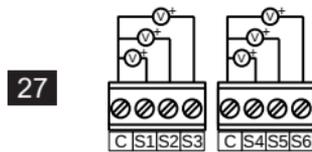
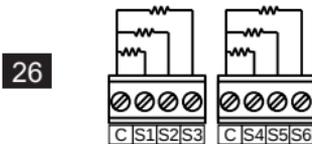
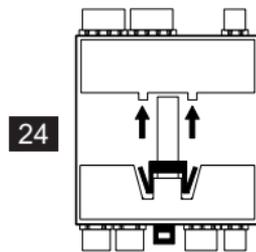
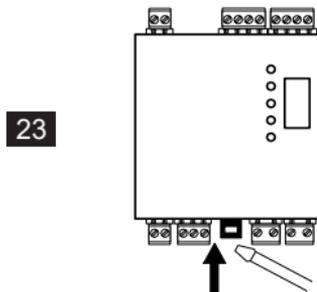
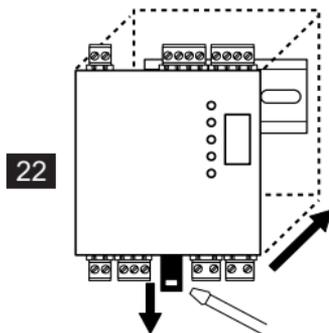
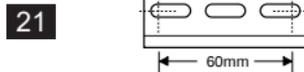
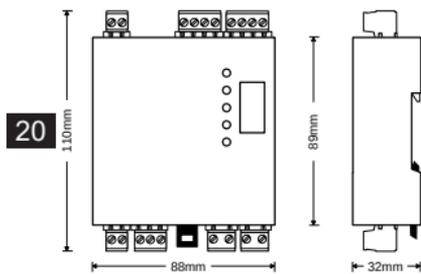


Reference  
manual

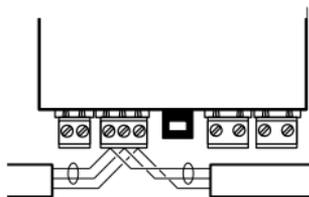
DCOM-LT/IO

Reference manual  
DCOM-LT/IO

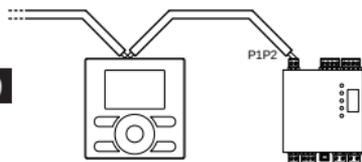
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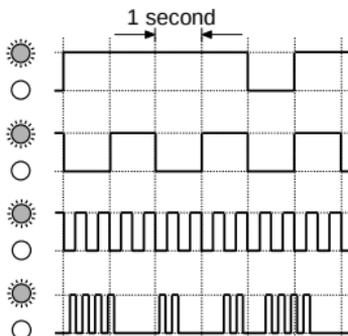
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29



30



31



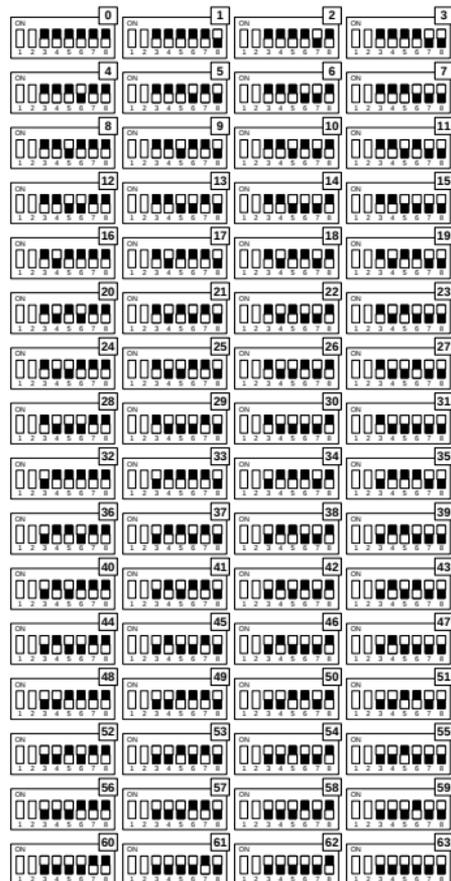
32



33



34



## GENERAL SAFETY PRECAUTIONS

The English text is the original instruction. Other languages are translations of the original instructions.

