

Domestic Renewable Heat Incentive (RHI)

www.ofgem.gov.uk/drhi

Version 3.0 May 2018

Domestic



Essential Guide to Metering

Information for applicants and installers
about metering for **payment** and
metering for **performance**

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Policy updates:

On 20 September 2017 and 22 May 2018, the Department for Business, Energy & Industrial Strategy (BEIS) made changes to the Domestic RHI Regulations. These changes reflect the first and second stage of amendments in the Government's response to its consultation on changes to the Domestic Renewable Heat Incentive (RHI) Scheme in December 2016.

Key changes to scheme rules that apply if you made an application on or after 20 September 2017 include:

- Annual heat demand limits for air source and ground source heat pumps and biomass systems; and,
- An increase in your tariff if you applied on or after 14 December 2016, which came into effect from 20 September 2017. This tariff uplift only applies to air source heat pumps, ground source heat pumps and biomass systems.

Key changes to scheme rules that apply if you make an application on or after 22 May 2018 include:

- If you have a heat pump, you're required to have electricity metering arrangements alongside your heat pump to monitor its performance;
- If you are applying for a Metering and Monitoring Service Package (MMSP), you're able to receive a portion of your total MMSP payment in a lump sum alongside your first RHI payment;
- Changes to the RHI's budget management mechanism; and,
- Assignment of rights – to help householders access finance to overcome the barrier of the upfront cost of a renewable heating system, households can assign their rights to RHI payments to investors.

Note assignment of rights will come into effect later on 27 June 2018.

For more information see the [Government's consultation response](#).

For an overview of the changes to the scheme, please read our factsheet for more information: [Factsheet: Important changes to the Domestic RHI Scheme](#).

Part 1 – For Applicants and Installers

Section 1 – About this guide

Who is the guidance for?

This guide is about metering for performance and metering for payment which may affect some people applying for the Domestic RHI.

It defines the circumstances in which you might need metering for performance and/or metering for payment, and has sections tailored for applicants and installers.

The sections for both applicants and installers are divided into metering for performance and metering for payment.

Solar thermal systems for heating [domestic hot water](#) never have to be metered. If that's all you have installed, you don't need to read this document.

If you have a biomass boiler or stove, the section 'metering for performance' does not apply to you. Go to the [Metering for Payment](#) section to see if your biomass plant needs to be metered for payment.

Our other guides

In the Essential Guides series, we also have:

[Essential Guide for Applicants](#)

[Essential Guide for Installers](#)

[Essential Guide to Metering and Monitoring Service Packages \(MMSP\)](#)

All domestic plants intended for the Domestic RHI must be installed and commissioned by a [Microgeneration Certification Scheme \(MCS\)](#) certified installer. This applies to both new applicants and existing participants, and applies when retrofitting meters, and when repairing or replacing plants.

This guide is for you:

Please give feedback on how our guidance could be improved, or on content you'd like to see added, to Suggestions.DomesticRHI@ofgem.gov.uk. We update this guide regularly. Check our website for the latest version, to be sure you're reading the most up-to-date information.

Section 2 – Overview: Metering for Payment

What is metering for payment?

Most people will receive their Domestic RHI payments based on the annual heat demand figure listed on their EPC, up to the relevant [heat demand limit](#) - whichever is lower. For cases where we can't easily estimate this, people need to install meters and submit readings regularly, which we use to work out how much to pay them. Heat meters are used to measure the amount of heat the renewable heating system produces.

For those people, it's a requirement of joining the scheme. For others, whose circumstances change during their participation in the scheme, it may become a condition to carry on receiving payments.

The important thing to know is that whether or not a heating system has to be metered is not a choice, but depends on specific factors. The important thing to know is that if specific circumstances are met, the installation of metering would be a requirement.

When do you need metering for payment?

To establish whether a system requires metering, MCS installers should read this guide alongside [the MCS Domestic RHI Metering Guidance](#). If you're an applicant, check that your installer has followed the MCS guidance.

If you have back-up heating

There are various situations where you will need to install meters for payment - the three most common ones are:

- Where a renewable heating system is installed alongside a fossil fuel space heating system. This would include, for example, where there is a biomass boiler and a back-up oil boiler.

- Where a hybrid heat pump (a combination of a heat pump and a fossil fuel gas/oil boiler located in one 'box') has been used. This needs to be metered as we need to take into account the non-renewable portion of the heat generated. This can be done by either:
 - (a) Metering the total heat produced by the hybrid heat pump (ie both the renewable and fossil fuel generated heat); and subtracting the equivalent heat output based on the metered fossil fuel input;
or,
 - (b) Metering the renewable heat output portion only; this would likely require metering inside the hybrid heat pump 'box'.
- Where your renewable heating system is installed alongside another renewable heating system that isn't solar thermal. There are a few situations where this could apply:
 - (a) Where two different types of renewable space-heating system (eg biomass and a heat pump) are installed in the same property. This applies regardless of whether they were installed at the same or a different time.
 - (b) Where two of the same types of eligible space-heating system (eg two air source heat pumps) were commissioned at different times.

If two of the same renewable heating systems are commissioned at the same time (eg two air source heat pumps) we'll consider these as one heating system, so it will not require metering.

Back-up heating that doesn't count:

You don't need metering for payment if your back-up heating is:

- a supplementary electric heater controlled by the same system as the renewable system such as an electric fan heater;
- anything designed to provide heat to only a single room, such as a standalone electric plug-in heater or wood burning stove;
- additional electric immersion heaters for domestic hot water; or,
- a mechanical ventilation system that heats the incoming fresh air using heat generated by the renewable technology alone (these are popular in the construction of new properties, but if you're not sure, speak with your installer).

Metering is never required for solar thermal systems.

If you have a biomass heating system that isn't designed to heat the whole property

A biomass system must be sized to meet 100% of the property's space heating requirements. If it isn't, the heating system must be metered because we can't use the annual heat demand figure listed on the [Energy Performance Certificate \(EPC\)](#) to work out tariff payments.

We will check the calculations on your [Microgeneration Certification Scheme \(MCS\)](#) Certificate to work out the size of your biomass boiler in order to check if your system needs to be metered

If your property is or has been occupied for less than 183 days before your application

If your heating system is installed in a domestic property that has been occupied for less than 183 days before you apply to the Domestic RHI, it will need to be metered. This is because it won't be using as much heat as a permanently occupied property, so we can't use the annual heat figure listed on the EPC to work out payments. This could apply to properties used as a second home, or rental properties which aren't permanently occupied.

When applying, people have to declare to us how many days in the past year the property was occupied. In addition, each year they have to tell us how long it was occupied for in the 12 month period ending on the date of the declaration. Applicants who think the property is likely to be occupied for less than 183 days in any of their seven years of payments may find it worthwhile to install meters when the system is installed.

If you have [custom-built](#) your property, you won't need metering as a result of the property being occupied for less than 183 days in the 12 months before your application. You'll still need to comply with the scheme's other eligibility criteria.

If you are moving into a home with a renewable heating system on the Domestic RHI scheme, and the tenants before you have lived in the property 183 days before you apply to the scheme, you can include their occupation time as part of your application.

Section 3 – Overview: Metering for Performance

What is metering for performance? What are your options for metering for performance?

The Government introduced new regulatory requirements on 22 May 2018. If you applied or were accredited on or after this date, it's a requirement for all new air source and ground source heat pump accreditations to have electricity metering arrangements alongside their heating systems. Electricity meters must be in place before submitting an application to the Domestic RHI.

This change was introduced to help people better understand their heat pump system's electricity usage and efficiency.

Unless your plant is otherwise required to be [metered for payment](#), Domestic RHI payments will be based on the annual heat demand figure listed on your [Energy Performance Certificate \(EPC\)](#), or the [heat demand limit](#) – whichever is lower. For more information on how your payments are calculated, please see our [Factsheet: Tariffs and Payments](#).

When do you need metering for performance?

You need to meet the metering for performance requirements if you have an air source heat pump or a ground source heat pump, and are accredited to the Domestic RHI on or after the date the Government's new regulations came into effect on 22 May 2018.

This is an eligibility requirement for the Domestic RHI.

If you have a solar thermal or biomass heating system, your plant won't need metering for performance.

There are three metering arrangements which can be used alone or in combination:

- [standalone electricity metering](#),
- [on-board electricity metering](#), or
- [a metering and monitoring service package \(MMSP\)](#).

If you don't have electricity meters alongside your renewable heat pump system, you'll need to have these installed before you apply to the scheme. The meters must be properly calibrated and be in good working order during your seven year membership to the scheme. Maintenance information is included in [Part 3 – Information for Installers](#). Make sure your MCS installer is familiar with these requirements.

You'll be asked questions about 'Metering for Performance' as part of your online application. You can find the answers to questions about metering for performance on your MCS Certificate.

Note: If you are metered for payment and also need additional metering for performance, make sure your Installer has specified and labelled which meters you must use to submit readings. These will be listed in the Installer Metering Questions they will give you.

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Part 2 – Information for Applicants

Metering for Payment

Section 4 – Information for Applicants on metering for payment

What to do

If you're still unsure if you need metering for payment, discuss it with an MCS certified installer with the appropriate metering training.

If metering is required, you'll need to have it before applying to the Domestic RHI. The meters must meet specific requirements to help make sure we receive accurate information on what we should pay you. This information is included in [Part 3 – Information for Installers](#). Make sure your MCS installer is familiar with these requirements.

Solar thermal for domestic hot water never has to be metered.

What are payments based on?

If your heating system is metered for payment, you'll receive quarterly scheme payments based on the amount of renewable heat your system produces, up to the annual heat demand on your EPC or the relevant [heat demand limit](#) – whichever is lower. We work this out by taking the total heat generated by your heating system. In some situations we must also deduct any heat from non-renewable sources, such as the electricity input for heat pumps, or the contribution of any backup heating system

Your quarterly payments will be based on the total eligible renewable heat generated by your heating system in that quarter.

You'll need to take readings every three months from your heat meter(s), and any other electricity, gas or oil meters you have, depending on your heating arrangements. You submit them to us using our online portal, [MyRHI](#). This system calculates payments automatically. The maximum we pay you is 'capped' so it will never exceed the amount we'd have paid if your system had not been metered and payments were instead 'deemed' (based on your property's annual [heat demand limit](#) or the relevant heat demand limit - whichever is lower). The annual [heat demand limits](#) by technology are:

- 20,000 kWh for air source heat pumps
- 30,000 kWh for ground source heat pumps.
- 25,000 kWh for Biomass boilers and stoves

See our [Factsheet: Tariffs and Payments](#) to understand how to calculate your payments.

Please note:

Payment calculations and estimates a third party (eg an installer) conducts as part of the system design should **not** be used to estimate RHI payments. We can't confirm exact payment amounts until your heating system is accredited.

Section 5 – Who can install meters

Your installer must be MCs certified

You must use an MCS certified installer to install all meters. This could be the person who installed your heating system, or someone different. If you choose someone different, they must be MCS certified to install the type of heating system that you have.

There are specific technical requirements that meters need to meet. You don't need to know these yourself, but make sure that your installer is aware of this. If you would like to read the technical requirements, see [Annex 7 – Technical requirements for electricity meters for performance for the Domestic RHI](#).

In addition, we recommend you ask your installer whether they have read the information in [Part 3 – Information for Installers](#).

Things to expect from your metering installer

While the meters (heat meters and any other necessary electricity, gas or oil meters) are being installed you should make sure your installer:

- 1. Labels all your meters** and that you understand what each label refers to. Frequently used abbreviations are: HM for a heat meter, EM for an electricity meter, GM for a gas meter and OM for an oil meter. In some cases the installer may also have written a number next to the reference letters because there is more than one of that type of meter (HM1, HM2 etc).
- 2. Hands you a signed, completed paper copy of the 'Installer Metering Questions' (IMQs)** before they leave the site. There are different versions for biomass boilers and heat pumps. This is essential as you'll need their answers to complete the metering questions in your application. You can download the document from our website and ask your installer to complete it. There are different versions for [biomass boilers](#) and [heat pumps](#).
- 3. Gives you the initial meter reading for each meter** once the system has been commissioned (when they test and sign off the heating system). Make sure they write it into the Installer Metering Questions (IMQs) document. There are different versions for biomass boilers and heat pumps. Without this reading we can't start paying you.

The meter reading is valid for the next two weeks only. If you apply to the Domestic RHI later than that, you'll have to take a new reading yourself.
- 4. Demonstrates how to read the meters** for your first meter reading so that you know how to take future readings, and informs you when you should do this. They should also show you how to compare future readings against the first.
- 5. Has told you what units your meter is showing.** Your heat and electricity meters should be in kilowatt hours (kWh). Gas and oil meters should be in m³ or litres.

