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Low-voltage switchgear and controlgear – Device profiles for networked industrial devices –

Part 2: Root device profiles for starters and similar equipment

Appareillage à basse tension – Profils d'appareil pour les appareils industriels mis en réseau –

Partie 2: Profils racines d'appareil pour les démarreurs et les matériels similaires



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – DEVICE PROFILES FOR NETWORKED INDUSTRIAL DEVICES –

Part 2: Root device profiles for starters and similar equipment

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International Standard IEC 61915-2 has been prepared by the subcommittee 17B: Low-voltage switchgear and controlgear, of the IEC technical committee 17: Switchgear and controlgear.

The text of this standard is based on the following documents:

FDIS	Report on voting
17B/1752/FDIS	17B/1755/RVD

Full information on the voting for the approval of this standard 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.

A list of all parts of the IEC 61915 series can be found, under the general title *Low-voltage switchgear and controlgear – Device profiles for networked industrial devices*, on the IEC website.

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- withdrawn,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.

The contents of the corrigendum of July 2012 have been included in this copy.

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INTRODUCTION

This International Standard follows the rules and uses the framework of IEC 61915-1, *Low-voltage switchgear and controlgear – Device profiles for networked industrial devices – Part 1: General rules for the development of device profiles*. This International Standard is to define the common set of functionality (data and behaviour) for motor starters and similar devices thereby allowing system designers, system integrators and maintenance personnel to handle profile-based devices without a special tool configuration.

This International Standard gives manufacturers and other organizations the common set of functionality to represent their network capable devices. Manufacturers or other organizations may use the root device profiles specified to add their manufacturer-specific extensions.

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – DEVICE PROFILES FOR NETWORKED INDUSTRIAL DEVICES –

Part 2: Root device profiles for starters and similar equipment

1 Scope

This part of IEC 61915 specifies root device profiles as defined by IEC 61915-1 for starters and similar equipment covered by the following product standards:

- electromechanical contactors and motor-starters (IEC 60947-4-1),
- AC semiconductor motor controllers and starters (IEC 60947-4-2),
- AC semiconductor controllers and contactors for non-motor loads (IEC 60947-4-3),
- control and protective switching devices (or equipment) (CPS) (IEC 60947-6-2),
- control units for built-in thermal protection (PTC) for rotating electrical machines (IEC 60947-8).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including amendments) applies.

IEC 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules*
Amendment 1 (2010)

IEC 61915-1:2007, *Low-voltage switchgear and controlgear – Device profiles for networked industrial devices – Part 1: General rules for the development of device profiles*

3 Terms, definitions and abbreviated terms

3.1 General

For the purposes of this document, the terms, definitions, abbreviations and symbols given in IEC 61915-1, as well as the following apply.

3.2 Terms and definitions

3.2.1

built-in thermal protection

protection of certain parts (called protected parts) of a rotating electrical machine against excessive temperatures resulting from certain conditions of thermal overload, achieved by means of a thermal protection system, the whole or part of which is a thermally sensitive device (thermal detector or protector) incorporated within the machine

[IEC 60947-8:2003, 3.1.1, modified]

3.2.2

thermal protection system

system intended to ensure the built-in thermal protection of a rotating electrical machine by means of a thermal detector (or thermal detectors) together with a control system, or by means of a thermal protector (or thermal protectors)

[IEC 60947-8:2003, 3.1.2, modified]

3.2.3 thermal detector

electrical insulated device (component), sensitive to temperature only, which will initiate a switching function in the control system when its temperature reaches a predetermined level

[IEC 60947-8:2003, 3.1.3]

3.2.4 control system

system to translate a particular point on the characteristic of a thermal detector to a switching function on the supply to the rotating electrical machine

NOTE The system is capable of being reset (either manually or automatically) when the temperature falls to the reset value.

[IEC 60947-8:2003, 3.1.5]

3.2.5 control unit

device which converts into a switching function the variation of the characteristic of a thermal detector

NOTE A control unit may be an electromechanical type, a static type or a combination of both.

[IEC 60947-8:2003, 3.1.15, modified]

3.2.6 manufacturer

any person, company or organisation with ultimate responsibility as follows:

- to verify compliance with the appropriate standard or standards;
- to provide the product information according to Clause 5 of IEC 60947-1:2007

NOTE For instance, in the case of “protected starters” assembled according to the instructions of the component providers, the manufacturer will be the entity that undertook the assembly.