Refer to <http://www.daikin-europe.com/support-and-manuals/product-information/> for more detailed user reference guides



Refer to Daikin documentation on the Daikin Altherma products and controllers compatibility.

Supported DCOM functions might be different depending on the unit. Refer to the unit manual for more details.



### WARNING

Carefully read these instructions before installation. They will tell you how to install, how to configure and how to use the unit properly. Keep this manual in a handy place for future reference.

This is an option to be used in combination with Daikin units. Refer to the installation and operation manual of the units for installation and operation instructions.

Improper installation or attachment of equipment or accessories could result in electric shock, short-circuit, leaks, fire or other damage to the equipment or personal injury.

If unsure of installation procedures or use, always contact your dealer for advice and information.



Do **NOT** install the DCOM:

Near machinery emitting electromagnetic radiation. Electromagnetic radiation may disturb the operation of the control system and result in a malfunction of the unit.

In moist areas or places where it may be exposed to water. If water enters the device, electric shocks may be caused and the inner electronics may fail.



In order to comply with SELV system requirements do not connect the P1P2 network to any other connection apart from the P1P2 connection on the DCOM and compatible P1P2 connections on Daikin equipment



**WARNING** the operation of the product in smart-grid applications must be according to EN60730-1:2011 and must not override the operation of any type 2 action controls nor interfere with any protective function of the control



**WARNING** The product must be securely fastened to a 35mm IEC/EN 60715 DIN rail. If the relay terminals R1 or R2 are connected to voltages greater than 50VAC or 75VDC, or if the DCOM power supply is not SELV/ PELV, then the product must be mounted in an enclosure that is only accessible to qualified persons by use of a tool. The enclosure may be metal or plastic, certified in accordance with EN62208:2011, if the enclosure is plastic it must have a flammability rating of at least IEC 60695-11-10 V-1.



**WARNING** Relays must only be used for indication function and must not be used for control function. Do not exceed the specified ratings of the relays. If the relay terminals R1 or R2 are connected to voltages greater than 50VAC or 75VDC, the connected cables must be insulated with a voltage rating of 600V and flame retardant insulation, conductors should be stranded copper to EN60228:2011 with cross-sectional area of 0.5 to 2.5mm square.



All cables must be fitted with adequate strain relief and be protected from abrasion.

### EN 60730-1 DECLARATION

Category	Declaration
Model Name	DCOM-LT/IO
Model Number	535-001
Mounting	Surface Mounting
Purpose of control	Operating Control
Protection against electric shock	Independently mounted Class I Equipment
Software Class	Class A
Control Action	Type 1
Pollution degree	2
Rated Impulse Voltage	Category II 500V
Surge Immunity Category	Installation Class 2



### WEEE

The adjacent symbol indicates that a product is not to be disposed of with household waste, according to the Directive and each country's national law. The product should be handed in at a designated collection point or to an authorised collection site for recycling waste electrical and electronic equipment (EEE).

## SPECIFICATIONS

Physical	Dimensions	110 x 88 x 32 mm
	Weight	80g
	Enclosure	PC ABS UL94-V0
	Connectors	PA 6.6 UL94-V0
	Mounting	35mm IEC/EN 60715 DIN Rail
	Protection	IP20
Electrical	Power Supply	Regulated 15-24VDC 120mA
	Terminals	CSA 0.5 to 2.5mm <sup>2</sup> Torque 0.5Nm
Networks	P1P2	<1m
	RS485	RS485(TIA-485-A) 3-wire <500m, 9600 Baud, No Parity, 1 Stop Bit
	Modbus	Modbus RTU
Inputs	Resistive	12VDC, max 20mA
	Voltage	0-10V, Impedance 345kΩ
Outputs	Outputs	230VAC, 3A resistive 30VDC, 3A resistive
Environment		Storage: -10..60°C Operating: 0..55°C
	Humidity	0-90% Non-condensing
	EMC	EN60730-1:2011
	Safety	EN60730-1:2011

Voytech Systems Limited, Unit 203, China House, 401 Edgware Road, London, NW2 6GY, UK. Tel: +44 203 287 2728 WWW: [www.voytech-systems.co.uk](http://www.voytech-systems.co.uk)

## INSTALLATION

### MOUNTING

**21** If using the DIN rail supplied with the DCOM, mount the DIN rail horizontally using two or more fasteners.

**22** Align the module DIN mounting points with the top of the DIN rail.

**23** Pull down the black clip H with a suitable tool, align the module vertically flush with the DIN rail and release the clip to fix the module to the DIN rail **24**.

