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CHP Metering Requirements

In order to claim climate change levy (CCL) exemption on the gas used by CHP schemes, certain criteria must be met with regards to the monitoring/metering of the utilities. These can be roughly divided into two scheme types: Those <2MWe and those ≥2MWe

CHP Schemes ≥2MWe

These schemes require a full metering suite; namely you must be able to measure the gas used, the heat supplied and the electricity generated to the standards detailed below. The gas meters must be pressure and temperature compensated and the heat meters must use a flow meter to measure actual flow.

CHP Schemes <2MWe

These schemes can be further subdivided into those that have heat dumps and those that do not:

CHP Schemes <2MWe WITH Heat Dumps

These schemes require the following metering:

Gas – If the unit is ≤500kWe *AND* is on the approved CHP List as issued by the CHPQA; then the gas consumption may currently be calculated by using the CHP units' electrical efficiency as stated on the list.

However, if the unit is >500 kWe *OR* below 500kWe but *NOT* on the approved CHP List; then gas metering is required and the meter must be pressure and temperature compensated. For the complete list of all currently approved CHP units see the CHPQA website at:

https://www.chpqa.com/guidance_notes/CHPQA_UNIT_LIST.pdf

The gas meter installed must be of a quality specified by S.I. 1983/684 (Statutory Instruments 1983 No. 684, Gas (Meters) Regulations 1983), summarised as:

- Diaphragm Meters: ±2% between 2% and 100% of design maximum flow
- Other Meters: ±1% between 20% and 100% of design maximum flow and ±2% between minimum design flow and less than 20% of design maximum flow

The volume measured must be corrected for the temperature and pressure of the gas (to 15°C and 1,013.25 millibars absolute) to enable direct comparison with billed gas to the site.

Electricity - For metering electricity, clearly labelled commercial/industrial three-phase electricity meters of billing quality should be used. Watt-hour meters, current and voltage transformers shall be to appropriate Standard and Accuracy Class dependant on the rated capacity, as shown in table below:

Rated Capacity	Meter Standard and Accuracy Class	Current Transformer Accuracy Class (Note 1)	Voltage Transformer Accuracy Class (Note 2)	Nominal Overall Uncertainty For CHPQA (Note 3)
≤1 MW	BS EN 61036:1997 Class 2 *or* BS EN 60521:1995 Class 2	0.5	1	±2.5%
<10 MVA	BS EN 61036:1997 Class 1 *or* BS EN 60521:1995 Class 1	0.5	1	±1.5%
<100 MVA	BS EN 60687:1993 Class 0.5S *or* BS EN 60521:1995 Class 0.5	0.2S	0.5	±1.0%
>100 MVA	BS EN 60687:1993 Class 0.2S	0.2S	0.2	±0.5%

Notes:

(1) CT's to IEC 60044-1 (1996) or IEC 60185 (withdrawn) for installations pre-1996

(2) VT's to IEC 60044-2 (2000) or IEC 60186 (1987) plus Amendments 1 & 2

(3) The actual uncertainty is influenced by power factor and metered load (percent of rated measuring current). The nominal values tabulated shall be used to assess the excess uncertainty of metering systems (meters, current and voltage transformers) that do not meet the applicable standard for their rated capacity.

Heat – CHP units will normally supply heat as either hot water or steam. The metering requirements are:

Steam – For measurement of steam mass flow and energy content, meters with an overall uncertainty of ±2.0% of span (full-scale) are required.

Hot Water – Where stand-alone commercially available heat meters are used these must be manufactured to metrological Class 2 or Class 3 as defined in BS EN 1414–1997 (~±1.5%). For fluid temperature measurements, matched pairs of platinum resistance thermometers to BS 1041-3:1989 and BS EN 60751:1996/IEC 60751:1983 are preferred.

Note: The dispensation that allowed CHP units with heat dumps to utilise a 'fixed flow' input to represent a flow meter has been discontinued. All new units are required to fit full heat metering as per >2MWe. Those units with the 'fixed flow' heat monitoring may continue using this methodology until further notice.

CHP Schemes <2MWe WITHOUT Heat Dumps

The measurement of gas and electricity is the same as for units that have heat dumps installed. The difference is with regards to the measurement of heat.

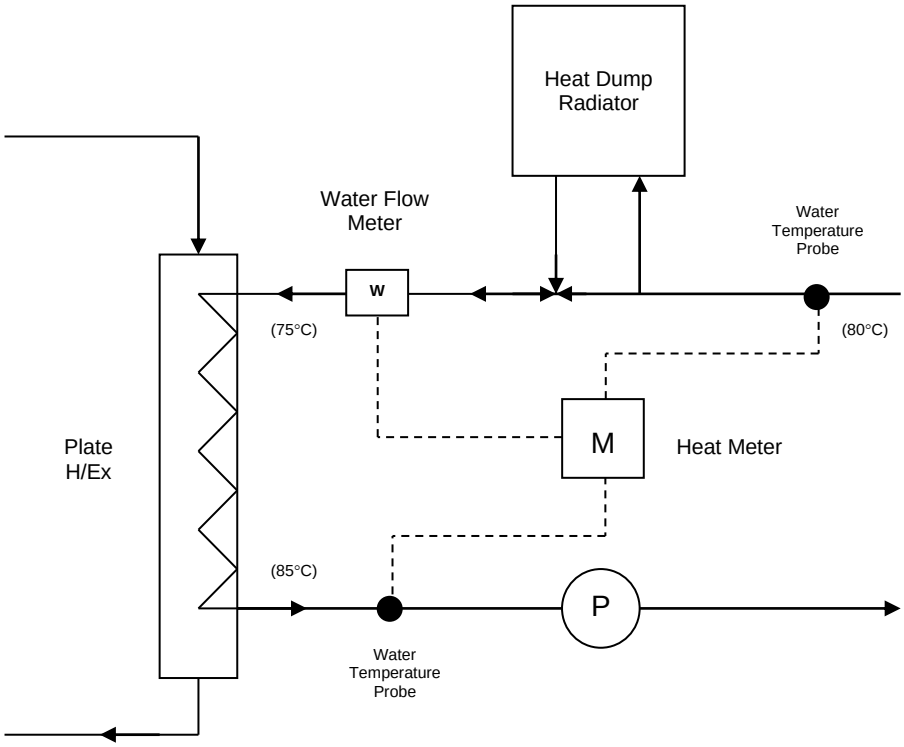
Heat – Existing schemes below 2MWe with no heat rejection facility are not required to meter heat outputs, the heat output may be calculated using the design Heat/Power ratio for the unit. If the scheme supplies heat in the form of steam, then the heat must be metered as for those units >2MWe.

CHP Schemes – Fuelled By Oil

Oil burned as either a main or a standby fuel will need to be monitored and recorded. Oil products are usually sold by the litre and will require volumetric measurement with an uncertainty no greater than ±1%.

Note: When utilising diesel powered CHP schemes, operators should take into account the 'Spill-back' effect created by the engines' fuel priming pump.

CHP Heat Metering Arrangement



Note: *Temperatures shown are approximate*