[IEC 60947-1:2007, 2.1.21, modified]

3.2.7 switching device

device designed to make and/or break the current in one or more electric circuits

[IEC 60050-441:1984, 441-14-01, modified]

3.2.8 semiconductor switching device

switching device designed to make and/or break the current in an electric circuit by means of the controlled conductivity of a semiconductor

[IEC 60050-441:1984, 441-14-03, modified]

3.2.9 (mechanical) contactor

mechanical switching device having only one position of rest, operated otherwise than by hand, capable of making, carrying and breaking currents under normal circuit conditions including operating overload conditions

NOTE Contactors may be designated according to the method by which the force for closing the main contacts is provided.

[IEC 60050-441:1984, 441-14-33]

**3.2.10
semiconductor contactor
solid-state contactor**

device which performs the function of a contactor by utilizing a semiconductor switching device

NOTE A semiconductor contactor may also contain mechanical switching devices.

[IEC 60947-1:2007, 2.2.13]

**3.2.11
starter**

combination of all the switching means necessary to start and stop a motor, in combination with suitable overload protection

NOTE Starters may be designated according to the method by which the force for closing the main contacts is provided.

[IEC 60050-441:1984, 441-14-38]

**3.2.12
short-circuit protective device
SCPD**

device intended to protect a circuit or parts of a circuit against short-circuit currents by interrupting them

[IEC 60947-1:2007, 2.2.21]

**3.2.13
tripping (operation)**

opening operation of a mechanical switching device initiated by a relay or release

[IEC 60947-1:2007, 2.4.22]

**3.2.14
switchgear and controlgear**

general term covering switching devices and their combination with associated control, measuring, protective and regulating equipment, also assemblies of such devices and equipment with associated interconnections, accessories, enclosures and supporting structures

[IEC 60050-441:1984, 441-11-01]

**3.2.15
motor management starter**

starter including extended functions and with communication ability

NOTE Some extended functions are described in IEC 60947-1.

**3.2.16
remote control**

control of an operation at a point distant from the controlled switching device

[IEC 60050-441:1984, 441-16-07]

NOTE Remote control, in the context of this standard, means control by any communication system using the profiles defined in this standard.

3.2.17**local control**

control of an operation at a point on or adjacent to the controlled switching device

[IEC 60050-441:1984, 441-16-06]

NOTE Local control, in the context of this standard, means the indication to a remote host controller that, as a result of operator intervention, commands received will not be accepted or acted upon. Safety control functions may still be active.

3.2.18**manual control**

control of an operation by human intervention

[IEC 60050-441:1984, 441-16-04]

3.2.19**manual mode**

switching commands are not accepted from the regular remote controller but from a manual secondary source for the purpose for example of maintenance, test, commissioning or configuring

NOTE 1 Manual mode, in the context of this standard, means that the starter does not react upon the switching commands from the remote host controller like for instance "Run forward", "Run reverse" and "Switch Off".

NOTE 2 The manual secondary source of command is for example a remote engineering tool or a remote operation terminal.

3.3 Abbreviated terms

(standards.iteh.ai)

O Optional

R Read

[IEC 61915-2:2011](https://standards.iteh.ai/catalog/standards/sist/f4c254ee-b664-489b-ba01-aae6c459f512/iec-61915-2-2011)

RW Read/write

<https://standards.iteh.ai/catalog/standards/sist/f4c254ee-b664-489b-ba01-aae6c459f512/iec-61915-2-2011>

r Reserved

Ready FRC Ready for remote control

4 Root device profiles

Table 1 lists the root device profiles defined in this standard.

Table 1 – List of root device profiles

Standard	Root device profile	
	Identification	Name
IEC 61915-2	P(IEC 61915-2)00001	Motor starter ^a
	P(IEC 61915-2)00002	Soft starter
	P(IEC 61915-2)00003	Motor management starter
^a Motor starter may include some kind of soft starters.		

Some elements of the root device profile are common to different profiles covered by this standard:

- parameters,
- parameters groups.

