

Forms and Lists for Instrumentation Designs

Standardization

This Standard replaces and cancels its previous revision.

The CONTEC - Authoring Subcommittee provides guidance on the interpretation of this Standard when questions arise regarding its contents. The Department of PETROBRAS that uses this Standard is responsible for adopting and applying the sections, subsections and enumerates thereof.

Technical Requirement: A provision established as the most adequate and which shall be used strictly in accordance with this Standard. If a decision is taken not to follow the requirement ("non-conformity" to this Standard) it shall be based on well-founded economic and management reasons, and be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by imperative nature.

Recommended Practice: A provision that may be adopted under the conditions of this Standard, but which admits (and draws attention to) the possibility of there being a more adequate alternative (not written in this Standard) to the particular application. The alternative adopted shall be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by verbs of a nonmandatory nature. It is indicated by the expression: **[Recommended Practice]**.

Copies of the registered "non-conformities" to this Standard that may contribute to the improvement thereof shall be submitted to the CONTEC - Authoring Subcommittee.

Proposed revisions to this Standard shall be submitted to the CONTEC - Authoring Subcommittee, indicating the alphanumeric identification and revision of the Standard, the section, subsection and enumerate to be revised, the proposed text, and technical/economic justification for revision. The proposals are evaluated during the work for alteration of this Standard.

"The present Standard is the exclusive property of PETRÓLEO BRASILEIRO S.A. - PETROBRAS, for internal use in the Company, and any reproduction for external use or disclosure, without previous and express authorization from the owner, will imply an unlawful act pursuant to the relevant legislation through which the applicable responsibilities shall be imputed. External circulation shall be regulated by a specific clause of Secrecy and Confidentiality pursuant to the terms of intellectual and industrial property law."

CONTEC

Comissão de Normalização
Técnica

SC - 10

Instrumentation and Industrial
Automation

Introduction

PETROBRAS Technical Standards are prepared by Working Groups - WG (consisting specialized of Technical Collaborators from Company and its Subsidiaries), are commented by Company Units and its Subsidiaries, are approved by the Authoring Subcommittees - SCs (consisting of technicians from the same specialty, representing the various Company Units and its Subsidiaries), and ratified by the Executive Nucleus (consisting of representatives of the Company Units and its Subsidiaries). A PETROBRAS Technical Standard is subject to revision at any time by its Authoring Subcommittee and shall be reviewed every 5 years to be revalidated, revised or cancelled. PETROBRAS Technical Standards are prepared in accordance with PETROBRAS Technical Standard N-1. For complete information about PETROBRAS Technical Standards see PETROBRAS Technical Standards Catalog.

Foreword

This Standard is the English version (issued in 07/2013) of PETROBRAS N-2833 REV. A 06/2013. In case of doubt, the Portuguese version, which is the valid document for all intents and purposes, shall be used.

This PETROBRAS standard is a combination of other standards which have been merged together to facilitate searches and access to the forms and lists used for instrumentation projects.

1 Scope

1.1 This Standard standardizes the forms and lists used for PETROBRAS's instrumentation projects. This Standard is not intended to cover all the possible aspects and needs of the different PETROBRAS departments; it is rather intended to standardize the contents and layout of the forms and lists.

1.2 This Standard applies to procedures started as of its date of issuance.

1.3 This Standard contains only Technical Requirements.

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 applies.

PETROBRAS [N-76](#) - Materiais de Tubulação para Instalações de Refino e Transporte;

PETROBRAS [N-381](#) - Execution of Drawing and Other General Technical Documents;

PETROBRAS [N-1913](#) - Material Requisition Preparation;

PETROBRAS [N-1931](#) - Instrumentation Piping Materials;

ABNT [NBR 10068](#) - Folha de Desenho - Leitura e Dimensões.

NOTE For documents referred in this Standard and for which only the Portuguese version is available, the PETROBRAS department that uses this Standard should be consulted for any information required for the specific application.

3 General Conditions

3.1 Annex A to this Standard contains templates and instructions for filling them out.

3.2 The standardized forms and lists shall be obtained from the editable files and copied for routine use.

3.3 The headers and footers of standard forms and lists shall be filled out in accordance with PETROBRAS [N-381](#).

3.4 The forms and lists shall be filled out in accordance with the general provisions, specific provisions and the instructions provided for each figure.

