# *iSolar*™ energy heat meter

## WMZ

CALEFFI SOLAR

ISO 9001 FM 21654 ISO 9001 No. 0003

CALEFFI

01275/14 NA

Replaces 01275/13 NA

### Function

The *iSolar*™ WMZ is an energy heat meter for thermal solar systems and conventional heating systems. This energy heat meter takes into consideration the density and the specific heat capacity of the heat transfer fluid depending on the temperature as well as on the mixing ratio of water/glycol. The *iSolar*™ WMZ calculates the energy quantity by counting the impulses of the flowmeter for the measurement of flow and by temperature difference of two Pt1000 temperature sensors, purchased separately, measuring the flow and return temperature. The calculated heat energy value is displayed in kWh (kilowatt hours) and stored. A memory feature guarantees that the adjusted system parameters and the calculated heat energy quantity are maintained in the case of power loss.

### Product range

Code 257202A *iSolar*™ WMZ energy heat meter, requires V40 flow meter and two Pt1000 RTD temperature sensors

### Technical specifications

**WMZ energy heat meter**

| | |
|---|---|
| Housing plastic: | PC-ABS and PMMA |
| Protection type: | indoor only |
| Mounting: | wall |
| Display: | 4 lines LCD |
| Interface: | three soft-push control buttons |
| Data interface: | VBus data connection |
| Inputs: | 2 Pt1000 temperature sensors, 1 V40 flow meter |
| Power supply: | 24 V AC/DC |
| Temperature measurement range: | -20–300°F (-30–150°C) |
| Adjustment temperature sensor offset: | ±0.9°F (0.5 K) |
| Measuring precision: | ±0.5°F (0.3 K) |
| Volume concentration of glycol: | 0–70% |
| Pulse rate volumetric flow rate: | 1–99 l/imp |

**NA797 flow meter** (purchase separately)*

Flow range:

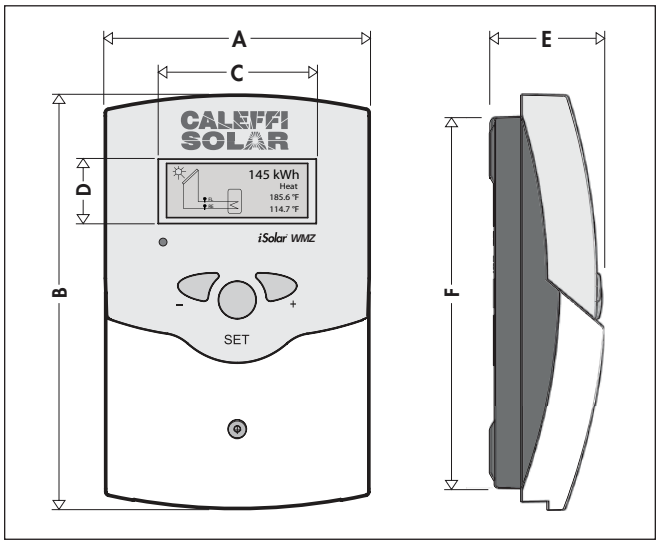
| | |
|---|---|
| - NA79701: | 1/4–10 gpm (1–40 lpm) |
| - NA79702: | 1/2–15 gpm (2–50 lpm) |
| - NA79703: | 1/2–25 gpm (2–100 lpm) |
| - NA79704: | 1–45 gpm (4–170 lpm) |
| - NA79705: | 1-1/2–65 gpm (6–240 lpm) |

**257205 temperature sensor** (purchase separately)

| | |
|---|---|
| Resistance: | 1,000 ohms |
| Working temperature range: | -58–355°F (-50–180°C) |
| Diameter: | 1/4" (6mm) |
| Length of sensor cable (black UV): | 60" (1.5m) |

*See technical specifications page 2.

### Dimensions




| Code | A | B | C | D | E | F | Wt. (lb.) |
|---|---|---|---|---|---|---|---|
| **257**202A | 4⅜" | 7" | 2½" | 1" | 2" | 6" | 2.0 |

## NA797 series V40 rotary pulse flow meters

NA79701

Sweat unions (included).

**NA79702**
**NA79703**
**NA79704**
**NA79705**

## Function

Series NA797 V40 rotary pulse flow meters are required components to be used in conjunction with the *iSolar*™ WMZ energy heat meter to measure heat energy.

