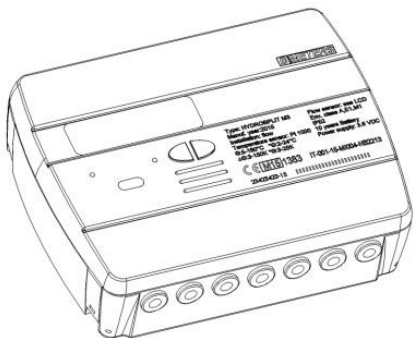


Hydrosplit-M3

Heat/cooling calculator, separated version



EN 1434

USER MANUAL

Premise

The installation must be carried out by qualified personnel only. The manufacturer doesn't assume any responsibility for improper installation or damages caused by third parties.

Warning

The calculator contains potentially dangerous batteries: handle carefully and do not dump in the environment.

INTRODUCTION

The model Hydrosplit-M3 is a separate electronic calculator that measures the thermal energy used in the heating and cooling systems.

The calculator allows the simultaneous calculation of:

- Thermal energy in a heating/cooling system.
- Volume up to 2 flow meters for hot and cold sanitary water.

The calculator is equipped with two pulse emitter outputs (one for the heating data and one for the cooling data) and one output for the Wired M-Bus network link.

PACKAGE CONTENTS

- Hydrosplit-M3 calculator
- Mounting bracket
- Wall mounting screws
- User manual
- Adhesive seal

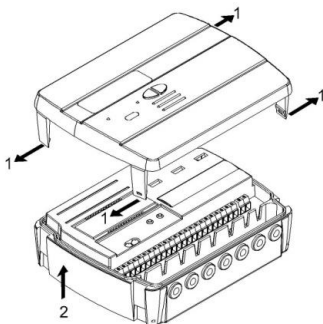
GENERAL INFORMATION

- Before proceeding with the installation and configuration of the product, read carefully the instructions described in this manual. For further technical questions, please contact Technical Support.
- The installation must be carried out by qualified personnel only.
- The relevant regulations regarding the instrument are the EN1434 (1-6) and Directive 2004/22/CE (Annex MI-004).
- Any tampering of the calculator or removal of the seals will void the warranty provided.
- For proper energy accounting, it is strictly mandatory that the flow meter and the calculator have the same pulse value.

INSTALLATION

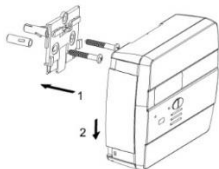
CALCULATION UNIT

Open the calculation unit by leveraging on the four hooks on the sides [1] and remove the cover [2].

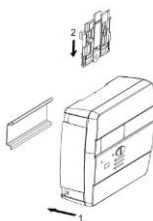


Remove the bracket behind of the calculation unit and secure it to the wall. There are two types of wall mounting allowed:

- 1) direct wall mounting by using the mounting bracket and the following hooking of the calculation unit on the same bracket;
- 2) by wall mounting of a Din Rail and following hooking of the mounting bracket (see pictures below).



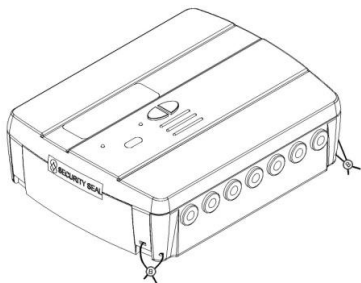
Case 1



Case 2

Then apply the basis on the bracket and secure it with any anti-removal seals.

After the installation, connection, configuration and commissioning, close the cover and apply adhesives and / or lead sealings.



TEMPERATURE SENSORS INSTALLATION

For the temperature sensors installation, see related manual.

FLOW METERS INSTALLATION

For the flow meters installation, see related manual.

COMPONENTS CONNECTIONS

The flow/volume meters, temperature sensors, M-Bus network etc. should be connected on the terminal board inside the calculator.

Tighten all the terminals carefully, making sure that the connections are completely secure.

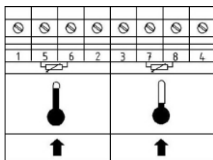
Warning: Be careful when entering cables into the terminal in order to avoid potential malfunctioning caused by the contact between the sheath and clamp.

TERMINAL BOARD DESCRIPTION

1	5	6	2	3	7	8	4	10	11	50	51	52	53	54	55	56	57	58	16	17	24	25	59	60
forward flow		return flow		flow IN		C1 IN		C2 IN		cold OUT		hot OUT		MBUS		Aux Power								
↑		↑		↑		↑		↑		↓		↓		↑↓		↑								

Numbers	Indication	Description
1/5/6/2	Forward flow	Inlet temperature sensor
3/7/8/4	Return flow	return temperature sensor
10/11/50	Flow IN	Flow meter input
51/52/53	C1 IN	Volume meter input 1
54/55/56	C2 IN	Volume meter input 1
57/58	Cold OUT	Cooling pulse output
16/17	Hot OUT	Heating pulse output
24/25	MBUS	M-Bus network connection
59/60	Aux Power	Power supply connection

TEMPERATURE SENSORS CONNECTION



- Connect the inlet temperature sensor in the terminals 5 and 6;
- Connect the return temperature sensor in the terminals 7 and 8;

Warning: To avoid errors in the energy calculation, respect the correspondence between the inlet and

return temperature sensors and the respective terminals. Use PT1000 temperature sensors only, EN1434-2 MID (2004/22/CE) approved.

