The CSC compensators are designed for use in radiator systems to control either a three port mixing valve or a boiler. The CSC senses outside temperature and varies the water flow temperature to the radiators. As the outside temperature falls, the radiator temperature is increased.

The controller is designed to be simple to install and easy to use. The controller is used in simple plants typically in schools, libraries and large domestic installations. It may be installed either within a control panel or it can be wall mounted.

An optional room temperature sensor can be used to trim the water temperature based on room temperature. The optional room influence will increase the flow temperature as the room falls below its set point and decrease as the room temperature rises. The CSC can average up to 4 room sensors.

The CSC is available in versions with or without a time clock.

The large Liquid Crystal Display (LCD) is used to recall plant status, temperature values and for programming the controller. The user can recall, display and adjust parameters quickly and easily, prompted by the controller display. The facia has clearly labelled push-buttons for use when setting the controller. There is an overlay card which must be placed over the controller display for use in the Fine Tune Mode. A rotary selector switch is provided to enable overrides to be quickly and easily applied.

The CSC is shipped with standard (default) values for parameters. These default settings are used so that in most cases only a minimal number of parameters need to be amended to get the best out of the controller. It is important, however, that you tune the CSC to your control system to get the best out of it.

FEATURES

- Easy to install and commission.
- Shipped with typical default values for the parameters, decreasing commissioning time.
- Quick Set Mode allows basic settings to be easily checked and set.
- Simple override switch.
- Operates a three port valve or boiler.
- Mains or 24Vac output from either model.
- 24Vac pump output on clock version.
- Programmable frost logic on clock version.
- 3 stages of frost protection on clock version.
- Max. return function for District Heating Applications.
- Adjustable economy function reduces energy consumption by turning off the plant when outside temperature rises above a user defined outside temperature (clock version only).
- Large Liquid Crystal Display (LCD) for viewing plant status/temperature and controller parameters.
- Two setting modes available (Quick Set and Fine Tune) so that users are only presented with the required parameters.
- Night Set Back (NSB) and Set-Up/Boost inputs.
- Existing CSC sensors can be used.
- Flow High Limit feature
- User configurable Day/Night plant operation.
- Room Influence Mode selection.
SPECIFICATIONS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>VERSION</th>
<th>OUTPUT TYPES</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC 5252</td>
<td>Mains or 24V output with no Clock</td>
<td>Valve or Boiler, 230Vac, 10A resistive, 6A inductive.</td>
</tr>
<tr>
<td>CSC 5352</td>
<td>Mains or 24V output with Clock</td>
<td>Valve or Boiler, 230Vac, 10A resistive, 6A inductive.</td>
</tr>
</tbody>
</table>

Power Supply: 230Vac, +10%, -6% (50/60Hz)
Power Consumption: 22VA fully loaded
Fuse: 100mA on the 230Vac input

OUTPUTS

Valve Actuator or Boiler Output Relays: 2 x Single Pole ON/OFF (interlocked) 230Vac, 10A resistive, 6A inductive.
Pump Output: 1 x 24Vac Triac, 1A (0V switched). Clock version only.
Output Supply: 2 x 24Vac terminals used to power external devices up to a total of 10VA maximum. If more than 10VA is required use an external 24Vac transformer conforming to EN 61558, see diagram for wiring details.

Notes:
1. New generation sensors should be used on all new installations.
2. If Adjustable Room Sensors are used on the CSC 5352 then "Space Frost" Protection must be inhibited by setting the limit to -10°. Non-adjustable sensors should be used for reliable frost operation.
3. Adjustable and non-adjustable sensors cannot be mixed on the same CSC.
4. ‘T’ Type and old generation sensors may not be mixed on the same CSC.

SENSOR INPUTS

‘T’ type (new generation) sensors may not be mixed with old generation sensors on the same CSC.

<table>
<thead>
<tr>
<th>Sensor INPUTS</th>
<th>Sensor Type</th>
<th>Temperature Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRT 3453, 3451</td>
<td>Room (Optional)</td>
<td>-5 to +40°C</td>
</tr>
<tr>
<td>DWT 1701, 1702</td>
<td>Water</td>
<td>-10 to +120°C</td>
</tr>
<tr>
<td>DST 1601, 1603</td>
<td>Water (strap on)</td>
<td>+5 to +120°C</td>
</tr>
<tr>
<td>DOT 2301</td>
<td>Outside</td>
<td>-40 to +40°C</td>
</tr>
</tbody>
</table>

SWITCHED INPUTS


CONSTRUCTION

Ambient Temperature Limits:
  Operating: 0°C to 50°C
  Storage: -10°C to 70°C

Ambient Humidity Limits:
  Operating: 0 to 95%rh non condensing
  Storage: 0 to 95%rh non condensing

Terminals: The terminals are provided to take wire of 2.5mm² cross-section.

Conduit Entries: Six, 21mm cut-outs in the top and bottom of the controller case.

Protection Class: IP 30

Case: Matt black coloured 2 piece polycarbonate case. Fire resistant to UL94V-0.

Mounting: Wall or flush panel mounting.