### WIRING

#### POWER TERMINALS **A**

Connect the Power Terminals to a regulated power supply.



#### NOTICE: POWER SUPPLY

The DCOM-LT/IO requires a 15-24VDC regulated power supply with a minimum supply current of 120mA. Do not operate the DCOM outside of the specified voltage range.



#### INFORMATION

Power terminals are polarity independent. 0V and +V can be wired to either terminal.

#### P1P2 TERMINALS **B**

Connect terminals P1P2 to a compatible Altherma LT Master Remote Controller, for example an MMI.



#### ALTHERMA 2 COMPATIBILITY

For Altherma 2 and EKRUCL\* / EKRUHML\* the DCOM can only be used with Remoon if LAN adaptor is NOT connected.

Refer to Daikin documentation for more details on the compatibility.

#### RS485 TERMINALS **B**

The DCOM RS485 Terminals are connected to an RS485 daisy-chained bus using a stranded twisted pair with overall shield and drain wire. Terminals '+' and '-' must be connected

to matching terminals on other RS485 devices using the twisted pair. Terminal 'C' must be connected to all other RS485 Common terminals using the drain wire. The shield should only be earthed at one location.

#### RELAY OUTPUTS **C D**

Relays 1 and 2 are volt-free normally open relay contacts for indication of unit operation and fault conditions.

#### CONTROL INPUTS **F G**

The Control Inputs Sensors S1 to S6 are configured to measure voltage, resistance and volt-free contacts. The input measurement mode is determined by the operating mode selected by SW1 (see **Description of Operation** for switch settings). Each input is connected between the input sensor terminal S1-S6 and the common C of one of the two connectors F and G. Input wiring should be 0.5 to 0.75mm<sup>2</sup> stranded twisted pair with screen, the screen must be earthed at only one end.

#### CONTROL INPUT MODES

The input measurement mode of each input is separately specified by the operation setting. In all cases a common terminal C is connected to the corresponding input terminal using a voltage **27**, resistance **26** or volt-free contact **25**. For voltage inputs the negative or 0V of the voltage source must be connected to the common terminal and the positive connected to the sensor terminal.

#### LEDS AND SWITCHES

##### DIP SWITCHES **J**

Switch SW1 consists of 8 switches numbered SW1.1 to SW1.8. Except for Smart Grid mode, Switches SW1.1 and SW1.2 select the operating mode, and switches SW1.3 to SW1.8 select the Modbus Address of the device **34**. In the case of Smart Grid Mode switches SW1.1 to SW1.4 select the Smart Grid function, and switches SW1.5 to SW1.8 select the Modbus Address of the device **34**.

##### LEDS **P Q R S T I**

LED flashing sequences are defined in **30** to **33**.



#### INFORMATION: LED OPERATION AT POWER-UP

At power-up all LEDs illuminate for 2 seconds. LEDs **P**, **Q**, and **R** change from RED to GREEN and then revert to the behaviour described in the following sections for each LED. LEDs **S**, **T** illuminate YELLOW for 2 seconds then revert to the behaviour described in the following sections for each LED.

Status LED **P** will then flash Yellow indicating **Waiting for Altherma Master**. All other LEDs will initially be off, until communications occurs on P1P2 or RS485 network.

#### STATUS LED **P**

Colour	Pattern	Meaning
YELLOW	<b>31</b>	Waiting for Altherma Master
YELLOW	<b>32</b>	Synchronising with Master
RED	<b>31</b>	Timeout Waiting for Master
GREEN	<b>30</b>	Master synchronised, No Fault
RED	<b>30</b>	Master synchronised, Unit Fault

When the device powers up it starts in the **Waiting for Altherma Master** status and the Status LED will flash YELLOW slowly **31**. When the Altherma master is detected the Status LED will flash YELLOW fast **32** while synchronising with the Altherma Master. When synchronisation is complete the Status LED is GREEN or RED depending if a fault condition exists, the LED will be off for 1 second every 5 seconds to indicate normal operation **30**.