6. **Has told you if your installation requires Alternative Metering Arrangements.** If it does, you'll need to download our template and make sure they complete and return it to you (you'll need it for your application). There are different versions for [biomass boilers](#) or [heat pumps](#). It has to include a simple schematic showing the meter placement and a description of why the heat output from your heating system cannot be metered alone. For more detail see [Section 18 – Alternative metering arrangements](#).
7. **Provides you with a handover document pack containing:**
- a paper copy of the Installer Metering Questions (IMQs). There are different versions for [biomass boilers](#) and [heat pumps](#).
 - a process to follow to check that the meter is operating correctly
 - any maintenance requirements
 - calibration requirements
 - meter instructions.

In addition, we recommend you ask your installer whether they have read the information in [Part 3 – Information for Installers](#) and to confirm in writing that the heating system and meters they're installing are intended to be eligible for the Domestic RHI.

For general queries

For free, impartial advice about the Domestic RHI scheme, including eligibility questions, contact:

The Energy Saving Advice Service (England or Wales)

Email: energy-advice@est.org.uk

Energy Saving Trust Scotland (Scotland) 0808 808 2282

Calls are free from landlines and most mobile networks

[Online email form](#)

Section 6 – When you're ready to apply

Metering for payment questions in the application form If you don't have the answers

You'll be asked questions about 'metering for payment' as part of your online application. You'll be asked these if:

1. **You declare that your heating system needs to be metered for payment.**
2. **You confirm that the property the renewable heating system is in has been occupied for less than 183 days in the 12 months before the application is made** (this does not apply to you if you are a [custom-builder](#)).
3. **Your MCS number triggers the questions**, based on the answers your installer gave when registering your heating system on the MCS database.

To answer the questions, use the Installer Metering Questions (IMQs) document that your installer signed and gave you (you'll probably find it in your handover pack). Copy the answers into the application metering questions – the questions will be identical.

We recommend that you complete the section on metering questions when you apply. If you don't have the answers to use from the Installer Metering Questions document, you can complete the rest of the application form and submit it. Note though that we can't process your application until you supply the missing information. You can find the Installer Metering Questions (IMQs) in [Annex 1 - Installer Metering for Payment Questions](#).

You can enter the answers to the metering questions at a later date by signing in to the [MyRHI portal](#) on the Domestic RHI website. You must complete them within three months of application. If you don't, your application will be rejected.

Future metering for payment readings

Once you're accredited to the scheme, you must sign in to MyRHI to submit meter readings every quarter. It will automatically show the different meters you need to submit readings for. We'll email you quarterly, before you need to do this.

To learn how to submit meter readings, see [Section 7 – Submitting your meter readings](#).

When you'll need alternative metering arrangements

If your installer says your heating system requires an alternative metering arrangement, make sure they give you a completed Alternative Metering Arrangements document. There are different versions for [biomass boilers](#) and for [heat pumps](#).

The five most likely scenarios are:

1. **You have a heating system that combines a heat pump with a fossil-fuel system (e.g. a gas boiler) in the same product.** Where your heating system falls into one of these scenarios and requires additional supporting information at application, you will not initially be able to use the [MyRHI](#) portal to submit your meter readings (see [section 15](#)). Instead, you'll need to submit your readings using a meter readings spreadsheet, which we'll send you.
2. **You have a back-up heating system.** The renewable system itself can't be metered (eg due to space constraints) so the total heat produced must be metered. But because this total may include heat from the back-up system, meters are required to measure the ineligible input so that it can be deducted from the total heat produced.
3. **You have a heat pump that you intend to use to provide cooling in summer.** The meter logging the electricity use when in heating mode will continue to work over summer when in cooling mode. You'd therefore be subtracting more than necessary from your renewable heat output figure. This would reduce your payments, so you may wish to have an alternative metering arrangement to account for it, although this is not mandatory.
4. **You heating system provides part of its heat output to an ineligible purpose (e.g. swimming pools).** Your heating system can provide heat to another purpose, like a swimming pool, however it's excluded from your annual heat demand figure on your EPC. Normally, payment is capped by the annual heat demand figure or relevant heat demand limit, whichever is lower. This stops payment for purposes not included in the EPC.

In cases where the annual heat demand is not used as a cap for payment (e.g. low occupancy) and your metered renewable plant is connected to a swimming pool, heat meters need to measure the proportion of heat from the renewable plant which goes to the swimming pool. If you do not want to complicate your metering arrangement, you can opt to meter all heat to the swimming pool and deduct it from the total eligible heat generated.
5. **You have a heating system where there are three or more electricity meters installed.** Our Installer Metering Questions (IMQs) are only applicable to systems with two meters. You'll need to get your MCS installer to fill out the Alternative Metering Arrangement Template to cover the extra meters.

How payments are calculated for metered systems

The formula for these payments will vary depending upon the setup of your heating system. We assign this formula based on the answers to your Installer Metering Questions (IMQs), which include the most common variables of metering a renewable heating system. You see the formula after you answer the metering questions in the online application form. If you're unsure what your formula means, or what variables have been accounted for, see [Annex 2 - Additional factors considered when calculating payments](#) and discuss with your installer.

An example payment formula for a heat pump might be:

$$\text{Renewable Heat Payment} = \text{Tariff} \times (\text{HM1} - \text{EM1}) \text{ or the relevant heat demand limit}$$

HM1 = total heat generated in that quarter by the heat pump as listed on the EPC

EM1 = electricity used by the heat pump.

Please note:

Any estimated potential payments by a third party may not accurately reflect actual RHI payments. Actual RHI payments can't be confirmed until heating systems are accredited, and readings are submitted.

Heat pumps and Seasonal Performance Factor (SPF)

If you're metered for payment, your quarterly payments are based on meter readings where the electricity used is deducted from the heat output, so calculating the renewable heat generated.

If you're applying with a heat pump, the [Seasonal Performance Factor \(SPF\)](#) is important. Quarterly payments are based on metered heat output BUT you will not be paid more than a set payment amount each year. There is a payment cap set so that you won't be paid more than you would have received if you were deemed for payment. The cap is based on the annual heat demand listed on your property's EPC, which is adjusted by the SPF of the heat pump. The more efficient your heat pump, the higher this payment cap will be.

Section 7 – Submitting your meter readings

Using MyRHI

If your heating system is accredited to the scheme, you'll be able to sign in to the [MyRHI](#) portal of the Domestic RHI website to submit your meter readings every quarter (except for alternative arrangements, as detailed at the end of [Section 7 – Submitting your meter readings](#)). Submitting a meter reading will enable us to calculate the payment owed to you for the preceding quarter.

You'll be presented with separate text boxes for each of your meters. The system knows how many meters you have and their type based on the answers on your application form (using the Installer Metering Questions document. There is one for [biomass](#) and one for [heat pumps](#)).

The system will record your previous meter readings, so you can check whether the new reading seems sensible. The system will alert you if they appear unlikely.

For more advice see our [Helpsheet: How to submit a meter reading](#).

Other uses of MyRHI

In [MyRHI](#), you'll also be able to:

- view your installer's details;
- view all your previous meter reading submissions;
- see information about your payment formula (heat equation;)
- check when your next meter reading is due; and,
- enter the Installer Metering Questions, if you weren't able to at the time when you applied.

When to submit meter readings

The first meter reading(s) you submit as part of your application provides us with a baseline figure to make your first quarterly payment. You must take this baseline reading at application and can do it up to two weeks before the date you apply¹.

You have to take and submit readings every three months within a specific window. This will be a four-week period, from one week before the quarterly meter reading date and up to three weeks after. The exact dates depend on when you're accepted to join the scheme. These meter reading dates are confirmed at the point of approval.

You'll need to submit 28 quarterly meter readings over the seven years of the scheme. You'll receive an email reminder one week before your window opens, and subsequent reminders if you haven't sent your readings, up to its end.

If you forget to submit a reading

If you forget to submit a meter reading or are away over your four-week window then you'll have to submit the readings in the next quarterly window. Once you do this, you'll be paid for the previous two quarters in one go.

You'll only be allowed to miss one meter reading submission. If you fail to provide the subsequent meter reading then we'll treat this as non-compliance with the scheme rules, which could lead to the suspension of your payments.

¹ However we'll pro-rata your first quarter's payment to account for meter readings taken from before the date you apply.

Section 8 – If a meter breaks or is not in good working order

Notifying us

If one of your meters breaks or is not in good working order, and this will stop you from taking or submitting your next set of readings, you must tell us within 28 days of you discovering the fault.

What to do

If a meter breaks or is not in good working order, let us know but don't submit any readings (including from other meters you may have) until it's been repaired or replaced by an MCS certified installer.

Once it has been fixed or replaced, email us at DomesticRHI@ofgem.gov.uk with readings from all of your meters.

We'll then reset your readings and, where possible, estimate your payments for the period that the meter was broken or not in good working order.

If a meter needs to be replaced

If the broken meter can't be fixed and needs to be replaced (or if just one component of a heat meter needs replacing, such as the pair of temperature sensors or a flow meter), you'll need to submit the details of this new meter to us.

It's your responsibility to keep the meters in good working order. If you fail to do so or fail to notify us within 28 days of discovering that it is not in good working order, then we'll treat this as non-compliance under the scheme rules, which could lead to the suspension, loss of your payments or revocation of your accreditation.

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Metering for Performance

Section 9 – Information for Applicants on metering for performance

What to do

If you own an air source heat pump or ground source heat pump, and have made a successful application to the scheme on or after 22 May 2018, you'll need to have electricity metering arrangements alongside your heating system to measure the electrical input to your heat pump and any additional heaters on the same control system. Although meters installed for payment or MMSP purposes are acceptable, they may not meet all three of the metering for performance requirements listed below. In such cases additional standalone metering would need to be installed.

In some cases, in order to meet the metering for performance requirement, you will need to install more than one electricity meter.

Metering is required to record and display electrical input into all of the following:

- electricity used by the heat pump to generate heat.
- electricity used by any supplementary heaters for [space heating \(SH\)](#) which are controlled by the same control system as the heat pump.
- electricity used by any immersion heaters for [domestic hot water \(DWH\)](#), which are controlled by the same control system as the heat pump.

Circumstances where your plant doesn't require additional electricity meters include:

- If you have a supplementary heater or an immersion heater, which is integrated within the heat pump.
- If you have a supplementary heater or an immersion heater which can be controlled separately to the heat pump.

Metering options

There are three metering arrangements which can be used alone or in combination:

- [standalone electricity metering](#),
- [on-board electricity metering](#), or
- [a metering and monitoring service package \(MMSP\)](#).

You can read more about your metering for performance options in [Section 10 – Electricity Metering Arrangements](#).

You'll need to have your electricity meters installed before applying for the Domestic RHI. The meters must be properly calibrated and be in good working order during your seven year membership of the scheme. Maintenance information is included in [Part 3 – Information for Installers](#). Make sure your MCS installer is familiar with these requirements.

For more details on requirements for metering arrangements, please see [Section 10 – Electricity Metering Arrangements](#).

Note: If there are multiple supplementary or immersion heaters controlled by the same control system as the heat pump, a single meter can be installed to record the total combined electrical input; or, each heater can be metered separately. Metering input to each heater separately could help monitor the efficiency of the heat pump and identify if there is an issue with an individual immersion heater/supplementary heater.

Details of your metering for performance status needs to be added to your MCS Certificate.

Section 10 – Electricity Metering Arrangements

Discuss with your installer which electricity metering option is best suited for you and your heating system.

Standalone electricity metering

One option for metering for performance is to use a standalone electricity meter that measures the electricity consumption of your heat pump. The electricity meter will likely have to be purchased in addition to the heat pump, and be installed alongside it.

There are certain technical specifications and accuracy requirements that standalone electricity meters need to meet. Your meters must meet certain requirements set out in the 2014 EU Measuring Instruments Directive (MID). For more detailed information, see [Annex Z](#).

This will mean that your electricity meter will measure the electricity consumption of your heat pump accurately in isolation from other devices in your home. An electricity meter is eligible to be used if your plant requires metering for payment or metering for performance

On-board electricity metering

Some heat pumps have built-in meters and monitoring devices. These are also known as 'on-board meters'. An on-board electricity meter is part of the plant and purchased with your heat pump, rather than separately as a standalone electricity meter. This means you don't have to install it separately.

On-board electricity meters don't have to meet the same technical specifications and accuracy requirements as stand-alone electricity meters. This will mean that the accuracy of this type of metering might be less. There are situations where you may need both.

Metering and Monitoring Service Package (MMSP)

[A Metering and Monitoring Service Package \(MMSP\)](#) consists of high specification heat meters, electricity meters and temperature sensors installed on the heating system. It will log data at least every two minutes, and you and your installer will be able to see the data. Applicants that choose this option and successfully register for an MMSP will get paid additional support in order to help cover the cost of installing and operating the package.

