Universal continuous/switching version, i.e. reduced stocks
100 ms cycle time, i.e. also suitable for fast control loops
Two freely configurable analog output, e.g. as process value output
Customer-specific Linearization for all sensors
Settings can be blocked via password and internal switch for high security
Extended temperature range up to 60 °C allows mounting close to the process
Easy 2-point or offset measurement correction
Monitoring of heating current and output circuit
Emergency operation after sensor break by means of the “output hold” function
Logical combination of digital outputs, e.g. for general alarm
Program controller version available KS 90-1 programmer
RS 422/485 Modbus RTU interface
Built-in transmitter power supply
Splash-water proof front (IP 65)

**APPLICATIONS**
- Furnaces and ovens
- Burners and boilers
- Plastics processing
- Driers
- Heat treatment plants
- Thermal oil systems

**Plug-in module**
KS 90-1 controllers are built as plug-in modules. This enables them to be replaced very quickly without tools, and without disturbing the wiring.

**Self-tuning during start-up and to the setpoint**
This new function determines the optimum settings for fast line-out without overshoot. With three-point controller configuration, the „cooling“ parameters are determined separately, thus ensuring an optimum match to the process. By pushing a button the KS 90-1 determines the best control parameters at the actual setpoint. This function does not require oscillation, and performs a minimal deviation of the process value.

**Display and operation**
The „day & night“ display of the KS 90-1 is characterized by particularly high contrast in both dark and bright surroundings. The status fields show operating conditions, control mode, and error messages reliably. The display is in plain text and can show various process values numerically or as a bargraph.

**Front interface and Engineering Tools**
Control parameter adjustment in seconds has now also been implemented in the KS 90 class of instruments. Via the BlueControl software incl. its simulation functions, and especially the convenient BluePort® front panel interface, the required set-up for a specific control task can be determined without a detailed study of the operating instructions. Off cause
almost all adjustments can be done comfortably over the instrument front. (see page 7, BlueControl)

**Password protection**
If required, access to the various operating levels can be protected with a password. Similarly, access to a complete level can be blocked.

**TECHNICAL DATA**

**INPUTS**

**SURVEY OF THE INPUTS**

<table>
<thead>
<tr>
<th>Input</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>INP1</td>
<td>x1 (process value)</td>
</tr>
<tr>
<td>INP2</td>
<td>Heating current, ext. set-point or ext. correction, position feedback (Y_p), 2nd process value (x_2), ext. correcting variable (Y_E), input for additional limit signalling and indication</td>
</tr>
<tr>
<td>INP3 (option)</td>
<td>as for INP2</td>
</tr>
<tr>
<td>di1</td>
<td>Operation disabled, controller off, disabled auto/manual function, reset of stored alarms, switch-over to ... second set-point SP.2, external set-point SP.E, fixed correcting variable Y2, ext. correcting variable Y.E, manual operation, parameter set 1 ↔ 2, process value INP1 ↔ X2</td>
</tr>
<tr>
<td>di2</td>
<td></td>
</tr>
<tr>
<td>di3 (option)</td>
<td></td>
</tr>
</tbody>
</table>

**PROCESS VALUE INPUT INP1**

| Resolution | > 14 bit |
| Decimal point | 0 to 3 decimals |
| Digital input filter | adjustable 0,000...9999 s |
| Scanning cycle | 100 ms |
| Measured value correction | 2-point or offset correction |
| Special (-linearization) | 16 segments |
| Standard table | temperature sensor KTY 11-6 |

**Thermocouples (Table 1)**

<table>
<thead>
<tr>
<th>Thermocouple</th>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt100</td>
<td>-200...850°C</td>
<td>-328...1562°F</td>
<td>≤ 2 K</td>
</tr>
<tr>
<td>Pt1000</td>
<td>-200...200°C</td>
<td>-328...392°F</td>
<td>≤ 2 K</td>
</tr>
<tr>
<td>KTY 11-6</td>
<td>-50...150°C</td>
<td>-58...302°F</td>
<td>≤ 2 K</td>
</tr>
<tr>
<td>special</td>
<td>0...450 Ω</td>
<td>0,2 mA</td>
<td>≤ 0,2 %</td>
</tr>
</tbody>
</table>