Synchronisation can take up to 8 minutes. When synchronised, if communications fails for 60 seconds then the DCOM reverts to **Waiting for Altherma Master** status.

If synchronisation takes more than 10 minutes then the DCOM will revert to **Waiting for Altherma Master** status and wait for synchronisation to restart. If the DCOM remains in **Waiting for Altherma** status for more than 3 minutes then the DCOM will switch to **Timeout Waiting for Master** status and the Status LED will flash RED **31**.

Colour	Pattern	Meaning
GREEN		Normal Communication
RED		Communications Errors
RED		Communications Failure

The ACNET LED will flash GREEN at irregular intervals when a message is received to indicate normal communications . If a communications error occurs the error will be indicated by the LED flashing RED on each error. If the communications are permanently in error then the LED will flash RED continuously .

RS485 LED 

Colour	Pattern	Meaning
GREEN		Normal Communication
RED		Communications Errors
RED		Communications Failure

The RS485 LED will flash GREEN at irregular intervals when a message is received to indicate normal communications . If a communications error occurs the error will be indicated by the LED flashing RED on each error. If the communications are permanently in error then the LED will flash RED continuously .

RELAY 1 AND 2 LEDS  

Relay 1 and 2 LEDs will illuminate when corresponding relay contacts are closed. Refer to the **Description of Operation** section for specific relay functions.

If the DCOM status is **Waiting for Altherma Master** or **Synchronising with Altherma Master** then Relay outputs will be open circuit. If the DCOM status is **Timeout Waiting for Master** then if a Relay Output is configured for Fault Indication, then the relay will be closed. Refer to the **Description of Operation** for further information.

**DESCRIPTION OF OPERATION**

The DCOM-LT/IO is a control interface for Daikin Altherma units, refer to Daikin documentation on the Daikin Altherma model and the controller compatibility. The DCOM-LT/IO has 4 modes of operation that are selected by the Configuration Switches SW1. The modes are

- Resistance/Voltage Mode
- Sequencer Mode
- Smart Grid Mode

The configuration and functions of the inputs and outputs in each mode are described in the following sections. Refer to the **DCOM-LT/IO Reference Manual** for description of each input function.

**INPUT CONTROL FUNCTIONS** **INFORMATION**

Input control values are only applied when the DCOM is synchronised with the Altherma system.

 **INFORMATION : ENFORCEMENT**

Some Input functions Enforce unit operation to be On and Off, this will override any user or time schedule changes to the unit function. Enforce operations remain in place after an input has been changed. Other Input functions only change unit operation when the Input function changes and further changes are allowed by user or time schedule operation. Cases where Enforced operation is in use are indicated in the description of the Input function.

 **INFORMATION : STARTUP BEHAVIOUR**

When the DCOM powers-up, or resynchronises with the Altherma Master, any inputs that are NOT enforced will not update unit settings until the input value changes after synchronisation has occurred.

In the case of inputs which change Setpoint and On/Off state, the input must transition from an OFF to ON state to transmit an ON command.

In the case of Enforced inputs the enforcement is applied when the synchronisation occurs.

**RESISTANCE INPUTS**

When inputs are configured for resistance mode the following input methods are available for changing control function operation.

	Input terminals are <b>open-circuit</b> or have a measured resistance of >100k $\Omega$
	Input terminals are <b>short-circuit</b> or have a measured resistance of <50 $\Omega$
	Input terminals are connected to a fixed resistance of 10k $\Omega$ +/- 1k $\Omega$
	Input terminals are connected to a variable resistance of 1-10k $\Omega$

**VOLTAGE INPUTS**

When inputs are configured for voltage mode a 0-10VDC signal can be used for changing control function operation.

	Input terminals are <b>open-circuit</b> or have a measured voltage of <0.5VDC
	Input terminals are connected to an external voltage source of >0.9VDC
	Input terminals are connected to an external variable voltage source of 1-10VDC

 **NOTICE**

Do not exceed the maximum input voltage of 10VDC

**SETPOINT AND ON/OFF INPUT**

In cases where an input is used for Setpoint and On/Off operation, the associated control function is updated only when the input resistance or voltage is changed. For resistance mode the input value must change by at least 0.1k $\Omega$ , for voltage mode the input value must change by at least 0.1V. If the control function value is modified by the user the DCOM will not change the value until the input value changes by the minimum specified amount.