3.5 All the fields of the form shall be filled out; when a field is not used, it shall be filled out with a dash.

3.6 Whenever a standard paper form is replaced by an equivalent electronic form, the form may only be changed with formal permission from PETROBRAS. The contents shall be the same as the paper form that has been replaced.

4 Specific Conditions

4.1 Cover Page - Figures A.1 and A.2

The forms shown in Figures A.1 and A.2 shall be used to compose the remaining documents.

4.2 Cable List - Figures A.3 and A.4

Cable list shall always have the cover page provided in Figure A.1 of this Standard or Figure A.1 of PETROBRAS [N-381](#), depending on the format of the list.

4.3 Instrument List - Figure A.5

4.3.1 Instrument list shall always be preceded by a cover page per Figure A.1 of this Standard.

4.3.2 The abbreviations used in location field shall be in accordance with Table 1.

Table 1 - Abbreviations Used for Location Details

Abbrev.	Description
BC	Central Rack
BL	Local Rack
IHM	DCS Operator Interface / Human-Machine Interface
L	Local
PC	Central Panel
PES	Programmable Electronic System
PL	Local Panel
UC	DCS or PLC SCADA Control Unit

4.4 Installation Details - Figures A.6 to A.8

4.3.1 Installation details shall always be preceded by a cover page per Figure A.1 of this Standard.

4.4.2 The index page is not required if the document has 15 pages or less.

4.4.3 The material summary in Figure A.8 is a mandatory component of the document.

4.4.4 The abbreviations used shall be in accordance with Tables 2 and 3.

Table 2 - Abbreviations Used in Process Installation Details

Abbrev.	Description	Abbrev.	Description
AC	Carbon Steel	ESP	Wall Thickness
AI	Stainless Steel	NRE	Swage Nipple
AL	Alloy Steel	PAM	Machine Bolt
AEC	Both Ends Beveled	PAE	Stud Bolt
AEP	Both Ends Flat	PC	Beveled End
AER	Both Ends Threaded	PL	Plain End
CC	Welded	RO	Threaded
CCT	Tubing Compression Fitting	S/C	Seamless
DE	External Diameter	UEP	One End Flat
DN	Nominal Diameter	UER	One End Threaded
EMAC	Largest End Beveled	UEC	One End Beveled
EMAP	Largest End Flat	VAG	Needle Valve
EMAR	Largest End Threaded	VGA	Gate Valve
EMEC	Smallest End Beveled	VGL	Globe Valve
EMEP	Smallest End Flat	VES	Ball Valve
EMER	Smallest End Threaded	VDF	Diaphragm Valve
ES	Socket Weld		

Table 3 - Abbreviations Used in Electrical Installation Details

Abbrev.	Description	Abbrev.	Description
EU	Explosion-proof male/female union	SVD	Vertical sealing fitting with drain
EUF	Explosion-proof female/female union	SHD	Horizontal sealing fitting with drain
EUM	Explosion-proof male/male union	ERE	Explosion-proof reducer
SV	Vertical sealing fitting	EF	Explosion-proof male/female conduit
SH	Horizontal sealing fitting	EFF	Explosion-proof female/female conduit
SVH	Vertical/horizontal sealing fitting	EFM	Explosion-proof male/male conduit

4.5 Material Requisition (RM) - General - Figures A.9 to A.12

4.5.1 The RM shall always be preceded by a cover page per Figure A.1 of PETROBRAS [N-381](#).

4.5.2 PETROBRAS [N-1913](#) shall be used to prepare the RMs.

4.6 Material Requisition - Cables - Figures A.13 and A.14

Cable RMs shall always be preceded by a cover page per Figure A.1 of PETROBRAS [N-381](#).