**Table 2 Resistance transducers**

<table>
<thead>
<tr>
<th>Type</th>
<th>Sensor current</th>
<th>Range</th>
<th>Accuracy</th>
<th>Resolution (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt100</td>
<td>0...160 Ω</td>
<td>0...450 Ω</td>
<td>≤ 0,1 %</td>
<td>0,01 %</td>
</tr>
<tr>
<td>Pt1000</td>
<td>0...1600 Ω</td>
<td>0...4500 Ω</td>
<td>≤ 0,1 %</td>
<td>0,01 %</td>
</tr>
<tr>
<td>KTY 11-6</td>
<td>0...300 Ω</td>
<td>0...450 Ω</td>
<td>≤ 0,1 %</td>
<td>0,01 %</td>
</tr>
<tr>
<td>special</td>
<td>0...450 Ω</td>
<td>0,2 mA</td>
<td>≤ 0,2 %</td>
<td>0,01 %</td>
</tr>
</tbody>
</table>

**Table 3 Current and voltage**

<table>
<thead>
<tr>
<th>Range</th>
<th>Input resistance</th>
<th>Accuracy</th>
<th>Resolution (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10 Volt</td>
<td>≈ 110 Ω</td>
<td>≤ 0,1 %</td>
<td>0,6 mV</td>
</tr>
<tr>
<td>0-100 mV</td>
<td>≥ 1MΩ</td>
<td>≤ 0,1 %</td>
<td>6 µV</td>
</tr>
<tr>
<td>0-20 mA</td>
<td>20 Ω</td>
<td>≤ 0,1 %</td>
<td>1,5 µA</td>
</tr>
</tbody>
</table>

**Resistance thermometer**

| Connection | 3-wire |
| Lead resistance | max. 30 Ω |
| Input circuit monitor | Break and short circuit |

**Current and voltage signals**

Span start, end of span: anywhere within measuring range

Scaling: selectable -1999...9999

Linearization: 16 segments, adaptable with BlueControl

Decimal point: adjustable

Input circuit monitor: 12,5% below span start (4 mA, 1 V)

The measuring range 0...100mV can be used together with the special linearization function for connection of thermocouples with external temperature compensation!

**SUPPLEMENTARY INPUT INP2**

| Resolution | > 14 bit |
| Scanning cycle | 100 ms |

**Heating current measurement**

via current transformer

Measuring range: 0...50 mA AC

Scaling: adjustable -1999...9999

Input circuit monitor: 12,5% below span start (4...20mA → 2mA)

**Potentiometer**

Ranges see Table 2

| Connection | 2-wire |
| Lead resistance | max. 30 Ohm |
| Input circuit monitor | Break |
**SUPPLEMENTARY INPUT INP3 (OPTION)**

Resolution: > 14 bit  
Scanning cycle: 100 ms  
Technical data as for INP1 except the 10V range.

**CONTROL INPUTS DI1, DI2**

Configurable as direct or inverse switch or push-button!  
Connection of a potential-free contact suitable for switching „dry“ circuits.  
Switched voltage: 5 V  
Switched current: 100 µA

**CONTROL INPUTS DI2, DI3 (OPTION)**

The digital input di2 located on the A-card and di2 located on the option card are or-linked.  
Configurable as switch or push-button!  
Optocoupler input for active triggering  
Nominal voltage: 24 V DC, external  
Current sink (IEC 1131 Type 1)  
Logic „0“: -3...5 V  
Logic „1“: 15...30 V  
Current requirement: approx. 5 mA

**TRANSMITTER SUPPLY UT (OPTION)**

Output: 22 mA / ≥ 18 V  
If the universal outputs OUT3, 4 are used there may be no external galvanic connection between measuring and output circuits!