The control function is switched On and Off by measurement of the values specified below.

		
OFF		
ON		

When the control function is ON, the control setpoint can be selected by setting the input value according to the table below.

		
0°C	2kΩ	2V
10°C	3kΩ	3V
20°C	4kΩ	4V
30°C	5kΩ	5V
40°C	6kΩ	6V
50°C	7kΩ	7V
60°C	8kΩ	8V
70°C	9kΩ	9V
80°C	10kΩ	10V

In Resistance mode the setpoint can be adjusted by 0.1kΩ increments to adjust setpoint to nearest 1°C. In Voltage mode the setpoint can be adjusted by 0.1V increments to adjust setpoint to nearest 1°C.



#### INFORMATION

Measurement accuracy of inputs is +/- 1°C.



#### INFORMATION

The available setpoint range for each control function is determined by the Minimum and Maximum Setpoint of the function allowed by the Altherma unit. Consult the Altherma operation manual for the setpoint ranges of the selected product.



#### INFORMATION

If the Input resistance or voltage value falls outside of the control function setpoint range the setpoint will be set to the nearest minimum or maximum value of the setpoint range..

#### OUTPUT CONTROL FUNCTIONS

The Output Relays Relay 1 **C** and Relay 2 **D** can be configured for a number of different output functions in each of the DCOM operating modes.

Relay	Function	Closed Circuit Indication
Relay 1	Space Heating/Cooling	Space Heating/Cooling ON
	Active Space Heating	Space Heating ON + 3-port valve position is Space Heating + Compressor is Running
Relay 2	Fault Indication	Closed on fault condition
	Pump Operation	Closed when pump is running

#### MODBUS CONTROL FUNCTIONS

The DCOM-LT/IO supports Modbus RTU control and monitoring functions via the RS485 communications port. Refer to the **DCOM-LT/MB Reference Manual** for further information.



#### NOTICE

If control function values are changed from Modbus, the input value will be overridden if the Input Function is not Enforced. If the Input Function is Enforced then the Modbus value will revert to the Enforced value.

## RESISTANCE/VOLTAGE MODE

#### SW1 Settings



Resistance Mode



Voltage Mode

In Resistance/Voltage Mode the Altherma system operation is controlled using the inputs of the DCOM. Inputs S1 to S3 are used to control the operation mode and adjust the space heating, space cooling and DHW Tank setpoints. These inputs can be configured as either Resistance or Voltage inputs.

#### RESISTANCE MODE

S	Function			
S1	Space Heating	OFF	ON + Set Heat Mode	ON + Set Heat Mode + Set LWT Heating Setpoint
S2	Space Cooling	OFF	ON + Set Cool Mode	ON + Set Cool Mode + Set LWT Cooling Setpoint
S3	DHW Tank	OFF	ON	ON + Set DHW Reheat Setpoint

#### VOLTAGE MODE

S	Function			
S1	Space Heating	OFF	ON + Set Heat Mode	ON + Set Heat Mode + Set LWT Heating Setpoint
S2	Space Cooling	OFF	ON + Set Cool Mode	ON + Set Cool Mode + Set LWT Cooling Setpoint
S3	DHW Tank	OFF	ON	ON + Set DHW Reheat Setpoint

In Resistance and Voltage Mode, inputs S4 to S6 are Resistance inputs and can be open circuit (O/C) or linked with 10kΩ Resistor or Short Circuit (S/C) to select the following functions.

S	Function	O/C	10kΩ	S/C
S4	Quiet Mode	Quiet Mode Off	Quiet Mode Off	Quiet Mode On
S5	Relay 1 Function	Space Heating/Cooling	Space Heating/Cooling + Cooling Mode Prohibit	Active Space Heating
S6	Relay 2 Function	Fault Indication	Fault Indication	Pump Operation

#### INFORMATION S1, S2

If Input S1 and Input S2 values change within 1 second input S1 control is updated and input S2 control is not changed.

