	25	4
PID parameter sets	8	8	8
Controller types	2P Heating, 2P Cooling, 2P-PID Heating, 2P-PID Cooling, PID Heating, PID Cooling, PID / PID, PID / 2P, PID / 2P-PID, 2P-PID / PID, 2P-PID / 2P, 2P-PID / 2P-PID, 2P / PID, 2P / 2P-PID, 2P / 2P, 3-Point Step		
Programmer			
Set values	50	30	4
Digital tracks	64	32	5
Program segments	200+1	50+1	50+1
Process steps	50	50	50
Number of loops	8	8	8
Cycles	✔	✔	✔
Loops repetitions, maximum	9999	9999	9999
Number of programs	250	99	99
Screen recorder (option)			
Number of screen recorders	15	10	10
Number of data channels	250	250	250
Number of batch texts	20	20	20
Number of batch files	200	99	99
Number of user data	500	500	500
Interfaces			
Ethernet	✔	✔	✔
CAN	✔	✔	✔
USB memory stick	✔	✔	✔
Further options			
C-level calculation	✔	✔	✔
C-diffusion calculation	✔	✔	✔
Nitriding potential	✔ 5-fold	✔ 2-fold	
Profibus master	✔	✔	✔
Profibus slave	✔	✔	✔
Printer interface	✔	✔	✔
Modbus	✔	✔	✔

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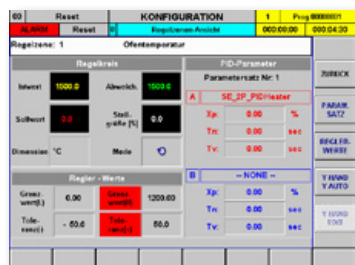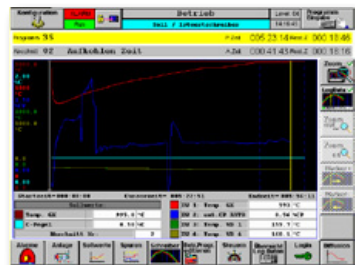

Configuration
- Configured with IEC 61131 program CoDeSys (free of charge)
- Online language switching via menu
- Date/time setting
- Configuration of IP address / I/Os
- Display of system settings
- Configuration of data logger / program graph / recorder
- AV correction table (measuring value comparison)
- Settings for automatic batch importing (data storage)
- Configuration of printer interface
- Load / delete configuration files
- Configuration of PID controller with self-optimization function
- 8 operating levels
- Configuration backup via PC
- Completed function modules (controller, programmer, logger etc.) in CoDeSys
- Freely configurable operating interface with ECS-EPAM (based on Excel)
- Changes at operation during operation

Programs (Recipes)
- Configurable process steps
- 250 programs with up to 200 segments
- Plain text description for programs (up to 30 characters)
- Graphical representation of set value curves and control tracks
- Configurable program loops (8 loops per program)
- Sort, change, copy and delete programs
- Load programs into the operating mode
- Save operating program

Operation
- Plant overview with plant pictures (configurable)
- Operating set value curve with graphic representation of up to 2 set values (future) and 3 actual values (configurable)
- Plain text alarm display with history memory
- Jump in program with graphic set value curves display
- Complete control zones display
- Programming of an automatic program start
- Numerical and graphical display of set values and tracks
- Manual operation for set values and tracks even during program run
- Auto-optimization of control parameters ("self-tuning")
- Manual operation for the manipulated variable Y ("Y-Man.")
- Representation of actual values, limit values, tolerance- and formula values
- Power failure definition
- Login code input page
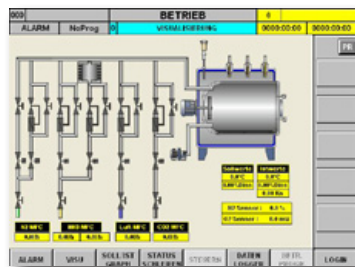
Batch logging with recorder function

- Batch logging with recorder function for up to 250 channels (digital or analogue) per logger.
  Up to 15 loggers can be started parallel.
- A batch head with up to 20 configurable data fields is stored for each batch
- Alarms occurred in this period are stored for each batch
- Batch storage takes place on a Compact Flash card
  (industrial grade) with 2 GB memory capacity
- Batches can be analyzed with batch management on the device
- Analysis includes zoom functions and scale
- Evaluation software ECS-AW is an option for importing stored batch data via Ethernet
  for comprehensive data analysis on the PC