FLOW METER CONNECTION

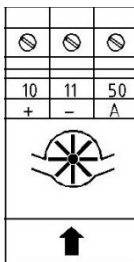
Connect the flow meter for thermal energy metering in the pulse input “flow in” (10,11,50).

The calculation unit is compatible with flowmeters with pulse output OC (open collector) or OA (reed), with pulse value “liters/pulse” (strictly compliant to the value set on the calculator).

Terminal 50 is reserved for eventual Anti-tampering wire connection.

Warning: in case of fiscal energy metering, it is mandatory to connect flow meters EN1434 approved.

Warning: when using flow meters with Open-Collector (OC) output, it is necessary to follow the correct connection polarity.













VOLUME METERS C1/C2IN CONNECTION

The inputs C1 IN (51, 52, 53) and C2 IN (54, 55, 56) are dedicated to the flowmeters for hot and cold sanitary water.

The calculation unit is compatible with flowmeters with pulse output OC (open collector) or OA (reed), with pulse value “liters/pulse” (strictly compliant to the value set on the calculator).

Terminals 53 and 56 are reserved for eventual Anti-tampering wire connection.

Warning: when using flow meters with Open-Collector (OC) output, it is necessary to follow the correct connection polarity.











					
51	52	53	54	55	56
+	-	A	+	-	A
					
					

PULSE OUTPUT CONNECTIONS

The calculator is equipped with two Open-Collector pulse outputs (30V):

- refrigeration units output: cold OUT (57, 58)
- heating units output: hot OUT (16, 17)

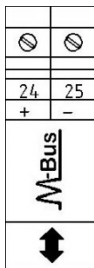
These outputs can be connected to a compatible totalizer or to a signal converter.

			
57	58	16	17
+	-	+	-
cold OUT		hot OUT	
			
			
			

M-BUS NETWORK CONNECTION

The inputs/outputs "M-Bus" (24 and 25) are dedicated to the calculator connection with an M-Bus network cable.

For the connection is not necessary to respect the polarity, although it is advisable to keep the same polarity on the entire cable network.

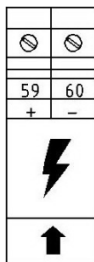


Warning: the M-Bus network is using voltage that can damage the device when applied to terminals dedicated to other functions, so be careful when connecting to this interface.

AUX POWER SUPPLY CONNECTION

The terminals 59 and 60 (Aux Power) are dedicated to the connection of the calculation unit to an external electric network by using a power adapter (3.6 ÷ 5 VDC, 300 mA) provided as an accessory.

When connected to the power supply, the battery will be used as backup power source.



MASUREMENTS REPRESENTATION

The representation format of the measurements of the energy/power and volume/flow rate is determined basing on the pulse value "k" set up directly on the configuration.

The pulse value also determines the maximum power that, in accordance with standard EN1434-2, must be:

- $k < 10$: representation of energy consumption with 5 integers and 3 decimal 00000,000 MWh (GJ)
- $10 < k < 100$: representation of energy consumption with 6 integers and 2 decimal 000000.00 MWh (GJ)
- $k \geq 100$: representation of energy consumption with 7 integers and one decimal 0000000.0 MWh (GJ)

Warning: after the input pulse value of the flow sensor has been set, it is no longer possible to change it. It is important to plan carefully the parameter before commissioning.

COMMUNICATION INTERFACES

HEATING/COOLING PULSE OUTPUT INTERFACE

The pulse outputs (Open Collector - 30V), when connected to suitable totalizers compatible, allow the remote reading of heating and refrigeration units consumption.

The calculation unit is equipped with a pulse output dedicated for heating units (16, 17) and one dedicated to the refrigeration units (57, 58).

M-BUS INTERFACE

The Wired M-Bus communication interface, allows the remote reading by using the appropriate M-Bus Masters, EN13757 (Parts 2 and 3) approved.

The communication with the calculation unit can take place through a research by secondary address (serial number of the calculator) or by primary address (configurable in the menu).

For the M-Bus system instructions, refer to the corresponding manuals.

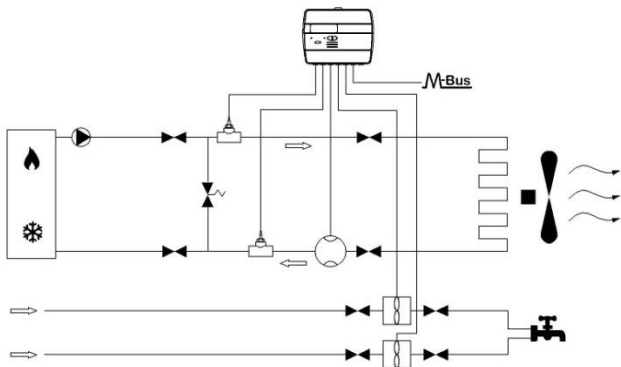
FUNCTIONALITY

The calculation unit **HYDROSPPLIT M-3** is equipped with dedicated sections for the thermal energy measurement of a heating/cooling system and for the volume measurement of the hot/cold sanitary water system.

The calculation unit is suitable for two-pipe domestic systems, in boiler room installations or any other compatible application.

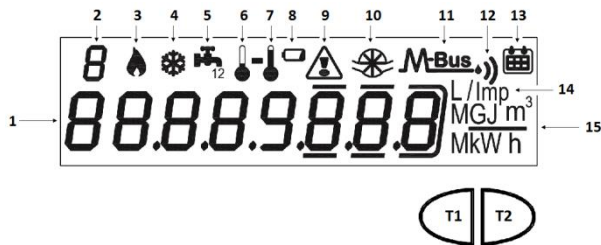
In residential systems, usually two pipes systems, the measurement of the thermal energy takes place on a single section, both in heating and cooling cycle.