Other elements are specific to the various parts of IEC 60947 series covered by this standard:

- header,

- parameters assemblies,
- state model.

The remaining elements of the root device profile described in IEC 61915-1 are under consideration:

- complex data types,
- functional elements,
- services.

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5 Common elements of the root device profile

5.1 R parameters

The R parameters, specified in Table 2, are defined for the whole series of root device profiles covered by this standard.

Table 2 – R parameters

PARAMETERS								
Parameter name	Data type	Units	Offset	Multiplier	Range	Access	Required	Parameter description
Ready FRC	BOOL	na	na	na	na	R	O	<p>1="READY" All the conditions that will permit the operation of a device by the remote host controller have been fulfilled.</p> <p>0="NOT READY" The controller is not able to control the device because at least one condition is not fulfilled.</p> <p>NOTE 1 The manufacturer/application of the device will determine the conditions that have to be fulfilled.</p> <p>EXAMPLE The conditions which have to be fulfilled may include: - communication to host established, - remote control selected, - etc.</p> <p>NOTE 2 Remote monitoring may be possible even if the device is "NOT READY". For example the parameter "Motor current" may be transmitted while the device is being operated under local control.</p>

PARAMETERS

Parameter name	Data type	Units	Offset	Multiplier	Range	Access	Required	Parameter description
On	BOOL	na	na	na	na	R	O	<p>1="ON" For an electromechanical switching device, the main circuit contacts are closed. For a semiconductor switching device, the switches are in the conducting state.</p> <p>0="OFF" For an electromechanical switching device, the main circuit contacts are open. For a semiconductor switching device, the switches are in non-conducting state.</p> <p>NOTE 1 "ON" doesn't imply that the motor is running. In simple devices, such as certain direct-on-line starters, the assumption may be made that when the starter is "ON", power is available at the incoming connections and the motor is running. In more complex devices, monitoring of parameters like "Current" can indicate that the motor is properly running.</p> <p>NOTE 2 In semiconductor starters, "ON" implies that current is flowing to the motor.</p> <p>NOTE 3 "On" parameter is used for motor starter.</p>
Off	BOOL	na	na	na	na	R	O	<p>1="OFF" For an electromechanical switching device, the main circuit contacts are open. For a semiconductor switching device, the switches are in non-conducting state.</p> <p>0="ON" For an electromechanical switching device, the main circuit contacts are closed. The motor may run forward or run reverse. For a semiconductor switching device, the switches are in the conducting state.</p> <p>NOTE 1 When changing the motion direction of the motor a short interruption of "ON" may occur.</p> <p>NOTE 2 "Off" parameter is used for motor management starter.</p>

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PARAMETERS								
Parameter name	Data type	Units	Offset	Multiplier	Range	Access	Required	Parameter description
Running forward	BOOL	na	na	na	na	R	O	<p>The main circuit contacts of the electromechanical starter are closed or the semiconductor switches of the semiconductor starter are in the conducting state.</p> <p>In unidirectional systems.</p> <p>1="RUNNING FORWARD", energy is being supplied to the motor.</p> <p>0="OFF"</p> <p>In bi-directional systems, energy is being supplied to the motor so that its direction of rotation is forward. Running forward and running reverse shall be considered together:</p> <p>running forward=0 and running reverse =0 → "OFF"</p> <p>running forward=1 and running reverse =0 → "RUNNING FORWARD"</p> <p>running forward=0 and running reverse =1 → "RUNNING REVERSE"</p> <p>running forward =1 and running reverse =1 → Shall be defined by the manufacturer</p>
Running reverse	BOOL	na	na	na	na	R	O	<p>The main circuit contacts of the electromechanical starter are closed or the semiconductor switches of the semiconductor starter are in the conducting state.</p> <p>In bi-directional systems, energy is being supplied to the motor so that its direction of rotation is reverse. Running forward and running reverse shall be considered together:</p> <p>See "Running forward"</p> <p>NOTE In unidirectional systems, this parameter is not used.</p>
Fault	BOOL	na	na	na	na	R	O	<p>1="FAULT" A trip fault condition exists.</p> <p>0="NO FAULT" No trip fault condition exists.</p> <p>NOTE A trip fault condition is any condition (for example short-circuit) which requires the opening of the main circuit.</p>

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