Case Dimensions: 144 x 144 x 136mm
Panel Cut Out Size: 138 x 138mm

Memory

The controller stores all non-volatile data in an E²PROM such as the user set control parameters. This means that in the event of a power failure, the user set parameters will be maintained without having to rely on battery support.

A battery (3.6V Lithium AA) will power the clock whilst the controller is powered off for a period of typically 1 year of continuous use. The typical shelf life of the battery is 10 years.
INSTALLATION AND COMMISSIONING

The CSC should be installed and commissioned by a technician.

Caution

Do not switch on the power supply until the commissioning procedures have been completed.

Location of Controller

- The controller must be installed in a position which is fairly clean and free from damp and condensation.
- Temperature and humidity limits must be obeyed. Ambient Operating Temperature: 0°C to 50°C. Operating Humidity: 0 to 95%rh non condensing.
- A minimum of 150mm clearance is required around the controller to allow access for mounting, wiring, servicing and to avoid electrical interference from other devices such as contactors.

Wiring Precautions

- On new installations all sensor cables must be screened with the screens connected separately to the 0V earth point provided. An MICC earth plate is provided for use if MICC cable is used.
- When upgrading a CSC or CXC installation, it is usually possible to use the existing unscreened sensor wiring as long as the cable run is less than 100 metres and is sited more than 75mm from mains wiring runs.
- The mains supply, 24Vac output, relay and triac output wiring must be run separately from all the controller sensor and override inputs.
- The controller must be located as far away as possible (minimum 150mm) from any contactors or switches and their cables. This is to avoid any interference to the controller.
- No connections to the controller should be made whilst power is applied.

Compatible Sensors

There are a large number of Satchwell sensors that are compatible with the CSC (See Sensor Inputs).

It is not possible to mix old and ‘T’ type sensors on the CSC.

The first time the CSC is powered up it will automatically configure itself to the sensor type connected (old or ‘T’ type).

Changing Sensors

If a CSC connected to old generation sensors is subsequently equipped with a set of ‘T’ type sensors it is necessary to manually select the sensor type as 5 (new generation). Remember that you cannot mix ‘T’ type and old generation sensors on the CSC.

COMMISSIONING

WARNING - ENSURE THE MAINS POWER SUPPLY IS OFF AND THAT ANY OTHER POWER SUPPLIES TO AND FROM THE CSC ARE ISOLATED.

1. Undo the central case fixing screw and separate the case to gain access to the terminals.
2. Check that all wiring is correctly connected to the terminals. This should be done using the connection or application diagram for reference.
3. The battery supplied should now be fitted. (CSC 5352 ONLY).
4. Reassemble the controller case and securely tighten the central fixing screw.
5. Apply mains power to the controller, the display will show reset followed by the controller firmware number.
6. The controller will then go into review mode.
7. Set the real time clock (see the Quick Set mode for details on setting the clock).
8. Complete the configuration via the Quick-Set and Fine-Tune parameters.

Reasonable default values have been selected for the CSC, but it is essential that the controller is properly tuned to the controlled system. Please see Page 9.
RELOADING THE DEFAULT VALUES

This procedure only needs to be carried out if you need to reload the controller default values. The controller will also automatically configure itself to the sensors connected to it.

The following procedure will reload the CSC default values.

**THIS WILL DELETE ALL YOUR EXISTING USER SETTINGS.**

1. Switch off the power.
2. Press and hold the **ENTER** key. Switch the power ON.
3. The controller will now display 'dflts'. Release the **ENTER** key.

**DISPLAY AND SETTINGS**

A Large Liquid Crystal Display (LCD) is used for the display of controller status temperatures and the setting of parameters. Arrows around the display indicate controller status and indicate the parameter currently being displayed/set. The controller works in three modes:

- **Review Mode**
  The controller usually operates in Review Mode, this allows the operator to view various system temperatures, the controller output status and the current time. No changes may be carried out in this mode.

- **Quick Set Mode**
  Quick Set Mode allows various basic controller functions to be set.

- **Fine Tune Mode**
  Fine Tune Mode allows the more advanced controller functions to be set. When using Fine Tune Mode an overlay card is used that gives the fine tune parameter symbols.

**Facia**

The following figures show the CSC facia panels of both the time clock and non-time clock versions.

**TIME CLOCK VERSION - 5352**

**NON-TIME CLOCK VERSION - 5252**

4. The controller display will shown 'reset' again followed by the firmware number.
5. The controller will then go into review mode.

The five buttons have the following functions:

- **Calendar Button**: Selects the mode that allows setting of the Time Switch functions. (Clock Version Only)
- **Tuning Button**: Selects the mode that allows setting of the controller parameters.
- **Enter Button**: Enter button for confirming the entry of parameters.
- **Plus Button**: To increase the value or move clockwise to the next function. Holding the button down will cause it to auto repeat.
- **Minus Button**: To decrease the value or move anti-clockwise to the next function. Holding the button down will cause it to auto repeat.