The picture below reports a typical connection diagram.



DISPLAY AND BUTTONS

The calculator is equipped in the front with a liquid crystal display and two buttons (T1 and T2), useful for the configuration of the parameters and for the readings.



- 1) Eight-digit numeric field;
- 2) Single-digit numeric index (menu level);
- 3) Heating data index;
- 4) Cooling data index;
- 5) Circuits 1-2 for hot/cold sanitary water index;

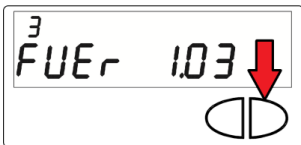
- 6) Return flow temperature index;
- 7) Inlet flow temperature index;
- 8) Battery level indicator;
- 9) Faults indicator;
- 10) Heating system flowmeter index;
- 11) Wired M-Bus data index;
- 11+12) Wireless M-Bus data index (predisposition);
- 13) Historical data index;
- 14) Pulse value index (k);
- 15) Measurement unit index;
- T1) Level selection button;
- T2) scroll button within the selected level;

PROGRAMMING MENU

The programming menu is useful for the ordinary programming of the calculation unit and for configured data verification.

PROGRAMMING MENU ACCESS

To enter the programming menu, press the T1 button and select level 3. Then keep the T2 button pressed for more than 3 seconds.



Once this is done, you will be prompted to enter a password for security reasons. Select the digit using the T2 button and change the single numbers with the T1 button.

The password is communicated by the manufacturer to the installer only.

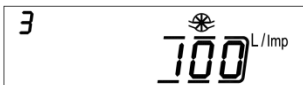


After entering the password, it is possible to start the parameters configuration.

The configuration screens are divided into 15 sub-levels. Here below there is a "step by step" guide for the correct configuration of the calculation unit:

- 1) The first parameter to be configured is the pulse value "k" of the heating system flowmeter.

The value can be selected by using the button T1: 0.1–0.25–1–2.5–10–25–100–250 L/imp

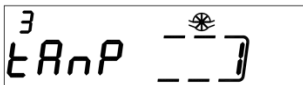


Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

Warning: the pulse value "k" of the heating system flowmeter is settable only once. Once the configuration is confirmed, this parameter is no longer editable.

2) The second parameter that has be configured is the enabling/disabling of the anti-tampering contact of the heating system flowmeter (Flow in).

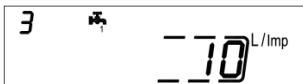
By using the T1 button, proceed with the enabling [1] or disabling [0].



Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter. The enabling of the anti-tampering system requires the connection of a normally closed (NC) contact between terminals 50 and 11. If the contact is opened, a fraud will be recorded.

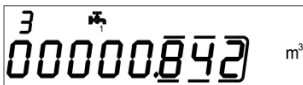
3) The third parameter that has be configured is the pulse value "k" of the C1 cold/hot water meter.

The value can be selected by using the button T1: 0.1–0.25–1–2.5–10–25–100–250 L/imp



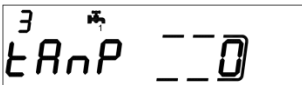
Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

4) The fourth parameter that has be configured is the update of the consumption data reported on the C1 hot/cold water meter dial. Select the digit using the T2 button and change the single numbers with the T1 button.



Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

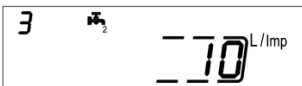
5) The fifth parameter that has be configured is the enabling/disabling of the anti-tampering contact of the C1 cold/hot water meter. By using the T1 button, proceed with the enabling [1] or disabling [0].



Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

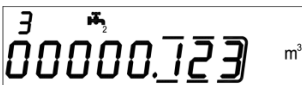
6) The sixth parameter that has be configured is the pulse value "k" of the C2 cold/hot water meter.

The value can be selected by using the button T1: 0.1–0.25–1–2.5–10–25–100–250 L/imp



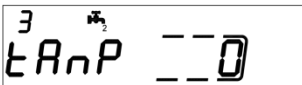
Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

7) The seventh parameter that has be configured is the update of the consumption data reported on the C2 hot/cold water meter dial. Select the digit using the T2 button and change the single numbers with the T1 button.



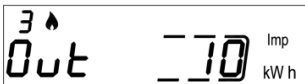
Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

8) The eighth parameter that has be configured is the enabling/disabling of the anti-tampering contact of the C2 cold/hot water meter. By using the T1 button, proceed with the enabling [1] or disabling [0].



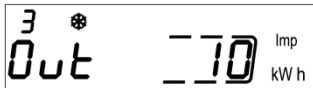
Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

9) The ninth parameter that has be configured is the pulse value "k" of the OC pulse heating output (hot out). The value can be selected by using the button T1: 0 - 1 - 10 - 100 - 1000 kWh/imp



Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

10) The tenth parameter that has been configured is the pulse value "k" of the OC pulse cooling output (cold out). The value can be selected by using the button T1: 0 - 1 - 10 - 100 - 1000 kWh/imp



Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

11) The eleventh parameter that has been configured is the secondary address of the Wired M-Bus (M-Bus) of the heating data. Select the digit using the T2 button and change the single numbers with the T1 button.



Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

12) The twelfth parameter that has been configured is the primary address of the Wired M-Bus (M-Bus) of the heating data. Select the digit using the T2 button and change the single numbers with the T1 button.



Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

13) The thirteenth parameter that has been configured is the secondary address of the Wired M-Bus (M-Bus) of the cooling data. Select the digit using the T2 button and change the single numbers with the T1 button.



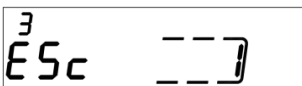
Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

14) The fourteenth parameter that has been configured is the primary address of the Wired M-Bus (M-Bus) of the cooling data. Select the digit using the T2 button and change the single numbers with the T1 button.



Confirm the selected parameter by holding the T2 button for more than 3 seconds, thus moving to the next parameter.

15) Finally to exit the menu and save the configured parameters, select the number [1] in the ESC panel by using the button T1. On the contrary, select the number [0] to return to the first sublevel



Warning: before confirming the settings saving, make sure to properly set all parameters, in particular the input pulse value of the flow sensor as it is no longer editable.

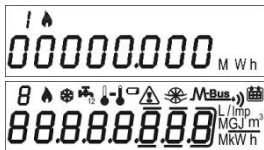
CONSULTING MENU

The consulting menu is divided in six levels by a numeric index, always shown in the left-upper part of the display.

By pressing the T1 button it is possible to choose the desired level, and by pressing the T2 button it is possible to consult the sublevels of the preset level.

Here below, it is shown the navigation map of the consulting menu.

LEVEL 1: CUMULATIVE VALUES



1.1 Accounted energy (Heating) – cumulative value

1.2 Display test – All segments on



1.3 Display test – All segments off



1.4 Accounted energy (cooling) – cumulative value



1.5 Volume useful for the accounting (heating) – cumulative value



1.6 Volume useful for the accounting (cooling) – cumulative value



1.7 Total volume (first pulse input - C1) – cumulative value (optional)



1.8 Total volume (second pulse input – C2) – cumulative value (optional)

LEVEL 2: ACTUAL ACCOUNTING VALUES



2.1 Actual power



2.2 Actual flow rate



2.3 Inlet flow temperature



2.4 Return flow temperature

2  016.5 C

2.5 Temperature difference

LEVEL 3: SETTINGS (DISPLAYING ONLY)

3 01234567

3.1 Serial number

3 FUEr 1.03

3.2 Firmware version

3 AUEr 1.02

3.3 Communication Firmware version

3 23.03.14 

3.4 Current Date

3  L/imp
1

3.5 Liters/pulse value for input flow sensor (flow in)

3   Unit 0 MWh

3.6 Measurement unit (0= Mwh, 1= GJ)

3  tAnP 1

3.7 Input flow sensor (Flow in) anti-tampering activated/deactivated

3  L/imp
0.1

3.8 Liters/pulse value for first input flow meter (C1)

3  00000.100 m³

3.9 Starting value first input flow meter (C1)

3
tAnP 0

3.10 Input flow meter (C1) anti-tampering activated/deactivated

3
0.1 L/imp

3.11 Liters/pulse value for second input flow meter (C2)

3
00000.177 m³

3.12 Starting value second input flow meter (C2)

3
tAnP 1

3.13 Input flow meter (C2) anti-tampering activated/deactivated

3
Out 10 imp
kW h

3.14 Liters/pulse value for heating pulse output (Hot out)

3
Out 1 imp
kW h

3.15 Liters/pulse value for cooling pulse output (Cold out)

3 M-Bus
140000008

3.16 M-Bus Secondary address (Heating)

3 M-Bus
bus 001

3.17 M-Bus Primary address (Heating)

3 M-Bus
940000001

3.18 M-Bus Secondary address (Cooling)

3 M-Bus
bus 002

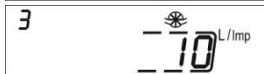
3.19 M-Bus Primary address (Cooling)

LEVEL 3: SETTINGS (CONFIGURATION)

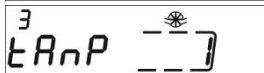
The setting of the parameters can be enabled by pressing T2 for 3 seconds while viewing one of the points of the level 3.



3s.1 Password request to enable parameters setting



3s.2 Liters/pulse value setting for input flow sensor (flow in)



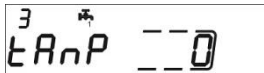
3s.3 Input flow sensor (Flow in) anti-tampering activated/deactivated setting



3s.4 Liters/pulse value setting for first input flow meter (C1)



3s.5 Starting value setting for first input flow meter (C1)



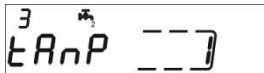
3s.6 Input flow meter (C1) anti-tampering activated/deactivated setting



3s.7 Liters/pulse value setting for second input flow meter (C2)



3s.8 Starting value setting for second input flow meter (C2)



3s.9 Input flow meter (C2) anti-tampering activated/deactivated setting



3s.10 Liters/pulse value setting for heating pulse output (Hot out)

3 * 00t 10 imp kWh

3s.11 Liters/pulse value for cooling pulse output (Cold out)

3 ^ M-Bus 14000000

3s.12 M-Bus Secondary address setting (Heating)

3 ^ M-Bus bus 00

3s.13 M-Bus Primary address setting (Heating)

3 * M-Bus 94000000

3s.14 M-Bus Secondary address setting (Cooling)

3 * M-Bus bus 002

3s.15 M-Bus Primary address setting (Cooling)

3 Esc 0

3s.16 Saving parameters settings and exit
1 = save and exit, 0 = don't exit

LEVEL 4: MEMORY DAY DATA

4 2303.14

4.1 Memory Day

4 ^ 000000003 MWh

4.2 Accounted Energy (heating) – cumulative value at memory day

4 * 000000003 MWh

4.3 Accounted Energy (cooling) – cumulative value at memory day

4 ^ 0000 1.302 m³

4.4 Accounted Volume (C1) – accounted volume at memory day (optional)



4.5 Accounted Volume (C2) – accounted volume at memory day (optional)

Memory day setting:

- View any of the points in the level 4
- Press and hold T2 button for 3 seconds.
- The setting screen will be displayed.
- Enter the desired date in the gg.mm format (T1 - digit increase, T2 - selection digit).
- Confirm the setting by pressing and holding the T2 button for 3 seconds.

