



**RENAULT**

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**INDUSTRIAL MACHINES AND INSTALLATIONS  
RULES FOR DRAFTING THE  
TECHNICAL DOCUMENTATION  
"ELECTRICITY – AUTOMATION"**

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**Importante Note :** This document has been translated from the French. In the event of any dispute, only the French version is referred to as the reference text and is binding on the parties.

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<i>Purpose</i>	To define the structure and content of the automation documentation required from the supplier to operate an item of Renault capital goods.
<i>Scope</i>	All industrial machines, installations and new parts installed on old systems ordered by Renault.
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<i>Approved by</i>	<i>Function</i>	<i>Signature</i>	<i>Date of application</i>
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	A	06/98	Creation. Supersedes the different 60256 requirements dealing with the same subject (DIV and DM).	P.DUPONT (1) S.ALLAIN (1)
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 European directive: CEE 89/392, CEE 91/368, CEE 93/44, CEE 93/68.  
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1.

## FOREWORD - GENERAL

The European CEE 89/392 directive modified by CEE 391/368 then CEE 93/44, CEE 93/68 requires that an instruction guide shall be provided with every system ordered by Renault.

This standard specifies the maintenance instructions in the instructions guide. It defines the rules for drafting the technical document "Electricity – Automation" to operate all machines and installations ordered by Renault.

It is common to both D.I.V and D.M..

It does not deal with the different **stages of distribution, or the classification and codification of documents.**

The documents provided shall also be used in the validation of designs according to the milestones and the form adopted in the technical specifications of DIV or DM methods.

### **For the D.I.V.:**

This standard specifies the content of the various documents which shall make up the technical file "Electricity/Automation" No. 8 of standard EB00°20°600: "Document technique des machines et installations industrielles DIV/DF Structure - Contenu – Jalonnement".

### **For the D.M.:**

This standard specifies the content of the "Electricity /Automation" technical file of a machine or installation. It is referred to in the instruction manual EB00 20 120. The technical specifications of the mechanical methods specify the stages of distribution.

## 2. PURPOSE

The purpose of this standard is to specify to the supplier what kind of documentation shall be supplied to constitute the "electricity/automation" technical file.

At the supplier's request, Renault may supply examples to explain its needs more clearly.

## 3. PRESENTATION

These documents shall be drawn up in the language of the equipment user's country in compliance with European standard EN 292-2/A1 which integrates the European CEE 89/392 directives.

The formats of the "paper" documents shall comply with the 1<sup>st</sup> choice, series A of standard ISO 5457 and their quality shall enable a back-up and a legible reproduction to be made.

The cover page of each file shall contain the following information:

- the manufacturer's serial number;
- the designation of the machine or installation;
- the number of pages.

A general summary shall be included on the first page of the technical file.

Each subassembly is part of a file or part file and shall have a title, summary and pagination.

**All documentation shall be backed-up electronically.**

**The ways to save the documentation electronically are defined in the "Méthodes de l'affaire" specifications.**

## 4.

## TECHNICAL DESCRIPTIVE

### 4.1 Hardware and functional architecture

The architecture diagram shall allow a rapid understanding of the hardware and functional organisations of the various control systems and associated automation equipment (API, CN, PC, variator, measurement system, engine, console, etc.) of a capital goods item and for computer and micro-computer applications.

Succinct description of the hardware and their main connections, including series and network connections.

Indicate the functions covered by each control system (security, current distribution, operating modes, measurements).

### 4.2 Architecture of control system programmes

The architecture of the programme is equivalent to the functional diagram of the capital goods item. It is designed to explain the organisation and structure of the programme. During the study phase, it prepares the structure of the programme thanks to reflection on the expected functional breakdown and the expected data exchanges. It can be used for maintenance training and future versions.

It shall be part of the preliminary design file of the computer and micro-computer applications.

It is presented in graph form using simple figures (grafcet, organisation chart). It enables the function of each programme block, their sequences, and cross-exchanges to be explained.

It shall display all exchanges (animation, IHM):

- with other programmed systems,
- between the processor and/or coprocessor of the same system.

### 4.3 IHM booklet (console and screen-images)

The booklet describes the "Man-Machine interfaces" which are necessary to run the machine.

It is used to write the user's operator guide.

It includes:

- the description of the service and signalling devices with their associated functions,
- a description of the imaging if there are screen-pages (menu, tree structure, associated controls and functions),
- a description of the start and operating modes.

## 5. ELECTRICAL FILE

### 5.1 Producing documents

**For the DIV**, the diagrams are produced in CAD XELEC respecting the following rules:

- The document is produced with the approved version specified in the technical specifications.
- The document is developed in the Renault environment (symbols and cartoons).
- Types and formats of magnetic supports:  
DDS1 type 2/4 giga-byte DAT or 60 or 150 mega-byte QIC format depending on the company receiving the document. (See the technical specifications in "Contract methods").

