GENERAL

The SERVAL Controller is an individual room controller which can be used to cover a wide range of control applications. It can operate as a stand-alone unit or as a part of a CentraLine control system.

Interfaces are provided for a wide range of actuator types. Heating systems can be water or electric, and cooling systems can be chilled water supply or compressors. Extensive timing and interlock features make them especially suitable for systems using electrical heat and compressors.

Table 1. Overview of equipment (by model)

<table>
<thead>
<tr>
<th>model</th>
<th>description</th>
<th>CLSE 1L230</th>
<th>CLSE 1L24</th>
</tr>
</thead>
<tbody>
<tr>
<td>power supply</td>
<td>230</td>
<td>X</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>--</td>
<td>X</td>
</tr>
<tr>
<td>digital outputs</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; relay</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; relay</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; relay</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>4&lt;sup&gt;th&lt;/sup&gt; relay</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>triac (open OUT1)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>triac (close OUT1)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>triac (open OUT2)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>triac (close OUT2)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>LED</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>digital inputs</td>
<td>configurable digital input</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>digital input (window contact)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>analog inputs</td>
<td>(fan speed + occ. override)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>room sensor</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>set-point. adjustment</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

FEATURES

- Direct connection of thermal or floating actuators
- Direct connection for up to three fan stages
- Direct connection to electrical heat
- Factory-configured default parameters
- Wide range of supported valves and actuators
- Interlocks and time delays to protect equipment
- Uses Echelon LonTalk® protocol
- Wall modules for manual override
- Slim design fits into narrow fan coil units and false ceilings
- Power supplied by power mains or 24 V
- eu.bac certified

DESCRIPTION

The SERVAL Controller provides room temperature control for two- and four-pipe control circuits with optional electrical heating coils and can control single-, two-, or three-speed fans. It is provided with default configuration settings from the factory and is fully operable upon installation. Using the COACH 1.2 configuration tool, the controller can be configured with job-specific settings. A variety of COMMAND wall modules interface with the controller and provide any or all of the following: setpoint adjustment, fan speed adjustment, and an occupancy bypass button.

SEQUENCES

Heat and cool sequences can be selected to be active or not active, giving a total of ten different room applications:
- Radiator with heating valve
- Floor heating with heating valve
- Floor heating/cooling with changeover valve
- Chilled ceiling with cooling valve
- Chilled ceiling with heating/cooling changeover valve
- Radiator with heating valve, chilled ceiling with cooling valve
- Fancoil unit with heating + cooling valve
- Fancoil unit with heating + cooling + electric reheat
- Fancoil unit with heating/cooling changeover valve
- Fancoil unit with heating/cooling changeover valve + electric reheat relay

Modes of Operation

The controller has the following modes of operation.
"Occupied" Mode
This is the normal operating condition for a room or zone when it is occupied. The controller can be switched into this mode by the system time program, by the room occupancy sensor, or using a bypass button on the COMMAND wall module. In the "occupied" mode, the fan is controlled by the setting of the fan speed switch ON the COMMAND wall module or, when the switch is set to "auto," by the control algorithm. The fan is switched OFF within the zero energy band.

"Standby" Mode
The "standby" mode saves energy by reducing heating or cooling demand during periods where the room is temporarily unoccupied. The fan is switched OFF within the zero energy band.

"Unoccupied" Mode
This mode is used for longer unoccupied periods, such as at night or during weekends and holidays.

Window Open
If the SERVAL Controller is configured for window open detection, the controller automatically disables heat and cool control until the window is closed again. Frost protection remains active.

Frost Protection
If the temperature drops below 8°C, the SERVAL Controller enables the heating circuit as frost protection.

Smoke Control
The fan can be turned ON or OFF with a window open contact for smoke control.

Fan Failure
When configured with electric reheat, an air flow detector is expected on digital input1. The SERVAL Controller protects equipment by disabling the system when the fan fails.

Changeover
The SERVAL Controller can operate two-pipe room control systems. The changeover input for this function is physically connected to the PANTHER with AH03 application for precontrol.

SPECIFICATIONS
Both models of the SERVAL Controller are equipped as shown in Table 2.

