

BCM

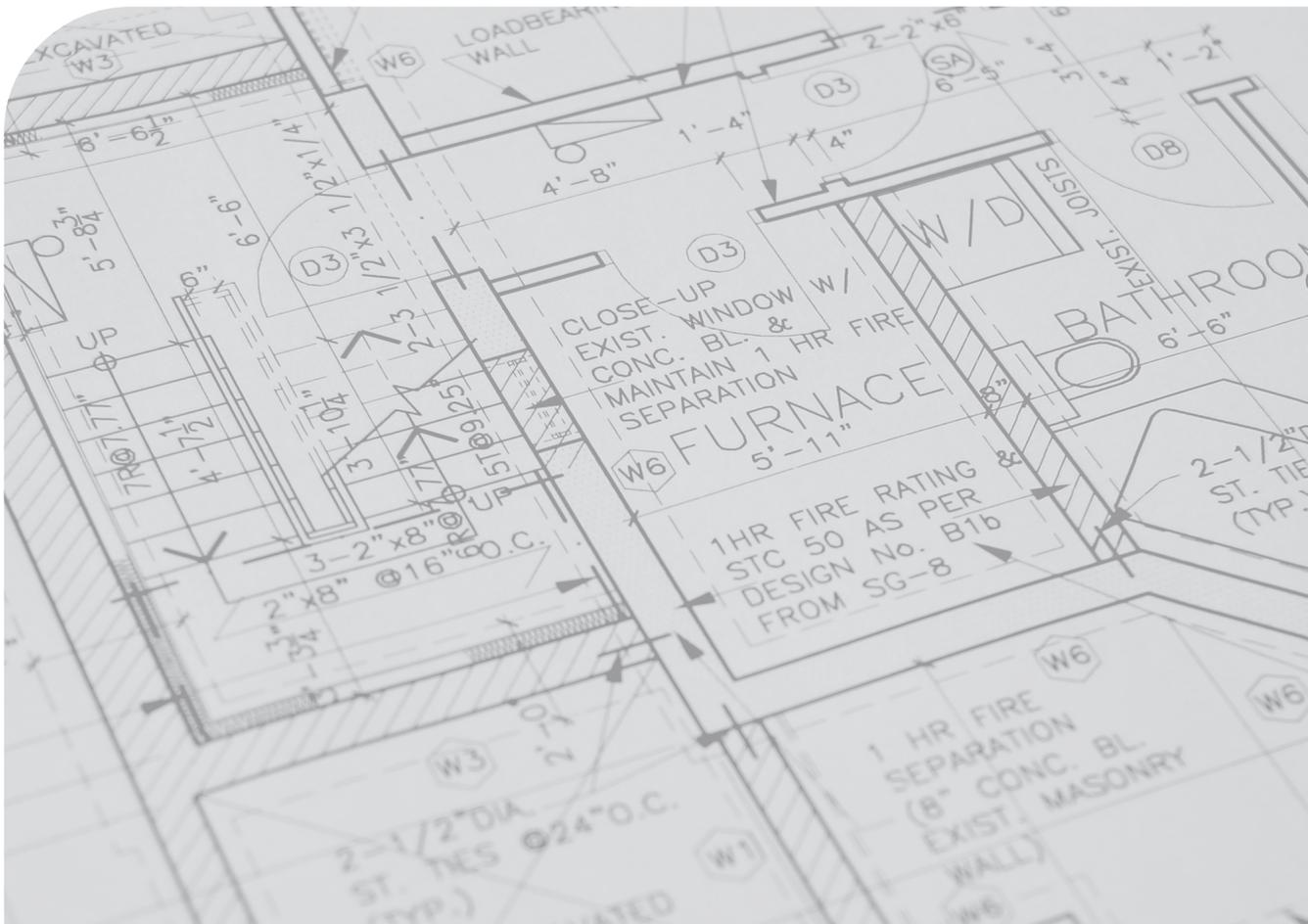
Boiler controller

IE

**Instructions and
recommendations**

Installer

Maintenance technician



INDEX

1	Generality	3
2	Description	4
3	Application	7
3.1	Programming the operation parameters	7
3.2	BCM parameters (HSC) - General settings/settings for use with HSCP	8
3.3	BCM Parameters (HSC) - General settings / use settings with HSCP	11
3.4	BCM (HSC) Parameters – Setting for 0-10 V use	12
3.5	BCM (HSC) Parameters - Setting For use With Modbus	13
3.6	Error code	14