#### INFORMATION S5

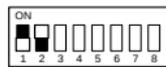
When Input S5 is configured with a 10kΩ resistor, Relay 1 is configured to indicate Space Heating/Cooling operation, and the DCOM prohibits Cooling Mode. If the unit mode is changed to Cooling Mode then the DCOM will change the mode to Heating.

#### INFORMATION : ENFORCEMENT

In Resistance/Voltage Mode, none of the inputs Enforce unit operation. All command inputs will update unit operation only when the input value changes.

## SEQUENCER MODE

### SW1 Settings



Sequencer Mode

For operation in Sequencer Mode the Altherma Unit must be configured to operate in Leaving Water Temperature control mode.

#### INFORMATION

When Sequencer Mode is selected, the Modbus Register Table is changed. Refer to the DCOM-LT/MB Reference Manual for details.

Inputs S1 to S4 functions are selected by a Short Circuit across the input terminal. Input S5 is not used. Inputs S6 is configured as a Voltage Input.

S	Function	O/C	S/C
S1	Space Heating On	OFF	ON + Set Heat Mode
S2	Space Cooling On	OFF	ON + Set Cool Mode
S3	DHW Reheat Disable	DHW Reheat Enable	DHW Reheat Disable
S4	Quiet Mode	Disable	Enable
S5	Not in use	--	--

S	Function	<0.5V	1-10V
S6	LWT Heating/Cooling Setpoint	Not active	Set LWT Heating/Cooling Setpoint

Relay	Function
Relay 1	Space Heating/Cooling
Relay 2	Fault Indication

#### INFORMATION S1, S2

If Input S1 and Input S2 values change within 1 second input S1 control is updated and input S2 control is not changed.

#### INFORMATION S3

When Input S3 is closed circuit, DHW Reheat is disabled and manual operation will be Enforced off. When Input S3 changes to open circuit, the previous DHW Reheat On/Off state will be restored.

#### INFORMATION S6

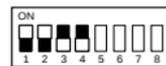
Input S6 must be connected to a 0-10V signal. The voltage on the terminals specifies the LWT Setpoint of the selected Heating or Cooling mode.

#### INFORMATION : ENFORCEMENT

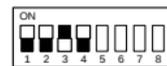
In Sequencer Mode, Input S3 will Enforce DHW Reheat Disable. All other command inputs will update unit operation only when the input value changes.

## SMART GRID MODE

### SW1 Settings



Permanent Enforcement



Time-limited Enforcement

In Smart Grid Mode inputs S1 to S4 are used to prohibit some or all functions of the Altherma unit. The prohibition operation can be selected using SW1.4 to be either permanent enforcement or can be time limited to a maximum of 3 hours.

In time limited enforcement, after a period of 3 hours the enforcement is removed. To extend a time limited enforcement to longer than 3 hours, before the end of the time period each prohibit input in use must be switched to open circuit for a minimum of 60 seconds before re-applying the prohibit enforcement.

In time-limited enforcement the enforcement will remain for 60

seconds after the input command is removed.

Inputs S5 and S6 override the prohibit functions S1 to S4. The S5 signal will run the DHW reheat function, the S6 signal will run the DHW booster heater.

S		
S1	Not Active	Prohibit Space Heating or Cooling
S2	Not Active	Prohibit DHW Reheat
S3	Not Active	Prohibit DHW Booster Heater
S4	Not Active	Prohibit All Functions
S5	Not Active	PV Energy Available for storage
S6	Not Active	Run Powerful Booster

Relay	Function
Relay 1	Space Heating/Cooling
Relay 2	Fault Indication



#### INFORMATION : ENFORCEMENT

In Smart Grid Mode, all inputs are Enforced and will override any user operation requests. When the input command is removed or Time Limited Enforcement ends, any previous user settings changed by the DCOM are restored.

## REFERENCE

## RESISTANCE/VOLTAGE MODE

### RESISTANCE MODE S1-S3

#### S1: SPACE HEATING OPERATION

If Short-circuit or 1-10kΩ resistance is placed on input S1 then Space Heating/Cooling will be switched On and the Mode will be changed to Space Heating. If the Input Value is a resistance in the range 1-10kΩ then the LWT Heating Setpoint will be set according to the Table in the **Description of Operation**. A change of resistance greater or equal to 0.1kΩ will cause the Setpoint to change. If the Input becomes Open-circuit then Space Heating/Cooling will be set to Off, the Mode and the LWT Heating Setpoint will not be changed.