5 Index of Annex A

- a) General documents:
 - Figure A.1 - document cover page, in A3 format;
 - Figure A.2 - document index, in A3 format;
- b) Instrumentation cable list:
 - Figure A.3 - instrumentation cable list, in A3 format;
 - Figure A.4 - simplified instrumentation cable list, in A4 format;
- c) Instrument list;
 - Figure A.5 - instrument list, in A3 format;
- d) Installation details:
 - Figure A.6 - process installation detail, in A3 format;
 - Figure A.7 - pneumatic and electric installation details, in A3 format;
 - Figure A.8 - summary for installation details, in A3 format;
- e) Material requisition - general:
 - Figure A.9 - requisition item, in A4 format;
 - Figure A.10 - technical documents required, in A4 format;
 - Figure A.11 - document recipients, in A4 format;
 - Figure A.12 - general conditions, in A4 format;
- f) Figure A.13 - material requisition - instrumentation electric cable, in A4 format;
- g) Figure A.14 - material requisition - instrumentation optical cable, in A4 format;

Annex A - Figures and Tables

SHEET REVISION INDEX														REFERENCE DRAWINGS	
SHEET	REV.	SHEET	REV.	SHEET	REV.	SHEET	REV.	SHEET	REV.	SHEET	REV.	SHEET	REV.	(4)	
	(1)														
REV.		DESCRIPTION												(5)	
(2)		(3)													
NOTES:														(6)	
(6)															
<div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="text-align: center;"> PETROBRAS </div> <div> <small>CLIENT OR USER</small> <small>PROGRAM OR PROJECT</small> <small>AREA OR UNIT</small> <small>TITLE:</small> </div> <div style="text-align: right;"> <small>SHEET</small> <small>of</small> </div> </div>															
<small>THIS FORM BELONGS TO STANDARD PETROBRAS N-2833 REV. A ANNEX A</small>														<small>THE INFORMATION CONTAINED IN THIS DOCUMENT IS PETROBRAS PROPERTY AND MAY NOT BE USED FOR PURPOSES OTHER THAN THOSE SPECIFICALLY INDICATED HEREIN</small>	

Figure A.1 - Form - Document Cover Page, in A3 Format
Table A.1 - Instructions for Filling Out Figure A.1

Field	Description
1	Indicate the revision of the relevant sheet.
2	Indicate the document revision.
3	Describe the revision.
4	Reserved for indicating reference drawings.
5	Indicate the abbreviations used, per item 4.4.4.
6	General notes.

[illegible]

Figure A.2 - Form - Document Index, in A3 Format

Table A.2 - Instructions for Filling Out Figure A.2

Field	Description
1	List the instrument tags in alphabetical order.

[illegible]

Figure A.3 - Form - Instrumentation Cable List, in A3 Format

Table A.3 - Instructions for Filling Out Figure A.3

Field	Description
1	Indicate the instrument tag.
2	Indicate the identification of the terminal on the instrument.
3	Indicate the identification of the cable, per the design criteria.
4	Indicate the identification of the wire (color) in the cable.
5	Indicate the length of the cable as established in the design.
6	Indicate the length of cable actually installed (as built).
7	Indicate the identification of the cable drum this cable shall be taken from.
8	Indicate the identification of the junction box.
9	Indicate the identification of the strip inside the junction box.
10	Indicate the identification of the terminals inside the junction box.
11	Indicate the identification of the multicable.
12	Indicate the identification of the pair (number) and wire (color) of the multicable.
13	Indicate the identification of the cable drum the multicable shall be taken from.
14	Indicate the number of the section of the panel or cabinet.
15	Indicate the number of the strip terminal in the panel or cabinet.
16	Indicate the terminal number in the panel or cabinet.
17	Indicate the documents that describe the route of the multicable from the terminal box to the panel or cabinet.
18	Notes related to the line.
19	General notes.

[illegible]

Figure A.4 - Form - Simplified Instrumentation Cable List, in A4 Format

Table A.4 - Instructions for Filling Out Figure A.4

Field	Description
1	Indicate the identification of the cable, per the design criteria.
2	Indicate where the cable is routed from.
3	Indicate where the cable is routed to.
4	Indicate the length of the cable as established in the design.
5	Indicate the length of cable actually installed (as built).
6	Indicate the identification of the cable drum this cable shall be taken from.
7	Indicate the documents where the cable route from source to destination is described.
8	Notes related to the line.
9	Indicate the cable drum identification found on this sheet.
10	Indicate the total length of the cables wound on the cable drum mentioned in item 9 on this sheet.
11	General notes.

