

Supplement Specifications for Energy Requirements for the Procurement of Buildings and New Plants

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1. Purpose

This specifications supplement is the basis for equipping energy meters of all kinds on buildings (new and existing buildings) as well as individual plants and isolated solutions with consideration of SEU's (*Significant Energy Users* = SEU's) for new procurement or Refit of plants.

It is relevant in order to analyse energy consumption and to be able to present it transparently (invoice distribution area level, energy data collection, main customs office, etc.).

It serves as a guide for tenders, obtaining tenders and as a contractual basis for procurement.

Furthermore, the process and procedure for checking the eligibility of procurements is presented and corresponding documents are made available to support this. In addition, by comparing the energy consumption of machines and plants, the energy efficiency and associated costs can be compared, a possible funding potential can be determined and economic efficiencies of plants can be considered.

2. Scope

This specification supplement applies to the planning and implementation of buildings, plants and processes for MGW/ ST/ LMG.

In addition, the instruction applies to Handtmann Service GmbH & Co. KG and Albert Handtmann Holding GmbH & Co. KG.

3. Definition of terms

- Machine:** A machine is an independent unit, which is defined in its characteristics in accordance with Directive 2006/42/EC (Machinery Directive).
Examples: die casting machine, press, CNC machine, compressor, evaporator, etc.
- Plant/cell:** A plant or cell is a set of machines that are functionally linked or linked to each other in terms of control technology or safety. This is given if they interact as a total unit (e.g. production of a certain product) and are in a spatial context (one unit) and are operated as a complete unit (higher-level control or common command device).
Examples: casting cell, production line, compressed air system, treatment plant, PV system, etc.
- Generator:** A generator can be a machine, plant or part of a machine that converts one form of energy into another form of energy (secondary energy).
Examples: PV system, compressed air systems, etc.
- Consumer:** A consumer is a machine or plant in which energy (secondary energy) is converted into another form of energy (useful energy).
- m-bus:** The M-Bus is a field bus for consumption data acquisition. Transmission is serial on a two-wire line, protected against polarity reversal, from the connected measuring devices (slaves) to a master. The master polls the slaves via the bus. The power supply of the slaves can be done via the bus.
- Modbus:** The Modbus protocol is a communication protocol based on a client-server architecture. It can be transmitted both serially (modbus RDP) and via Ethernet (modbus TCP/IP).
- SEU:** DIN EN ISO 50001 defines SEUs (Significant Energy Users) as the relevant energy consumers in a company. At Handtmann, SEUs are defined by energy management in coordination with the departments

4. Goal

Exercise of a uniform approach to

- planning of buildings (new and existing)
- the procurement, extensions and conversions of new facilities
- processes with consideration of energetic facts and thus of possible promotion programs and potentials

Enabling an analysis of the energy consumption of buildings, facilities and processes, as well as reduction of energy consumption and associated emissions (environmental protection)

5. Description

5.1 Guidelines for equipping measuring points on buildings:

All main types of energy (e.B. : Electricity, gas, heating water, cold, compressed air, etc.) for the supply of buildings as well as process media (Water, permeate, nitrogen, etc.) must be used for energy data acquisition with energy meters be equipped.

The energy consumption in the metal casting plant must be assigned to each department and in other companies to each company.

5.2 Guide to equipping energy meters for generators

It should be possible to form key figures for generating plants, which is why the output (i.e. the generated secondary energy) must also be recorded by measurement via a counter.

The input to the generators (i.e. the energy supplied) must be taken into account in connection with measurements of SEU's (para. 7).

The output of producers shall be measured from the following limits as follows:

Table 1: Energy meters for generators:

Producer	Performance:	Provider of energy meters / minimum requirement:
Air compressors	Compressed air normal volume flow: >4m ³ /min. Volume flow according to: ISO1217:2009, Annex C	CS - Instruments VA 500/520 in conjunction with an integrated M-Bus board
PV systems	Regardless of size, the electricity generated in PV systems must always be measured separately for each system.	Econ, alternatively Gossen Metrawatt Cable conversion current transformer Janitza
Heating water generators	Heating capacity: > 100 kW	Kamstrup Multical 603
Waste heat from compressors	Waste heat output: >15 kW	Kamstrup Multical 603
Refrigeration systems	Cooling capacity: >50 kW	Kamstrup Multical 603

5.3 Consumer Energy Meter Equipment Guide

It should be possible to form key figures for consumption systems, which is why the input (i.e. the secondary energy consumed) is to be recorded metrologically via a meter.