The V40 rotary pulse flow meters measure flow in the flow stream of the solar system while standard RTD temperature sensors — included with *iSolar*™ WMZ meter — transmit temperature readings at critical points in the system. These flow and temperature readings are calculated into heat energy in the *iSolar*™ WMZ meter and displayed as kWh units. This information is stored in the *iSolar*™ WMZ and can be exported via the VBus data interface to a connection PC, DL2 or DL3 datalogger and used to analyze and verify real-time and cumulative heat energy generation values from the solar collectors.

Accurate to international standards OIML R75, EN1434 and MID.

## Product range

| | | | |
|---|---|---|---|
| Code NA79701 | V40 single-jet rotary pulse flow meter | 1 pulse = 1 liter* | 1/4–10 gpm .....includes 3/4" union sweat fittings |
| Code NA79702 | V40 multi-jet rotary pulse flow meter | 1 pulse = 2.5 liters* | 1/2–15 gpm ..... includes 1" union sweat fittings |
| Code NA79703 | V40 multi-jet rotary pulse flow meter | 1 pulse = 10 liters* | 1/2–25 gpm .....includes 1-1/4" union sweat fittings |
| Code NA79704 | V40 multi-jet pulse flow meter | 1 pulse = 10 liters* | 1–45 gpm ..... includes 1-1/2" union sweat fittings |
| Code NA79705 | V40 multi-jet pulse flow meter | 1 pulse = 10 liters* | 1-1/2–65 gpm .....includes 2" union sweat fittings |

*The pulse rate value input to WMZ meter during set up is in liters. Check the tag attached to V40 flow meter to confirm pulse rate.

## Technical specifications

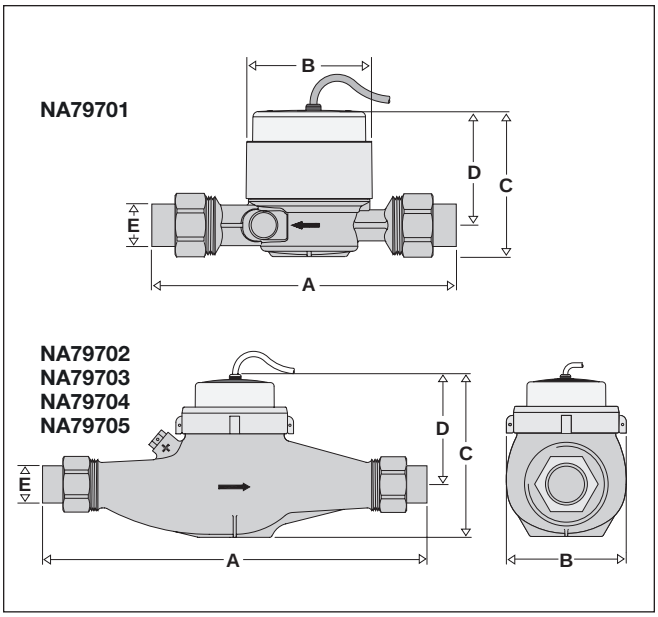
**Materials:**

| | | |
|---|---|---|
| Meter body | - body and sealing plate: | brass |
| | - seals (head to body): | EPDM |
| Meter head | - housing: | brass, stainless steel, composites |
| | - bearings: | hard metal, sapphire, chrome nickel steel |
| | - impeller wheel/head piece: | high grade synthetic material |

**Performance:**

| | |
|---|---|
| Medium: | water and glycol |
| Max. percent of glycol: | 50% |
| Working temperature range: | -40–210°F (-40–100°C) |
| Max. working pressure: | 235 psi (16 bar) |
| Max. fluid temperature: | 265°F (130°C) |
| Flow range: | |
| - NA79701: | 1/4–10 gpm (1–40 lpm) |
| - NA79702: | 1/2–15 gpm (2–50 lpm) |
| - NA79703: | 1/2–25 gpm (2–100 lpm) |
| - NA79704: | 1–45 gpm (4–170 lpm) |
| - NA79705: | 1-1/2–65 gpm (6–240 lpm) |
| Flow accuracy (full scale): | ±2% |
| **Connections** - sweat union: | 3/4", 1", 1-1/4", 1-1/2" & 2" |