**Manual Overrides**

A simple rotary switch used to select the override function:

![Rotary Override Switch](image)

---

**THIS SWITCH CAN BE SET IN ANY MODE INCLUDING REVIEW MODE.**

**IT IS IMPORTANT TO REMEMBER TO SWITCH BACK TO AUTO AFTER THE MANUAL OVERRIDE FUNCTION HAS BEEN USED.**

**WHEN THE SWITCH IS IN AN OVERRIDE CONDITION THE DISPLAY WILL FLASH AND THE OVERRIDE CONDITION WILL BE INDICATED (EXCEPT IF IT IS OVERRIDDEN OFF).**

**PUMP EXERCISE WILL ONLY TAKE PLACE WHEN THE CONTROLLER IS IN AUTO OR OVERRIDDEN TO STANDBY.**

The modes are as follows:

- **Auto Mode**: Allows the controller to operate on the time schedule and uses all of the set parameters.
- **Day Mode**: Removes the effect of the time schedule and makes the controller run at the day set value constantly.
- **Night Mode**: This mode overrides the controller time schedule and decreases the calculated flow temperature by the value set in night setback.
- **Boost Mode**: This mode overrides the controller time schedule and increases the calculated flow temperature by the value set in boost.
- **Standby Mode**: This causes the actuator to close and turns the controller off, but it does leave the frost protection running. The pump exercise will also remain active.
- **Close Actuator**: Forces the actuator to close or turns the boiler off.
- **Controller Off**: Causes both actuator outputs to be off and stops the actuator. In this mode no control function is operative including frost protection and pump exercise.
- **Open Actuator**: Forces the actuator to open or turns the boiler on.
Setting the Time Schedule  

The default schedule is programmed as:

<table>
<thead>
<tr>
<th>Day No.</th>
<th>Day</th>
<th>First ON Time (1)</th>
<th>First OFF Time (2)</th>
<th>Second ON Time (3)</th>
<th>Second OFF Time (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monday</td>
<td>08:00</td>
<td>00:00</td>
<td>00:00</td>
<td>17:00</td>
</tr>
<tr>
<td>2</td>
<td>Tuesday</td>
<td>08:00</td>
<td>00:00</td>
<td>00:00</td>
<td>17:00</td>
</tr>
<tr>
<td>3</td>
<td>Wednesday</td>
<td>08:00</td>
<td>00:00</td>
<td>00:00</td>
<td>17:00</td>
</tr>
<tr>
<td>4</td>
<td>Thursday</td>
<td>08:00</td>
<td>00:00</td>
<td>00:00</td>
<td>17:00</td>
</tr>
<tr>
<td>5</td>
<td>Friday</td>
<td>08:00</td>
<td>00:00</td>
<td>00:00</td>
<td>17:00</td>
</tr>
<tr>
<td>6</td>
<td>Saturday</td>
<td>00:00</td>
<td>00:00</td>
<td>00:00</td>
<td>00:00</td>
</tr>
<tr>
<td>7</td>
<td>Sunday</td>
<td>00:00</td>
<td>00:00</td>
<td>00:00</td>
<td>00:00</td>
</tr>
</tbody>
</table>

Note: If switching points 2 and 3 are not required, the time at these points should be programmed to zero (00:00).

1. Press and hold the - button and then the + button, keeping both buttons pressed down until SEC appears on the display. This means that mode selection has been accessed.
2. Press the 'Calendar' button to enter Time Schedule mode.
3. The screen will display the day number (flashing) followed by the First ON Time. Select which day number (1 to 7, where 1 is Monday and 7 is Sunday) is to be set using the - and + buttons.
4. Press the enter button to select the day and the hour will flash.
5. Use the - and + buttons to set the hour and press the enter button to move on to set the minutes. Set the minutes in the same way as the hour and the First OFF Time will be displayed.
6. Either amend the time or press the enter button twice and the Second ON Time is displayed and is amended in the same way as the First. Having amended the Second OFF Time the display will again indicate the First ON Time. The day number is now flashing again.
7. Use the - and + buttons to select another day number to set or press the calendar button to exit back to the Review Mode.

Review Mode

The review mode is a read only display mode. It shows various temperatures, the status of the actuator, pump and the current time and day.

No settings can be changed in this mode, except the facilities on the manual override switch.

The main display will show the main sensor reading by default.

Press the + button before trying to move the cursor.

By pressing the + or - buttons the display will show the CSC parameters in turn with the appropriate symbol highlighted by the display arrow. The + button moves the cursor clockwise and the - button moves the cursor anti-clockwise.

Setting the Default Display for Review Mode

Move the cursor arrow to the required parameter and press the enter button; the arrow will stop flashing. You have now selected the default parameter to be displayed when the CSC returns to Review Mode.

