Satchwell

MICROPROCESSOR COMPENSATOR/OPTIMISER
Type CSMC 3805

The CSMC 3805 Microprocessor Compensator/Optimiser is an advanced full feature Energy Saving Controller for central heating systems in intermittently occupied or residential buildings.

The CSMC is a highly sophisticated, yet easy to use and set up device, providing a more comprehensive range of functions than most other individual Compensators or Optimisers in a combined package. All of these features are built-in and do not require any add-on modules to provide extra functionality such as communications.

All these features genuinely correspond to the specific requirements for running heating plant in the most energy efficient way. The CSMC can be easily configured to operate in one of the following five control modes:-

Optimiser only

Dual loop compensator control (single optimiser loop)

Dual boiler sequencing (single Optimiser/Compensator loop)

Single loop Compensator/Optimiser with DHWS timeschedule output

Single loop Compensator/Optimiser with DHWS control output

During occupation the building is controlled from water temperature which is varied with the weather. When the building is unoccupied the heating is switched off unless the outside temperature is below frost limit, in which case the heating is switched on at a considerably reduced level (assuming European frost logic is used).

It also embodies the principles of optimum start in which the heating plant is switched on at a time which is automatically varied each day, providing further energy savings over fixed time starting.

In addition the Building Research Establishment recommended optimum start algorithm (BRESTART) is included for significantly more accurate and consistent performance.

The CSMC provides interlocking where a single boiler is used for heating and domestic HWS, alternatively a separate output may be used where two boilers are being used.

The unique LCD provides dynamic information for visual status checks, including plant performance which is displayed in graphical format.

The built-in serial link facility enables all display values to be read at a remote computer. The latter can also be used to enter or change any parameter values. Use of such a computer with the appropriate software is entirely optional.

Dimensions in mm

Weight 1.6 Kg

PANEL CUT-OUT 138mm x 138mm

3–21mm Ø conduit entries

FEATURES

- Full feature Compensator and Optimiser with extensive Energy Saving features
- Optimiser only control option
- Dual Compensator control option
- Single loop control with DHWS on timeschedule option
- Single loop control with DHWS on timeschedule and controlled option
- Dual boiler control option
- Boiler lead/lag changeover at specified hours run setting
- lead/lag changeover whilst in night mode
- Night setback applied to boiler and valve for residential applications
- Central boiler control possible by linking upto 2 CSMC 3805s to the central boiler CSMC 3805 for remote boiler request
- Maximum switchings per hour for boilers logged
- Dual Compensation Ratios
- Compensation and Optimisation Curves are self learning, to increase plant efficiency and control performance
- Optimum On and Off (2 Periods per day)
- Choice of standard Optimisation Algorithm or BRESTART Type Logarithmic Algorithm
- Separate holiday and timeschedule for Optimisation and DHWS Output
- Holidays programmable up to one year ahead
- Data Logging of optimiser switching points, temperature and voltage inputs
- Large clear liquid crystal display used for programming and reviewing the weekly time schedule also gives plant status indication
- Alarm Monitoring
- Built-in RS 422/485 Serial Link
- Programmable changeover from GMT to BST and BST to GMT (Daylight saving)
- Self Diagnostics Programme allows the user to easily check the display
- Selectable UK or European Frost Logic
- Inside and Outside Limit Control
- Three day outside temperature moving average (Optimiser High Limit inhibits boiler operation)
- Built-in Overrun
- Pump exercised for 15 minutes every 24 hours
- Three year battery back-up of all settings
- Main controller plugs into rear section holding the terminals and transformer
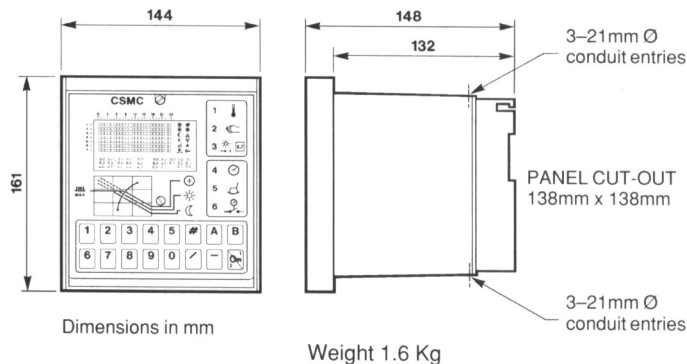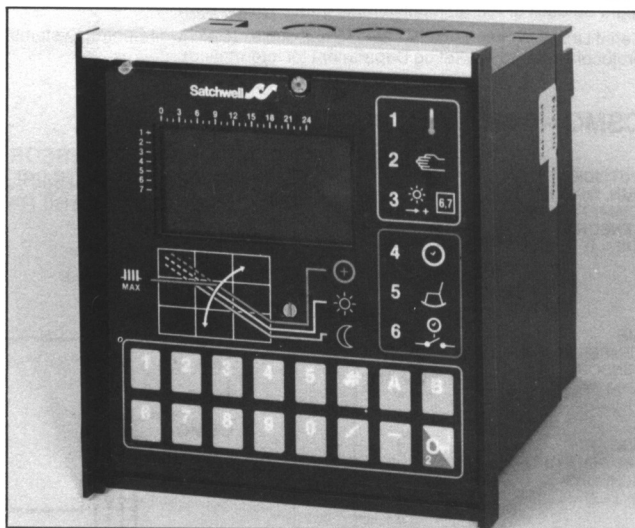
SPECIFICATION

