

PD IEC/TR 62837:2013



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Energy efficiency through automation systems

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee GEL/65, Measurement and control.

A list of organizations represented on this committee can be obtained on request to its secretary.

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TECHNICAL REPORT



Energy efficiency through automation systems

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms and definitions	9
3.1 Energy	9
3.2 Energy use and energy consumption.....	10
3.3 Energy efficiency	11
3.4 Energy performance.....	12
3.5 Energy management	13
3.6 Automation process equipment.....	13
3.7 Automation system.....	14
4 Abbreviations and alphabetical index.....	15
4.1 Abbreviated terms.....	15
4.2 Alphabetical index of terms	16
5 Generic models	18
5.1 Functional hierarchy of production systems.....	18
5.2 Functions in level 4	19
5.3 Functions in level 3 or lower.....	19
5.4 Application function and automation function.....	20
6 Generic tools and methods	22
6.1 Organisational issues.....	22
6.2 Energy managed unit (EMU).....	22
6.3 General recommendations	23
6.3.1 Architecture of energy sourcing	23
6.3.2 Managed energy efficiency	24
6.3.3 Low power states.....	25
6.3.4 Standardised component interface.....	25
6.3.5 Control systems.....	25
6.3.6 Classification and energy labels for components and systems	26
6.3.7 Simulation of systems and components	26
6.4 Key performance indicators (KPIs) for energy efficiency.....	27
6.4.1 Basics for defining KPIs for energy efficiency	27
6.4.2 Recommendations for defining KPIs for energy efficiency.....	30
6.4.3 Guidelines for defining KPIs.....	31
7 Applications.....	38
7.1 The application point of view.....	38
7.1.1 Energy consumption in industry	38
7.1.2 Characteristics of production processes.....	40
7.2 Discrete manufacturing	40
7.2.1 Description	40
7.2.2 Recommendations for discrete manufacturing.....	42
7.3 Process industry	43
7.3.1 Description	43
7.3.2 General recommendations for the process industry.....	44
7.3.3 Existing standards	45

7.3.4	Gaps	45
7.3.5	Specific recommendations	45
7.4	Support functions	46
7.4.1	General	46
7.4.2	Building automation and facility management	46
8	Components	46
8.1	The component specific view	46
8.2	Actuators	47
8.2.1	Electrical drives: regulate or self-learn optimal energy efficiency	47
8.2.2	Electrical drives: standardised intermediate current link	47
Annex A (informative)	System boundary	48
Annex B (informative)	Current approaches for KPIs for energy efficiency	51
B.1	Existing KPIs	51
B.2	KPIs for components	51
B.3	KPIs for products	51
B.4	KPIs for systems	52
B.5	Target values of KPI by industry sectors in Japan	52
B.6	How to measure the energy consumed to produce a product	54
Annex C (informative)	Energy baseline model	56
C.1	Guidelines for the creation and usage of an energy baseline model	56
C.2	Examples of a facility energy baseline model	57
C.2.1	General	57
C.2.2	Cooling water pump with parallel pumping control	57
C.2.3	Cooling water pumps with variable frequency AC drive	58
Annex D (informative)	Energy labels	60
D.1	Examples of energy labels	60
D.2	Energy label for electrical motors	60
Annex E (informative)	“RENKEI” control	61
E.1	Background of “RENKEI” control	61
E.2	“RENKEI” control	61
Annex F (informative)	Measurement and control technologies that support energy efficiency improvement	64
F.1	Technologies to improve energy efficiency	64
F.2	Detection of air leakage	64
F.3	Control valves	65
F.4	Control loop performance improvements	66
F.5	Combustion control	67
F.6	Advanced process control (APC)	68
F.7	Air supply pressure control	70
F.8	Steam header pressure control	70
F.9	Optimal operational planning system	71
F.10	Analytical sensors	72
Bibliography	74
Figure 1	– Functional hierarchy of production systems according to IEC 62264	18
Figure 2	– Energy functions mapped over the functional hierarchy levels (IEC 62264)	19
Figure 3	– Structural overview of automated industrial plants	21