The controller functions available for viewing in Review Mode are as follows:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>➔</td>
<td>Valve Opening</td>
</tr>
<tr>
<td>➕</td>
<td>Valve Closing</td>
</tr>
<tr>
<td>🎥</td>
<td>Pump Running (CSC 5352 only)</td>
</tr>
<tr>
<td>🎥</td>
<td>Controller is in Night</td>
</tr>
<tr>
<td>🎥</td>
<td>Display Flow Temperature</td>
</tr>
<tr>
<td>🎥</td>
<td>Display Room Temperature or Water Temperature</td>
</tr>
<tr>
<td>🎥</td>
<td>Temperature for District Heating</td>
</tr>
<tr>
<td>🎥</td>
<td>Display Outside Temperature</td>
</tr>
<tr>
<td>🎥</td>
<td>Display Calculated Flow Set Value</td>
</tr>
<tr>
<td>🎥</td>
<td>Display Current time and Day (CSC 5352 only)</td>
</tr>
</tbody>
</table>
Accessing and Exiting Quick Set Mode

1. Press and hold the - button and then the + button, keeping both buttons pressed down until SEC appears on the display. This means that mode selection has been accessed.
2. The display will show the arrow pointing towards the tuning graphic on the left side of the display.
3. Press the tuning key button followed by the enter button to access the Quick Set Mode.
4. To exit Quick-Set Mode, the tuning key button must be pressed when the icons are flashing. If no keys are pressed within 30 seconds, the controller will return to the default review mode.

The user settings that are able to be adjusted or viewed in the Quick Set Mode are:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Used in</th>
<th>Default</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tuning Key</td>
<td>Quick Set Mode</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Set Current Time and Date</td>
<td>Quick Set Mode</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Set Compensator Ratio 1</td>
<td>Quick Set Mode</td>
<td>25 (2.5:1)</td>
<td>0 to 255</td>
</tr>
<tr>
<td></td>
<td>Set Night Set Back Value (NSB)</td>
<td>Quick Set Mode</td>
<td>10</td>
<td>0 to 255°C</td>
</tr>
<tr>
<td></td>
<td>Set Flow Temperature Set-up Value</td>
<td>Quick Set Mode</td>
<td>10</td>
<td>0 to 255°C</td>
</tr>
<tr>
<td></td>
<td>Set Flow High Limit Temperature</td>
<td>Quick Set Mode</td>
<td>82</td>
<td>0 to 255°C</td>
</tr>
<tr>
<td></td>
<td>Low Outside Temperature (Frost)</td>
<td>Quick Set Mode</td>
<td>0</td>
<td>-60 to 30°C</td>
</tr>
<tr>
<td></td>
<td>Set Ratio 2</td>
<td>Quick Set Mode</td>
<td>30 (3:1)</td>
<td>0 to 255</td>
</tr>
<tr>
<td></td>
<td>Set Change-over Value</td>
<td>Quick Set Mode</td>
<td>5</td>
<td>0 to 255°C</td>
</tr>
<tr>
<td></td>
<td>Set Flow Origin</td>
<td>Quick Set Mode</td>
<td>20</td>
<td>0 to 255°C</td>
</tr>
</tbody>
</table>
How To Set Values

This method applies to all parameters:

1. Enter Quick Set Mode as previously described.
2. When in the Quick Set Mode, an arrow will appear and the required symbol can be selected by scrolling left or right using the - and + buttons.
3. When the parameter is highlighted press the "enter" button. This allows the value to be adjusted, using the - and + buttons.
4. Press the "enter" button when the required value is displayed. This will enter the value. If you decide not to change the value press the "tuning" button instead.
5. The display will clear, but the arrow will continue to flash at the selected symbol.
6. To return to review mode at any time press the "tuning" button until the review mode appears.

Setting the Time and Day (CSC 5352 Only)
The day, hours and minutes are programmed as follows:
1. Enter Quick Set Mode as previously described.
2. Begin by obtaining the Clock symbol in the normal way, then press the "enter" button. The number on the far left of the display will flash, this is the day number.
3. Use the - and + buttons to select the day number (1 to 7) with 1 representing Monday and 7 representing Sunday. If you decide not to change the value at any stage press the "tuning" button instead.
4. Press the "enter" button to enter the day number and the hours will flash. The - and + buttons will allow the hour to be set.
5. Press the "enter" button to enter the hour and the minutes will flash. The - and + buttons will allow the minutes to be set.
6. Press the "enter" button and the display will return to the Quick-set mode and the time and day will be set.

To return to review mode at any time press the "tuning" button.

Fine Tune Card Settings for the CSC 5352

![Fine Tune Card Settings for the CSC 5352](image)

Fine Tune Card Settings for the CSC 5252

![Fine Tune Card Settings for the CSC 5252](image)

Entering and Exiting The Fine Tune Mode

The Fine Tune Mode is used by Commissioning Engineers and the more advanced users to set the Fine Tune parameters.

Note: The overlay card must be placed on the CSC to use the Fine Tune mode.

