

INTERNATIONAL STANDARD

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**Measuring relays and protection equipment –
Part 181: Functional requirements for frequency protection**

**Relais de mesure et dispositifs de protection –
Partie 181: Exigences fonctionnelles relatives aux protections de fréquence**



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CONTENTS

FOREWORD.....	6
1 Scope.....	8
2 Normative references	9
3 Terms and definitions	9
4 Specification of the function.....	13
4.1 General.....	13
4.2 Input energizing quantities / energizing quantities	13
4.3 Binary input signals.....	14
4.4 Functional logic.....	14
4.4.1 Operating characteristics	14
4.4.2 Reset characteristics	17
4.5 Additional influencing functions/conditions	18
4.5.1 General	18
4.5.2 Specific characteristics for under/over frequency function.....	18
4.5.3 Specific characteristics for rate of change of frequency (ROCOF) function	19
4.6 Binary output signals	19
4.6.1 General	19
4.6.2 Start (pick-up) signal	19
4.6.3 Operate (trip) signal.....	19
4.6.4 Other binary output signals.....	19
5 Performance specification	20
5.1 General.....	20
5.2 Effective and operating ranges.....	20
5.3 Accuracy related to the characteristic quantity	21
5.4 Start time for under/over frequency function.....	21
5.5 Start time for rate of change of frequency (ROCOF) function	21
5.6 Accuracy related to the operate time delay setting	22
5.7 Disengaging time	22
5.8 Reset hysteresis and reset ratio.....	22
5.9 Accuracy related to restraint/blocking elements	23
5.10 Performance with harmonics	23
5.11 Stability in case of sudden voltage change (phase shift and magnitude shift).....	23
5.12 Voltage input requirements	23
6 Functional test methodology	24
6.1 General.....	24
6.2 Determination of steady state errors related to the characteristic quantity	26
6.2.1 Accuracy of the start value	26
6.2.2 Reset hysteresis or reset ratio determination	32
6.3 Determination of the start time	41
6.3.1 General	41
6.3.2 Under/over frequency	41
6.3.3 Rate of change of frequency	47
6.4 Determination of the accuracy of the operate time delay	50
6.4.1 General	50
6.4.2 Description of test method	50
6.4.3 Reporting of the operate time delay accuracy	52

6.5	Determination of disengaging time	53
6.5.1	General	53
6.5.2	Under/over frequency	53
6.5.3	Rate of change of frequency	56
6.6	Performance with harmonics	58
6.6.1	General	58
6.6.2	Accuracy of the under/over frequency start value in the presence of harmonics	58
6.6.3	Accuracy of the ROCOF start value in the presence of harmonics	63
6.7	Stability in the case of sudden voltage change (phase shift and magnitude change)	65
6.7.1	General	65
6.7.2	Performance in case of voltage phase shift and magnitude change	65
6.7.3	Performance in case of voltage magnitude drop and restoration	68
7	Documentation requirements	70
7.1	Type test report	70
7.2	Other user documentation	71
Annex A (normative)	Test signal equation with constant frequency variation (df/dt)	72
Annex B (normative)	Calculation of mean, median and mode	73
B.1	Mean	73
B.2	Median	73
B.3	Mode	73
B.4	Example	73
Annex C (informative)	Example of frequency measurement and calculation	74
C.1	Definitions	74
C.2	Signal observation model	74
C.3	General requirements on frequency measurement	76
C.3.1	General requirements on frequency measurement	76
C.3.2	Periodic algorithm	76
C.3.3	Analysis algorithm	78
C.3.4	Error minimization algorithm	79
C.3.5	Discrete Fourier transformation (DFT)	82
Annex D (informative)	Performance with inter-harmonics	84
D.1	General	84
D.2	Proposed test accuracy of the under/over frequency start value	84
D.2.1	Description of the generated frequency ramp	84
D.2.2	Protection function settings	85
D.2.3	Test points and calculation of frequency accuracy in the presence of inter-harmonics	86
D.2.4	Reporting of frequency accuracy in the presence of inter-harmonics	86
Annex E (informative)	Management of sudden frequency change without discontinuity in voltage waveform	87
	Bibliography	90
	Figure 1 – Operate time and operate time delay setting	11
	Figure 2 – Simplified protection function block diagram	13
	Figure 3 – Underfrequency independent time characteristic	15
	Figure 4 – Overfrequency independent time characteristic	16