**For the DM**, the TS methods shall specify how to use or how not to use the system to produce diagrams in CAD XELEC.

- If this is the case, respect the rules described in the previous paragraph.
- If not, supply the electronic documents in DXF file format.

## Principle diagrams

The electrical principle diagrams are vital for maintenance operators to keep the installation running. They shall be sufficiently detailed to demonstrate the elements of electrical equipment.

### 5.2.1 Distribution block diagram

This document gives a general overview in the form of a block diagram of the different distribution systems.

In particular, it represents:

- the general supply, activating and start-up circuits,
- distribution of power supply (inputs, outputs, other),
- the start of various power supply circuits.

The distribution block diagram is not required if the file is created using the CAD software XELEC.

### 5.2.2 Electrical circuit diagrams

Distribution: It represents the hardware which corresponds to the general power supply, activating and start-up circuits.

Safety: It represents the hardware and circuits, which have a safety function (emergency stop, access doors, start-up relay).

Control: It represents the hardware and circuits required to control the actuators which do not have one single safety function.

Power: It represents the power equipment such as engine, variator, weld column and their circuits.

Networks: It represents the equipment and communication network component serial links (top level, ground, racks and remote modules, etc.).

### 5.2.3 Control system circuit diagrams

They represent the control system boards and their circuits such as: discrete input/outputs, analogue input/outputs, communications, inter-rack, positioning, etc..

The address and configuration of the card is written on the folios.

### 5.2.4 Configuration diagrams of the control systems and associated peripherals

They represent the installation of cards and their allocation in the racks, whilst highlighting the free slots. This is also true for the remote I/O, ASI, modules etc..

Indicate the full card designation: type, reference No.

Specify the configuration of the boards and components (switch).

### 5.2.5 Information exchange diagrams

They represent the hardware (relay terminals, casings) and their circuits which are necessary for information exchanges between the different control systems (including those of adjacent installations).

## 5.3 Interconnection diagrams

### 5.3.1 Cabling block diagram

This shall only be supplied for complex installations on request from the Renault automation project manager.

It represents the routing of all cables with their supporter and bordering (web of cables).

### 5.3.2 Terminal block diagrams

They represent all consoles installed in the casings:  
Terminal block diagrams are required for installations which do not have equipotential wiring marking.  
They are not required when the CAD software XELEC is used and if the terminals and their associated markings are illustrated in the principle diagrams.

### 5.3.3 Connection plan of the protection conductors

It is imperative to supply connection plans for the protection conductors (earths, screening) whether they are inside or outside cabinets, in order to check and control the continued operation of the equipotential circuits and electromagnetic compatibility.  
Compliance with standard EN 60204-1.

## 6. PARTS LIST

The methods technical specifications specify whether the parts list has to be computerised or not using the BDN software.

It shall at least include the indications prescribed in standard EN 60204-1. It shall list parts according to the electrical hardware breakdown.

When using CAD XELEC, it is recommended to use XNOMEN and the associated platform to automatically create the parts list in BDN format.

## 7. CONTROL SYSTEMS PROGRAMME

### 7.1 Producing the document

The programme file includes all files on memory in the installation control system (API, PC, CN, IHM). It shall comply with part 1 of standard CEI 61131.

### 7.2 File content

#### 7.2.1 Monitoring software developments

It summaries for each modification:

- the name of the author,
- the date of the modification,
- the issue reference of the modification,
- the explanation of the modifications made (where, what, why, how, etc.).

#### 7.2.2 List of data and parameters

For each piece of data or parameter, according to the name of the manufacturer, this document indicates:

- the nature of the data (input, output, variable, time delay, counter, typology, etc.),
- the mnemonics,
- the content,
- the cross references relating to each piece of data,
- in the bistable field: the address where this piece of data is positioned at 0 and at 1,
- for variable indexing data processing: the extreme values of the variable addresses concerned by the indexing and/or their full list.

Supply the composition of the communication exchange tables according to the protocol selected.

For the digital controls, supply the inter-coprocessor exchange parameters and specify the composition of the data tables and "M" functions between CN and API.

Supply the equipment software parameters.

### 7.2.3 Detailed illustration of application programmes

They are different ways to illustrate a software package:

- Using graphs (scale diagram, GRAFCET, organisation chart, etc.),
- Symbolically or literally (instruction list).

The main purpose of the graphical illustration is to get a quick understanding of the programme, particularly for the debugging and maintenance personnel.

The most widely used and recommended is the contact diagram also known as a "Ladder". It is highly recommended for the programme for machine animation.

If several illustration methods are used simultaneously, the links between these different methods shall clearly indicated.

Each sub-programme and programme sequence shall include a comment which explains its function and/or action.

The inputs, outputs, parameters and function dealt with shall be indicated, when using functional blocks.

For the same file, the whole file shall be published in folios of the same presentation.

None of the sequences shall be cut-off: if a sequence does not fit onto the rest of the page, use the next page. The manufacturer shall take account of this when programming the viewing and editing tools for the chosen hardware.

## 8.