Input/Output, Power Consumption
Table 2. Input/output specifications

<table>
<thead>
<tr>
<th>function/characteristics</th>
<th>1st DI</th>
<th>1st AI</th>
<th>2nd AI</th>
<th>1st DO</th>
<th>3rd AI</th>
<th>2nd DI</th>
<th>4th relay</th>
<th>1st, 2nd and 3rd relays</th>
<th>triac outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>configurable to read input from hardwired window contact, occupancy sensor, etc.; suitable for dry contacts, only; max. voltage at open contact = 5 Vdc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>permanently configured to write output to hardwired COMMAND wall module</td>
</tr>
<tr>
<td>permanently configured to read input from hardwired COMMAND wall module's temperature setpoint adjustment knob</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>permanently configured to read input from window contact; enabled / disabled using right DIP switch; suitable for dry contacts, only; max. voltage at open contact = 5 Vdc</td>
</tr>
<tr>
<td>permanently configured to read input from hardwired COMMAND wall module's room temperature sensor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>permanently configured to read input from window contact enable/ disable using right DIP switch; suitable for dry contacts, only; max. voltage at open contact = 5 Vdc</td>
</tr>
<tr>
<td>permanently configured to write output to LED of hardwired COMMAND wall module</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>permanently configured to write output to hardwired electrical reheat coil; switching voltage = 24...230 Vac; switching current = 0.05...10 A</td>
</tr>
<tr>
<td>permanently configured to read input from hardwired COMMAND wall module's 3-speed fan control knob and &quot;occupancy override&quot; button</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>permanently configured to write output to hardwired 3-speed fan; switching voltage = 24...230 Vac; switching current = 0.05...3 A (max. 3 A for all three relays together)</td>
</tr>
<tr>
<td>permanently configured to write output to hardwired electrical reheat coil; switching voltage = 24...230 Vac; switching current = 0.05...10 A</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>permanently configured to write output to OUT1/2; switching voltage = 230 Vac (CLSE1L230) or 24 Vac (CLSE1L24), max. switching current = 0.5 A; max. peak (10 sec) current = 1 A</td>
</tr>
<tr>
<td>Maximum allowable continuous current for all of the triac outputs together: 1 A.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Maximum allowable continuous current for all of the triac outputs together: 1 A.</td>
</tr>
<tr>
<td>• cos ϕ &gt; 0.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• cos ϕ &gt; 0.8</td>
</tr>
</tbody>
</table>

Power Supply
CLSE1L230: 230 Vac +10%, -15%, 50/60 Hz
- Power consumption: < 6 VA (device unloaded)

CLSE1L24: 24 Vac ±20%, 50/60 Hz
- Power consumption: < 3 VA (device unloaded)

Hardware Design
Processor: Neuron 3150® running at 5 MHz, with 2 kB of RAM and 0.5 kB of EEPROM on chip.
Ext. memory: EPROM, 64 kB by 8.

Specified Sensing Temperature Range
0° to 40°C
Environmental Ratings
Operating temperature: 0...50°C
Shipping/storage temperature: -40...+70°C
Relative humidity: 5% to 95% non-condensing

Dimensions
110 x 180 x 60 mm

Weight
CLSE1L230: 420 g
CLSE1L24: 260 g

Communications
The SERVAL Controller uses the LonTalk protocol. It supports the LonMARK Functional Profile # 8020 “Fan Coil Unit Controller”, version 2.0.

Approvals and Standards
- CE
- EN50081-1
- EN50082-1
- eu.bac

Accessories
- COMMAND Wall Modules
- Dew-Point Sensor H7018A1003
- LonWorks termination module 209541B
- LonWorks termination module XAL-Term
- M7410C Small Electric Linear Valve Actuator
- M6410L Small Electric Linear Valve Actuator
- M5410C Small Electric two-position actuators
- M100 thermal actuators, 24 V and 230 V
- XAL-COV-L Terminal Covers (8 pcs. bulk)

System Components
- configuration software: COACH 1.2
- front-end software: ARENA 1.2
- graphic editor: ARENA EDITOR
- plant controller: PANTHER
For detailed information, see related literature.