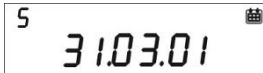
LEVEL 5: HISTORICAL DATA



5.1 Total operation hours during calculation



5.2 Total lifetime hours



5.3 Historical data storage (up to 26 possible values, saving at the end of the month)



5.3.1 Accounted Energy (heating) – cumulative value at historical memory day



5.3.2 Accounted Energy (cooling) – cumulative value at historical memory day



5.3.3 Accounted Volume (C1) – accounted volume at historical memory day (optional)



5.3.4 Accounted Volume (C2) – accounted volume at historical memory day (optional)

LEVEL 6: ERRORS AND FAULTS



5.1 Functioning hours during error



5.2 Active error list



5.3 Number of accesses with installer password



5.3.1 Date of last modified setup parameters

COMMISSIONING


Premise: the procedures explained in this paragraph must be carried out only after the conclusion of the installation phases, the connection procedures and after the testing of the hot/cold water and heating/cooling systems.

Warning: once the calculation unit has accounted energy and volumes, some of the settable parameters will no longer be editable. It is important to set all parameters carefully before the final commissioning.

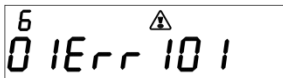
COMMISSIONING PROCEDURE

- 1) Ensure that the electrical wirings are carried out correctly;
- 2) Check in the level 3 that all parameters are correctly set on the calculator (especially the pulse value for the flow sensor –flow in-);
- 3) Verify that the flowmeters and volume meters, the temperature sensors etc. are installed correctly. (always refer to the installation manuals specific to every product)
- 4) Start the heating system:
 - Check if the registered values are coherent (inlet/return temp.)
 - Check the totalized volume and current flowrate;
- 5) Start the hot/cold sanitary water system:
 - Check if the registered values are coherent (volume)
- 6) Check that no error is active.
- 7) Apply eventual adhesive or lead sealings.

ERRORS AND FAULTS

when one or more anomalies occur, the calculation unit will signal the recorded error and will display the following icon: .


The log of all faults is shown at level 6 of the consulting menu, where the abbreviation *Err* followed by three digits identifies the anomaly.



Here is a list of all the error codes:

Error	Description	Prescription	Notes
Err101	One of the two temperature sensor cables is cut; At least one cable is disconnected	Check the integrity and the connection of the temperature sensor cables.	The alarm automatically resets when the issue is solved.
Err102	One of two temperature sensor measurement out of range; at least one sensor is damaged. The error resets after the sensor replacement.	Check the integrity and the functioning of the temperature sensors.	The alarm automatically resets when the issue is solved.
Err103	Reading/writing error; Memory of historical data damaged.	Return the device to the manufacturer.	
Err104	Calendar Error (time bases corrupted); Faulty time bases oscillator.	Return the device to the manufacturer.	
Err105	MBUS communication interface error	Return the device to the manufacturer.	The error doesn't affect the calculation unit correct measurement.
Err106	Reserved		
Err107	Loss of power supply	Return the device to the manufacturer for repairing	
Err108	Electronics case opening	Return the device to the manufacturer for repairing	
Err201	Reserved		
Err202	Reserved		
Err203	Battery life below 1 year	Return the device to the manufacturer.	
Err204	Reserved		
Err205	Fraud attempt pulse input of the flow sensor (flow in); Detected fraud on the alarm line from the pulse emitter device of the flow sensor (flow in)	Check connection cable between calculator and pulse emitter device.	
Err206	Fraud attempt pulse input of the volume meter (C1); Detected fraud on the alarm line from the pulse emitter device of the volume meter (C1)	Check connection cable between calculator and pulse emitter device.	
Err207	Fraud attempt pulse input of the volume meter (C2); Detected fraud on the alarm line from the pulse emitter device of the volume meter (C2)	Check connection cable between calculator and pulse emitter device.	
Err301	MBUS data exchange interactions limit reached	Wait 00:00 of the current day before sending additional data requests through MBUS interface	
Err302	Reserved		

BATTERY AND REPLACEMENT PROCEDURES

The calculation unit constantly checks the battery status (average lifetime: 10 years) and signals the imminent discharge showing the icon  on the display. The signal will be shown one year before the complete discharge.

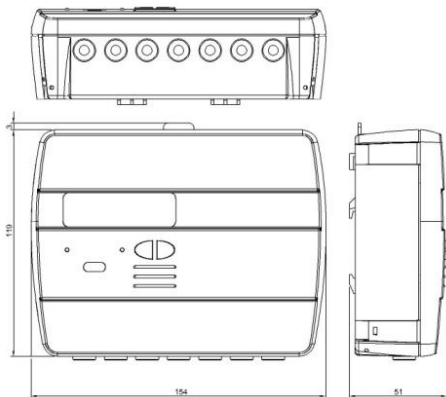


For the replacement, contact the manufacturer.