## Dimensions



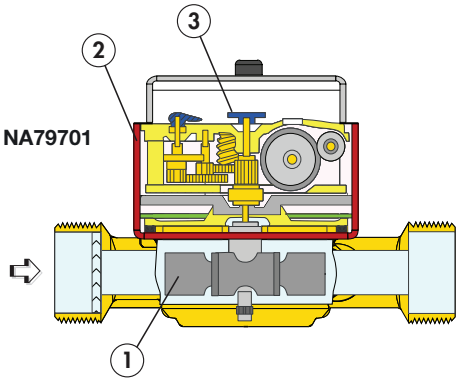

| Code | A | B | C | D | E | Wt. (lb.) |
|---|---|---|---|---|---|---|
| **NA797**01 | 7¼" | 3⅛" | 4¼" | 3½" | ¾"* | 3.0 |
| **NA797**02 | 12¼" | 3 15/16" | 5⅜" | 3¾" | 1"* | 5.0 |
| **NA797**03 | 12¼" | 4 1/16" | 5⅜" | 3¾" | 1¼"* | 8.0 |
| **NA797**04 | 17" | 5¼" | 6 7/16" | 4⅝" | 1½"* | 14.0 |
| **NA797**05 | 18" | 5 15/16" | 7" | 4¾" | 2"* | 17.0 |

*Sweat tailpiece

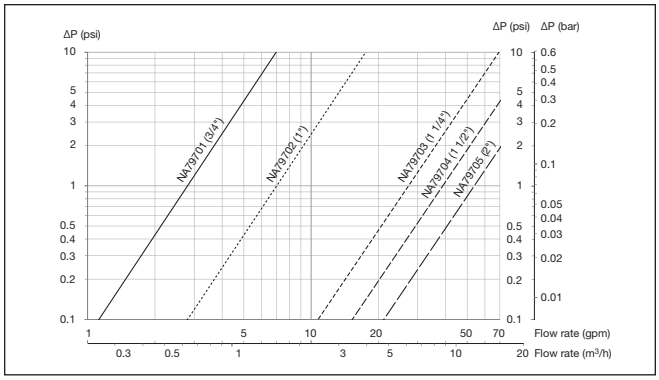
## Operating principle

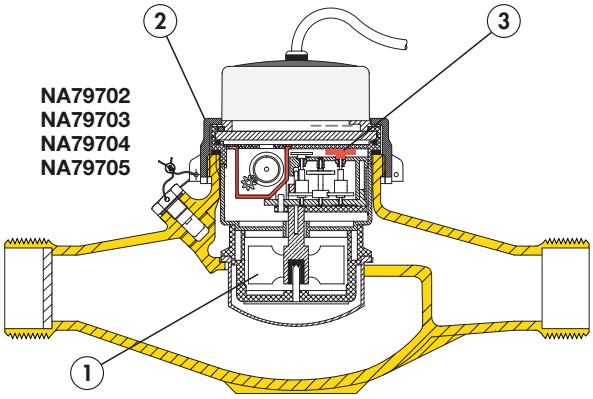
Flow measurement is based on pulses generated in the meter head. The brass flow pipe directs hydronic fluid to the impeller turbine (1), causing it to spin. The flow meter head (2) generates a pulse to turn the rotary volume indicator disc (3) according to a pre-calibrated volume per pulse. This pulse sends a signal through the communication cable to the *iSolar*™ WMZ energy heat meter, where this information is used to calculate real-time and cumulative heat energy generation values.

Enter the value of volume/impulse, in liters, from tag attached to the V40 rotary meter into the WMZ meter.