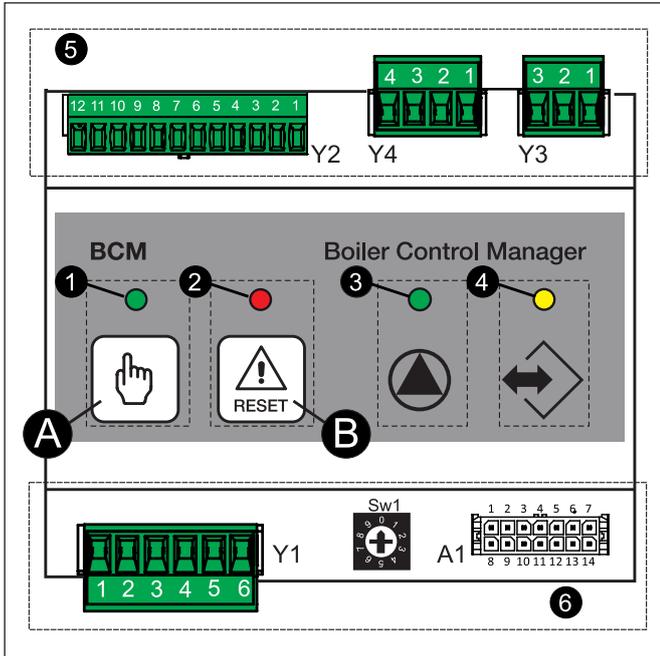
1 GENERALITY

The BCM unit is capable of acting:

- as a controller of a single boiler, checking the basic services of the heating system, including the system's safety devices.
- as an HCM (Heating Cascade Manager) controller, checking the overall structure of several heat generators.



2 DESCRIPTION



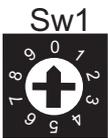
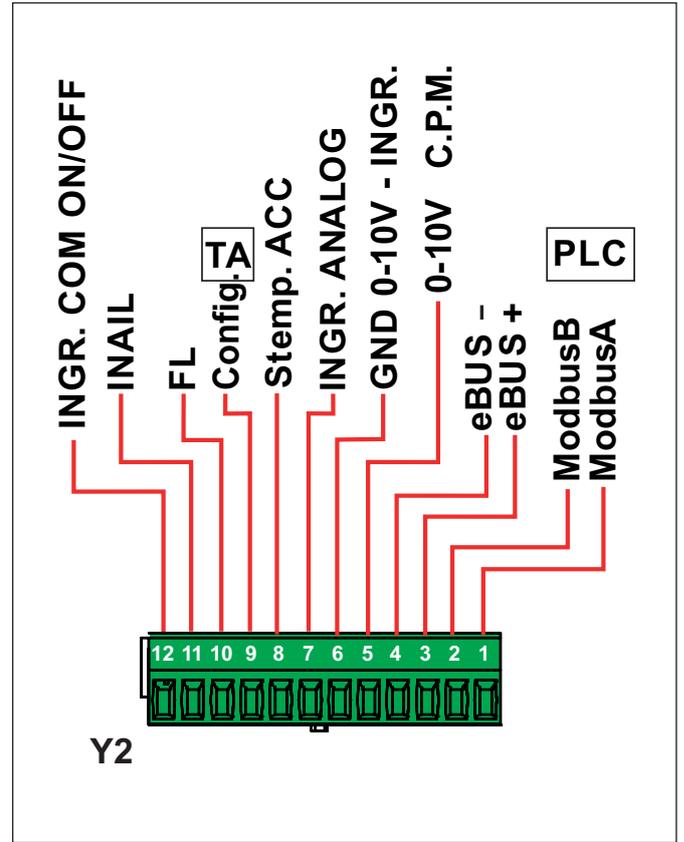
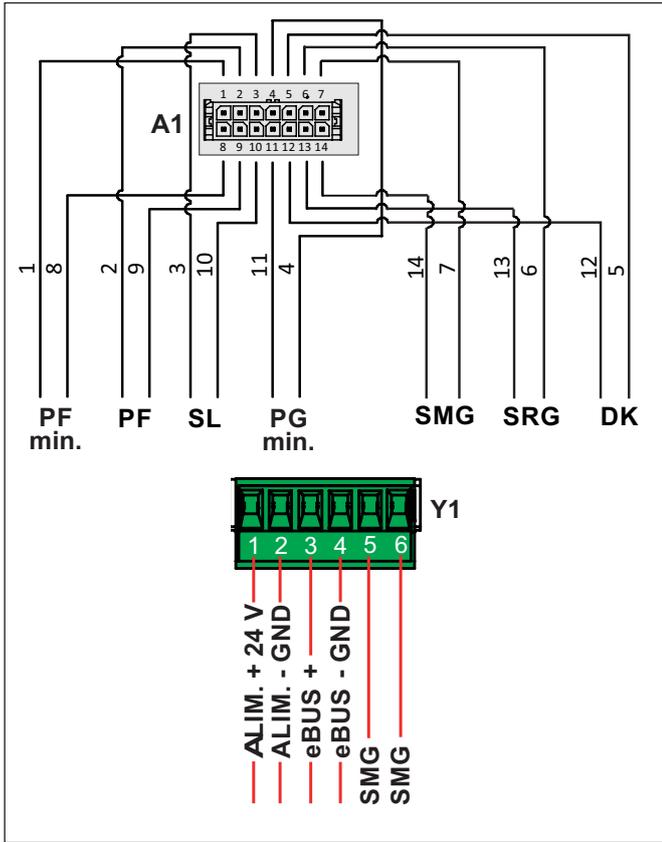
5 LOCAL CONNECTORS for boiler/cascade management				
N°	Pin	S.E.	Description	
Internal boiler connections				
A1	7	14	SMG	Global flow sensor
	6	13	SRG	Global return sensor
	5	12	DK	No water safety pressure switch
	4	11	PG min.	Min Gas pressure switch
	3	10	SL	Level sensor
	2	9	PF	Flue pressure switch
	1	8	PF min	Minimum flue pressure switch
Y1 Generator cascade connections				
Y1	1	+	Supp.	Input 20 ÷ 40 Vdc
	2	-		GND
	3	+	eBUS	GND
	4	-		
	5	6	SMG	Global flow sensor (duplicated).