1. Press and hold the - button and then the + button, keeping both buttons pressed down until 'SEC' appears on the display. This means that mode selection has been accessed.
2. Press the "tuning" button three times. The display will show 'CARD 1' and all the arrows will flash simultaneously on the screen to show that the Fine Tune Mode is being entered. Place the overlay card on the display. The overlay card has a different set of symbols for the arrows to point to. Press the "enter" button.
3. The display will show a flashing arrow pointing towards the tuning graphic on the left side of the display.
4. Parameters are set in the same way as in Quick Set Mode.
5. To exit Fine Tune Mode at any time press the "tuning" button. If no keys are pressed within a period of 30 seconds, the product will return to the Review mode.
The user settings that are able to be adjusted or viewed in the Fine Tune Mode are:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Used In</th>
<th>Default</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuning Key</td>
<td>Indicates that you are in Fine Tune Mode of the arrow is flashing.</td>
<td>Fine Tune Mode</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IA</td>
<td>Set Integral Time Usually how long the actuator will take to run from fully closed to fully open given a continuous demand signal.</td>
<td>Fine Tune Mode</td>
<td>120</td>
<td>0 to 999</td>
</tr>
<tr>
<td>PB</td>
<td>Controller Tuning (ºC) Used to tune the controller to the control system.</td>
<td>Fine Tune Mode</td>
<td>50</td>
<td>0 to 255</td>
</tr>
<tr>
<td>SV</td>
<td>Set Actuator Stroke Time in Seconds</td>
<td>Fine Tune Mode</td>
<td>1</td>
<td>0 = Plant Off 1 = Control to NSB 2 = NSB then Off</td>
</tr>
<tr>
<td>SVT</td>
<td>Select SVT (CSC 5252 Only) Selects the digital input as SVT or Set-up. There are two connection/operation options for the SVT/CSC.</td>
<td>Fine Tune Mode</td>
<td>0</td>
<td>Set-up 1 = SVT</td>
</tr>
<tr>
<td>INF</td>
<td>Set Economy Set Value (CSC 5352 Only) Sets the outside temperature above which the plant will shut down. Frost protection remains active, as does pump exercise.</td>
<td>Fine Tune Mode</td>
<td>18</td>
<td>0 to 255°C</td>
</tr>
<tr>
<td>Room Influence Mode Select (only if Space Sensor fitted) If space sensor is fitted then the flow temperature can be adjusted in relation to the space temperature. The ratio for this is 3:1. The use of this feature can increase or decrease the flow temperature depending on the setting and Time Clock. A value of 3 should only be used when the max. return is used in Scandinavian applications. This allows the sensor input to be used for another purpose.</td>
<td>Fine Tune Mode</td>
<td>0</td>
<td>No Room Inf 1 = Day (+/- 3ºC) &amp; NSB (-3ºC) &amp; 3 = Distinct Htg</td>
<td></td>
</tr>
<tr>
<td>INF</td>
<td>Set Pump Overrun Time - (CSC 5352 Only) This setting should be used with direct boiler compensation or non-storage calorifier applications to dissipate heat after demand.</td>
<td>Fine Tune Mode</td>
<td>15</td>
<td>0 to 59 Minutes</td>
</tr>
<tr>
<td>INF</td>
<td>Set Low Outside Temperature Frost Logic - (CSC 5352 Only) Sets the action of the plant in relation to low outside air temperature. UK logic will start the pump until the Hysteresis (+2°C) has been cleared. European logic will start the pump and control the valve/boiler to the NSB setting until the Hysteresis (+2°C) outside has been cleared.</td>
<td>Fine Tune Mode</td>
<td>1</td>
<td>0 = UK 1 = European</td>
</tr>
<tr>
<td>SVT</td>
<td>Select SVT (CSC 5252 Only) Selects the digital input as SVT or Set-up. There are two connection/operation options for the SVT/CSC.</td>
<td>Fine Tune Mode</td>
<td>6</td>
<td>0 to 255K</td>
</tr>
<tr>
<td>Room Influence Mode Select (only if Space Sensor fitted) If space sensor is fitted then the flow temperature can be adjusted in relation to the space temperature. The ratio for this is 3:1. The use of this feature can increase or decrease the flow temperature depending on the setting and Time Clock. A value of 3 should only be used when the max. return is used in Scandinavian applications. This allows the sensor input to be used for another purpose.</td>
<td>Fine Tune Mode</td>
<td>0</td>
<td>No Room Inf 1 = Day (+/- 3ºC) &amp; NSB (-3ºC) &amp; 3 = Distinct Htg</td>
<td></td>
</tr>
<tr>
<td>SV</td>
<td>Set Day Room Temperature Origin (Only used when a space temperature sensor is fitted) The space temperature will influence the compensated flow temperature for each ºC error from this figure. Subject to the fine tune setting (INF).</td>
<td>Fine Tune Mode</td>
<td>10</td>
<td>83 -10 to 127°C</td>
</tr>
<tr>
<td>SV</td>
<td>Set Night Room Temperature Origin (Only used when a space temperature sensor is fitted) The space temperature will influence the compensated flow temperature for each ºC error from this figure. Subject to the fine tune setting (INF).</td>
<td>Fine Tune Mode</td>
<td>16</td>
<td>0 to 255°C</td>
</tr>
<tr>
<td>Valve or Boiler Control</td>
<td>Selects the controller type.</td>
<td>Fine Tune Mode</td>
<td>0</td>
<td>0 = Valve 1 = Boiler</td>
</tr>
<tr>
<td>SV</td>
<td>Stroke Set Actuator Stroke Time in Seconds In order for the control loop to operate accurately, the stroke time for the actuator to run from Closed to Open must be entered.</td>
<td>Fine Tune Mode</td>
<td>120</td>
<td>0-999 Seconds</td>
</tr>
<tr>
<td>Mr</td>
<td>Maximum Return Set Value Ratio - (CSC 5252 only) If the INF setting = 3 (max. Return Application) this value sets the set point ratio. The outside air origin is 10°C. A divisor of 100 is used for the Max. Return Ratio Setting, e.g. 83 = 0.83.</td>
<td>Fine Tune Mode</td>
<td>83</td>
<td>-10 to 127°C</td>
</tr>
</tbody>
</table>
COMMISSIONING - WHICH PARAMETERS TO CHANGE