The input of consumers is to be measured from the following limit values as follows:

Consumers:	Connection/flow/consumption/ power values:	Provider Energy meter/ minimum requirement:
Electricity:	Connected load machine > 20 KW	ECON, alternatively Gossen Metrawatt Cable current converter Janitza
	Connected load cell > 50 KW (Def. cell/ production island must be defined in advance between production and energy team)	Feed-through converter Redur U 2389 Gossen Metra Watt
Compressed air:	Consumption machine > 3 m ³ /min.	VA 500/520 CS - Instruments in connection with an integrated M-Bus board
Gas:	Consumption machine > 50 m ³ /h	
Water:	Consumption machine > 10 m ³ /h	
Heat	Connected load machine > 50 KW	Kamstrup Multical 603
Cold	Connected load machine > 50 KW	Kamstrup Multical 603

5.4 Guidelines and framework conditions for equipping energy meters

Execution of meters:

- Newly procured, overhauled or expanded facilities must be equipped with energy meters (taking into account the criteria defined in the previous tables). Any deviation from the specifications in the tables requires prior consultation with the responsible contact person (see 6. Information carriers and contact persons).
- The appropriate meter type is selected by the responsible planner group in coordination with Handtmann TD Service according to the installation type and the respective specifications.
- The meters must be connected in compliance with the applicable guidelines and manufacturer specifications.
- The voltage supply for the meter must be maintained even when the main switch is switched off in order to exclude unnecessary error messages in the energy management system.
- In the case of energy meters (as a precaution when installing them on transformers), it must be ensured that they are connected to the same potential as the cables to be measured.

- Cable current transformers must be connected on the secondary side to current transformer disconnect terminals, which automatically short-circuit with leading contacts when disconnected.
- All meters shall be designed with an m-Bus interface. This interface must be connected to a through terminal to which Handtmann can connect its m-Bus line and establish the connection to the energy management system.
- If it is not possible to implement an m-bus interface, it is possible, in coordination with Handtmann, to use an m-bus interface.
- Energy meters must be able to output kWh as the unit.
- Heat meters must meet a resolution of 0.1 kW. This must be specified when ordering.
- Heat meters must also have a Modbus interface in addition to the m-Bus interface, so that data transmission (flow and return temperature, flow rate and energy) can be transmitted to the corresponding MSR technology.
- Water meters must be able to output m³.
- Water meters must have the possibility to measure a "small" and a "large" quantity if the measuring range is quite large (dual range meter).
- Compressed air meters must be able to output m³ and m³/min according to ISO 1217:2009 and DIN1343.
- Gas meters must measure in Nm³. In exceptional cases, m³ can also be approved after consultation.
- Measuring instruments must bear the prescribed MID marking (Directive 2004/22/EC) and be supplied with a certificate of conformity.
- For customs-relevant measurements, it must be ensured that converters with a declaration of conformity are used for billing purposes.
- When integrating energy meters (electricity, gas, heating water, cooling, water, air, etc.) by the contractor that do not comply with this document, they must either be executed with an S0 counting pulse, which is provided on a terminal point, or the manufacturer provides the processed values via network (OPC, DB access, etc.). The second version requires prior coordination with the energy team, as Handtmann's IT guidelines must be observed here. Deviations from the specifications in this document require informal written approval by a representative of the energy team (see 6.).