KEY		
N°		Description
A		MANUAL request button (Emergency activity) (*)
1	GREEN LED	
	OFF	MANUAL request NOT active
	ON	MANUAL request active
B		RELEASE button
2	RED LED	
	ON	FAULT detected
	FLASHING	ANTIFREEZE protection activation
	OFF	Normal functioning
3	GREEN LED	
	ON	CH heating operation or antifreeze protection active
	FLASHING	DHW demand operation
	OFF	Stand-by
4	YELLOW LED	
	ON	BCM communication with local controllers and remote BCM (cascade)
	FLASHING	BCM communication with local HSCP or SHC controllers
	OFF	No communication with controllers (manual request A)

6 HOST CONNECTORS to manage remote system				
N°	Pin	S.E.	Description	
Y2	1		A (PLC)	
	2		B (PLC)	
	3		Modbus	
	4		eBUS +	Ext. Cascade regulator
	5		eBUS -	GND
	6		0-10V C.P.M.	Modulating Pump Controller
	7			GND - 0-10 V
	8			Analogue input 0 - 10 V (*)
	9		Stemp. ACC	Storage tank temperature sensor
	10		Config	Programmable digital input: Enable generator
	11		FL	Flow switch
	12		INAIL	Safety devices input (nc)
			Inputs 9 ÷ 12 common	

(*) Active only if HSCP faulty or input 9 of Y2 (Config) not enabled. LED off.





Sw1 SW1
Bus addresses 0 - 9 selector.

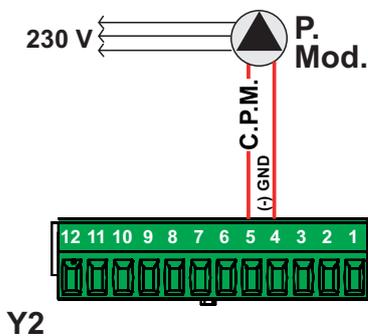
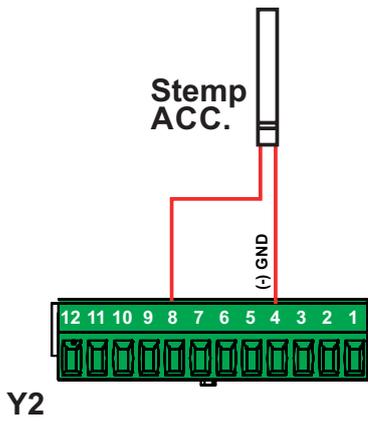
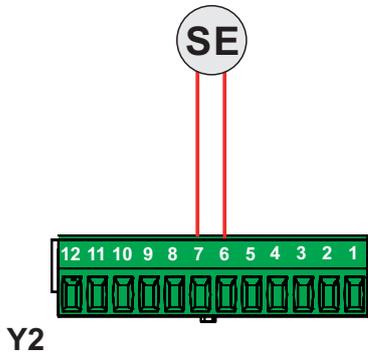
Normally set at 0 for external BCM (cascade controller). In internal BCM (with single cascade boiler) it has other values.

(*) ANALOGUE INPUT

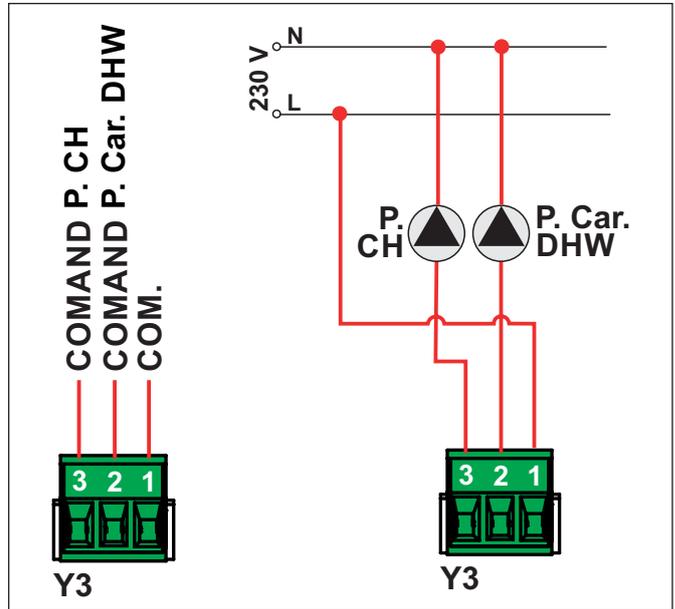
It is normally configured for control via EXTERNAL TEMPERATURE CONTROL (PLC) 0-10 V. (If external HSCP is used, input 0-10 must be configured).