**OUTPUTS**

**SURVEY OF THE OUTPUTS**

<table>
<thead>
<tr>
<th>Output</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUT1,2 (relays)</td>
<td>Control output heating/cooling or Open/Close, limit contacts, alarms *</td>
</tr>
<tr>
<td>OUT1,2 (logic)</td>
<td>as OUT1 and OUT2</td>
</tr>
<tr>
<td>OUT1,2 (continuous)</td>
<td>Control output, process value, measured values INP1/2/3, set-point, control deviation, position feedback Yp, transmitter supply 13 V / 22 mA</td>
</tr>
<tr>
<td>OUT5, OUT6 (Optocoupler)</td>
<td>as OUT1 and OUT2</td>
</tr>
</tbody>
</table>

* All logic signals can be OR-linked!

**Galvanic isolations:**

- Safety isolation  
- Functional isolation

**Dimensions (mm):**

- Mains supply  
- Process value input INP1  
- Supplementary input INP2  
- Optional input INP3  
- Digital inputs di1, di2  
- Relay OUT1  
- Relay OUT2  
- Relay OUT3  
- Relay OUT4  
- Universal output OUT3  
- Universal output OUT4  
- Transmitter supply UT  
- OUT5, OUT6
**RELAY OUTPUTS OUT1..OUT4**

Contacts: Potential-free changeover contact
Max. contact rating: 500 VA, 250 VAC, 2A at 48...62 Hz, resistive load
Min. contact rating: 6 V, 1 mA AC/DC
Operating life (electrical): 800,000 duty cycles with max. rating

Note:
If the relays operate external contactors, these must be fitted with RC snubber circuits to manufacturer specifications to prevent excessive switch-off voltage peaks.

**OUT3, OUT4 AS UNIVERSAL OUTPUT**

Galvanically isolated from the inputs.
Freely scalable
DA-converter limiting frequency T_{SP}: 50 ms
Limiting frequency of the complete continuous controller: > 2 Hz
Resolution: 11 bit

**Current output**
0/4...20 mA, configurable.
Signal range: 0...approx. 22 mA
Load: ≤ 500 Ω
Load effect: none
Resolution: ≤ 22 μA (0,1%)
Error: ≤ 40 μA (0,2%)

**Voltage output**
0/2...10V, configurable
Signal range: 0...11 V
Load: ≥ 2 kΩ
Load effect: none
Resolution: ≤ 11 mV (0,1%)
Error: ≤ 20 mV (0,2%)

**OUT3, OUT4 used as transmitter supply**
Output: 22 mA / ≥ 13 V

**OUT3 used as logic output**
Load ≤ 500 Ω: 0/≤ 20 mA
Load > 500 Ω: 0/> 13 V

**OUTPUTS OUT5, OUT6 (OPTIONAL)**

Galvanically isolated opto-coupler outputs.
Grounded load: common positive control voltage.
Output rating: 18...32 VDC; =70 mA
Internal voltage drop: = 1 V with I_{max}
Protective circuit: built-in against short circuit, overload, reversed polarity (free-wheel diode for relay loads).

**FUNCTIONS**

**Control behaviour**
- Signaler with asymmetric adjustable switching differential (ON/OFF controller)
- PID controller (2-point and continuous)
- Delta / Star / Off or 2-point controller with switch-over from partial to full load
- 2 x PID (heating/cooling)
- 3-point stepping controller with or without position feedback
- Continuous controller with internal positioner (stepping controller)

Two parameter sets for manual gain scheduling
Self-tuning control parameters or adjustable manually via front keys or BlueControl software.

**Behaviour with 2- and 3-point controllers**
- **Standard behaviour:**
  For precise matching of the required output value at the output signal limits, the controller changes the cycle times for heating and cooling automatically and continuously.
- **With constant cycle times:**
  The length of the shortest heating and cooling pulse is adjustable.
- **Water cooling linear**
  (heating=standard):
  To ensure a sufficient cooling effect, the cooling function starts only after reaching an adjustable temperature value. The pulse length is adjustable, too and remains constant for all output values.
- **Water cooling nonlinear**
  (heating=standard):
  The general function is described above but the controller additionally takes in consideration that the water cooling is usually much stronger than the heating (thus preventing unfavorable behavior when changing from heating to cooling).