The CSC is programmed with typical defaults to suit most applications. These should always be checked to maximise energy savings and comfort. Depending on the model being used, the following table shows which parameters are most likely to be in need of adjustment to allow correct and safe operation.

<table>
<thead>
<tr>
<th>Quick Set Mode</th>
<th>CSC 5352</th>
<th>CSC 5252</th>
<th>Why Do You Need To Alter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time &amp; Day</td>
<td>✓</td>
<td></td>
<td>To enable correct plant time switching.</td>
</tr>
<tr>
<td>Low Outside Temperature</td>
<td>✓</td>
<td></td>
<td>To protect the plant from low outside temperatures if required.</td>
</tr>
<tr>
<td>Flow High Limit</td>
<td>✓</td>
<td>✓</td>
<td>This setting sets the highest possible flow temperature that the CSC will allow. Must be used in sensitive applications such as under floor heating.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fine Tune Mode</th>
<th>IA Integral Action</th>
<th>✓</th>
<th>✓</th>
<th>Allows the CSC to react to temperature deviations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PB Proportional Band</td>
<td>✓</td>
<td>✓</td>
<td>Allows the CSC to position the value according to the error.</td>
<td></td>
</tr>
<tr>
<td>NSB Action</td>
<td>✓</td>
<td>Do you want heating during the relaxed periods: 0 = (No Heating) 1 = (Yes both periods) 2 = (Yes to 1st Off period, No to 2nd Off period).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INF Room Influence Mode</td>
<td>✓</td>
<td>✓</td>
<td>How do you want the Space Temperature to influence the Flow Temperature.</td>
<td></td>
</tr>
<tr>
<td>Frost Logic</td>
<td>✓</td>
<td>Do you want to use UK or European Frost Logic.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve or Boiler</td>
<td>✓</td>
<td>✓</td>
<td>Are you controlling a value or boiler.</td>
<td></td>
</tr>
<tr>
<td>SVd Set Value Day Origin</td>
<td>✓</td>
<td>✓</td>
<td>If you have a space Sensor what will be your target Space temperature for the Day period.</td>
<td></td>
</tr>
<tr>
<td>SVn Set Value Night Origin</td>
<td>✓</td>
<td>✓</td>
<td>If you have a space Sensor what will be your target Space temperature for the Night period.</td>
<td></td>
</tr>
<tr>
<td>Low Space Temperature</td>
<td>✓</td>
<td>If you have a non-adjustable Space Sensor what is the lowest permissible Space Temperature.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke Actuator Stroke</td>
<td>✓</td>
<td>✓</td>
<td>How long does the actuator take to run from fully closed to fully open in seconds.</td>
<td></td>
</tr>
</tbody>
</table>

OTHER SETTINGS - CSC 5352

1. Set the time schedule to complete the basic commissioning procedure.

Note: If you have set the above they should not need further adjustment given your application. Always check periodically as a part of ongoing maintenance program. Ratios and ECO functionality must be set to maximise energy savings.
TYPICAL APPLICATIONS

COMPENSATED VALVE CONTROL

This compensator application operates a 3 port mixing valve to control the flow temperature of the system based on the outside temperature. A room sensor is optional and is used to trim the flow temperature and not to control it. The way room influence works can be selected to suit your needs. It need not be used. The flow temperature can be adjusted by 3°C for every 1°C the room temperature is above or below the day time space temperature set value (SVd).

If a clock version CSC is used, the clock determines whether the compensator operates in day or Night Set-Back (NSB) mode. The CSC can be set to allow the heating i.e. pump, valve etc., to run at reduced set points or turn off during the off periods. When in NSB mode the action of Room Influence is adjusted to work only in a negative fashion as to reduce the flow temperature. The flow temperature will be lowered by 3°C for every 1°C the room temperature is above the relaxed set point (Svn). The compensator has 2 compensation ratios and a high limit function to prevent excessive set points occurring.

Out of hours, if the outside temperature drops below an adjustable frost setting, defaulted to 0°C, the pump is enabled and ‘Auto 1’ is displayed on the controller. The CSC will resume normal operation when the outside temperature increases by 2°C. If a space sensor is used, this will also provide frost protection to protect the building fabric. The low space temperature is adjustable but is normally set to 10°C. If this limit is passed then the heating will come on in boost to ensure the fastest possible relief. ‘Auto 3’ will be displayed during this period. The frost condition will be removed when the space temperature has risen by 2°C. If for any reason, the flow temperature should fall below 5°C, the CSC will act to prevent freezing. The controller will start the pump and open the valve to raise the water temperature of the system; the CSC will remain in this condition for 30 minutes. If the water frost event occurs during a standby period, the CSC will display ‘Auto 2’.