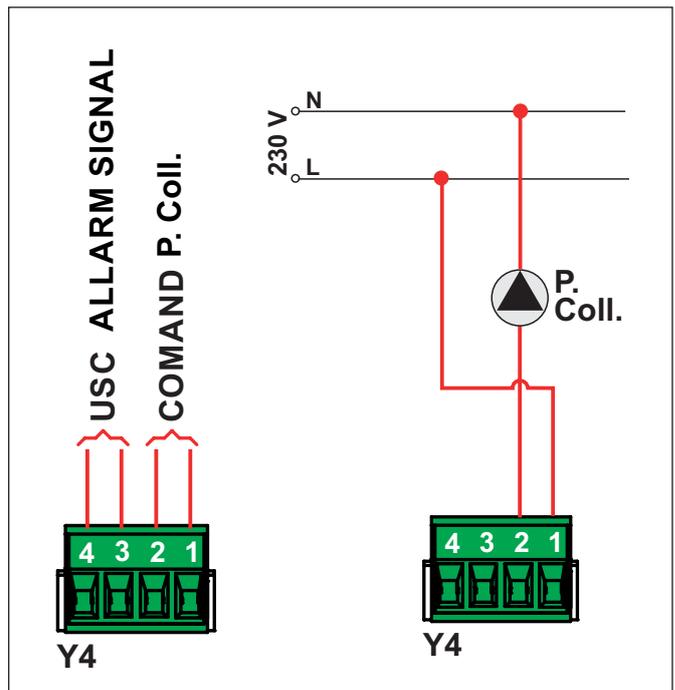
DESCRIPTION



Y3	1	COM.	Common output
	2	P.Car. DHW	Storage tank load pump
	3	P. CH	Central heating pump



Y4	1	2	P.Coll.	Manifold pump
	3	4	ALARM	Alarm output
			S.E.	= WIRING DIAGRAM KEY (see boiler booklet)



3 APPLICATION

CASCADE MANAGER

- eBUS communication interface with SHC BMM modules
- Management of a cascade with a maximum of 8 boilers
- Global return temperature detection
- Global flow temperature - temperature limit - differential temperature detection.
- Six ON / OFF inputs for global protection sensors:
 - FL minimum water flow rate
 - PG min minimum gas pressure
 - DK minimum water pressure
 - PF flue gas 1 obstruction
 - PF flue gas 2 obstruction
 - SL water level sensor of the drain trap
- 0-10 V CPM Live output for modulating control of the manifold pump.
- CONFIG. TA ON / OFF enabling input for the heat generator.
- Relay output for fixed speed pump or for boiler status indication (in demand or standby).

REMOTE CONTROL

- eBUS communication interface for higher level HCM.
- Modbus communication interface for integration with a building automation system.
- Voltage input to interface with a commercial temperature controller.
- Relay contact output for the indication of the boiler alarm.
- ON/OFF input to reset alarm.

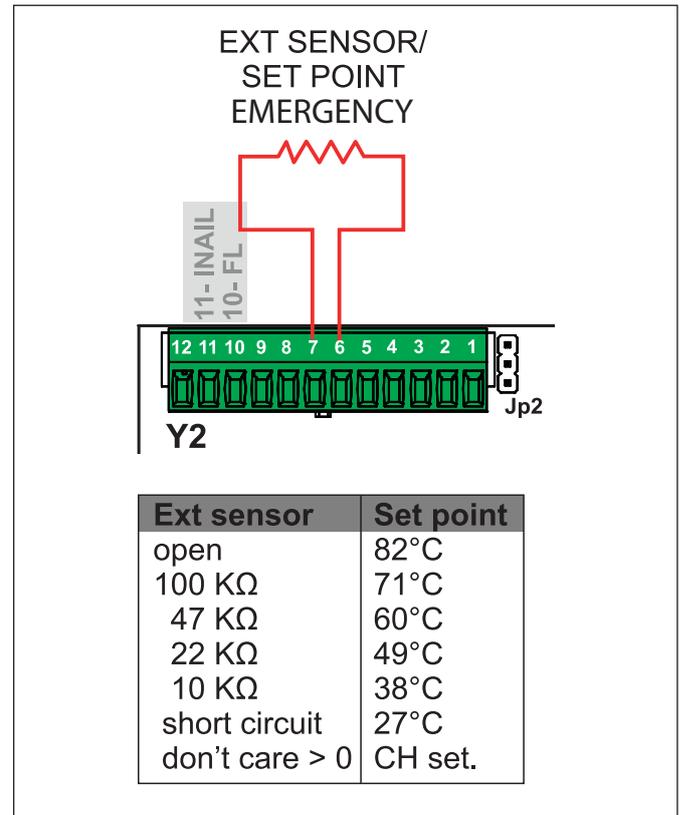
DHW MANAGEMENT

- Stemp ACC. Temperature sensor for DHW storage tank.
- COMMAND P.Car DHW Relay output for storage tank load pump.