1) If you are successfully registered for MMSP before 22 May 2018:

- £230.00* per year (£57.50 every three months) for heat pumps
- £200.00* per year (£50.00 every three months) for biomass pellet boiler

2) If you successfully registered for MMSP on or after 22 May 2018

New MMSP registrations on or after 22 May 2018 will be able to get a lump sum payment alongside their first Domestic RHI payment, and a maximum of up to seven years of annual MMSP payments.

- For heat pumps, a single lump sum payment of £805.00*, and an MMSP payments of £115.00* per year (£28.75 every three months)
- For biomass pellet boilers, a single lump sum payment of £700.00*, and MMSP payments of £100.00* per year (£25.00 every three months)

Please see our [Essential Guide to Metering and Monitoring Service Packages](#) for more detailed information.

* MMSP payments will not be adjusted in line with RPI or CPI. They remain fixed for the lifetime of the scheme.

Note: If you apply for an MMSP alongside your Domestic RHI application, you would get the lump sum and the maximum of seven yearly MMSP payments. If you apply for the MMSP afterwards, you'd still get the lump sum but only get yearly payments for the remainder of the seven years you are a participant of the Domestic RHI scheme, or until the MMSP agreement is ended, terminated, or registration is withdrawn by us.

Checking your data

It's good practice to regularly check the data recorded by your electricity meters, especially just after your new heating system has been installed. It will help you spot teething problems and optimise your setup. Your installer should be there to help you.

If you have an MMSP, you'll need to submit your data to us in the format we require, when we ask for it. To find out more on how to submit your data, please see [section 9](#).

Your installer should be able to explain any issues with your data and how your heating system is performing.

More information

For more information, read [Section 15 'helpful hints and tips for heat pump owners'](#).

If you are unsure of what these requirements mean for your heating arrangements, talk to your installer.

If you want to discuss the requirements before you install a heat pump for the Domestic RHI scheme, call **0300 003 0744** or email:

DomesticRHI@ofgem.gov.uk and put '**Metering for Performance**' in the subject line.

Section 11 – Who can install meters

Your installer must be MCS certified

You must use an MCS certified installer to install all meters. This could be the same person who installed your heating system, or someone different. If you choose someone different, they must be MCS certified to install the type of heating system that you have.

There are specific technical requirements that meters need to meet. You don't need to know these yourself, but make sure that your installer is aware of this. If you do want to read the technical requirements, see [Annex 7 – Technical requirements for electricity meters for performance for the Domestic RHI](#).

In addition, we recommend you ask your installer whether they have read the information in [Part 3 – Information for Installers](#).

Things to expect from your metering installer

While the meters (electricity meters, or any other necessary heat, gas or oil meters) are being installed you should make sure your installer:

1. Labels all your meters and ensures that you understand what each label refers to. Frequently used abbreviations are: HM for a heat meter, EM for an electricity meter, GM for a gas meter and OM for an oil meter. In some cases the installer may also have written a number next to the reference letters because there is more than one of that type of meter (HM1, HM2 etc).
2. Demonstrates how to read the meters for your first meter reading so that you know how to take future readings, and informs you when you should do this. They should also show you how to compare future readings against the first.
3. Has told you what units your meter is showing. Your heat and electricity meters should be in kilowatt hours (kWh). Gas and oil meters should be in m³ or litres.

In addition, we recommend you ask your installer whether they have read the information in Part 3 of this guide – Information for Installers - and to confirm in writing that the meters they're installing are intended to be eligible for the Domestic RHI.

Section 12 – Submitting your MMSP data

If you have a Metering and Monitoring Service Package (MMSP), Ofgem may request MMSP data on a regular basis, generally twice a year (though it could be more or less often than this).

We won't assess your data at Ofgem, but we'll pass on the information about the plant's performance to the Department for Business, Energy & Industrial Strategy (BEIS). BEIS use this data to inform future research and policy development.

We'll contact you to ask you to send us this data. You'll have 28 days to comply with the request. You may wish for us to speak directly to your installer to get the data, in which case you can give us permission to speak to your installer on your behalf. If you refuse to provide the data, or if it's not sufficiently complete, we may withdraw your MMSP registration.

As part of the MMSP agreement, your installer has to store your data for 12 months.

For more details on your and your installer's responsibilities, please refer to your MMSP agreement.

This section doesn't apply to you if you don't have an MMSP.

Section 15 – Helpful hints and tips for heat pump owners

Design, installation and operation can all affect heat pump performance. A well-designed, installed and operated heat pump will provide whole-house comfort while reducing household energy bills and the CO₂ emissions associated with burning fossil fuels such as oil or LPG. **This section is for people who own heat pumps systems.**

How to make the most of your mandatory electricity metering

From 22 May 2018, the Government requires that all Domestic RHI-supported heat pumps have electricity metering.

This change was introduced to enable consumers to monitor the performance of their heating system and to provide a better understanding of the heat pump system's electricity usage. Efficient heat pumps are essential to deliver savings on energy bills for consumers.

Make sure that your installer has explained to you how to read the electricity meter. We suggest that you check your heat pump's electricity meter reading regularly (at least every month or every quarter) and keep a note of meter readings. You can keep track of the amount you spend on heating and domestic hot water by multiplying the difference between monthly meter readings by the unit cost of electricity from your electricity bill.

You can also compare the annual amount of electricity used with the amount estimated by your installer.

If you have metering for payment

If your heat pump is installed in a property that you live in for less than 183 days of the year (e.g. a holiday home), or if it's a secondary heating system and controls are integrated with a fossil fuelled boiler, then you require heat and electricity metering ([metering for payment](#)). You should make sure that your installer shows you how to read the heat and electricity meters. You must submit regular readings from both these meters to Ofgem.

How to get the best performance from your heat pump

You can take these simple steps to ensure that your heat pump performs well:

- Keep track of your heat pump's electricity meter readings. If the electricity consumption increases suddenly and remains high, contact your installer.

Make sure that the installer has provided you with the manufacturer's operating instructions. However, we recommend that you don't change your settings, but instead talk to your installer if the room temperature is not as you require.

What your installer can do to help

Your installer should select suitable settings to ensure good performance. Some common examples to look out for include:

- **Setting-up weather-compensation:** the heat pump is more efficient if it uses low temperatures in the central heating circuit when the weather is warmer.
- **Avoiding excessive use of the domestic hot water immersion:** this is more expensive than using the heat pump to heat water. The domestic hot water immersion should be timed to come on only for weekly sterilisation and, if required, to provide top-up heat to the hot water tank, once the heat pump has heated the water to around 50-55°C. Your installer should provide a separate electrical meter for the domestic hot water immersion.
- **If your heat pump model includes a boost electric heater within the heat pump:** ask your installer what steps are taken to ensure that it does not come on except in very cold weather. (Many heat pump models do not include boost electric heaters).
- **If you suspect that your heat pump has developed a fault:** we suggest that you contact your installer.

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Part 3 – Information for Installers

Metering for Payment

Section 16 – Information for installers on metering for payment

If metering for payment is required

If metering for payment is required, then your customer will need to enter technical information about their meters and their arrangement when completing their application. You provide the answers by completing and giving to your customer the Installer Metering Questions (IMQs) document at the time of installation. Download the document from our website – there are different versions for [biomass boilers](#) and [heat pumps](#). The questions on the Domestic RHI application mirror those in the document – all your customer has to do is copy in your answers.

Installer Metering Questions

Installer Metering Questions are required for all metered applicants; for example when:

- installing meters for payment for a new system
- retrofitting meters to an existing system
- when verifying existing metering arrangements. See [Installer Metering Questions](#).

In some cases you must also complete and give to your customer the 'Alternative Metering Arrangements Template', but it's required only for a specific set of circumstances. See [Section 18 – Alternative metering arrangements](#).

Please note: Any estimated potential payments by a third party may not accurately reflect actual RHI payments. Actual RHI payments can't be confirmed until applications are accredited, and readings are submitted.

Payments for Participants

Metered for payment participants on the scheme have to submit quarterly meter readings to us using the online portal, [MyRHI](#). You can direct your customers to our [Helpsheet on How to submit a meter reading](#) for more instructions. Their payments are based on a heat equation specific to each metered installation. Participants will never receive more than they would otherwise have received if they hadn't been metered. Payments are capped at the amount of their annual head demand figure listed on their EPC, or the [heat demand limit](#), whichever is lower.

The formula for these payments will vary depending upon the setup of the heating system. We assign this formula based on the answers in the Installer Metering Questions (IMQs), which include the most common variables of metering a renewable heating system. Participants will see the formula after they answer the metering questions in the online application form. Go to [Annex 2](#) to see what the formula means and what variables have been accounted for.

For examples of payment calculations, please see our key term [payment calculations - deemed](#) and [payment calculations - head demand limits](#).

Section 17 – The Design Stage

MCS Certification

To install any meters in situations where your customer is applying for the Domestic RHI and needs to be metered for payment, you must be an MCS installer and certified to install their specific technology. This applies to both new applicants and when retrofitting meters for legacy applicants.

Meter installation

The meter installer must be MCS certified and satisfied that metering meets the Domestic RHI criteria. This verification means that they assume responsibility for ensuring that the metering specifications and arrangement are correct and will be the first point of contact if the customer has any problems.

Metering arrangements

A minimum of one heat meter must measure the [eligible](#) renewable heat output from any Domestic RHI biomass or heat pump installation. Additionally, a minimum of one electricity meter must measure the electricity consumed by ALL heat pump installations to produce the metered heat output. This will be subtracted from their total heat output figure. This is known as 'standard' metering, which should be suitable for the majority of installations

What else?

There are certain instances where the installation can't have a standard metering arrangement and requires an alternative arrangement. Some examples are:

- when an additional technology contributes to the metered heat output of the Domestic RHI installation – such as an electric input prior to a [domestic hot water \(DHW\)](#) cylinder and where, due to space constraints, the heat output from the Domestic RHI installation alone cannot be metered;
- to avoid subtracting the electrical input when a heat pump is used for cooling.

In these cases you'll have to provide your customer with additional supporting information so we can verify it for their Domestic RHI application. For more information about alternative metering arrangements, see [Section 18 – Alternative metering arrangements](#).

Heat pumps and Seasonal Performance Factor (SPF)

If your customer is metered for payment, their quarterly payments are based on meter readings where the electricity used is deducted from the heat output, so calculating the renewable heat generated.

If they are applying with a heat pump, the Seasonal Performance Factor (SPF) is important. Quarterly payments are based on metered heat output BUT your customers will not be paid more than a set payment amount each year. There is a payment cap set so that they will not be paid more than they would have received if they were deemed for payment. The cap is based on the annual heat demand listed on their property's EPC, which is adjusted by the SPF of the heat pump. The more efficient the heat pump, the higher this payment cap will be.

Standard metering arrangement design

Standard metering for heat pumps:

Where a heat pump installation needs to be metered for payment, and 'standard' metering can be used, a minimum of both one heat meter and one electricity meter should be installed, so that the eligible renewable heat output from the Domestic RHI heat pump alone is measured. We subtract the electricity used from the heat generated in order to calculate the amount of eligible heat produced.

The number of **heat meters** required will depend upon the number of heating circuits that the heat pump is feeding, and whether meters can be installed directly as flow and return pipes enter/exit the unit. If this isn't possible due to physical constraints, they may have to be installed after the pipework diverges.

You need to ensure that all electrical input to the system that may influence the heat output is metered. The number of **electricity meters** required will depend on whether the electricity supplying the heat pump uses one connection for all necessary components, or whether two or more connections are required.

This will always, as a minimum, supply the compressor but may also supply one or more of any internal or external supplementary heater(s), an immersion heater(s), any circulation pump(s), a ground loop circulation pump (for ground source heat pumps) or an evaporator fan (for air source heat pumps). Make sure you're aware of what the electricity supply is feeding, as your customer will be asked this in their application

Standard metering for biomass boilers or stoves:

Where a biomass installation needs to be metered for payment, and 'standard' metering can be used, a minimum of one heat meter should be installed as close to the biomass boiler heat output (flow and return pipes) as possible, depending upon the number of heating circuits exiting or entering the biomass boiler.

These meters should be installed to enable the eligible renewable heat output from the Domestic RHI system alone to be measured.

The number of heat meters required will depend upon the number of heating circuits that the system is feeding; and whether meters can be installed directly as flow and return pipes exit/enter the biomass installation. If this is not possible due to physical constraints, meters may have to be installed after the pipework diverges.

Biomass systems that use electricity, gas or oil purely for ignition purposes can ignore the additional fuel input, as it does not need to be accounted for in the metered eligible renewable heat output.