#### S2: SPACE COOLING OPERATION

If Short-circuit or 1-10kΩ resistance is placed on input S2 then Space Heating/Cooling will be switched On and the Mode will be changed to Space Cooling. If the Input Value is a resistance in the range 1-10kΩ then the LWT Cooling Setpoint will be set according to the Table in the **Description of Operation**. A change of resistance greater or equal to 0.1kΩ will cause the Setpoint to change. If the Input becomes Open-circuit then Space Heating/Cooling will be set to Off, the Mode and the LWT Cooling Setpoint will not be changed.

#### S3: DHW TANK OPERATION

If Short-circuit or 1-10kΩ resistance is placed on input S3 then DHW will be switched On. If the Input Value is a resistance in the range 1-10kΩ then the DHW Reheat Setpoint will be set according to the Table in the **Description of Operation**. A change of resistance greater or equal to 0.1kΩ will cause the Setpoint to change. If the Input becomes Open-circuit then DHW will be set to Off, the DHW Reheat Setpoint will not be changed.

### VOLTAGE MODE S1-S3

#### S1: SPACE HEATING OPERATION

If 1-10VDC is placed on input S1 then Space Heating/Cooling will be switched On and the Mode will be changed to Space Heating. The LWT Heating Setpoint will be set according to the Table in the **Description of Operation**. A change of voltage greater or equal to 0.1V will cause the Setpoint to change. If the Input voltage changes to <0.5VDC then Space Heating/Cooling will be set to Off, the Mode and the LWT

Heating Setpoint will not be changed.

#### S2: SPACE COOLING OPERATION

If 1-10VDC is placed on input S2 then Space Heating/Cooling will be switched On and the Mode will be changed to Space Cooling. The LWT Cooling Setpoint will be set according to the Table in the **Description of Operation**. A change of voltage greater or equal to 0.1V will cause the Setpoint to change. If the Input voltage changes to <0.5VDC then Space Heating/Cooling will be set to Off, the Mode and the LWT Cooling Setpoint will not be changed.

#### S3: DHW TANK OPERATION

If 1-10VDC is placed on input S3 then DHW will be switched On. The DHW Reheat Setpoint will be set according to the Table in the **Description of Operation**. A change of voltage greater or equal to 0.1V will cause the Setpoint to change. If the Input voltage changes to <0.5VDC then DHW will be set to Off, the DHW Reheat Setpoint will not be changed.

### RESISTANCE/VOLTAGE MODE S4-S6

#### S4: QUIET MODE

If Input S4 changes to Short-circuit then the Altherma system is set to Quiet Mode. If Input S4 changes to Open-circuit then Quiet Mode operation is removed. After the input has changed, the Quiet mode function is not enforced by the DCOM and can be changed by user command.

#### S5: RELAY 1 FUNCTION

If Input S5 is Open-circuit then Relay 1 will be closed if Space Heating/Cooling is On, even if compressor is not running or 3-port valve is position is DHW.

If Input S5 measures a 10kΩ resistance (tolerance +/- 1 kΩ) then the Relay 1 will be closed if Space Heating/Cooling is On, in addition the DCOM will prohibit Cooling mode, if cooling mode is selected the DCOM will change the mode to Heating. When the 10kΩ input is removed from the input the Space Heating/Cooling mode will be restored to the value before the Prohibit Cooling function was applied.

If Input S5 is Short-circuit, then Relay 1 will be closed if Space Heating/Cooling is On, Space Heating/Cooling Mode is Heating, the Compressor is running and the 3-port valve position is set to Space Heating.

#### S6: RELAY 2 FUNCTION

If Input S6 is Open-circuit then Relay 2 will be closed if the Altherma system reports a fault condition that is reported as

an error condition. If the fault condition is reported as a warning the relay will not close.

## SEQUENCER MODE

### S1: SPACE HEATING ON

When Input S1 changes to Short-circuit, Space Heating/Cooling is set to On and the Mode is changed to Heating. When S1 changes to Open-circuit Space Heating/Cooling is set to Off, the Mode is not changed. When input S1 is not changing, user operation can change Space Heating/Cooling On/Off state.