Type:	CSMC 3805 – Microprocessor Compensator/Optimiser – Specification no. 561-3-805
Control Range:	–40 to +150°C
Power Supplies:	240V ac (±10%), 47 to 63 Hz or 220V ac (±10%), 47 to 63 Hz voltage selectable by transformer terminals used
Consumption:	14VA (3.5VA 24V supply available from the transformer if required)
Fuses:	630mA (20mm) mounted on the PCB 500mA (20mm) for the 24V actuator output, mounted to the right of the transformer in the base
Power Failure Reserve:	Lithium Chloride (Non rechargeable) battery provides 3 years life in normal conditions of use. Memory provides 5 minutes data retention while changing the battery*. External power should not be disconnected for long periods otherwise battery life will be considerably reduced. Displays and commands will be off during power failure but memory will be preserved so that normal control will be resumed on restoration of power.
Ambient Temperature Limits:	Operating: 0 to 40°C, Storage/Transit: –20 to +55°C

SPECIFICATION (continued)

INPUTS

Sensors: See fig. 1

Switched Inputs: Voltage free contacts, normally open

Day Extension: Use RDE 1752 or standard make/break contact (selectable on key code B47)

Night Setback or Alarm: (configurable from keycode B48)

Serial Link: EIA Standard RS 422/485 half duplex (Satchwell Control Systems' protocol – refer to Marketing Department for information).

OUTPUTS

Actuators: See fig.1

Switched Outputs: Voltage free SPCO contacts rated at 240V ac 3A resistive. 1A inductive. Three relays available for boiler, pump and HWS (hot water services). If an external relay is switched from these outputs the external relay should have a minimum holding current of 5mA.
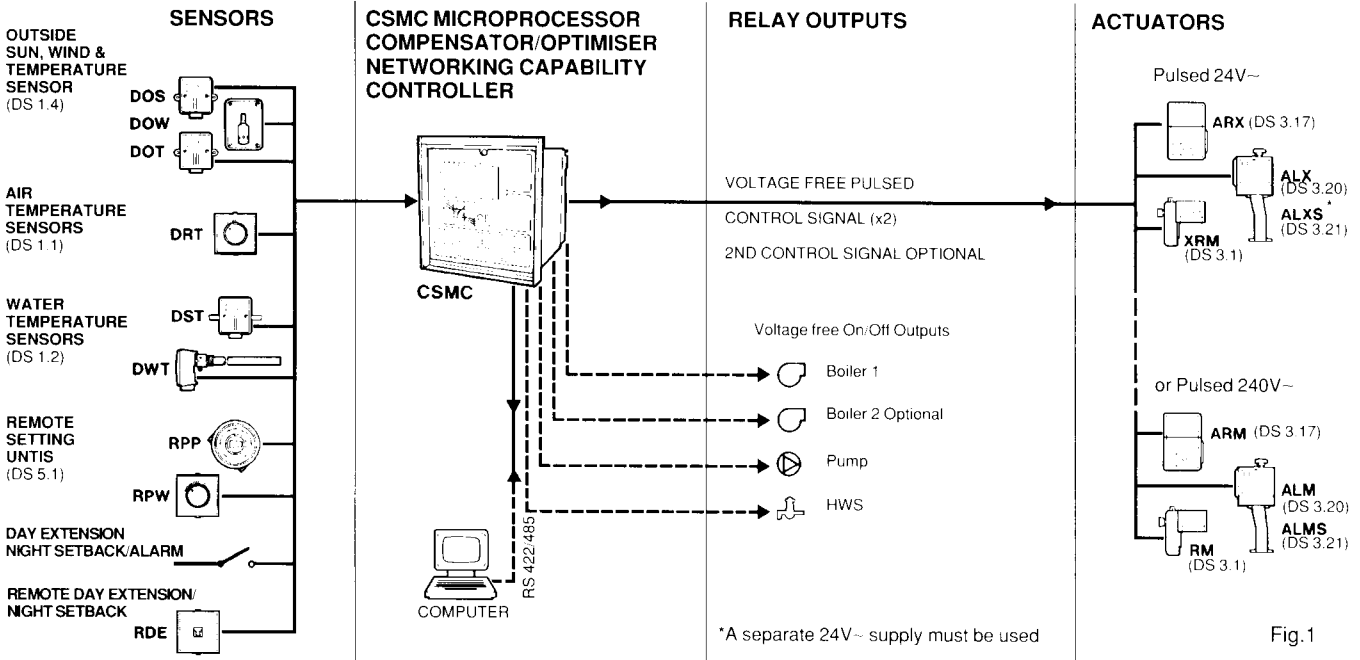
CSMC – INPUT/OUTPUT DIAGRAM

Fig.1

CONSTRUCTION

Case: Moulded Polycarbonate plastic case. Fire resistant to UL94 V-0. The main section plugs directly into the rear section which houses all terminals and the transformer.