Warning: the calculation unit is equipped with non-rechargeable batteries, that can be dangerous when used improperly. In order to reduce the risks, it is necessary to respect the following precautions:

- Don't recharge the battery;
- Don't put the battery in short circuit;
- Don't expose the battery at temperatures higher than 85°C.
- Don't use open flames near the calculation unit
- Don't let the calculator make contact with water
- Always dispose the batteries in compliance with current regulations
- Always use original spare parts authorized by the manufacturer.

CALCULATION UNIT DATA SHEET



Model	Hydrosplit M3
Power supply	-Battery supply -Electrical supply (optional, 3.6 ÷ 5 VDC, 300 mA): in this case, the battery will be used as backup power supply)
Battery type	Li-SoCl ₂ Lithium-thionyl chloride, 3.6V "size D" 20Ah
Battery Life	10 years +1
Operating temperature range	5 ÷ 55°C
Storage temperature range	-10 ÷ 55°C
Dimensions	154 x 119 x 51mm
IP protection grade	IP52
Approval	2004/22/CE MID (Module B) Certificate nr.IT-MI004-xxxx EN1434
Environmental class	A (E1, M1)
Temperature measurement range, MID approved (heating applications)	Θ: 5÷180°C
Temperature difference range, MID approved (heating applications)	ΔΘ: 3÷150K
Temperature measurement range (cooling)	Θ: 2÷24°C
Temperature difference range (cooling)	ΔΘ: 3÷20K

Operative counting conditions	Heating: $\Delta\theta \geq 1\text{K}$ and fluid temperature $\geq 5^\circ\text{C}$ (accounting enabling conditions) Cooling: $\Delta\theta \leq 0.2\text{K}$ and fluid temperature $\leq 24^\circ\text{C}$
Maximum measurable power	99 MW
Maximum measurable flowrate	2000 m ³ /h
Display	LCD, 8 digits + icons
Measurement unit	MWh (standard), GJ (optional)
Temperature sensors	Pt1000 (two-wired)
Cable length	3 m
Pulse inputs	1 dedicated for the heating circuit flow meter 2 dedicated for the cold/hot sanitary water volume meter
Pulse input class	Class IA (default): Open Collector or electromagnetic contact (reed), max 5Hz
Pulse input maximum frequency (MID approved)	5 Hz
Maximum length pulse emitter cable	3 m
Installation site of flowmeter (Flow in)	Return flow pipe (Default), Inlet flow pipe (optional). Always refer to the indication on the cover of the calculator.
Supported vector fluid	Water

FUNCTIONING BEYOND THE LIMITATIONS DECLARED

It is recommended to ensure that the measurement conditions are within the exposed limits of certification. The unit doesn't disable the functioning outside these ranges, its use is not covered by the certification if the measurement conditions don't meet the certification validity conditions.

Regarding the flow measurement conditions of the flow sensor connected to the calculator, always respect of the flow rates recommended in the table here below depending on the factor of the flow sensor.

Flow sensor (Flow In) pulse value [liter\imp]	Max. allowed flow rate [m3\h]	Min. recommended flowrate [m3\h]
0,1	1,8	0,010
0,25	4,5	0,025
1	18	0,1
2,5	45	0,250
10	180	1
25	450	2,5
100	1800	10
250	2000	25

1. General

1.1 Use

The flow meter is used as a flow meter for calculators for heating or cooling consumption measurement in systems with water.













The flow meter consists of a metal measuring part and an associated electronic unit. These two components are affixed with each other by cable.

1.2 General Notes

The flow meter left the factory in a faultless condition where safety is concerned. The manufacturer will provide additional technical support on request. Calibration relevant security seal on the flow meter must not be damaged or removed. Otherwise the guarantee and calibration validity of the flow meter will lapse.

- Keep the packaging so that you can transport the flow meter in its original packaging following expiry of the calibration validity.
- Lay all cables at a minimum distance of 500 mm to high voltage and high frequency cables.
- A relative humidity of < 93 % at 25 °C is permissible (without condensation).
- Avoid cavitation in the whole system due to overpressure i.e. at least 1 bar at qp and approx. 3 bar at qs (applies for approx. 80 °C).

2. Safety Information

-  The flow meter may only be used in building service engineering systems and only for the applications described.
-  The local regulations (installation etc.) must be adhered to.
-  Adhere to the operating conditions according to the dial plate during use. Non-adherence can cause hazards and the guarantee will lapse.
-  The flow meter is only suitable for circulating water in heating systems.
-  The flow meter is not suitable for drinking water.
-  Adhere to the AGFW requirements regarding circulating water (FW510).
-  Do not lift the flow meter by the electronic unit.
-  Be aware of sharp points on the thread, flange and measuring tube.
-  Only personnel, trained in the installation and operation of meters in heating and cooling systems, may install and remove the flow meter.
-  Only install or remove the flow meter when the pipes are pressure-less.
-  After installing the flow meter, check the leak-tightness of the system.
-  Guarantee and calibration validity will lapse if the calibration relevant security seals are broken.



Only clean the flow meter from outside with a soft, lightly wetted cloth. Do not use any spirit or cleaning solvent.



As far as disposal is concerned, the flow meter is a waste electronic appliance in the sense of European Directive 2002/96/EC (WEEE) and it must not be disposed of as domestic waste. The relevant national, legal regulations must be observed as the appliance must be disposed of via the channels provided for this purpose. The local and currently valid legislation must be observed.