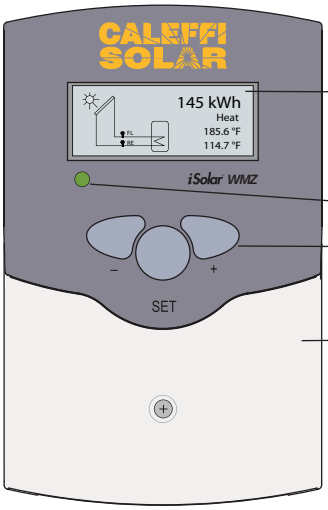



## Pressure drop across V40 rotary pulse flow meter




## Characteristics




**User-friendly operation**

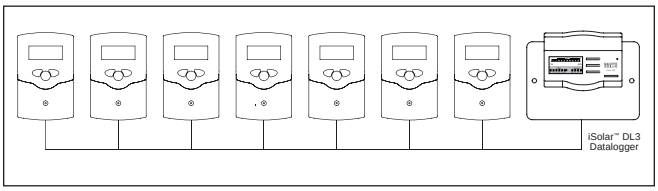
System screen LCD display

Operating LED control lamp

3 push-button controls

Attractive design and compact dimensions

Easy to install

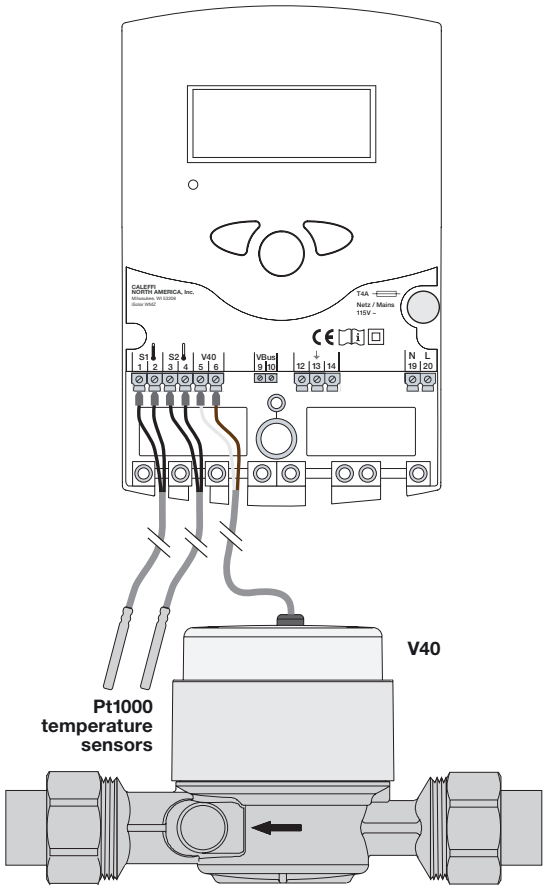



### Multinode network

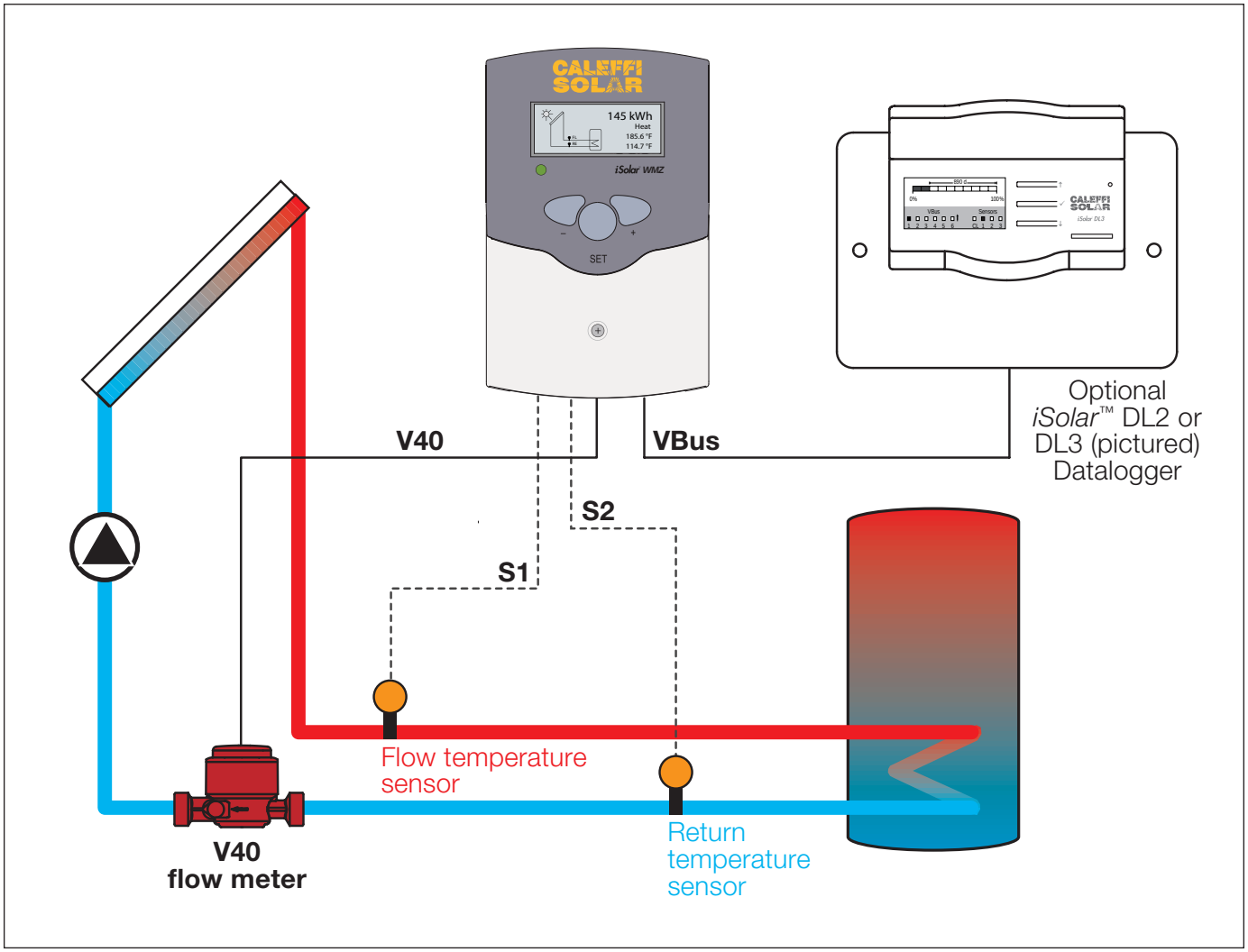
Additional WMZ energy heat meters can be cascaded together on the VBus connection. One WMZ is configured as the master and additional WMZ meters are configured as slaves. Up to 16 meters can be cascaded together with two conductor wire (bell wire) at least 20 AWG and up to 150 feet for transmission of data values to a connected PC, DL2 or DL3 Datalogger.