Nitriding Potential Control

Software module for displaying and controlling the nitriding potential
(classical nitriding, nitrocarburizing, oxynitriding, X nitriding, pre-oxidation, post-oxidation,
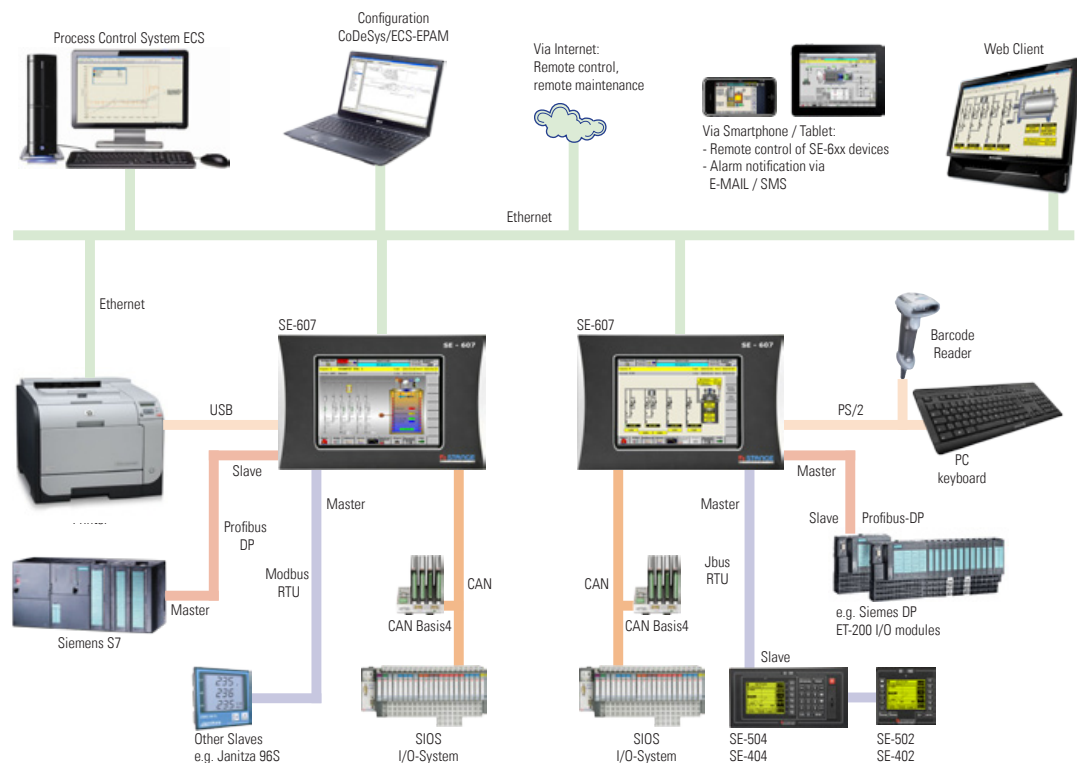low temperature oxynitriding)

Online-C-Diffusion with Hardness Progression

Mathematical module for calculating the carburizing and hardness progression in the component
with knowledge of component and process specific characteristics

Online Printer

Batch protocols, diagrams (pins and colours configurable) and event lists can be printed based on
batch recording of the internal data logger

Process Control System ECS

Configuration
CoDeSys/ECS-EPAM

Via Internet:
Remote control,
remote maintenance

Via Smartphone / Tablet:
- Remote control of SE-6xx devices
- Alarm notification via
  E-MAIL / SMS

Web Client

Ethernet

Ethernet

SE-607

SE-607

Barcode
Reader

USB

PS/2

PC
keyboard

Slave

Master

Master

Slave

Profibus-DP

Profibus
DP

Master

Master

Modbus
RTU

Jbus
RTU

CAN

CAN

Master

CAN Basis4

CAN Basis4

e.g. Siemes DP
ET-200 I/O modules

Siemens S7

Slave

Other Slaves
e.g. Janitza 96S

SIOS
I/O-System

SIOS
I/O-System
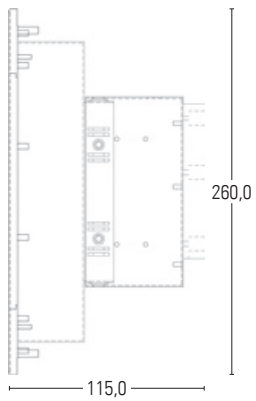
SE-504
SE-404

SE-502
SE-402

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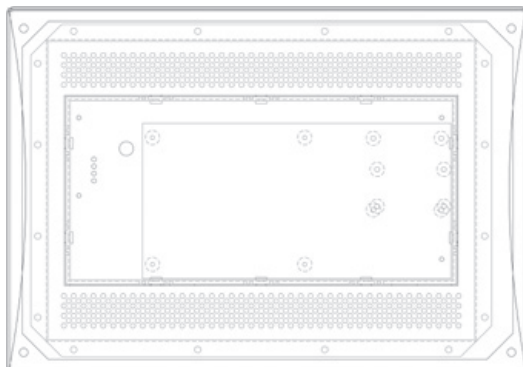
Dimension Diagram (mm)

Front view

SE - 607

260,0

370,0

Side view

260,0

115,0
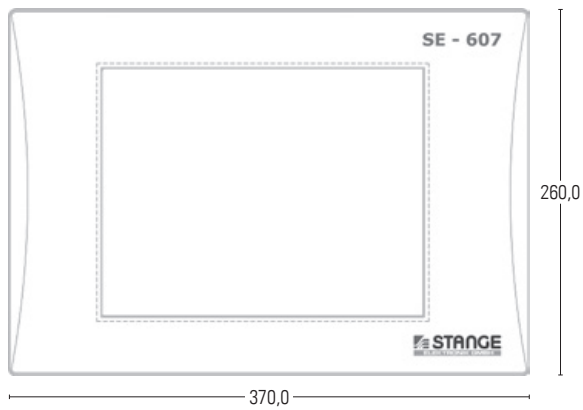
Rear view

Hardware Concept SE-607