For heat pumps and biomass boilers or stoves:

The number of meters and complexity of the arrangement will vary from one installation to another. See Annex C of the [MCS Domestic RHI Metering Guidance](#) for examples of meter installation locations and also [Annex 4 – Standard schematics for Metering for Payment](#) for some of the most commonly anticipated metering scenarios. Please note, they are simplified.

Installer Metering Questions document

After showing your customer how to take readings, you must complete and sign a paper copy of the 'Installer Metering Questions' document and give it to them. There are different versions for [biomass boilers](#) and [heat pumps](#). (see [annex 1](#)). It provides all the information they need to complete the section about metering on the Domestic RHI application form. Your customer will copy your answers. In addition to the technical information, it includes your contact details and MCS number should there be an issue after they've been approved for the scheme. You will be the first point of contact if there's a problem.

At the end of the document, you will be asked to confirm a number of declarations - that:

- all meters have been labelled appropriately (ie HM1, 2 etc. for heat meters and EM1, 2 etc. for any necessary electricity meters);
- all heat meters installed are MID class 3 compliant (or better);
- all electricity meters installed are MID class A compliant (or better) with the exception of [on-board metering](#);
- all meters are properly calibrated;
- all meters have been properly installed in accordance with manufacturer's instructions;
- to the best of your knowledge the arrangement complies with the [MCS Domestic RHI Metering Guidance](#) and will as such be eligible to be accredited under the Domestic RHI;
- you have advised the customer on the correct procedure to read the meters; and,
- you have advised the customer of their obligation to provide quarterly meter readings and the implications if they fail to do so.

Section 18 – Alternative metering arrangements

When it's required

There are certain instances where the installation can't have a standard metering arrangement and requires an alternative arrangement. In these cases you'll have to provide your customer with additional supporting information so that we can verify it for their Domestic RHI application. These scenarios include where your customer has:

1. **An additional technology contributing to the metered heat output figure of their Domestic RHI installation:** where the metered heat output from the Domestic RHI technology includes heat from an additional ineligible technology on the same heating system.
2. **A heat meter has been installed after a standalone hot water cylinder (HWC); not an integrated HWC and it uses an additional supplementary heat source:** where a heat meter has been installed after a standalone DHW cylinder² where the standalone DHW cylinder uses some form of supplementary input (e.g. electric immersion heater or a twin coil cylinder with the secondary coil fed from an ineligible technology such as a gas or oil boiler) or it could be where an ineligible heat source is simply contributing to the metered heat output. See annex 5 for example schematics. Please note that a buffer tank should not be confused with a [Domestic Hot Water \(DHW\)](#) cylinder. It may make a difference to the metering requirements whether a meter is installed before or after a buffer tank.
3. **A heat pump capable of cooling:** where your customer is likely to use the heat pump in cooling mode during the summer months. This would reduce their scheme payments due to the additional metered electrical consumption recorded and subtracted from the heat output figure. However, this decision is ultimately up to your customer.

4. **The heating system provides part of its heat output to an ineligible purpose (e.g. swimming pools):** where your customer's heating system provides part of its heat to another source, for example a swimming pool. Where the domestic plant is metered and a back-up heating system is also connected to a swimming pool, the position of a heat meter is important as we need to ensure it measures only the output from the renewable heating plant and before it mixes (if it does) with that from a fossil fuel source.

In cases where the annual heat demand on the EPC is not used as a cap for payment (e.g. low occupancy) and the customer's metered domestic plant is connected to a swimming pool, heat meters need to measure the proportion of heat from the renewable plant which goes to the swimming pool. If the customer does not want to complicate the metering arrangement, they can opt to meter all heat to the swimming pool and deduct it from the total eligible heat generated.

5. **Here are three or more electricity meters installed:** where your customer's heating system has three or more electricity meters installed for metering for payment, our Installer Metering Questions (IMQs) are only applicable to systems with two meters. You'll need to fill out the Alternative Metering Arrangement Template to cover the extra meters.

Please note: For these scenarios you need to complete and give to your customer the 'Alternative Metering Arrangement Template'. There are different versions for [biomass boilers](#) or [heat pumps](#) (see [Annex 1 - Installer Metering for Payment Questions](#)).

² Domestic Hot Water cylinder used to heat a store of water [using a coil fed by the Domestic RHI technology and sometimes an additional heat source e.g., an immersion heater or additional heating coil fed by a fossil fuel back-up heat source].

Process for designing alternative metering arrangements

Option 1 – For where there’s an additional technology contributing to the metered heat output figure of the Domestic RHI installation:

You need to install one or more heat meters to measure the total combined heat output from the eligible installation and the additional ineligible technology, plus one of the following options:

- A. Install a heat meter to measure the heat output being contributed to the heating system by the additional ineligible technology so it can be subtracted from the total combined heat output

or

- B. Install one or more gas/oil or electricity meters as necessary to measure the fuel input to the additional technology (includes electric immersion heaters) so that the equivalent heat energy output based on a 100% boiler/ immersion heater efficiency can be calculated. This figure will then be subtracted from the total combined heat output.

Complete the ‘Alternative Metering Arrangement Template’ - there are different versions for [biomass boilers](#) or [heat pumps](#) (see [Annex 1 - Installer Metering for Payment Questions](#)), and give it to your customer for their Domestic RHI application along with the answers to the Installer Metering Questions document.

To complete the Alternative Metering Arrangement template, you must provide:

A written description as to why the heat output from the Domestic RHI technology alone cannot be metered (e.g. due to space implications) and how the metering arrangement you are proposing will get around this problem using one of the methods (‘A’ or ‘B’) as described on the left.

1. A simple schematic showing the proposed metering arrangement including all necessary heat meters required and any electricity, gas or oil meters to enable only the eligible renewable heat output to be measured. Refer to the list of what is required for a ‘simplified schematic’. Use the format shown in [Annex 5 – Alternative metering schematics](#).
2. Details of the additional heat source to enable us to factor in any effect on the payment calculation.

This will allow us to check the proposed metering arrangement and assign a heat equation to be used for all future payments.

Where the fuel input is being measured instead of the heat output from the additional plant (see option ‘B’ left) the equivalent heat output figure will be calculated using fuel gross calorific values selected from BEIS’s published calorific values in [DUKES \(Digest of UK Energy Statistics\)](#), Annex A1³:

The equivalent heat output calculation assumes a 100% boiler/ immersion heater efficiency figure (100% of the fuel input being converted to heat output).

³ Within the DUKES report we will use the following fuel inputs: LPG, we will use Propane/Butane (LPG); for oil, we will use burning oil, which is the large majority of all oil used for domestic heating; for natural gas, we will use natural gas consumed.

Process for designing alternative metering arrangements

You must provide a 'simplified schematic' as part of the alternative metering arrangement template which your customer needs for their Domestic RHI application. We review it as part of the application assessment process. See example schematics in [Annex 5 – Alternative metering schematics](#). Your 'simplified schematic' must show:

- All heat generating technologies feeding into the heating system. For example, the Domestic RHI installation plus any additional technologies, including any immersion heaters.
- Any [domestic hot water \(DHW\)](#) cylinders located on the system, where the heat meter is installed after the DHW cylinder.
- The placement of all heat meters - to measure total heat output from the Domestic RHI installation and any heat contribution by additional plants where the heat output from the Domestic RHI installation could not be measured separately.
- The placement of any electricity meters. For example, where a heat meter is installed after the DHW cylinder and the DHW cylinder contains an immersion heater.
- The placement of any gas or oil meters. This is applicable where hybrid heat pumps have been used, or where the additional plant is a gas or oil system contributing heat to the heating system, and the heat output from the Domestic RHI installation or the additional plant cannot be measured separately. In these cases the equivalent heat will be calculated using the metered gas or oil figure based on a 100% conversion efficiency.
- Flow and return piping used on the system (including red/blue colouring or directional arrows).

Note:

Do not show any valves or other engineering symbols. It isn't necessary to show the heat uses on the simplified illustration, however you must provide summary details of them in the Installer Metering Questions document.

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Metering for Performance

Section 19 - Information for Installers: Metering for Performance

If metering for performance is required

The Government introduced new regulatory requirements on 22 May 2018. It is now an eligibility requirement for the Domestic Renewable Heat Incentive (RHI) that all applications for air source (ASHP) and ground source heat pumps (GSHP) with an RHI date on or after the above date have electricity metering arrangements alongside their heating systems.

This change is being introduced so people can better understand their heat pump system's electricity usage, bills and carbon savings.

In some cases, your customer may require 'metering for performance', as well as 'metering for payment' for their heat pump system. In cases where the electrical input into additional heaters needs to be recorded for metering for payment, this may fulfil the requirements needed for metering for performance. This is because the installation of such meters could also meet the criteria listed below. We will review the [Installer Metering Questions for Heat Pumps](#) before accrediting the system.

The meter(s) will be required to record and display:

- electricity used by the plant to generate heat;
- electrical input into any supplementary electric heater controlled by the same control system as the heat pump; and
- electrical input into any immersion heater for a domestic hot water cylinder where the immersion heater is controlled by the same control system as the heat pump.

This will need to be added to the MCS Certificate.

Note: If there are multiple supplementary or immersion heaters controlled by the same control system as the heat pump, it may be that a single meter can be installed to record the total combined electrical input; or, each heater can be metered separately. Metering input to each heater separately could help the customer monitor the efficiency of the heat pump and identify if there is an issue with an individual immersion heater/supplementary heater.

Details of the installations' metering for performance status needs to be added to the MCS Certificate.

Payment for participants

If your customer is metered only for performance, Domestic RHI payments will be based on the deemed heat demand on your customer's property EPC - or the heat demand limit (where relevant).

Participants whose plants are metered for payment must submit regular meter readings, so that we can calculate payments appropriately. These payments are subject to the [heat demand limits](#) introduced from 20 Sep 2018. If applicants have a heat pump that is only metered for performance, they won't need to submit anything to us to receive payments.

Please note: Any estimated potential payments by a third party may not accurately reflect actual RHI payments. Actual RHI payments can't be confirmed until heating systems are accredited, and readings are submitted.

Section 20 – Standard metering arrangement design

Standard metering for performance for heat pumps:

You need to ensure that all electrical input to the system that may influence the heat output is metered. The number of electricity meters required might vary depending on the option that is chosen to satisfy the requirements of metering for payment or metering for performance. In addition, it also might change depending on whether the electricity supplying the heat pump uses one connection for all necessary components, or whether two or more connections are required.

It's a requirement that, as a minimum, the electricity that is metered supplies the compressor. However, it may also supply one or more of any internal or external supplementary heater(s), an immersion heater(s), any circulation pump(s), a ground loop circulation pump (for ground source heat pumps) or an evaporator fan (for air source heat pumps). Make sure you're aware of what the electricity supply is feeding, as your customer will be asked this in their application.

See here for further information on [MCS Guidance on RHI Metering](#).

For more details on technical requirements for metering for performance, please see [Annex 7 – Technical requirements for electricity meters for performance for the Domestic RHI](#).

Meter seals

We recommend all electricity meters are appropriately sealed. This is useful for you as an installer and helpful for us if we decide to carry out any audits to detect any post installation tampering.

Labelling

Please ensure you label all meters. Find details on labelling in the next section.

Meter display

Meters should be selected to read:

- heat meters: kWh
- electricity meters: kWh
- gas meters: m³ or litres
- oil meters: m³ or litres

After you've installed

With regard to your customer's electricity meters for performance, it's essential that:

- all electricity meters installed are MID class A compliant (or better) except for [on-board metering](#)
- all electricity meters installed are MID class A compliant (or better) with the exception of
- all meters are properly calibrated
- all meters have been properly installed in accordance with manufacturer's instructions
- to the best of your knowledge the arrangement complies with the [MCS Domestic RHI Metering Guidance](#) and will as such be eligible to be accredited under the Domestic RHI
- you have advised the customer on the correct procedure to read the meters

For more details on technical requirements for metering for performance, please see [Annex 7](#).

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Metering for Payment and Metering for Performance

Section 21 – When installing heat and/or electricity meters

Requirements

During and following the installation of the meters, you must choose and install all necessary meters in line with the requirements set out both in this guide and the [MCS Domestic RHI Metering Guidance](#).

There are various accuracy, physical and installation requirements for all types of meters – heat meters and any other necessary electricity, gas or oil meters. Whatever the type, all must meet the minimum standard required by the EU Measuring Instruments Directive (MID) in conjunction with other specific requirements. For specific details, see [Annex 6](#) and [Annex 7](#).

Calibration

You must choose suitably calibrated meters for the type of heating system where they are being installed. For example, if the heating system uses glycol rather than water as the heat circulating medium then any meters chosen should be calibrated accordingly.

Preferably, select meters that don't need to be re-calibrated during the seven year payment period of the Domestic RHI. If you select meters that do need re-calibrating you should make sure your customer knows when it must be done. Be aware that if meters are found to not be properly calibrated, we would treat this as a non-compliance which could lead to us withholding payments or other sanctions from your customer.