Figure 4 – Plant application with automation assets	22
Figure 5 – Energy managed unit (EMU)	23
Figure 6 – Start up phase of a system and its power consumption	27
Figure 7 – Creation of an energy baseline model	28
Figure 8 – Measurement of energy savings	28
Figure 9 – KPI and its driving factor	30
Figure 10 – Characteristics of the energy baseline model	33
Figure 11 – Production system hierarchy	34
Figure 12 – Energy consumption characteristics of equipment	35
Figure 13 – Model of automotive production	41
Figure 14 – Supervisory control	43
Figure A.1 – Unit process model	48
Figure A.2 – Unit process model dealing with the direct and indirect influences	49
Figure A.3 – Process units in the definition and context of plants	49
Figure A.4 – Typical expanded equipment hierarchy	50
Figure B.1 – Product production process	55
Figure B.2 – Production process flow	55
Figure C.1 – Energy baseline model	56
Figure C.2 – Cooling water pump facility with parallel pumping control	58
Figure C.3 – Cooling water pumps with variable frequency AC drive	59
Figure D.1 – Examples of energy labels	60
Figure E.1 – “RENKEI” control	62
Figure E.2 – “RENKEI” control detail	62
Figure E.3 – Energy flow in a factory	63
Figure F.1 – Components and automation functions	64
Figure F.2 – Pipe air leaks	65
Figure F.3 – Structure of control valve	66
Figure F.4 – Control loop performance improvements	66
Figure F.5 – The effects of control performance analysis and tuning	67
Figure F.6 – Relationship between air-fuel ratio and heat efficiency (combustion)	67
Figure F.7 – CO and O ₂ control system for combustion furnace	68
Figure F.8 – APC	69
Figure F.9 – Example of APC application for distillation column	70
Figure F.10 – Air supply pressure control by pressure transmitter and compressor	70
Figure F.11 – Control of steam header pressure by means of compressor quantity control	71
Figure F.12 – Optimal operational planning system	72
Figure F.13 – Coal gasification plant	73
Table 1 – Guideline for EMU energy data	29
Table 2 – Guideline to define KPIs for EMU	36
Table 3 – Guideline for the definition of KPIs for products	37

Table 4 – KPI description based on ISO 22400-2 model.....	38
Table 5 – Characteristics of production processes	40
Table B.1 – Target values of KPI by industry sectors in Japan	53
Table C.1 – Guidelines for defining an energy baseline model	57
Table F.1 – Pipe air leaks detected by ultrasonic sensing device	65

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ENERGY EFFICIENCY THROUGH AUTOMATION SYSTEMS

FOREWORD

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IEC 62837, which is a technical report, has been prepared by IEC technical committee 65: Industrial-process measurement, control and automation.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
65/513/DTR	65/517/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

Energy efficiency has received an ever growing attention worldwide since it is considered a major lever to help secure a sustainable society in view of climate change, growing population and security of supply [1]¹. Additionally the sustainability and conservation of resources need to be considered. Automation is the enabler of measures, solutions and systems for demand/response and energy efficiency. In the context of this TR we will only consider energy efficiency. IEC and ISO have both identified energy efficiency as one of their main areas of activity.

The current focus of the Standard Development Organisations (SDO) is harmonised terminology, calculation methods, indicators, energy management systems and standards for assessment and ratings (e.g. for buildings and industrial plants). For this purpose IEC SMO Decision 128/20 “New initiatives for IEC” work endorsed the SMB Strategic Group on Energy Efficiency and Renewable Energy. This strategic group has since then developed 34 recommendations for future work in different domains. The three following recommendations cover the area of automation:

- Recommendation #7: IEC/TC 2, SC 22G and TC 65 together with ISO/TC 184 should develop guidelines for the design and operation of energy efficient systems in the field of industrial automation and industrial process control from a system point of view.
- Recommendation #27: In order to support the optimisation of automation and production processes already during the planning phase of production systems, SG1 recommends that all relevant product TC/SC include key data in their components/devices standards that are vital for a priori simulation of the component/device behaviour in an intended production system, as such simulation leads to optimised processes from an energy efficiency perspective.
- Recommendation #28: In order to support the optimisation of automation and production processes already during the planning phase of production systems, SG1 recommends that TC 65 and its SCs consider the development of simulation tools from a system point of view, to allow a priori optimisation of automation and production processes on the factory floor in terms of energy efficiency.

In line with the recommendation #7, a workshop organized by the quoted committees and by SC 17B reached the consensus to create the JWG 14, settled in TC 65, to cover the objectives and perform the tasks specified in the above mentioned recommendations. This document identifies a number of technology areas in the scope of various technical committees that need standardisation.

¹ Numbers in square brackets refer to the Bibliography.

ENERGY EFFICIENCY THROUGH AUTOMATION SYSTEMS

1 Scope

This Technical Report provides to the technical committees a framework for the development and adaptation of documents in order to improve energy efficiency in manufacturing, process control and industrial facility management.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62264 (all parts), *Enterprise-control system integration*

IEC 62264-1:2013, *Enterprise-control system integration – Part 1: Models and terminology*

ISO 20140-1:2013, *Automation systems and integration – Evaluating energy efficiency and other factors of manufacturing systems that influence the environment – Part 1: Overview and general principles*

ISO 22400-2, *Automation systems and integration – Key performance indicators for manufacturing operations management – Part 2: Definitions and descriptions²*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 Energy

3.1.1

energy

capacity of a system to produce external activity or perform work

Note 1 to entry: Commonly, the term “energy” is used for electricity, fuel, steam, heat, compressed air and other like media. Energy can take a wide variety of forms, for example: chemical energy, mechanical energy, thermal energy, electric energy, gravitational energy, nuclear energy, hydraulic energy, etc.

Note 2 to entry: The SI unit for energy is joule (J), and for electric energy also watt-hour (W·h).

[SOURCE: CEN/CLC/TR 16103:2010, 4.1.1]

3.1.2

energy conversion

transformation of the physical or chemical form of energy

Note 1 to entry: The term “energy transformation” may be employed in this sense.

² To be published.