**Set-point functions**
- Adjustable set-point gradient (rate) 0,01...9999 °C/min
- Set-point control
- Set-point/cascade control
- Set-point/cascade control with external correction

**Process value calculation**
- Standart (x_{eff} = INP1)
- Ratio (INP1/X2)
- Difference (INP1-X2)
- Max (INP1, X2)
- Min (INP1, X2)
- Mean value (INP1, X2)
- Switch-over between INP1 and X2

**Behaviour with sensor break or short circuit:**
- Control outputs switched off
- Switch-over to a safe output value
- Switch-over to a mean output value

**SPECIAL FUNCTIONS**

**DAC ensures operational safety**
Digital Actuator Control monitors the most important functions of the actuator and is able to detect problems long before they cause large control deviations. Typical disturbances are a blocked actuator, a defective motor or capacitor and all related problems with an actuator.
The DAC® function is available for three-point stepping controllers with potentiometer position feedback measured via INP3.

**Modbus Master**
The KS 90-1 can be configured as Modbus Master. This enables it to transmit user-specified signals or parameters cyclically to all connected Slave controllers. For example, the following applications are possible:
- Set-point shifting relative to the set-point adjusted in the Slave (see picture)
- matching of control parameters, limit contacts, etc.
- Limiting the output value (override control OVC)
- ...

**LIMIT SIGNALLING FUNCTIONS**

Max., Min. or Max./Min. monitoring with adjustable hysteresis.

**Signals which can be monitored:**
- Process value
- Control deviation
- Control deviation with suppression during start-up or set-point changes
- Effective set-point
- Output signal Y
- Input values of INP1, INP2, INP3
- Difference INP1 - X2. This function allows to detect aged thermocouples.

**Functions**
- Input signal monitoring
- Input signal monitoring with latch (reset via front key or digital input)
- Rate of change monitoring (/min)
- Adjustable discriminator time of 0...9999 seconds

Several limit signals or alarms can be OR-linked before being output.
Applications: Release of a brake with motor actuators, general alarms, etc.
**ALARMS**

**Heating current alarm**
- Overload and short circuit
- Open circuit and short circuit

Limit value adjustable 0...9999 A

**Control loop alarm**
Automatic detection if there is no response of the process to a change of output value.

**Sensor break or short circuit**
Depending on selected input type, the input signal is monitored for break and short circuit.

**MAINTENANCE MANAGER**
Display of error signals, warnings, and latched limit messages in the error list.

Signals are latched, and can be reset manually.

Possible signals in the error list:
- Sensor break, short circuit, reversed polarity
- Heating current alarm
- Control loop alarm
- Fault during self-tuning
- Latched limit messages
- Re-calibration warning
- Maintenance interval of actuator
- Internal fault (RAM, EEPROM, ...)

Flashing Error symbol indicates active alarm in the error list:

---

**Modbus Master function supports setpoint changes e.g. in extruder applications**

<table>
<thead>
<tr>
<th>Master</th>
<th>Slaves</th>
</tr>
</thead>
<tbody>
<tr>
<td>KS 90-1</td>
<td>KS 90-1, KS 50-1, KS 40-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature</th>
<th>180°C</th>
<th>185°C</th>
<th>190°C</th>
<th>195°C</th>
<th>200°C</th>
<th>205°C</th>
<th>210°C</th>
<th>215°C</th>
<th>220°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>+5°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Display and operation:**

- 4 LEDs for the output states
- Temperature unit °C / °F
- Parameter or configuration function key activated
- Self-tuning is active
- Error list
- Automatic/manual-key
- Configurable function key
- BluePort front interface