CH MANAGEMENT

- ON / OFF input for CH demand.
- COMMAND P.CH Relay output for the direct flow.

Manual Emergency request at temperature SET POINT, by inserting a resistance at the indicated value.



3.1 PROGRAMMING THE OPERATION PARAMETERS



In order to change the BCM parameters, refer to HSCP book chap. 1.9 DEVICE MANAGEMENT



3.2 BCM PARAMETERS (HSC) - GENERAL SETTINGS/SETTINGS FOR USE WITH HSCP

Code	Symb.	Value	Description	Factory setting	BCM use setting with HSCP
803	Srv		Services enabled		
		16	All services disabled	16	
		17	Only CH heating		
		18	Only antifreeze		
		19	CH heating + Antifreeze		19
		24	Only DHW		
		25	CH heating + DHW		
		26	DHW + Antifreeze		
		27	CH heating + DHW + Antifreeze		
483	rP	°K	Temp. Max Differential		
		0	Disabled		
		1 ÷ 500	Maximum Δ temperature (° C x 10)	0	0
34	HY	°K	Burner Hysteresis		
		50 ÷ 200	(°C x 10)	5	=
31	HL	°C	CH#1: Burner Minimum Setpoint		
		200 ÷ 400		250	=
39	HH	°C	CH#2: Burner Maximum Setpoint		
		450 ÷ 850		850	=
799	AC		0/10 V analogue input function:		
		0	Manual adjustment target temperature		
		1	Outdoor temperature sensor		1
		2	0 / 10 V Temperature control target	2	
		3	0 / 10 V Modulation control		
376	DI1		Programmable Input #1		
		0	CH Service Enabling		0
		1	Heat generator enabling		
		2	Reset alarms		
322	Po	min	Pump Post-circulation		
		1 ÷ 10		5	
341	PL	V	Minimum modulation outlet pump		
		0 ÷ 100	burner level V x 10	30	
313	Pr	V	Maximum modulation outlet pump		
		0 ÷ 100	burner level V x 10	100	
792	CHP	%	Central heating: Maximum modulation		
		0 ÷ 100		100	
611	POT	°K	Gen: Err. Max. Parallel		
		0/1 ÷ 30		5	
612	POL	%	Gen: Mod. Max. Parallel		
		0 ÷ 100		0	

Code	Symb.	Value	Description	Factory setting	BCM use setting with HSCP
650	dL	°C	DHW: Minimum Setpoint		
		250 ÷ 450		350	
385	dH	°C	DHW: Maximum Setpoint		
		500 ÷ 650		650	
360	dt		Storage tank adjustment		
		0 ÷ 15		0	
656	drt	°K	DHW: Temp. Request Differential		
		-20 ÷ 20		4	
657	drH	°K	DHW: Request Temp. Hysteresis		
		1 ÷ 20		8	
310	dpT	sec.	DHW Pump: Post-circulation		
		5 ÷ 600		60	
660	dbT	°C	DHW: Temp. Boiler Maximum		
		50 ÷ 85		75	
48	ChSet	°C	CH#1: Setpoint		
		20 ÷ 85		85	
64	ChPO		CH#1: Parallel Supply		
		0 ÷ 1		0	
346	mC	%	Minimum % of burner modulation		
		0 ÷ 1000	(*) minimum modulation which determines switching off burner, only cascade management	(*) 250	
600	mB		Burners: Min. Inserted		
		1 ÷ 8		1	
616	BSt	sec.	Gen: Insertion Time		
		30 ÷ 900		120	
613	BRt	sec.	Gen: Removal Time		
		30 ÷ 900		120	
336	HS	°C/min	Temperature Gradient		
		1 ÷ 30		5	
353	HP	°K	CH PID: Proportional		
		0 ÷ 50		25	
354	HI	°K	CH PID: Integrative		
		0 ÷ 50		12	
478	Hd	°K	CH PID: Derivative		
		0 ÷ 50		0	
816	MI		ModBus Address		
		0 ÷ 127		1	