Properly installed meters

All heat meters must be properly installed and in good working order. To ensure this, you should follow the [MCS Domestic RHI Metering Guidance](#). In most situations we would expect installers to install meters in line with manufacturer's instructions, unless there is good reason not to.

We have found a number of instances of:

- meters installed too close to bends⁴
- meters installed too close to valves
- flow meters wrongly orientated
- flow meters installed in the flow pipe rather than the return pipe
- temperature sensors not installed to enable good thermal contact with the thermal transfer fluid (note standard components should be used; do not fabricate your own).

This can affect the accuracy of meter readings which may result in a non-compliance and could lead to suspension of payments to your customer.

⁴ Refer to annex 5 of this document or section 5.1 of the MCS Domestic RHI Metering Guidance Document for 'good practice' space requirements for meter placement

Meter seals

We recommend all heat meters are appropriately sealed. This is useful for you as an installer and helpful for us if we decide to carry out any audits to detect any post installation tampering.

Meter Display

Meters should be selected to read:

- heat meters: kWh
- electricity meters: kWh
- gas meters: m³ or litres
- oil meters: m³ or litres

Labelling

When meters are installed, you should place clear labels (sticky labels or permanent marker) next to/on all of them, along the lines of:

- 'HM1' for a heat meter ('HM2' for a second heat meter etc);
- 'EM1' for an electricity meter ('EM2' for a second electricity meter etc);
- 'GM1' for a gas meter ('GM2' for a second gas meter etc);
- 'OM1' for an oil meter ('OM2' for a second oil meter etc)

Helping customers understand their meters

You have an important role to play in showing your customers how to read their meters and to understand the labelling. They may be unfamiliar with heat meters, especially if there is more than one, or a variety of heat meters and other meters.

For customers with metering for performance, you should help your customers to understand how much electricity their technology uses, so they can recognise if their heating system is or is not working properly.

For customers with metering for payment, once you've completed commissioning, make sure that the installed meters are functioning properly and show your customer how to take a meter reading from all relevant meters. Write the initial meter readings in the 'Installer Metering Questions' document. There are different versions for [biomass boilers](#) and [heat pumps](#) (see [annex 1](#)).

Remember that if they have additional metering for performance make sure you show them clearly which meters readings must be taken from.

The first meter reading(s) your customer submits as part of their application provides us with a baseline figure to make their first quarterly payment. You must take this baseline reading for your customer when they apply to the scheme, and can do it up to two weeks before the date they apply⁵. If they apply later than this, they'll need to provide a revised set of readings that are taken on the day they apply or up to two weeks beforehand. Where possible, opening readings should be taken on the day of application, otherwise we'll have to estimate the amount we have to subtract from their Domestic RHI payments to account for the number of days between when the readings were taken and the date they applied.

Customer handover

You should provide your customer with a handover pack that contains:

- a description of how to check that the meter is operating;
- any maintenance requirements / calibration requirements;
- instruction on how to use the meter(s), read meters and take meter readings (if relevant);
- answers to the Installer Metering Questions (if relevant). There are different versions for [biomass boilers](#) and [heat pumps](#);
- an alternative metering arrangement template (if relevant – see [Section 18 – Alternative metering arrangements](#)) and,
- any other helpful information baseline meter reading(s) (contained within the Installer Metering Questions document).

After your customer has applied

You should be available to answer technical queries, meter reading issues or other questions your customer may have as well as providing support should amendments to the metering solution be required.

We do not recommend giving specific estimates about RHI payments to your customers. Any estimated potential payments may not accurately reflect actual RHI payments. Actual RHI payments cannot be confirmed until applications are accredited. Please direct customers to the [BEIS RHI Calculator](#).

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⁵ However, we'll pro-rata your customer's first quarter's payment to account for meter readings taken from before the date they apply.

Annexes to Part 3

Annex 1 - Installer Metering for Payment Questions

[Installer Metering Questions for biomass](#)

[Installer Metering Questions for heat pumps](#)

[Alternative metering arrangements template for biomass](#)

[Alternative metering arrangements template for heat pumps](#)

Annex 2 - Additional factors considered when calculating payments

Additional factors will need to be taken into account by Ofgem when we calculate the relevant payment for your customer and, as such, should be considered during the design of the metering arrangement. We will get this information from the Installer Metering Questions (IMQs) which you provide to your customer when the installation of the metering is finished.

For biomass boilers or stoves:

- If a biomass stove (rather than a biomass boiler) has been installed, a 1.2 multiplier factor will be applied to the metered heat output figure to take account of heat radiated to the room;
- If a heat meter has been installed after the [domestic hot water \(DHW\)](#) cylinder, a multiplier factor of 1.43 will be applied to the heat output figure to take account of DHW cylinder heat losses;
- Subtract any heat contribution from any additional plant* where this is included in the total heat output figure (ie the Domestic RHI installation cannot be metered alone);
- Where any additional plant is included in the total heat output figure and it is an ASHP with a defrost coil that uses heat purely from the home (i.e. there is no additional heat source that wasn't generated by the ASHP contributing to the defrost coil), a multiplier factor of 0.97 should be applied to the heat output figure of the additional plant*.
- If a biomass system isn't sized to meet 100% of the property's heat demand, it must be metered because we can't use the annual heat demand figure listed on the [Energy Performance Certificate \(EPC\)](#) to work out tariff payments.

For heat pumps:

- ASHPs which use a defrost coil that uses heat purely from the home (ie there is no additional heat source that wasn't generated by the ASHP contributing to the defrost coil), a multiplier factor of 0.97 should be applied to the heat output figure;
- If a heat meter has been installed after the domestic hot water (DHW) cylinder a multiplier factor of 1.43 will be applied to the heat output figure to take account of DHW cylinder heat losses;
- Subtraction of any heat contribution from any additional plant* where this is included in the total heat output figure (ie the Domestic RHI installation cannot be metered alone);

* If your customer has an additional plant, in some cases your renewable heating system does not need to be metered.

This will apply to them if their additional plant:

- is a solar thermal plant, or
- is an immersion heater for a DHW cylinder or is any other plant solely generating heat for DHW, or
- is a heat transfer system using heated air expelled from the domestic property only to heat fresh air entering the property without generating additional heat, or
- is a supplementary electric heater controlled by the same control system as that governing the Domestic RHI installation, or
- is designed and installed to heat to heat one room

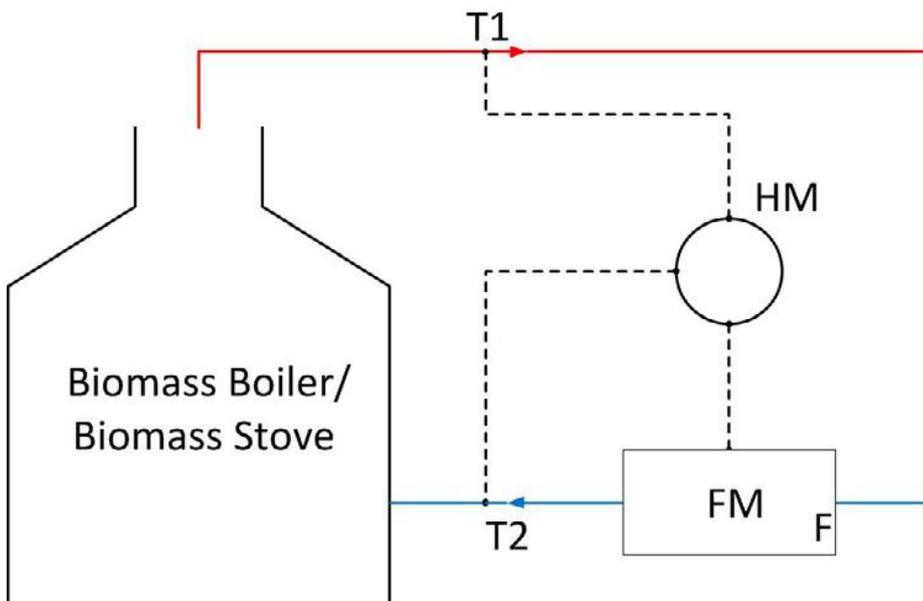
Phone us on 0300 003 0744 if you are unsure.

Annex 3 – Standard schematics for Metering for Payment

Please note:

The following Renewable Heat Payment calculations would be capped at the technology’s [heat demand limit](#) or the property’s [annual heat demand figure](#), whichever is lower. These limits must be taken into consideration when a customer is working out what payments they will receive.

Illustration 1: Biomass installation using x1 heat meter



Space heating only/
or space heating and
domestic hot water
(pipework is likely to
diverge to supply
different heating
loops/ and or a DHW
loop after this point).

NOTE: This is a biomass system which may be supplying hot water to multiple heating loops; ie the pipes might diverge after the heat meter. It may not always be possible to install a x1 heat meter before the pipes diverge and therefore multiple meters may be required.

T1 = Temperature Sensor Flow Pipe

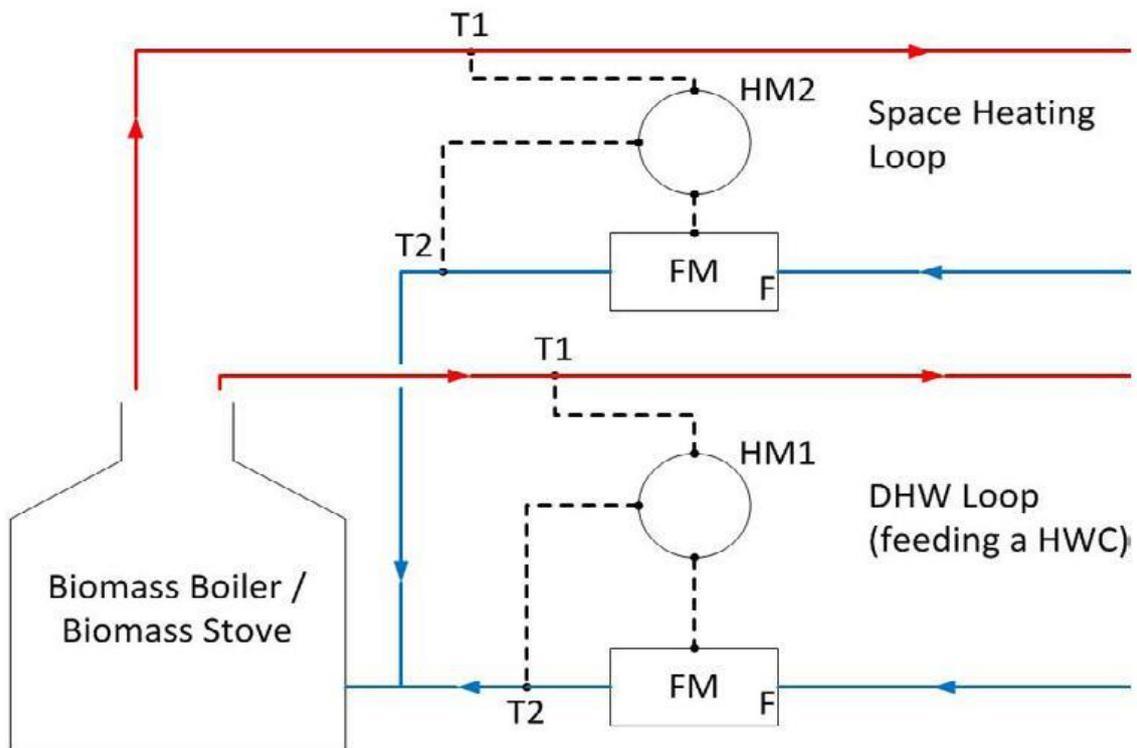
T2 = Temperature Sensor Return Pipe

FM = Flow Meter

HM = Heat Meter Digital Calculator

Metering Payment Formulae

$$\text{Renewable Heat Payment} = \text{Tariff} \times \text{HM1}$$

Illustration 2: Biomass installation using x2 heat meters

NOTE: This is a 3-pipe biomass installation using x2 flow pipes and x1 common return. It requires the installation of x2 heat meters.