Protection Class: IP 41

Terminals: Accept 2 x 1.5mm² wires

Conduit Entries: 6 x 21mm diameter conduit entries. Entries are placed in the top and bottom of the rear section of the case.

Indication: The LCD is made up of three areas:
- 7 x 24 matrix that is used to display time schedules
- Status area which gives continuous information on the CSMC's control status
- Displays the current time day and sensor value, but during programming it is used to display setting information.

Mounting: Panel, wall or DIN rail mounting. DIN rail should be to DIN 46277 Part 3 – EN50022/BS 5584.

CONNECTION OPTIONS

CSMC 3805 Terminal No.	Standard Optimiser Compensator Keycode 53 = 0 Keycode 46 = 0	Dual Boiler Compensator Keycode 53 = 1 Keycode 46 = 0	Dual Compensator Control Keycode 53 = 2 Keycode 46 = 0	Compensator and HWS Control Keycode 53 = 3 Keycode 46 = 0	Optimiser Only Keycode 53 = any Keycode 46 = 1
1	Valve Open	Valve Open	Valve 1 Open	Valve Open	Boost
2	Valve Close	Valve Close	Valve 1 Close	Valve Close	Normal
3	Valve Common	Valve Common	Valve 1 Common	Valve Common	Not used
4	Valve Supply	Valve Supply	Valve 1 Supply	Valve Supply	Common
5 6	Boiler Relay	Boiler 1 Relay	Valve 2 supply Valve 2 open	Boiler Relay	Boiler Relay
7 8	Pump Relay	Boiler 2 Relay	Valve 2 supply Valve 2 close	Pump Relay	Pump Relay
9 10	HWS Relay	Pump Relay	Pump Relay	HWS Control Relay	HWS Relay
11	Not used	Not used	Not used	Not used	Not used
12 13	Remote Night Setback Inputs	Remote Night Setback Inputs or Remote Boiler Request	Remote Night Setback Input or Remote Boiler Request	Remote Night Setback Input	Remote Night Setback Input
14	Common	Common	Common	Common	Common
14	Common	Common Remote Day Extension Inputs	Common Remote Day Extension Input or Remote Boiler Request	Common	Common
15 16	Remote Day Extension Inputs	Remote Day Extension Inputs or Remote Boiler Request	Remote Day Extension Input or Remote Boiler Request	Remote Day Extension Input	Remote Day Extension Input
17	RS422/485 –	RS422/485 –	RS422/485 –	RS422/485 –	RS422/485 –
18	RS422/485 +	RS422/485 +	RS422/485 +	RS422/485 +	RS422/485 +
19 20 21	Not used	Not used	Not used	Not used	Not used

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22 23	0V Wind 0to10V Sensor (optional)	0V Wind 0to10V Sensor (optional)	0V Wind 0to10V Sensor (optional)	0V Wind 0to10V Sensor (optional)	Not used
24 25	DOS Solar Sensor (optional)	DOS Solar Sensor (optional)	DWT, DST Valve 2 Flow Sensor	DWT, DST HWS Control Sensor	Not used
25 26	DOT Outside Sensor	DOT Outside Sensor	DOT Outside Sensor	DOT Outside Sensor	DOT Outside Sensor
27 28	DRT Room Sensor	DRT Room Sensor	DRT Room Sensor	DRT Room Sensor	DRT Room Sensor
28 29	DWT, DST Return Water Sensor or RPP/RPW	DWT, DST Return Water Sensor or RPP/RPW	DWT, DST Return Water Sensor or RPP/RPW	DWT, DST Return Water Sensor or RPP/RPW	DRT Room Sensor (optional)
30 31	DWT, DST Valve Flow Sensor	DWT, DST Valve Flow Sensor	DWT, DST Valve 1 Flow Sensor	DWT, DST Valve Flow Sensor	DRT Room Sensor (optional)
31 32	DWT, DST Boiler Flow Sensor	DWT, DST Boiler Flow Sensor	DWT, DST Boiler Flow Sensor	DWT, DST Boiler Flow Sensor	DRT Room Sensor (optional)

CAUTION
- **This is a mains operated device. Local wiring regulations and usual safety precautions must be observed. Note earthing requirements.**
- For full wiring information refer to DS 2 47A
- Design and performance of Satchwell equipment are subject to continual improvement and therefore liable to alteration without notice.
- Information is given for guidance only and Satchwell do 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