APPLICATION

Code	Symb.	Value	Description	Factory setting	BCM use setting with HSCP
817	MT	sec.	Timeout Modbus		
		0 ÷ 240		30	
896	TU		Unit temperature °C / °F		
		0 ÷ 1		0	
309	St		Application Code		
		0	Burner cascade		
		1	Single burners	1	
368	VA1		Programmable Relay #1		
		0	Main pump control	0	
		1	Boiler status		
369	VA2		Programmable Relay #2		
		0	activated only if fault prevents engagement of minimum burner number.	0	
		1	Activated by each boiler failure		
771	PS		Water Pressure Sensor		
		0	Not enabled	0	
		1	Enabled		
768	LG		Min. Gas Pressure Sens.		
		0	Not enabled	0	
		1	Enabled		
793	COC		Chimney Obstruction Sens.		
		0	Not enabled	0	
		1	CO		
		2	CO and COL		
622	FS		Minimum Flow Sensor		
		0÷7	Bitmap	0	
		1	Flow sensor enabled/Global Fault		
		3	Flow sensor enabled/Local Fault		
		5	Flow sensor enabled/Global Fault and Flow switch fault check		
		7	Flow sensor enabled/Local Fault and Flow switch fault check		
			Software code (read only)		
			Software revision (read only)		



3.3 BCM PARAMETERS (HSC) - GENERAL SETTINGS / USE SETTINGS WITH HSCP

The BCM received is factory preset for control via **0-10V** in temperature. (Control via EXTERNAL TEMPERATURE CONTROL 0-10 V).

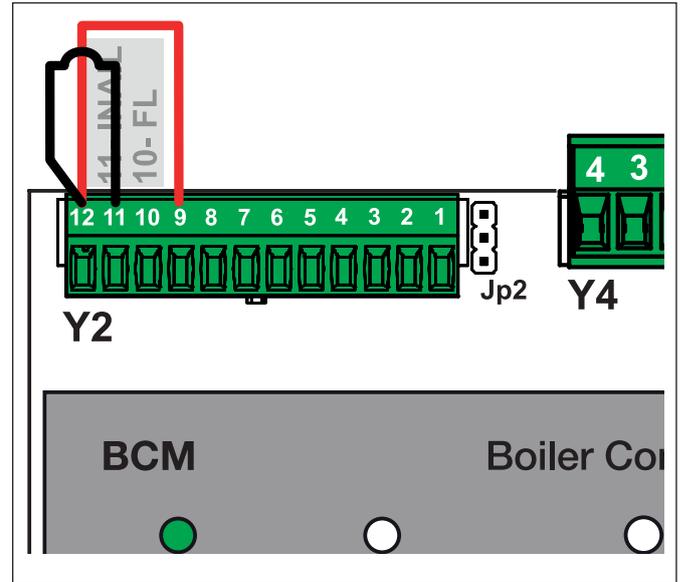
To enable the **0-10 V** request, the contact must be closed between **pin 12** and **pin 9** with a jumper or with a command coming from the external temperature control together with 0-10.

Also jumper **pin 12 and 11 (ISPESL alarm input)** or use it to manage the system's safety devices, with the contact open, all the generators are switched off with alarm triggering.



When using the BCM coupled with HSCP, the following parameters must be modified (parag. 3.1).

Connecting a storage tank probe, **Stemp ACC**, in automatic mode, the parameter **803 Srv** assumes the value **27** and the system re-configuration is requested on HSCP (actually saving the new configuration).

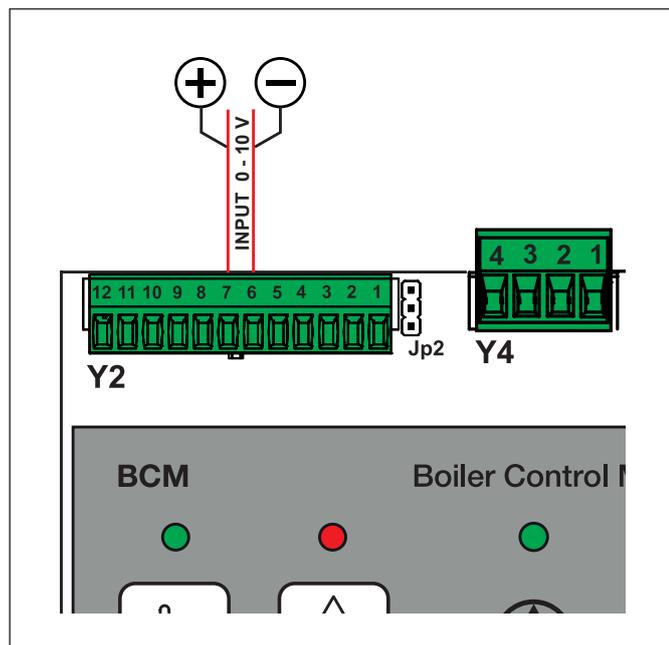


Code	Symb.	Value	Description	Factory setting	BCM use setting with HSCP
803	Srv		Services enabled		
		19	CH heating + Antifreeze		19
		18	Antifreeze		
		27	DHW + Antifreeze		
		1	Boiler control (read only)		
		16	Disabled	16	



APPLICATION

3.4 BCM (HSC) PARAMETERS – SETTING FOR 0-10 V USE



1 Set parameter 39

CH#2: Burner Maximum Setpoint at 10V

2 Value at 0 V always corresponds to 0°C

3 Set parameter 31

CH#1: Burner Minimum Setpoint, below which the request value will be deleted and the burner will switch off

With this configuration, the system will set a temperature based on the received voltage of the 0 - 10 V inlet.