T1 = Temperature Sensor Flow Pipe

T2 = Temperature Sensor Return Pipe

FM = Flow Meter

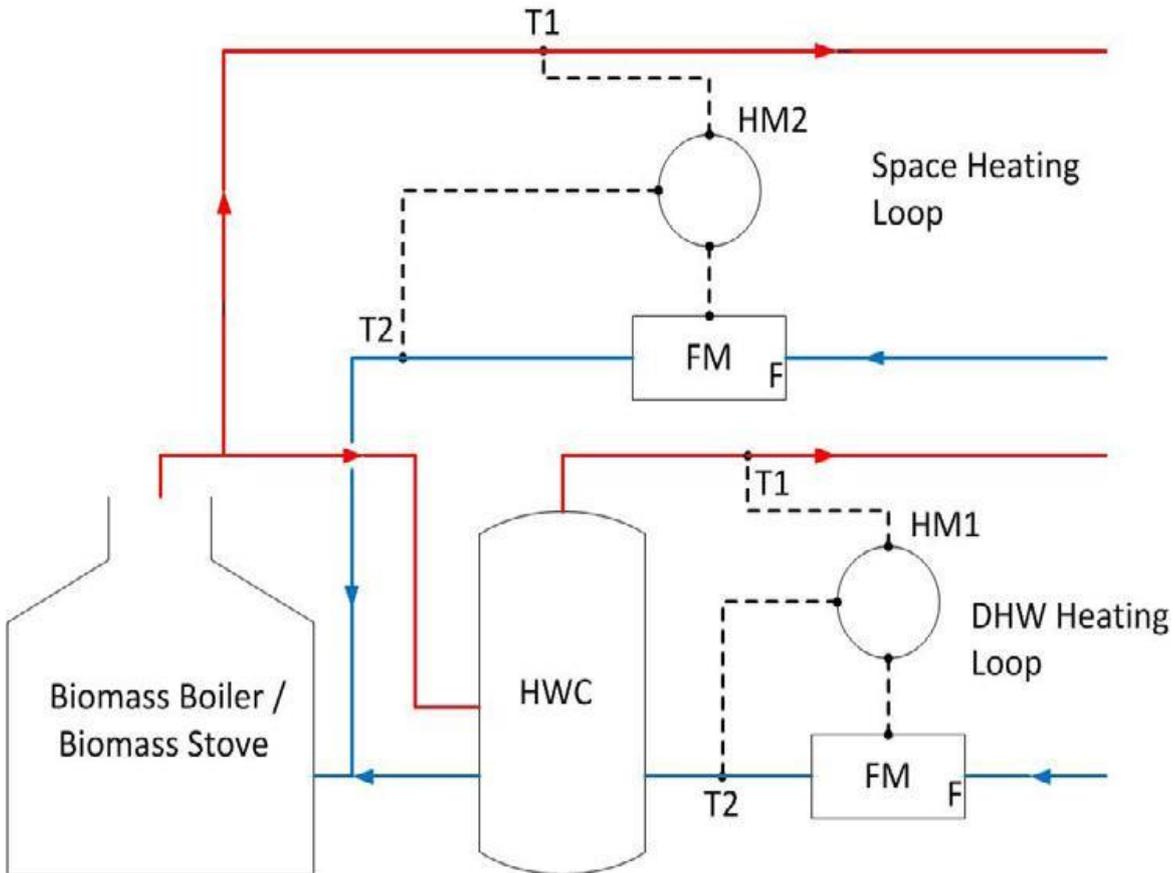
HM = Heat Meter Digital Calculator

HWC = Hot Water Cylinder

Metering Payment Formulae

Renewable Heat Payment = Tariff rate x (HM1 + HM2)

Illustration 3: Biomass installation using x2 heat meters



NOTE: This 2-pipe biomass installation uses x1 flow pipe and x1 return pipe. The pipes diverge after they exit the boiler to feed a space heating loop and a DHW loop. Due to physical/ space constraints 1 heat meter alone cannot be installed before the DHW cylinder and as such must be installed just after. In this example, the HWC does not use any sort of additional heating source (ie an electric immersion or is a twin coil) and therefore this is a standard metering arrangement. If it did use an additional heating source you should follow the alternative metering arrangements requirements (see illustration 9).

T1 = Temperature Sensor Flow Pipe

T2 = Temperature Sensor Return Pipe

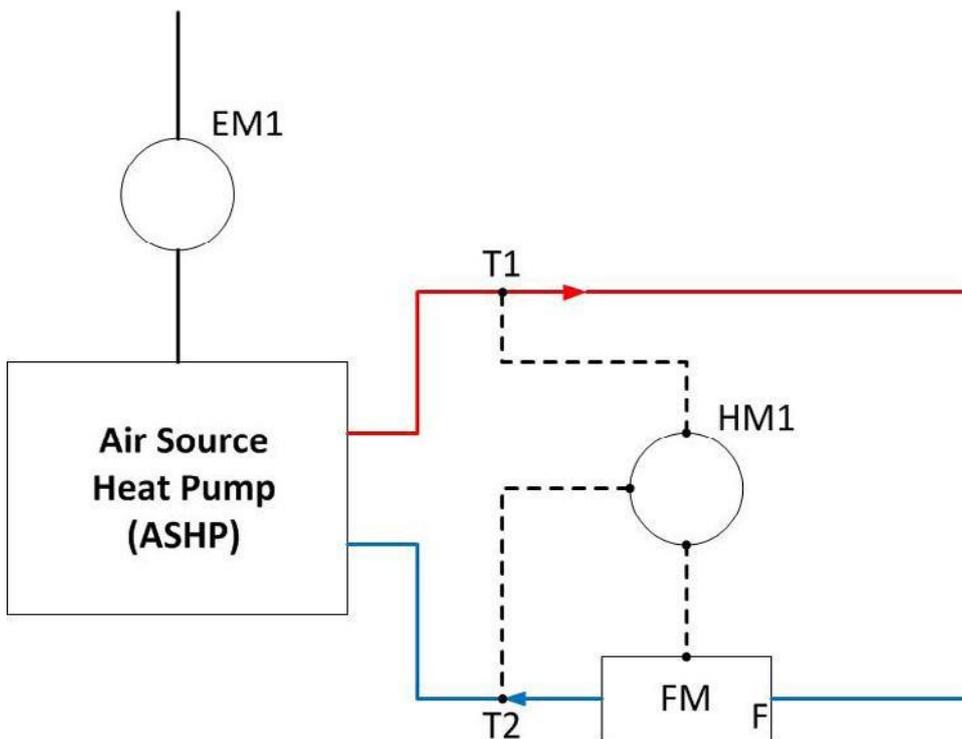
FM = Flow Meter

HM = Heat Meter Digital Calculator

HWC = Hot Water Cylinder

Metering Payment Formulae

$$\text{Renewable Heat Payment} = \text{Tariff rate} \times [(\text{HM1} \times 1.43) + \text{HM2}]$$

Illustration 4: Air source heat pump unit using x1 heat meter & x1 electricity meter

Space heating loop(s) or space heating and domestic hot water loops (NB: If feeding a DHW loop it will most likely be supplying a HWC).

NOTE: The pipes may diverge after they exit the ASHP to feed one (or multiple) space heating loops or a combination of space heating and domestic hot water heating loops. A minimum of one electricity meter is required to measure the input electricity required to run the heat pump compressor and any other electrical input (eg for hot water boosting, evaporator fans etc) that has gone into the generated heat output. Potentially more than one electricity meter may be required.

T1 = Temperature Sensor Flow Pipe

T2 = Temperature Sensor Return Pipe

FM = Flow Meter

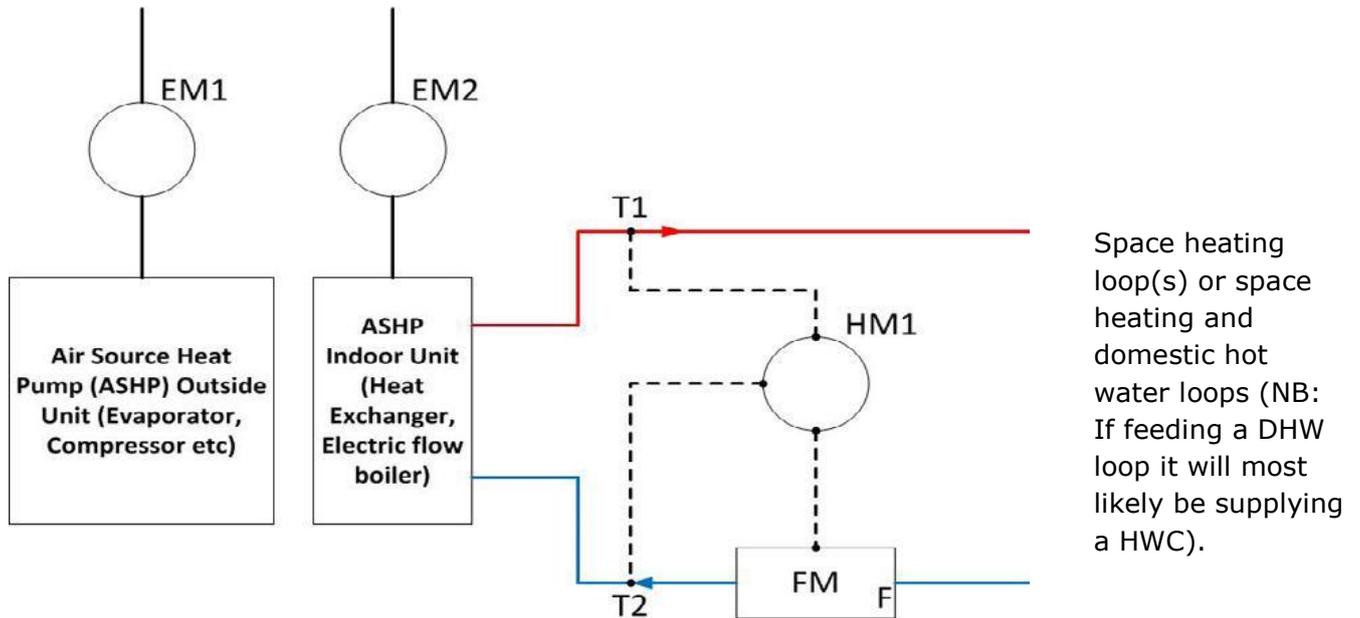
HM = Heat Meter Digital Calculator

EM = Electricity Meter

Metering Payment Formulae

Renewable Heat Payment = Tariff rate x (HM1 - EM1)

Illustration 5: Air source heat pump (ASHP) unit (with separate outdoor & indoor units) using x1 heat meter and x2 electricity meters



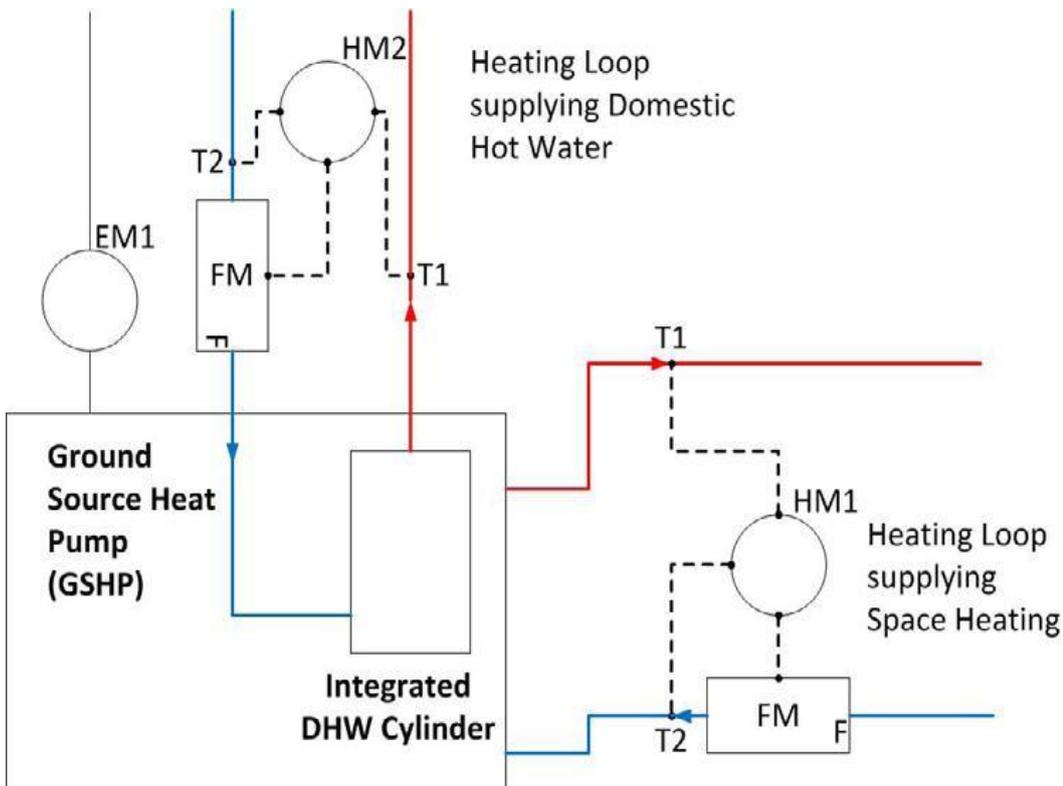
NOTE: The pipes may diverge after they exit the ASHP to feed one (or multiple) space heating loops or a combination of space heating and domestic hot water heating loops. Two electricity meters are required to measure the input electricity required to run the heat pump compressor (outdoor unit) plus one additional electricity meter required to measure the electrical input into the indoor unit to run the electric back up flow boiler.