**Example of the linkage of the internal functions:**

1. Setpoint processing
2. Controller function with loop monitoring
3. Limit monitoring, configurable with latch and suppression
4. Heating current monitoring
5. Output processing with logic or-combination and inverting
6. Analog inputs with logical sensor fail signal
7. Digital inputs, function key and enter key with lock function
8. Process value processing
**OPERATION AND DISPLAY**

**Display**
- Multi-function Day & Night display with red backlighting (adjustable)
  - Process value: 4 x 7 segment 10.5 mm
  - Lower display: 4 x 7 segment 7.8 mm
  - Text display: 8-character dot matrix used as numeric or bargraph display

**Operating functions**
The functions of the [ ]-key and the [ ]-key are configurable:

<table>
<thead>
<tr>
<th>Function</th>
<th>[ ]-key</th>
<th>[ ]-key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote (no front operation)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SP 2 (2nd setpoint)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Y 2 (2nd output value)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SP E (external setpoint)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Manual operation</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>C.OFF (controller function off)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Lock of manual key</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Reset of latched limits and error list</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Parameter set 1 ↔ 2</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Several functions can be combined e.g. SP 2 and parameter set switch-over (gain scheduling) with only one key.

**POWER SUPPLY**
Depending on version:

**AC SUPPLY**
- Voltage: 90...260 VAC
- Frequency: 48...62 Hz
- Power consumption: approx. 8 VA

**UNIVERSAL SUPPLY 24 V UC**
- AC voltage: 20.4...26.4 VAC
- Frequency: 48...62 Hz
- DC voltage: 18...31 V DC
- Power consumption: approx. 8 VA (W)

**BEHAVIOUR WITH POWER FAILURE**
Configuration, parameters, and adjusted set-points, control mode:
Non-volatile storage in EEPROM

**BluePort® FRONT INTERFACE**
Connection of PC via PC adapter (see „Accessories“). The BlueControl software is used to configure, set parameters, and operate the KS 90-1.

**BUS INTERFACE (OPTION)**

**RS 422/485 INTERFACE**
- Galvanically isolated
- Physical: RS 422/485
- Protocol: Modbus RTU
- Transmission speed: 2400, 4800, 9600, 19.200 bits/s
- Address range: 00..99
- Number of controllers per bus: 32
- Repeaters must be used to connect more controllers.

**PROFIBUS DP**
- see data sheet 9499-737-44813

**ENVIRONMENTAL CONDITIONS**

**Protection modes**
- Front panel: IP 65
- Housing: IP 20
- Terminals: IP 00

**Permissible temperatures**
- For specified accuracy: 0...60°C
- Warm-up time: < 15 minutes
- Temperature effect: < 100ppm/K
- For operation: -20...65°C
- For storage: -40...70°C

**Humidity**
75% yearly average, no condensation

**Shock and vibration**
- Vibration test Fc (DIN 68-2-6)
  - Frequency: 10...150 Hz
  - Unit in operation: 1g or 0.075 mm
  - Unit not in operation: 2g or 0.15 mm
- Shock test Ea (DIN IEC 68-2-27)
  - Shock: 15g
  - Duration: 11ms

**Electromagnetic compatibility**
Complies with EN 61 326-1
- Complies with the immunity requirements for continuous, unattended operation
- Complies with the emission requirements class B for rural areas
- Surge disturbances may increase the measurement error and lead to error messages

**GENERAL**

**Housing**
- Material: Makrolon 9415, flame-retardant
- Flammability class: UL 94 VO, self-extinguishing
- Plug-in module, inserted from the front

**Safety tests**
- Complies with EN 61010-1 (VDE 0411-1):
  - Over voltage category II
  - Contamination class 2
  - Working voltage range 300 VAC
  - Protection class II

**Certifications**
Type test to DIN 3440
Can therefore be used in:
- Heat generating plants with outflow temperatures up to 120°C to DIN 4751
- Hot-water plants with outflow temperatures above 110°C to DIN 4752
- Thermal transfer plants with organic transfer media to DIN 4754
- Oil-heated plants to DIN 4755