The setting will be between the value of parameter 31 (minimum) and 39 (maximum) when the temperature is lower than 2 °C when compared to the parameter 31 (minimum) the central heating request will be cancelled.

The central heating request restarts when the input voltage corresponds to the value of parameter 31 (minimum).

By changing parameter 39, you can adjust the gradient of the curve.

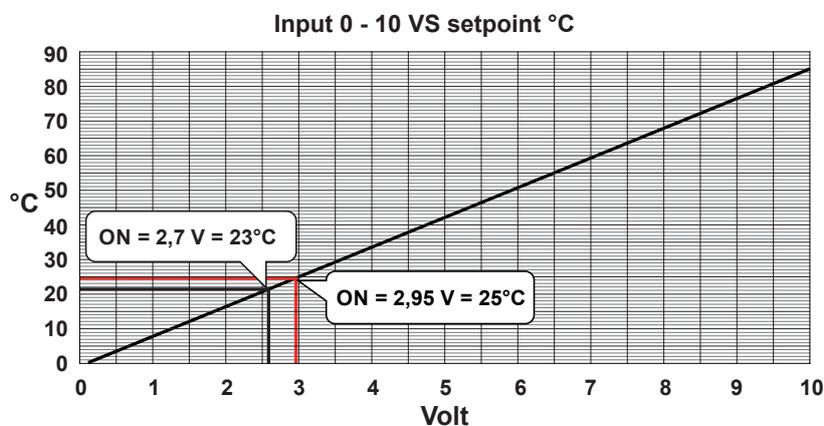
The value of the voltage with reference to the temperature is calculated as follows:

$$V = x \text{ } ^\circ\text{C} * 10 / \text{par } 39 \text{ or } ^\circ\text{C} = V * \text{par } 39/10$$

Standard setting condition example:

Parameter 39 = 85°C

Parameter 31 = 25°C

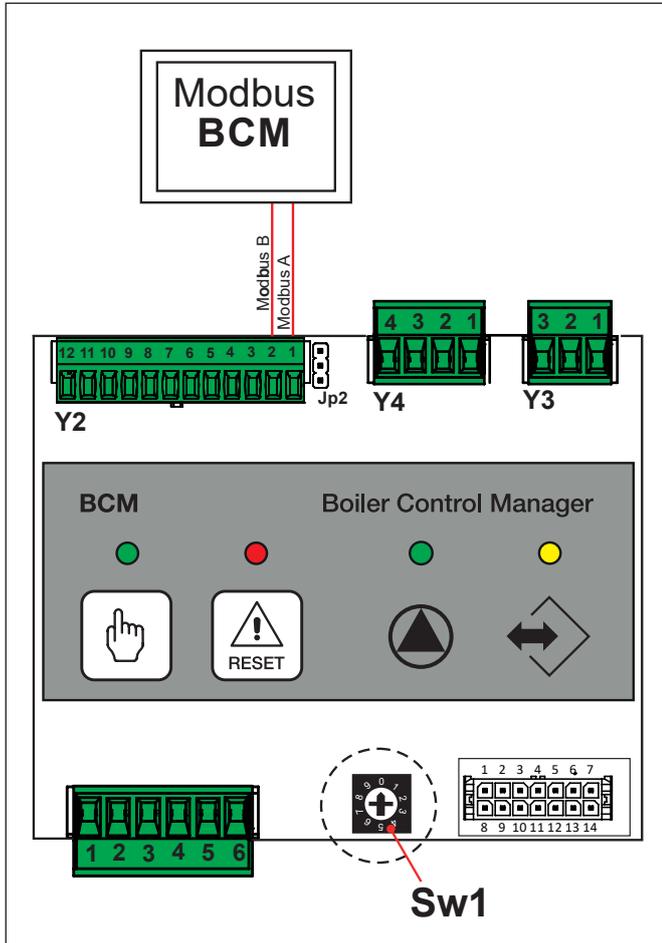


Cod.	Simb.	Valore	Descrizione	Impostazione Fabbrica	Impostazione utilizzo BCM con HSCP
799	AC		0/10 V analogue input function:		
		0	Manual adjustment target temperature		
		1	Outdoor temperature sensor		1
		2	0 / 10 V Temperature control target	2	
		3	0 / 10 V Modulation control		
31	HL	°C	CH#1: Burner Minimum Setpoint,		
		200 ÷ 400		350	=
39	HH	°C	CH#2: Burner Maximum Setpoint		
		450 ÷ 850		850	=



3.5 BCM (HSC) PARAMETERS - SETTING FOR USE WITH MODBUS

It is possible to control the boiler not only with 0-10V but also with Modbus



Notes:

The tables of the Modbus registers can be consulted from the technical info site.

To change the Modbus address (default 1), parameter 816 must be changed.