If your CSC does not have a time clock, Frost Protection is not available as the controller does not control the pump. All frost protection must be provided by other interlocked devices such as thermostats.

If under floor heating is used, please remember to check the high limit setting, to prevent excessive flow temperatures.

* A control and safety high thermostat must be used on the boiler.

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Remove links 7-8 and/or 9-10 if Set-up/Boost and/or Night Set-back is used.

Ensure that 34 is always hard wired to 35, for all 24Vac actuators only.
TYPICAL APPLICATIONS

COMPENSATED BOILER CONTROL

This compensator application switches the boiler to control the flow temperature of the system based on the outside temperature. A room sensor is optional and is used to trim the flow temperature and not to control it. The way room influence works can be selected to suit your needs. It need not be used. The flow temperature can be adjusted by 3°C for every 1°C the room temperature is above or below the day time space temperature set value (SVd).

If a clock version CSC is used, the clock determines whether the compensator operates in day or Night Set-Back (NSB) mode. The CSC can be set to allow the heating i.e. pump, valve etc., to run at reduced set points or turn off during the off periods. When in NSB mode the action of Room Influence is adjusted to work only in a negative fashion as to reduce the flow temperature. The flow temperature will be lowered by 3°C for every 1°C the room temperature is above the relaxed set point (Svn). The compensator has 2 compensation ratios and a high limit function to prevent excessive set points occurring.

Out of hours, if the outside temperature drops below an adjustable frost setting, defaulted to 0°C, the pump is enabled and 'Auto 1' is displayed on the controller. The CSC will resume normal operation when the outside temperature increases by 2°C. If a space sensor is used, this will also provide frost protection to protect the building fabric. The low space temperature is adjustable but is normally set to 10°C. If this limit is passed then the heating will come on in boost to ensure the fastest possible relief. 'Auto 3' will be displayed during this period. The frost condition will be removed when the space temperature has risen by 2°C. If for any reason, the flow temperature should fall below 5°C, the CSC will act to remove the possibility of frost. The controller will start the pump and start the boiler to raise the water temperature of the system; the CSC will remain in this condition for 30 minutes. If the water frost event occurs during a standby period, the CSC will display 'Auto 2'.

If your CSC does not have a time clock, Frost Protection is not included as the controller does not control the pump. All frost protection must be provided by other interlocked devices such as thermostats.

If under floor heating is used, please remember to check the high limit setting, to prevent excessive flow temperatures.
TYPICAL APPLICATIONS
DISTRICT HEATING SYSTEMS

This application operates a two or three port valve to control the secondary water temperature of the heat exchanger based on the outside temperature. In Scandinavian applications a DWT sensor can be connected to the CSC via the input used for Room Influence. The CSC will use the DWT sensor to control the Primary Return Temperature. This will ensure that the permitted limits will not be exceeded. Space Frost Protection or room influence cannot be offered if the maximum return sensor is used.

Where the primary medium could enable extremely high secondary water temperatures, a dedicated safety circuit is required.

If a clock version CSC is used, the clock determines whether the compensator operates in day or Night Set-Back (NSB) mode. The CSC can be set to allow the heating i.e. pump, valve etc., to run at reduced set points or turn off during the off periods. When in NSB mode the action of Room Influence is adjusted to work only in a negative fashion as to reduce the flow temperature. The flow temperature will be lowered by 3°C for every 1°C the room temperature is above the relaxed set point (Svn). The compensator has 2 compensation ratios and a high limit function to prevent excessive set points occurring.

Out of hours, if the outside temperature drops below an adjustable frost setting, defaulted to 0°C, the pump is enabled and ‘Auto 1’ is displayed on the controller. The CSC will resume normal operation when the outside temperature increases by 2°C. If a space sensor is used, this will also provide frost protection to protect the building fabric. The low space temperature is adjustable but is normally set to 10°C. If this limit is passed then the heating will come on in boost to ensure the fastest possible relief. ‘Auto 3’ will be displayed during this period. The frost condition will be removed when the space temperature has risen by 2°C. If for any reason, the flow temperature should fall below 5°C, the CSC will act to remove the possibility of frost. The controller will start the pump and open the valve to raise the water temperature of the system; the CSC will remain in this condition for 30 minutes. If the water frost event occurs during a standby period, the CSC will display ‘Auto 2’.

If your CSC does not have a time clock, Frost Protection is not included as the controller does not control the pump. All frost protection must be provided by other interlocked devices such as thermostats.

If under floor heating is used, please remember to check the high limit setting, to prevent excessive flow temperatures.

The INF setting in Fine Tune Mode must be set to 3 to enable the max. return application and settings.

† Room influence or Max. Return Sensor, not both. Max. Return Sensor used for controlling primary water temperature in Scandinavian Public Systems.

Fig.9

† A safety high thermostat may need to be used on the secondary side to operate the safety valve.

Pump (Clock version only)

Remove links 7-8 and/or 9-10 if Set-up/Boost and/or Night Set-back is used.