The meter contains lithium batteries. Do not dispose of the meter and the batteries with domestic waste. Observe the local stipulations and laws on disposal.



You can return the lithium batteries to the manufacturer for appropriate disposal following use. When shipping please observe legal regulations, in particular, those governing the labelling and packaging of hazardous goods.



Do not open the batteries. Do not bring batteries into contact with water or expose to temperatures above 80 °C.



The flow meter does not have any lightning protection. Ensure lightning protection via the in-house installation.

3. Installation

Proceed as follows to install the flow meter:

- Observe the dimensions of the flow meter and check whether there is sufficient space available.
- Rinse the system thoroughly before installing the flow meter.
- Fit the flow meter vertically or horizontally between two slide valves so that the arrow on the housing and the flow direction match. Also observe the installation situations and the following examples of installation (see figure 2 and figure 3).
- Seal the fittings to protect against manipulation.
- Loosen the elastic band or the cable tie, provided for the transport, from the volume measurement unit. In operation, the control cable should not depend directly on the volume measurement unit.
- If you install the flow meter for cold metering, follow the appropriate notes.

Recommendation: If you are installing more flow meters in one unit, make sure that all the flow meters operate under the same mounting conditions.

Installation Notes



Note: When installing the flow meter the locally applicable installation regulation for flow meters must be observed.

Inlet or outlet sections are not necessary. If you install the flow meter in the common return of two circuits, determine a place of installation with a minimum distance of 10 × DN from the T-piece. This distance ensures a good thorough mixing of the different water temperatures.

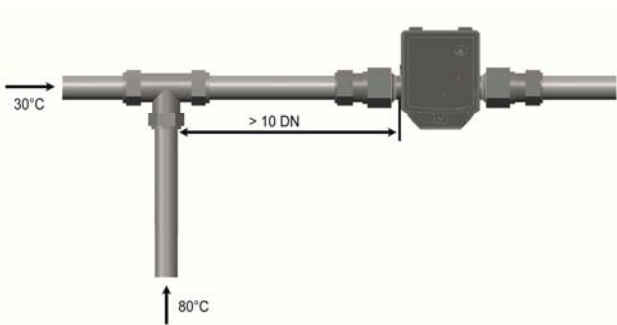


Fig. 1: Mixture of different return temperatures

Examples of installation

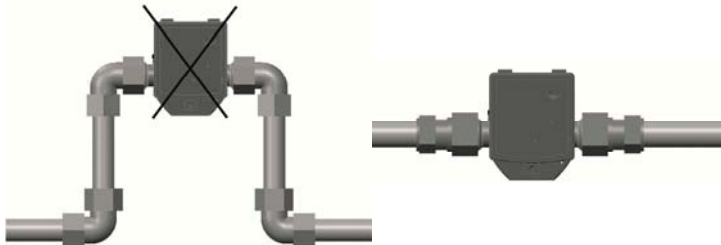


Fig. 2: Avoid accumulation of air

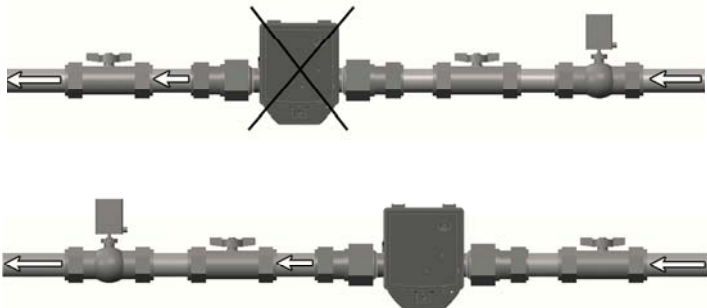


Fig. 3: Mount a valve or a regulator after the flow meter

Note: During installation it must be ensured that no water can enter the electronic unit during operation.

3.1 Installation for cooling metering

Note: It is recommended that the flow meter installed on the hot side.

When installing as a cold meter it is essential that the black cover on the measuring tube is pointed to the side or downwards in order to avoid problems with condensation forming.

Fit the electronic unit separate to the volume measurement tube, e.g. on the wall. Make a loop downwards in order to prevent condensation running along the connected lines into the electronic unit.

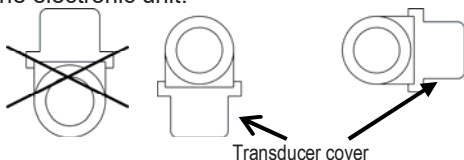


Fig. 4: Recommended installation position for cooling metering

3.2 Installation of qp 150

Note: Use flange bolts with a length of at least 100 mm to install the flanged body in the pipeline.

As an assembly aid two M10 threads are mounted on the flange. The threads allow the use of stainless steel eye bolts, for example, for a lifting device.

The measurement insert in the flanged body should be positioned on the top. This allows a simple exchange of the measurement insert (see chapter 5).

3.3 Electronic unit

The ambient temperature of the electronic unit must not exceed 55 °C. Avoid direct sunlight. For water temperatures between 10 °C and 90 °C you can fit the electronic unit on the volume measurement unit or on the wall.

Aligning electronic unit

Proceed as follows to align the electronic unit:

1. Pull the electronic unit off the volume measurement unit.
2. Turn the electronic unit to the left or right through 90° or 180° as required.
3. Push the electronic unit onto the adapter plate in this position until it engages.