- T1 = Temperature Sensor Flow Pipe
- T2 = Temperature Sensor Return Pipe
- FM = Flow Meter
- HM = Heat Meter Digital Calculator
- EM = Electricity Meter

Metering Payment Formulae

$$\text{Renewable Heat Payment} = \text{Tariff rate} \times [\text{HM1} - (\text{EM1} + \text{EM2})]$$

Illustration 6: Ground source heat pump (GSHP) unit using x2 heat meters and x1 electricity meters



NOTE: Two heating loops exit the GSHP given that it contains an integrated DHW cylinder (with no immersion heater). One loop feeds the DHW and the other the space heating.

A minimum of one electricity meter is required to measure the input electricity required to run the heat pump compressor and any other electrical input (ie ground loop circulation pumps etc).

T1 = Temperature Sensor Flow Pipe

T2 = Temperature Sensor Return Pipe

FM = Flow Meter

HM = Heat Meter Digital Calculator

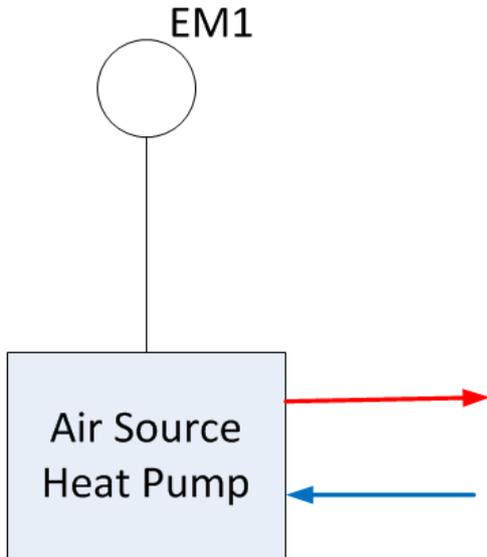
EM = Electricity Meter

Metering Payment Formulae

Renewable Heat Payment = Tariff rate x [(HM1 + HM2) - EM1]

Annex 4 – Standard schematics for Metering for Performance

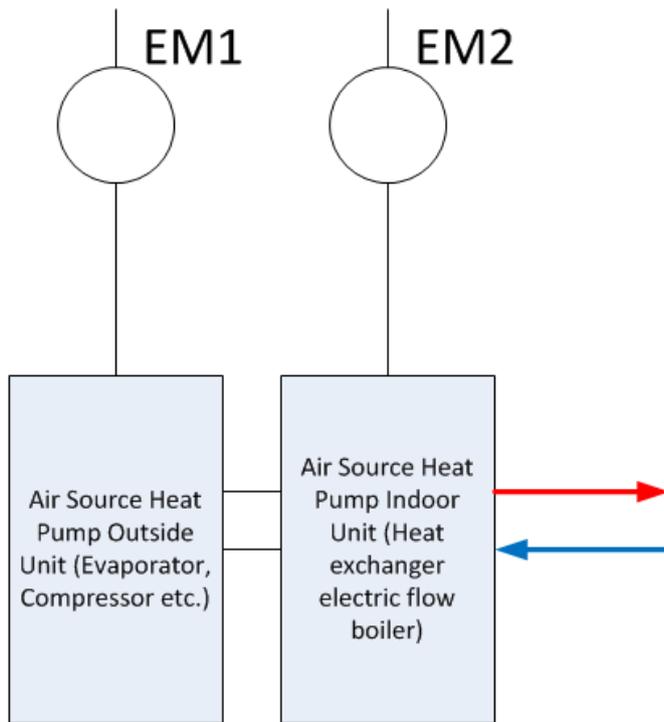
Illustration 1: Air source heat pump (ASHP) unit using 1 electricity meter



NOTE: The pipes may diverge after they exit the ASHP to feed one (or multiple) space heating loops or a combination of space heating and domestic hot water heating loops. A minimum of one electricity meter is required to measure the input electricity required to run the heat pump compressor and any other electrical input (eg for hot water boosting, evaporator fans etc) that has gone into the generated heat output. Potentially more than one electricity meter may be required.

EM = Electricity Meter

Illustration 2: Air source heat pump (ASHP) unit (with separate outdoor & indoor units) using 2 electricity meters



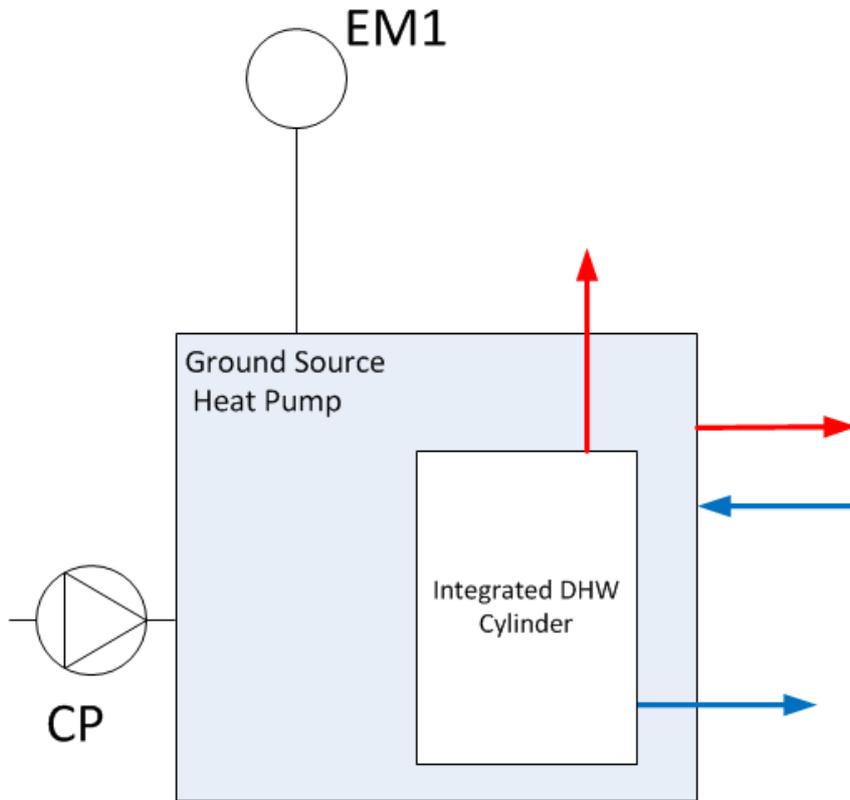
NOTE: The pipes may diverge after they exit the ASHP to feed one (or multiple) space heating loops or a combination of space heating and domestic hot water heating loops.

If there are multiple supplementary or immersion heaters controlled by the same control system as the heat pump, a single meter can be installed to record the total combined electrical input; or, each heater can be metered separately. Electricity input means the electricity required to run the heat pump compressor (outdoor unit) plus one additional electricity meter required to measure the electrical input into the indoor unit to run the electric back up flow boiler.

Metering input to each heater separately could help identifying if there is an issue with an individual immersion heater/supplementary heater.

EM = Electricity Meter

Illustration 3: Ground source heat pump (GSHP) unit using 1 electricity meter



NOTE: Two heating loops exit the GSHP given that it contains an integrated DHW Cylinder (with no immersion heater). One loop feeds the DHW and the other the space heating.

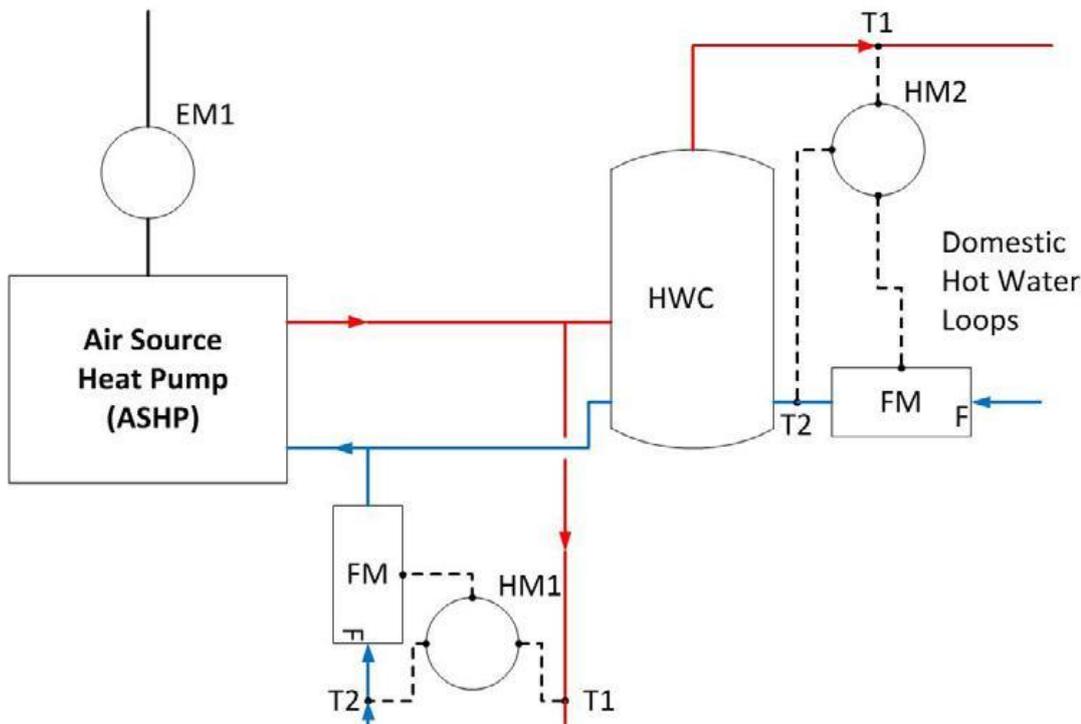
A minimum of one electricity meter is required to measure the input electricity required to run the heat pump compressor and any other electrical input (e.g. ground loop circulation pumps etc.). Additional electricity meters can be used to measure different electrical inputs of the heat pump (e.g. ground loop circulation pumps *and* heat pump compressor with one electricity meter, and integrated domestic hot water cylinder with a second electricity meter)

EM = Electricity Meter

CP = Ground loop circulation pump

Annex 5 – Alternative metering schematics

Illustration 7: Air source heat pump (ASHP) unit using x2 heat meters and x1 electricity meter



NOTE: One heat meter cannot be installed at the point that the pipes exit the ASHP due to physical constraints therefore must be installed as shown.

A minimum of one electricity meter is required to measure the input electricity required to run the heat pump compressor and any other electrical input (i.e. for hot water boosting, evaporator fans etc.) that has gone into the generated heat output. Potentially more than one electricity meter may be required.