Fig.10

Remove links 7-8 and/or 9-10 if Set-up/Boost and/or Night Set-back is used.

Ensure that 34 is always hard wired to 35, for all 24Vac actuators only.

Fig.11
**CONNECTION TO 24V ACTUATOR AND PUMP RELAY NEEDING MORE THAN 10VA**

Note: The independent 24V transformer secondary should be fused and must conform to EN 61558.

Ensure that 34 is always hardwired to 35, for all 24Vac actuators only.

**SENSOR AVERAGING (UPTO 4 SENSORS)**

Set the number of room sensors connected on the Fine Tune Mode.
**ACTUATOR OVERRIDE FOR MAINS OUTPUT APPLICATIONS**

![Diagram](https://via.placeholder.com/150)

**ACTUATOR OVERRIDE FOR 24VAC OUTPUT APPLICATIONS**

![Diagram](https://via.placeholder.com/150)

**MAINTENANCE**

A periodic system and tuning check of the control system is recommended.

**Changing the Battery**

The battery is provided to keep the clock running if the power is switched off.

**WARNING**

WHEN CHANGING THE BATTERY, ENSURE THE MAINS POWER SUPPLY HAS BEEN SWITCHED OFF.

1. Undo the central fixing screw and remove the front of the case to allow access to the battery (located in the back of the main case).
2. Replace the front of the cover and lock it securely with the central fixing screw.
3. Switch the mains supply on.

The clock will now need to be reset. (See the Quick Set Mode for details on setting the clock).
WIRING PRECAUTIONS

For runs over 100m up to 300m maximum, use one of the following screening options:

- Screening cable. Earth screen at the controller end only.
- MICC. Earth screen at the controller end only

The mains supply, 24Vac output, relay and triac output wiring must be run separately from all the controller sensor and override inputs.

The controller must be located as far away as possible (minimum 150mm) from any contactors or switches and their cables. This is to avoid any interference to the controller.

No connections to the controller should be made whilst power is applied.

---

<table>
<thead>
<tr>
<th>Wiring from CSC compensator to:</th>
<th>Maximum unscreened length</th>
<th>Maximum resistance per core</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensors</td>
<td>Screened Only&lt;sup&gt;a&lt;/sup&gt;</td>
<td>15Ω</td>
</tr>
<tr>
<td>Actuators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARM, ALM, ALMS</td>
<td>100m</td>
<td>5Ω</td>
</tr>
<tr>
<td>ARX, ALX, ALXS</td>
<td>100m</td>
<td>5Ω</td>
</tr>
<tr>
<td>XRM, RM</td>
<td>100m</td>
<td>10Ω</td>
</tr>
<tr>
<td>AVUM, AVUX</td>
<td>100m</td>
<td>5Ω</td>
</tr>
<tr>
<td>Relays, ON/OFF Inputs</td>
<td>Screened Only</td>
<td>5Ω</td>
</tr>
<tr>
<td>Power Supply 230Vac</td>
<td>Screened Only</td>
<td>-</td>
</tr>
</tbody>
</table>

<sup>a</sup> On new installations all sensor cables must be screened with the screens connected separately to the 0V earth point provided, however when upgrading old CSC or CXC installations it is usually possible to use the existing unscreened sensor wiring as long as the cable run is less than 100 metres and is sited more than 75mm from mains wiring runs.
DIMENSION DRAWINGS

Dimensions in mm

3-21mmØ conduit entries

PANEL CUT-OUT
138mm x 138mm

Weight 1.5 kg

WARNINGS -
THIS IS A MAINS OPERATED DEVICE. LOCAL WIRING REGULATIONS AND USUAL SAFETY PRECAUTIONS MUST BE OBSERVED. NOTE EARTHING REQUIREMENTS.

THE CSC CONTAINS A LITHIUM CHLORIDE BATTERY WHICH IS COMPLETELY SAFE WHILST IN NORMAL USE. THE BATTERY MUST BE DISPOSED OF IN AN AUTHORISED GROUND FILL SITE.

Cautions

• Observe wiring precautions on Page 3.
• Do not apply any voltages until a qualified technician has checked the system and the commissioning procedures have been completed. See Page 3.
• Do not short circuit sensor terminals for test purposes.
• Observe ambient temperatures and humidities shown on Page 2.
• If any equipment covers have to be removed during the installation of this equipment, ensure that they are refitted after installation to comply with UL and CE safety requirements.
• Interference with those parts under sealed covers renders the guarantee void.
• Design and performance of Schneider Electric equipment is subject to improvement and therefore liable to alterations without notice.
• Information is given for guidance only and Schneider Electric does not accept responsibility for the selection or installation of its products unless information has been given by the Company in writing relating to a specific application.
• A periodic system and tuning check of the control system is recommended. Please contact your local sales office for details.

On October 1st, 2009, TAC became the Buildings business of its parent company Schneider Electric. This document reflects the visual identity of Schneider Electric, however there remains references to TAC as a corporate brand in the body copy. As each document is updated, the body copy will be changed to reflect appropriate corporate brand changes.