**UL certification (applied for)**

**Electrical connections**
Depending on version:
- Flat-pin connectors 1 x 6.3 mm or 2 x 2.8 mm to DIN 46 244
- Screw terminals for conductor cross-section from 0.5 to 2.5 mm²

**Mounting**
Panel mounting with two fixing clamps at top/bottom or left/right
Close mounting possible
- Mounting position: not critical
- Weight: 0.27 kg (9.52 oz)

**Accessories supplied with unit**
Operating instructions
2 fixing clamps
**ACCESSORY EQUIPMENT**

**BlueControl (Engineering Tool)**

PC-based program for configuring, setting parameters, and operating (commissioning) the KS 90-1 controller. Moreover, all the settings are saved, and can be printed on demand.

Depending on version, a powerful data acquisition module is available, complete with trend graphics.

**Visibility mask**

The BlueControl software can be used to blind out parameters in the instrument. Thus, only allowed parameters can be changed on side. Safety relevant parameters are invisible!

Two parameters are blinded out:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Visible</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP &lt;sub&gt;L&lt;/sub&gt;</td>
<td>lower setpoint range</td>
<td>✔️</td>
</tr>
<tr>
<td>SP &lt;sub&gt;H&lt;/sub&gt;</td>
<td>upper setpoint range</td>
<td>✔️</td>
</tr>
<tr>
<td>rSP</td>
<td>setpoint ramp [/min]</td>
<td>✔️</td>
</tr>
<tr>
<td>LSP</td>
<td>linear dwell time [min]</td>
<td>✔️</td>
</tr>
</tbody>
</table>

**Simulation**

The built-in simulation serves to test the controller settings, but can also be used for general training and observing the interaction between controller and control loop.

**Software requirements**


**Configurations that can only be implemented via the BlueControl software (not via the front-panel keys):**

- Customer-specific linearizations
- Enable „forcing“ for inputs/outputs
- Adjustment of limits for operating hours and switching cycles
- Switch-over to 60 Hz mains frequency
- Master/slave configuration
- Disable operator actions and operating levels, plus password definition
- Prevent automatic optimization of cycle times T1, T2

**Hardware requirements:**

A PC adapter (see „Accessories“) is required for connecting the controller.

Updates and demo software can be downloaded from: www.pma-online.de

---

**BlueControl, versions and functionality:**

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Mini</th>
<th>Basic</th>
<th>Expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>parameter and configuration setting</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>controller and control loop simulation</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>download: writes an engineering to the controller</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>online mode / visualisation</td>
<td>SIM only</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>creation of user defined linearizations</td>
<td>SIM only</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>configuration of extended operating level</td>
<td>SIM only</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>upload: reads an engineering from the controller</td>
<td>SIM only</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>basic diagnosis function</td>
<td>SIM only</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>file, save engineering data</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>printer function</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>online documentation, help system</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>measurement correction (calibration procedure)</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>program editor</td>
<td>SIM only</td>
<td>SIM only</td>
<td>yes</td>
</tr>
<tr>
<td>data acquisition and trend function</td>
<td>SIM only</td>
<td>SIM only</td>
<td>yes</td>
</tr>
<tr>
<td>network and multiuser licence</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>personal assistant function</td>
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<td>extended simulation</td>
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<td>extended diagnostic and service functions</td>
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### ORDERING INFORMATION

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<td>Current converter 50A AC</td>
<td>9404-407-50001</td>
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<tr>
<td>PC adapter, for connecting the BlueControl software to the BluePort®</td>
<td>9407-998-00001</td>
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<td>Standard rail adapter</td>
<td>9407-998-00061</td>
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<tr>
<td>Operating manual German</td>
<td>9499-040-62918</td>
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<td>Operating manual English</td>
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<td>Operating manual French</td>
<td>9499-040-62932</td>
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<td>BlueControl Mini German/English/French</td>
<td><a href="http://www.pma-online.de">www.pma-online.de</a></td>
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<td>BlueControl Basic German/English/French</td>
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### ACCESSORIES

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