The Sw1 rotary selector only works on the eBUS address.

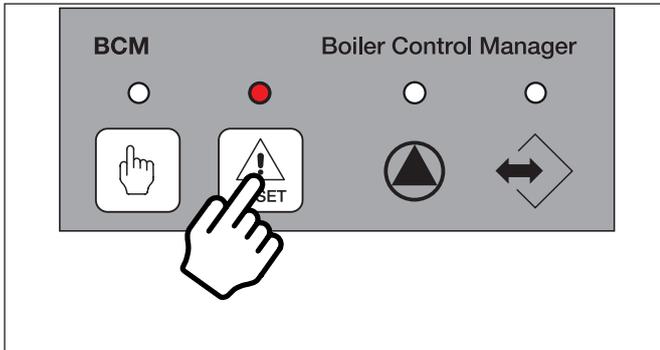
Cod.	Simb.	Valore	Descrizione	Impostazione Fabbrica
816	MI		ModBus Address	
		0 ÷ 127		1
817	MY	sec.	Timeout Modbus	
		0 ÷ 240		30



3.6 ERROR CODE

When the boiler detects a fault, the alarm symbol is shown on the user interface display.

It is possible to reset the boiler by pressing R from user interface or pressing RESET from BCM.



CODE	DESCRIPTION detected on BCM (HSC)	REMEDIES
9	EXTERNAL PROBE (SE) Enabled but not connected Effect: No OTC	RESET: MANUAL / AUTO
13	DHW SENSOR (S.acc DHW) DHW sensor failure Effect: DHW service is not active	RESET: AUTO Check efficiency of the sensor (see Res/Temp table) or its connections.
39	USER PARAMETERS CORRUPTED by electromagnetic interferences Effect: none	RESET: AUTO
56	THE HSCP remote control is connected but not detected.	It is possible to activate the ignition of the burner by means of the BCM manual request button (A)
02	GAS PRESSURE SWITCH Gas pressure insufficient if the parameter LG = 1 Effect: stop	RESET: AUTO The ignition procedure is prevented until the gas pressure has reached the correct values.
57	BMM BOARD NOT DETECTED Effect: stop	RESET: AUTO Check electrical connections BMM e-BUS1
29	WATER IN THE COMBUSTION CHAMBER Effect: stop	RESET: AUTO
18	MAXIMUM PROTECTION ΔT FLOW-RETURN Effect: Stop burner, Pump on maximum speed.	RESET: AUTO Circulation control, check installation
19	FLOW TEMPERATURE RISE. It is activated when the flow temperature is > 95. It is automatically restored when the temperature is < 80. Effect: Stop burner, Pump on maximum speed.	Circulation control
14	RETURN PROBE Auxiliary (SRG) sensor interrupted	Check the wiring; if necessary, replace the auxiliary sensor

CODE	DESCRIPTION detected on BCM (HSC)	REMEDIES
40	MINIMUM WATER FLOW RATE (DK) The main water flow is not detected by DK within 20" after activation of the pump. It is enabled if the parameter FS = 1, 2 or 3 .. If FS.1 = 0, Effect: Burner stop	RESET: AUTO Circulation control, check installation
73	NO WATER PRESSURE SWITCH Fault is controlled only if the parameter FS 2 = 1. It is detected if the input DK is active for more than 20" after deactivation of the pump. Effect: Burner stop	RESET: AUTO Circulation control, check installation
08	NO WATER Insufficient water pressure and consequent triggering of pressure switch of minimum water pressure (DK). Effect: Burner stop	RESET: AUTO
17	HEAT EXCHANGER FREEZING Heat exchanger freezing detection. If the central heating sensor detects temperature below 2° C, burner ignition is prevented until the sensor detects temperature above 5°C. Effect: Burner stop, Pump active for 5 ' at maximum speed to receive heat from the pump.	RESET: AUTO
58	FLOW SENSOR SGM Effect: Burner OFF.	RESET: AUTO Detected only if more than 1 BMM is connected (cascade application).
28	CLOGGED DRAINS Detected by the CO sensor if enabled by the parameter COC = 1 or 2. If COC = 2, the COL sensor is controlled to detect obstruction of the chimney in low air flow rate conditions. It is controlled when only 1 burner switches on. If the chimney is obstructed, the code is automatically cancelled after 10'. Effect: burner off.	RESET: MANUAL Check Chimneys / Check drain trap.
93	SAFETY PROTECTION: Triggering of INAIL safety devices, or, if missing, jumper open (Y2-11/12) Effect: Burner stop and pump stop	RESET: MANUAL (after having released individual safety devices).
30	SERVICE PARAMETERS CORRUPTED by electromagnetic interferences Effect: Burner ignition inhibited	RESET: MANUAL
38	DEFAULT PARAMETERS CORRUPTED by electromagnetic interferences Effect: Burner ignition inhibited	RESET: MANUAL
37	DEFECTIVE PARAMETERS MEMORY Effect: Burner ignition inhibited	RESET: MANUAL











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