Figure A.5 - Form - Instrument List, in A3 Format

Table A.5 - Instructions for Filling Out Figure A.5

Field	Description
1	Indicate the instrument tag.
2	Indicate the location of the instrument, using the abbreviations provided in item 4.3.2.
3	Indicate the service, the number of the line or equipment. In the case of control valves and orifice plates, the line number shall be indicated.
4	Indicate the number of the P&ID (Piping and Instrumentation Diagram) where the instrument is located.
5	Indicate the number of the instrument's data sheet.
6	Indicate the number of the RM and/or invoice describing the supply of the instrument (units, packages or instruments included).
7	Indicate Logic Diagram code.
8	Indicate the number of the isometric or piping plan where the instrument tap is indicated.
9	Indicate the number of the process installation detail.
10	Indicate the number of the pneumatic and/or electric installation detail.
11	Indicate the number of the loop diagram.
12	Indicate the number of the pneumatic instrumentation drawing.
13	Indicate the number of the electrical instrumentation drawing.
14	Indicate the number of the certified instrument drawing provided by the supplier.
15	Indicate the instrument supplier's name and model.
16	Indicate the number of invoices for the instrument of this line.
17	Indicate general notes.

[illegible]

Figure A.6 - Form - Process Installation Detail, in A3 Format

Table A.6 - Instructions for Filling Out Figure A.6

Field	Description
1	List the instruments in alphabetical order.
2	Indicate the number of the instrumentation plan where the instrument is located.
3	Indicate the number of the drawing where the location of the instrument tap is indicated, in the following order of preference: A - Isometric; B - Piping Plan; C - Vessel or equipment drawing.
4	Indicate the standard material specification (PETROBRAS N-76) of the line or equipment the instrument will be installed on.
5	Indicate the number corresponding to the material shown in the figure provided in field 13.
6	Indicate the material code.
7	Briefly describe the main characteristics of the material.
8	Indicate the main dimensions of the material.
9	Indicate the quantity of material for one detail.
10	Indicate the total quantity of material for the entire sheet.
11	Indicate the standard instrumentation material specification (PETROBRAS N-1931).
12	General notes.
13	Space for installation detail drawing.

[illegible]

Figure A.7 - Form - Pneumatic and Electric Installation Details, in A3 Format

Table A.7 - Instructions for Filling Out Figure A.7

Field	Description
1	List the instruments in alphabetical order.
2	Indicate the number of the instrumentation plan where the instrument is located.
3	Indicate the number corresponding to the material shown in the figure provided in field 10.
4	Indicate the material code.
5	Briefly describe the main characteristics of the material.
6	Indicate the main dimensions of the material.
7	Indicate the quantity of material for one detail.
8	Indicate the total quantity of material for the entire sheet.
9	General notes.
10	Space for installation detail drawing.

[illegible]

Figure A.8 - Form - Summary for Installation Details, in A3 Format

Table A.8 - Instructions for Filling Out Figure A.8

Field	Description
1	Indicate the material code, when applicable.
2	Provide a complete description of the material, to be transcribed to the RM for purchase.
3	Indicate the dimensions of the material.
4	Indicate the number of sheets where the material appears.
5	Indicate the total quantity of material for the sheet.
6	Indicate the subtotal if the same code is listed on other sheets.
7	Indicate the total quantity of the code on the last sheet where the code appears.
8	General notes.


 PETROBRAS	MATERIAL REQUISITION		No.	REV.
				SHEET
	TITLE:			of
REQUISITION ITEMS				
ITEM	DESCRIPTION	QTY.	DATA SHEET/SPECIFICATION (ATTACHED)	REV.
REFERENCE DOCUMENTS				
ITEM	DOCUMENT No.	REV.	DESCRIPTION	ATTACHMENT (YES/NO)
PROPOSAL EXTENSION				
<input type="checkbox"/> SIZING OR CALCULATION CONFIRMATION <input type="checkbox"/> TECHNICAL DOCUMENTATION				
<input type="checkbox"/> SPARE PARTS FOR ____ YEAR(S) OF OPERATION <input type="checkbox"/> TRANSPORT PACKAGING				
<input type="checkbox"/> TECHNICAL ASSISTANCE FOR COMMISSIONING <input type="checkbox"/> TRANSPORT				
<input type="checkbox"/> TECHNICAL ASSISTANCE FOR OPERATION/MAINTENANCE <input type="checkbox"/> COMPLIANCE CERTIFICATION FOR INSTALLATION IN EXPLOSIVE ATMOSPHERES				
<input type="checkbox"/> CONVENTIONAL INSPECTION PER AFM <input type="checkbox"/>				
<input type="checkbox"/> COMPLIANCE TESTS <input type="checkbox"/>				