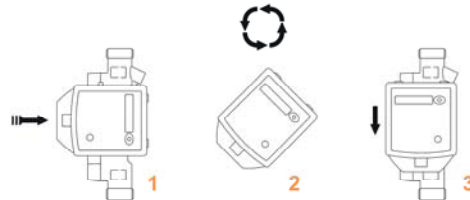


Fig. 5: Electronic unit installation position

Wall fitting (split fitting)

Fit the electronic unit to the wall at water temperatures below 10 °C and above 90 °C.

For wall mounting proceed as follows:

- Pull the electronic unit off the adapter plate.
- Unscrew the adapter plate from the volume measurement unit.
- Fit the adapter plate to the wall.
- Push the electronic unit onto the adapter plate.

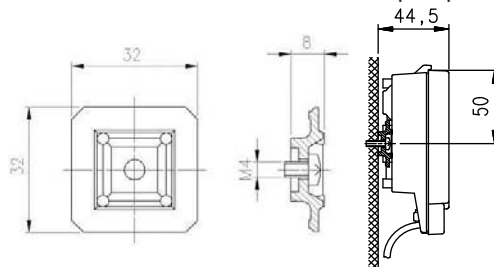


Fig. 6: Adapter plate and wall fitting

3.4 Power supply

The flow meter is equipped with a long life battery for 5 or 9 years of operation. You can take the operating time from the dial plate.



Warning: Do not open the batteries. Do not bring battery into contact with water or expose to temperatures above 80 °C. Dispose of used batteries at suitable collection points.



Note: Only batteries approved by the manufacturer may be installed.

3.5 Interfaces

The flow meter is equipped with an optical interface in accordance with EN 62056-21 as standard.

In addition, the flow meter is equipped with a pulse output and is delivered with a 2m two wire cable. The connecting cable can be lengthened with a cable 2 x 0.75mm². A distributing box is recommended.

4. Getting Started

For activation proceed as follows:

- Open the slide valves slowly.
- Check the system for leak-tightness and bleed air out carefully.

After more than 100 sec. the flow meter begins to work.

If the operating limit is exceeded and the flow rate is positive, volume pulses are generated according to the pulse parameter settings.

- Check the measured value flow or the volume of progress on the connected calculator for plausibility.
- Vent the system until the flow rate value on the calculator is stable. Check the output.
- Fit the user locks to the fittings.

5. Functional Details

The operating hours are counted from the first connection of the power supply.

Missing hours are summated if there is an error and the flow meter is thus unable to take a measurement.

Operating hours and missing hours can be reset through the service software.



Note: Detailed information's on resetting operating hours and missing hours with the service software you will find in the UltraAssist user manual.

Volume readings, maximum flow rates and missing hours are stored monthly for 36 months.

The device number and the firmware version number are issued by the manufacturer.

6. Technical Data



Note: The information on the flow meter must be observed!

General

Measuring accuracy	Class 2 or 3 (EN 1434)
Environment class	A (EN 1434) for indoor installation
Mechanical class	M1 *)
Electromagnetic class	E1 *)
*) according to 2004/22/EC Directive on Measuring Instruments	
Ambient humidity	< 93 % rel. humidity at 25 °C, without condensation
Max. height	2000 m above sea level
Storage temperature	- 20 ... 60 °C

Electronic unit

Ambient temperature	5 ... 55 °C
Housing protection rating	IP 54 according to EN 60529
Power supply	Battery for 5 or 9 years
Optical interface	Standard, EN 62056-21
Communication	Pulse output
Separability	Always, optional cable length

Pulse output

Type	Open drain
Dielectric strength	500 V _{eff} against ground, galvanic insulated
Pulse significance	Optional
Pulse length	Optional
Pulse sequence	In packages every 0,5 s (not equally spaced)
Cable length	2 m
Voltage	Maximal 30 V
Current	Maximal 30 mA
Voltage drop	< 0,3 V at 10 mA
Polarity	bipolar

Volume measurement unit

Protection class	IP 54 / IP 65 according to EN 60529 IP 68 (at qp 150) according to EN 60529
Mounting place	Hot side / cold side
Installation position	Any
Flow straightening	None
Measuring range	1:100 resp. 1:50
Temperature range	5 ... 130 °C National type approvals may be different.
recommended...	
...heat application	10 ... 130 °C
...cooling application	5 ... 50 °C
Maximum temperature	150 °C for 2000 h
Maximum overload	2,8 x qp
Nominal pressure	PN16 (1,6 MPa; PS16), PN25 (PS25)

7. EU-Directives Declaration of Conformity

Landis+Gyr GmbH, Humboldtstr. 64, D-90459 Nürnberg, Germany hereby declares that the type Ultraheat T150 / 2WR7 meter meets the requirements of the following directives:

- **2004/108/EC** Electromagnetic Compatibility of Electrical and Electronic Devices
- **2006/95/EC** Low voltage directive
- **2004/22/EC** Measuring instruments directive
- **2011/65/EU** Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS2)
- **1997/23/EC** Pressure Equipment Directive

Nürnberg, 17.03.2014

Brunner, COO

name, function

signature

Fuchs, Head R&D

name, function

signature

This declaration and the associated documents are deposited with Mr. Fuchs c/o Landis+Gyr with the number CE 2WR7 007/03.14.

EC type-examination certificate
DE-06-MI004-PTB004

Certificate recognising the quality management system
DE-12-AQ-PTB006MID

Notified body:
PTB Braunschweig and Berlin, Germany; identification number
0102