The connection sequence is arbitrary, up to 16 can be cascaded together.

## Wiring



## Application diagram




## SPECIFICATION SUMMARIES

***iSolar*™ WMZ energy heat meter**

Intelligent energy heat meter with Vbus data connection and kilowatt hours calculated heat energy stored and displayed. Power supply 24 V AC/DC. Power failure protection. Inputs: Two Pt1000 RTD temperature sensors, One V40 rotary impulse flow meter. Housing plastic PC-ABS and PMMA. Protection type is indoor only. Display is 4 lines LCD. Three soft-push button interface. Temperature measuring range: -20 to 300°F (-30 to 150°C). Adjustment temperature sensor offset: ±0.9°F (0.5 K). Measuring precision: ±0.5°F (0.3 K). Volume concentration of glycol: 0–70%. Pulse rate volumetric flow rate: 1–99 liter per impulse (l/imp). Provide with two Pt1000 RTD temperature sensors and one V40 rotary pulse flow meter.

**V40 Rotary pulse flow meter**

Rotary pulse flow meter for use with *iSolar*™ WMZ energy heat meter. Body and sealing plate brass, head to body seals EPDM, meter head housing brass, stainless steel, composites, bearings hard metal, sapphire, chrome nickel steel, impeller wheel/head piece high grade synthetic material. Suitable fluids: water or 50% maximum glycol solution. Working temperature range -40 to 210°F (-40 to 100°C), max. fluid temperature 265°F (130°C). Maximum working pressure 235 psi (16 bar). Flow accuracy (full scale): ±2%. Accurate to International Standards OIML R75, EN1434 and MID. For code NA79701 single-jet, flow measuring rate 1/4 to 10 gpm (1–40 lpm), connections 3/4" union sweat. For code NA79702 multi-jet, flow measuring rate 1/2 to 15 gpm (2–50 lpm), connections 1" union sweat. For code NA79703 multi-jet, flow measuring rate 1/2 to 25 gpm (2–100 lpm), connections 1-1/4" union sweat. For code NA79704 multi-jet, flow measuring rate 1 to 45 gpm (4–170 lpm), connections 1-1/2" union sweat. For code NA79705 multi-jet, flow measuring rate 1-1/2 to 65 gpm (6–240 lpm), connections 2" union sweat.



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