Figure A.9 - Material Requisition (Typical)

[illegible]

Figure A.10 - Material Requisition (Typical)

[illegible]

Figure A.11 - Material Requisition (Typical)


	MATERIAL REQUISITION	No.	REV.
		SHEET	
	of		
TITLE:			
<p align="center">GENERAL CONDITIONS</p> <p>1 - THE SUPPLY SHALL BE IN ACCORDANCE WITH THE "GENERAL CONDITIONS FOR THE SUPPLY OF MATERIALS TO PETROBRAS".</p> <p>2 - ALL DOCUMENTS SENT BY THE SUPPLIER SHALL HAVE THE FOLLOWING IDENTIFICATION: a) PETRÓLEO BRASILEIRO S.A. - PETROBRAS b) No. RM, No. PCM, No. AFM.</p> <p>3 - THE DOCUMENTS SHALL BE IN ACCORDANCE WITH THE SIZES ESTABLISHED IN ABNT STANDARD NBR 10068, PREFERABLY WRITTEN IN PORTUGUESE, ALTHOUGH ENGLISH DOCUMENTS SHALL ALSO BE ACCEPTED; FOLDS SHALL BE PROVIDED WHERE NECESSARY FOR CONVERSION TO SIZE A-4.</p> <p>4 - EVERY INSTRUMENT SHALL BE IDENTIFIED WITH AN IDENTIFICATION PLATE CONTAINING AT LEAST THE FOLLOWING: THE RM NUMBER, THE SERIAL NUMBER AND THE IDENTIFICATION NUMBER. THE IDENTIFICATION PLATE SHALL BE MADE OF A WEATHER AND CORROSION-RESISTANT MATERIAL, AND SHALL BE FASTENED TO THE EQUIPMENT.</p> <p>5 - THIS RM AND ITS APPENDICES DO NOT RELEASE THE SUPPLIER FROM THE OBLIGATION TO ENSURE THAT THE EQUIPMENT, MATERIALS AND COMPONENTS WILL BE COMPATIBLE WITH THE OPERATING CONDITIONS SPECIFIED.</p> <p>6 - THE PROPOSALS SHALL BE IN ACCORDANCE WITH THE STIPULATIONS CONTAINED IN THE MATERIAL REQUISITION; ANY DEVIATIONS AND/OR ALTERNATIVES SHALL BE CLEARLY INDICATED IN THE PROPOSALS OR SUPPLIER DOCUMENTATION. FAILURE TO DO SO SHALL BE INTERPRETED TO MEAN THAT THE SUPPLIER HAS ACCEPTED ALL THE SPECIFICATIONS AND CONDITIONS ESTABLISHED IN THIS MATERIAL REQUISITION.</p> <p>7 - PRICE QUOTES SHALL BE PROVIDED AS UNIT PRICES AND TOTAL PRICES FOR EACH ITEM.</p> <p>8 - SHIPPING AND PACKING COSTS AND TAXES PAYABLE BY PETROBRAS SHALL BE PRESENTED SEPARATELY IN THE PROPOSAL.</p>			

Figure A.12 - Material Requisition (Typical)


	MATERIAL REQUISITION					No.		REV.
								SHEET
	TITLE: STRUMENTATION OPTICAL CABLE							of
DESCRIPTION:								
ITEM	SECTION (mm ²)	No. OF CONDUCTORS	EXTERNAL DIAM. (mm)		OVERALL DIAM. (OVER ARMOR) (mm)		TOTAL QUANTITIES (m)	MATERIAL NUMBER
			MAX.	MIN.	MAX.	MIN.		
NOTES:								

Figure A.13 - Instrumentation Electrical Cable


 PETROBRAS	MATERIAL REQUISITION						No.	REV.
								SHEET
	TITLE: STRUMENTATION OPTICAL CABLE							of
<p>DESCRIPTION:</p>								
ITEM	SECTION (mm ²)	No. OF FIBERS	EXTERNAL DIAM. (mm)		OVERALL DIAM. (OVER ARMOR) (mm)		TOTAL QUANTITIES (m)	MATERIAL NUMBER
			MAX.	MIN.	MAX.	MIN.		
<p>NOTES:</p>								

Figure A.14 - Instrumentation Optical Cable

[illegible]