T1 = Temperature Sensor Flow Pipe

T2 = Temperature Sensor Return Pipe

FM = Flow Meter

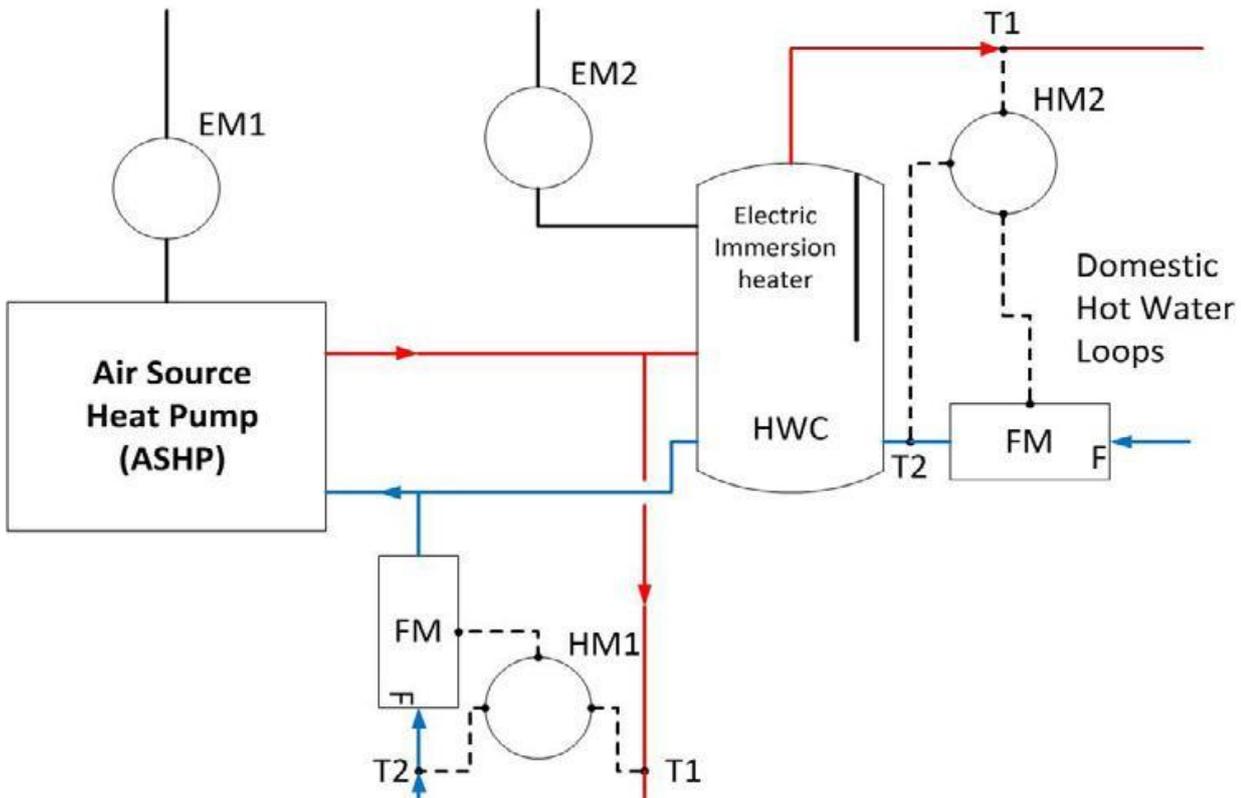
HM = Heat Meter Digital Calculator

EM = Electricity Meter

Metering Payment Formulae

$$\text{Renewable Heat Payment} = \text{Tariff rate} \times [[\text{HM1} + (\text{HM2} \times 1.43)] - \text{EM1}]$$

Illustration 8: Air source heat pump (ASHP) unit using x2 heat meters and x2 electricity meters (an Alternative metering arrangements)

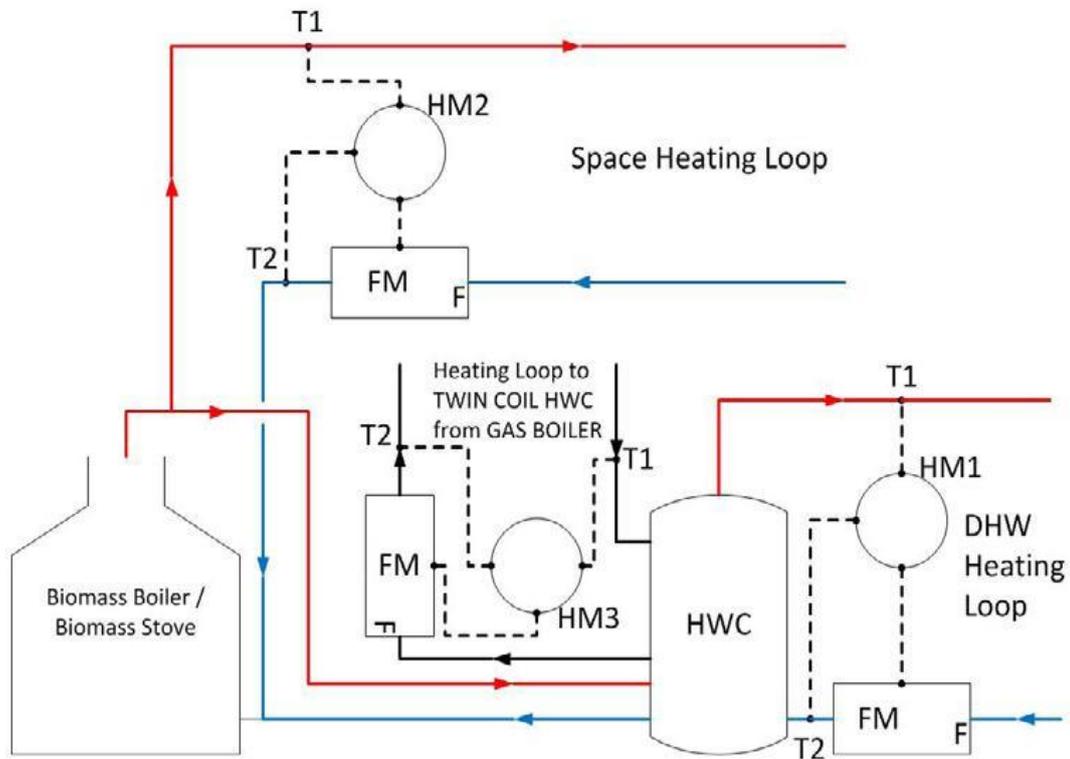


NOTE: One heat meter cannot be installed at the point that the pipes exit the ASHP due to physical constraints therefore must be installed as shown. One electricity meter is required to measure the input electricity required to run the heat pump compressor and any other electrical input plus given that the DHW cylinder has an additional electrical immersion heater it requires an additional electricity meter to record this electrical contribution to the metered heat output.

- T1 = Temperature Sensor Flow Pipe
- T2 = Temperature Sensor Return Pipe
- FM = Flow Meter
- HM = Heat Meter Digital Calculator
- EM = Electricity Meter

Metering Payment Formulae

$$\text{Renewable Heat Payment} = \text{Tariff rate} \times [(\text{HM1} + (\text{HM2} \times 1.43)) - (\text{EM1} + \text{EM2})]$$

Illustration 9: Biomass installation using x3 heat meters (an alternative metering arrangement)

NOTE: This 2-pipe biomass installation uses x1 flow pipe and x1 return pipe feeding a Space Heating and a DHW loop. Due to physical/ space constraints the meters cannot be installed where the pipes feed the heating loops and as such one of the meters must be installed after the DHW cylinder. The hot water cylinder is a twin coil cylinder with a secondary coil being fed from a gas boiler. This input must be metered (using HM3) as per the alternative metering arrangements requirements to allow this figure to be subtracted from the total heat output figure calculated using heat meters HM1 + HM2.

T1 = Temperature Sensor Flow Pipe

T2 = Temperature Sensor Return Pipe

FM = Flow Meter

HM = Heat Meter Digital Calculator

HWC = Hot Water Cylinder (Twin Coil)

Metering Payment Formulae

$$\text{Renewable Heat Payment} = \text{Tariff rate} \times [(\text{HM1} \times 1.43) + \text{HM2}] - \text{HM3}$$

Annex 6 – Technical requirements for meters for payment for the Domestic RHI

Heat meters:

Accuracy requirements:

- Comply with the relevant requirements set out in Annex I to the 2014 EU Measuring Instruments Directive (MID);
- Comply with the specific requirements listed in Annex VI of the MID;
- Fall within accuracy Class 3 or better* as defined in Annex VI of the MID;

*Although the Domestic RHI Regulations specify that all heat meters must be of Class 3 accuracy or better, it should be noted that 'the better' option is definitely preferable. Class 2 heat meters are likely to last longer (ie past the end of the 7 years of payments) than Class 3 heat meters which may well need to be replaced after 5 years, meaning the customer may have to pay for a second meter rather than just choosing to install a slightly more expensive meter (a Class 2 meter) at the outset.

Component requirements:

- a flow sensor,
- a matched pair of temperature sensors; and,
- a digital calculator.

Meter installation advice:

Note: Heat meters can either be 'packaged' or 'non-packaged' meters. Our definition of a 'packaged' unit is a heat meter that was bought as a complete unit from one manufacturer. Our definition of a 'non-packaged' unit is a heat meter that is bespoke because it is made up of separate components each potentially developed by different manufacturers.

These are areas that we'd like to highlight as having a significant impact on meter readings and as such would recommend particular attention is given at installation:

- correct installation of temperature sensors, including appropriate mounting to ensure good thermal contact with the thermal transfer fluid, appropriate insulation and sensor cables to be run independently of power cables to limit interference. Sensor cable lengths shall be compliant with manufacturer's guidance and must not be shortened or extended under any circumstances. Where sensor pockets are used then the manufacturer's thermal transfer compound shall be used if specified;
- appropriate selection of heat meters (including consideration of the meter manufacturer's limit of operating temperature difference and sizing of the meter to suit the heating system's flow rate and pressure drop);
- caution when fitting meters on the suction side of pumps. This should only be carried out in a manner that is compliant with heat meter manufacturer's instructions;
- wiring of the heat meter calculator;
- placement of heat meters so that the meter display is visible to the customer and easy to read.

Best practice heat meter installation space requirements:

These are best practice guidelines or rule of thumb requirements; please note that they do not replace requirements set out in the manufacturer's requirements, which should be followed as closely as possible.

Pipe diameter	Total length of straight pipework required in the <u>return</u> pipe (mm)	Total length of straight pipework required in <u>flow</u> pipe (mm)
15	300	175
22	440	175
28	560	175
35	700	175
42	840	175

Electricity meters:

Accuracy requirements:

- comply with the relevant requirements set out in Annex I to the 2014 EU Measuring Instruments Directive (MID);
- comply with the specific requirements listed in Annex V of the MID;
- fall within accuracy Class A or better as defined in Annex V of the MID; meters marked class 1 or 2 are not compliant
- must be installed by a competent, suitably qualified and registered person in accordance with industry standards and manufacturer's instructions, including with respect to safety requirements.

Gas meters (if required):

Accuracy requirements:

- comply with the relevant requirements set out in Annex I to the 2014 EU Measuring Instruments Directive (MID);
- comply with the specific requirements listed in Annex IV of the MID;
- fall within accuracy Class 1.5 or better as defined in Annex MI-IV of the MID;
- must be installed by a competent, suitably qualified and registered person in accordance with the requirements of the Gas Safety (Installation and Use) Regulations 1998, industry standards and manufacturers' instructions, particularly with respect to safety requirements

Solid fuel energy outputs:

- See note on section 6.2 page 17 of the [MCS Domestic RHI Metering Guidance](#).

Annex 7 – Technical requirements for electricity meters for performance for the Domestic RHI

Standalone meters:

- comply with the relevant requirements set out in Annex I to the 2014 EU Measuring Instruments Directive (MID);
- comply with the specific requirements listed in Annex V of the MID;
- fall within accuracy Class A or better as defined in Annex V of the MID; meters marked class 1 or 2 are not compliant;
- must be installed by a competent, suitably qualified and registered person in accordance with industry standards and manufacturer's instructions, including with respect to safety requirements.

On-board meters:

- There are no relevant requirements that on-board meters need to comply with.

Please note that the accuracy and technical specifications are specific to each heat pump manufacturer

MMSP meters:

- MMSP requires both heat and electricity meters to be installed. As such, please see the technical requirements for heat and electricity meters in [Annex 6](#) and [Annex 7](#) for heat meters.

Guidance

We regularly update our guidance. Check the website for the latest versions, to be sure you're reading the most up-to-date information.

See our website:

[Domestic RHI](#) [Non-Domestic RHI](#)

Domestic RHI Factsheets

[Factsheet: The Renewable Heat Incentive – Domestic or Non-Domestic?](#)
[Factsheet: A Metering and Monitoring Service Package for the Domestic RHI](#)
[Factsheet: Tariffs and Payments](#)
[Factsheet: Do I Need Metering?](#)

Domestic RHI Essential Guides

[Essential Guide for Applicants](#)
[Essential Guide for Installers](#)
[Essential Guide to Metering](#)
[Essential Guide to Metering and Monitoring Service Package \(MMSP\)](#)

Domestic RHI Reference Document

[Domestic RHI Reference Document](#)

Find out more

Next steps

See the Department for Business, Energy & Industrial Strategy (BEIS)
[Domestic RHI Payment Calculator](#)

Ask your installer to fill out and give to you:
[Installer Checklist](#)

For Help

For questions about the Domestic RHI scheme requirements and eligibility and for free impartial information on how to save energy in the home:

Energy Saving Advice Service

(England or Wales)

Email energy-advice@est.org.uk

Home Energy Scotland

(Scotland) **0808 808 2282**

Calls are free from landlines and most mobile networks

[Online email form](#)

For consumer protection information

Renewable Energy Consumer Code (RECC)

www.recc.org.uk

The Home Insulation and Energy Systems Contractors Scheme (HIES)

www.hiesscheme.org.uk

The Glass and Glazing Federation (GGF)

www.ggf.org.uk

If you need help with a Domestic RHI application:

Domestic RHI Applicant Support Centre

Telephone: **0300 003 0744**

Email: DomesticRHI@ofgem.gov.uk

For opening hours, please see [our website](#).

London
10 South Colonnade
Canary Wharf
London E14 4PU

Glasgow
Commonwealth House
32 Albion Street
Glasgow G1 1LH
Tel: 0141 331 2678

Wales
1 Caspian Point
Cardiff Bay
CF10 4DQ
Tel: 029 2044 4042

www.ofgem.gov.uk