### S2: SPACE COOLING ON

When Input S2 changes to Short-circuit, Space Heating/Cooling is set to On and the Mode is changed to Cooling. When S2 changes to Open-circuit Space Heating/Cooling is set to Off, the Mode is not changed. When input S1 is not changing, user operation can change Space Heating/Cooling On/Off state.

### S3: DHW REHEAT DISABLE

When Input S3 is closed circuit, DHW Reheat is disabled and manual operation will be overridden off. When Input S3 changes to open circuit, the previous DHW Reheat On/Off state will be restored When input S3 is Open-circuit, user operation can change DHW On/Off state.

### S4: QUIET MODE

If Input S4 changes to Short-circuit then the Altherma system is set to Quiet Mode. If Input S4 changes to Open-circuit then Quiet Mode operation is removed. After the input has changed, the Quiet mode function is not enforced by the DCOM and can be changed by user command.

### S6: LWT HEATING/COOLING SETPOINT

If 1-10VDC is placed on input S6 then if Mode is Heating then LWT Heating Setpoint will be set according to the Table in the Description of Operation. If Mode is Cooling then LWT Cooling Setpoint will be set according to the Table in the **Description of Operation**. A change of voltage greater or equal to 0.1V will cause the Setpoint to change. If the Input voltage is less than to <0.5VDC then the Heating or Cooling Setpoint will not be changed.

## SMART GRID MODE

### S1: PROHIBIT SPACE HEATING/COOLING

If Input S1 is Short-circuit then the Altherma system Space Heating/Cooling is Enforced Off. If the Space Heating/Cooling is switched On by user or schedule, then the DCOM will switch it to the Off state. When the S1 input becomes Open-circuit, or the Time-limited Enforcement period ends, the DCOM will restore the Space/Heating On/Off state to the value before the Prohibit operation was applied.

### S2: PROHIBIT DHW REHEAT

If Input S2 is Short-circuit then the DHW is Enforced Off. If the DHW is switched On by user or schedule, then the DCOM will switch it to the Off state. When the S2 input becomes Open-circuit, or the Time-limited Enforcement period ends, the DCOM will restore the DHW On/Off state to the value before the Prohibit operation was applied.

### S3: PROHIBIT DHW BOOSTER HEATER

If Input S3 is Short-circuit then the DHW Booster Heater is Enforced Off. If the DHW Booster Heater is switched On by user or schedule, then the DCOM will switch it to the Off state. When the S3 input becomes Open-circuit, or the Time-limited Enforcement period ends, the DCOM will restore the DHW Booster Heater On/Off state to the value before the Prohibit operation was applied.

### S4: PROHIBIT ALL FUNCTIONS

If Input S4 is Short-circuit then the DCOM will prohibit Space Heating/Cooling, DHW and DHW Booster Heater. If any of these functions are switched On by user or schedule, the DCOM will switch the functions Off. When the S4 input becomes Open-circuit, or the Time-limited Enforcement period ends, the DCOM will restore each function to the value before the Prohibit operation was applied.

### S5: PV AVAILABLE FOR STORAGE

If Input S5 is Short-circuit then the DCOM will run the DHW Reheat function, this overrides any prohibit function that may also be applied. When the S5 input becomes Open-circuit, or the Time-limited Enforcement period ends, the DCOM will restore DHW Reheat function to the value before the override operation was applied.

If either Prohibit DHW Reheat and PV Available functions or both are applied the On/Off state of DHW Reheat before either function is applied will be stored by the DCOM, and when both Prohibit DHW Reheat and PV Available functions are removed

the DHW Reheat On/Off state will be restored.

### S6: RUN DHW BOOSTER HEATER

If Input S6 is Short-circuit then the DCOM will run the DHW Booster function, this overrides any prohibit function that may also be applied. When the S6 input becomes Open-circuit, or the Time-limited Enforcement period ends, the DCOM will restore DHW Booster function to the value before the override operation was applied.

If either Prohibit DHW Booster Heater and Run Booster functions or both are applied the On/Off state of DHW Booster Heater before either function is applied will be stored by the DCOM, and when both Prohibit DHW Booster and Run Booster Heater functions are removed the DHW Booster Heater On/Off state will be restored.

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