Documentation:

- The meters are to be listed with documentation containing the following information
 - Circuit diagram including all required components
 - Type
 - Settings
 - MID certificate
 - if required calibration certificate
 - if required for transducers declaration of conformity for billing purposes

Energy meter special conditions

- Parts refinement according to electricity or energy tax law (Ex.: hardening, annealing, tempering, annealing, melting, cleaning, etc.).
According to the Electricity Tax Act (StromStG) / § 9a or the Energy Tax Act (EnergieStG) / § 51, a waiver, refund or compensation of the tax is possible for certain processes and procedures.
Prerequisite: In the case of parts finishing, here using the example of cleaning systems, it must be possible to account for the heat flow used to heat and keep warm the cleaning emulsion and also the flow subsequently used to heat/dry the castings (e.g. hot air) via a separate energy meter. A distinction must be made between the total energy consumption of the plant and the heat flow of the plant.
- Special equalization scheme
Within the framework of the special equalization scheme (EEG), electricity quantities forwarded to non-privileged areas (from Handtmann Metallgusswerk Produktions-GmbH & Co. KG to e.g. Albert Handtmann Metallgusswerk GmbH & Co. KG) are metrologically recorded in compliance with calibration law (forwarding of electricity to third parties). This regulation is obligatory since January 2022 and may only be estimated in the course of a hardship regulation

5.5 Energy Efficiency: Guide for Plant Planners, Manufacturers and SuppliersGeneral:

- Energy concerns to reduce energy costs and reduce emissions must be taken into account.
- The absorbed and emitted forms of energy in machines and systems must be clearly listed with mass or volume flows with corresponding energy levels (e.B. temperature, pressure, specific energy content, etc.), so that efficiencies, specific key figures and the necessary technical framework conditions can be determined.
- The representation of energy flows can be done informally or in the form of energy balance schemes, a table or simply as a listing.
- In the case of plants, in addition to the installed capacities, the absorbed and emitted forms of energy must also be displayed in full-load operation at 100 % and in part-load operation at 50 %. In addition, meaningful simultaneity and change factors shall be reported.

Engine management:

When supplying and installing electric motors, the following guidelines and standards must be taken into account.

Consideration of the Ecodesign Directive (2009/125/EC), whereby the latest requirement must always be observed Regulation (EC) No. 640/2009 (electric motors)

- Consideration of high efficiency motors, whereby the latest edition must always be included - Basis of standard IEC 60034-30.

Load profile management:

- Consideration of standby shutdowns. These must be listed separately in an overview for individual components.

- In the case of standby shutdowns, the consumption of individual components must be demonstrated.

Prerequisite for the assessment of eligibility for energy efficiency measures:

- Possible optional energy efficiency measures for components, functional units, plants, etc. must be offered and the additional costs and energy savings presented in order to be able to check the use of subsidies. For this purpose, the supplier or system manufacturer must enclose corresponding energy efficiency certificates by means of comparative measurements or energy considerations in the form of manufacturer's certificates in addition to the offers. An example of a manufacturer's certificate is available in Appendix 1 "Energy Efficiency Calculation Manufacturer Example". Furthermore, if necessary, a template in Appendix 2 "Energy Efficiency Calculation Manufacturer Template" can be used as a basis for the preparation of a suitable document.

Hint:

As a basis for comparison for proof of energy efficiency, machines and systems are to be used as a reference, which have an identical/comparable system benefit and also technology, but are less energy-efficient and also freely available on the market.

Received offers are processed internally by purchasing and planning, among other things, on the basis of the documents "Checklist of necessary information for energy efficiency calculations (planning and purchasing) " and "Information sheet Assessment eligibility for the investment application" for the existence of necessary documents and the possibility with regard to the Use of funding programmes reviewed.

Below the above documents are listed again as LINK FOR INTERNAL USE:

[Checklist of necessary information for energy efficiency calculations \(planning and purchasing\)](#)
[Information sheet Assessment eligibility for the investment application](#)

6. Information carrier and contact person

All inquiries and information can be sent to the general e-mail address of the energy team. This is where the allocation to the respective responsible persons takes place.

Energieteam@handtmann.de

(if necessary by phone Mr. Ralf Funk Tel.: 07351 342 6 771)

7. Annexes

Appendix 1: Energy Efficiency Calculation Manufacturer Example
Appendix 2: Energy Efficiency Calculation Manufacturer Template
Appendix 3: Supplier list / Tender texts