Figure 5 – ROCOF independent time characteristic (for negative or positive ROCOF).....	16
Figure 6 – Explanatory diagram for start, operate, disengage and reset.....	18
Figure 7 – Example of test method for overfrequency	26
Figure 8 – Example of test method for positive ROCOF function	29
Figure 9 – Frequency ramps for assessing the reset hysteresis for overfrequency functions.....	33
Figure 10 – Frequency ramps for assessing the reset hysteresis for underfrequency functions.....	33
Figure 11 – Test method for measurement of reset value for ROCOF functions: example for positive ROCOF function	37
Figure 12 – Start time measurement of overfrequency with sudden frequency change	42
Figure 13 – Start time measurement of overfrequency with constant slope frequency ramp	43
Figure 14 – Example of start time reporting for under/over frequency protection function.....	47
Figure 15 – Start time measurement of positive ROCOF function.....	48
Figure 16 – Histogram for the start time test results for ROCOF.....	50
Figure 17 – Operate time delay measurement of overfrequency and positive ROCOF	51
Figure 18 – Disengaging time measurement of overfrequency with sudden frequency change.....	54
Figure 19 – Disengaging time measurement of overfrequency with constant slope frequency ramp.....	54
Figure 20 – Disengaging time measurement of ROCOF.....	56
Figure 21 – Histogram for the disengaging time test results for ROCOF.....	58
Figure 22 – Example of an increasing pseudo-continuous ramp for overfrequency functions.....	59
Figure 23 – Voltage signal with superimposed harmonics	61
Figure 24 – Representation of the input energizing quantity (voltage, RMS) injection sequence.....	67
Figure 25 – Representation of the input energizing quantity (voltage, RMS) injection sequence with the power system frequency values	69
Figure C.1 – Zero-crossing algorithm	77
Figure C.2 – Level crossing algorithm.....	77
Figure D.1 – Example of an increasing pseudo-continuous ramp for overfrequency function.....	84
Figure E.1 – Example of voltage waveform without discontinuity at $t_0 = 0,02$ s.....	88
Figure E.2 – Example of voltage waveform with discontinuity at $t_0 = 0,02$ s	89
Table 1 – Frequency protection designation.....	8
Table 2 – Example of effective and operating ranges for over/under frequency protection	20
Table 3 – Example of effective and operating ranges for ROCOF protection	20
Table 4 – Test points for under/over frequency function	28
Table 5 – Reporting of the frequency accuracy	28
Table 6 – Reporting of the frequency accuracy (alternative solution).....	29
Table 7 – Test points for ROCOF function.....	31
Table 8 – Reporting of ROCOF accuracy	32

Table 9 – Test points of reset hysteresis for under/over frequency function	35
Table 10 – Reporting of the reset hysteresis for over/under frequency functions	36
Table 11 – Test points of reset value for ROCOF function.....	40
Table 12 – Reporting of the reset value for ROCOF function.....	40
Table 13 – Test points of start time for overfrequency function	44
Table 14 – Test points of start time for underfrequency function	45
Table 15 – Reporting of start time for under/over frequency functions	46
Table 16 – Test points of start time for ROCOF function	49
Table 17 – Reporting of typical start time for ROCOF function	50
Table 18 – Test points to measure operate time delay	52
Table 19 – Test points for accuracy of the operate time delay.....	52
Table 20 – Reporting of operate time delay accuracy for under/over frequency functions.....	53
Table 21 – Test points of disengaging time for overfrequency function.....	55
Table 22 – Test points of disengaging time for underfrequency function.....	55
Table 23 – Reporting of disengaging time for over/under frequency functions.....	56
Table 24 – Test points of disengaging time for ROCOF function	57
Table 25 – Typical disengaging time for ROCOF protection	58
Table 26 – Superimposed harmonics	60
Table 27 – Test points for under/over frequency function in the presence of harmonics	63
Table 28 – Test points for ROCOF function in the presence of harmonics.....	64
Table 29 – Under/over frequency settings for stability tests with voltage drop/restoration	70
Table D.1 – Superimposed inter-harmonics	85
Table D.2 – Test points for under/overfrequency function in the presence of inter-harmonics.....	86

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International Standard IEC 60255-181 has been prepared by IEC technical committee 95: Measuring relays and protection equipment.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
95/402/FDIS	95/409/RVD

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

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

A list of all parts in the IEC 60255 series, published under the general title *Measuring relays and protection equipment*, can be found on the IEC website.

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

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MEASURING RELAYS AND PROTECTION EQUIPMENT –

Part 181: Functional requirements for frequency protection

1 Scope

This part of IEC 60255 specifies the minimum requirements for functional and performance evaluation of frequency protection. This document also defines how to document and publish performance test results.

This document covers the functions based on frequency measurement or rate of change of frequency measurements. This document also covers frequency protection when additional blocking elements are used.

This document defines the influencing factors that affect the accuracy under steady state conditions and performance characteristics during dynamic conditions. The test methodologies for verifying performance characteristics and accuracy are also included in this document.

The frequency functions covered by this document are shown in Table 1:

Table 1 – Frequency protection designation

	IEE/ANSI C37.2 function numbers	IEC 61850-7-4 logical nodes
Underfrequency protection	81U	PTUF
Overfrequency protection	81O	PTOF
Rate of change of frequency protection (ROCOF)	81R	PFRC

This functional document is applicable to frequency functions embedded in a protection relay but also to other physical devices which include frequency protection in their functionality (for example, trip units in a low voltage circuit breaker or inverters associated with photovoltaic or storage systems).

This document does not cover synchronizing or synchronism-check functions.

This document does not specify the functional description of additional features often associated with frequency functions such as undervoltage blocking, df/dt or $\Delta f/\Delta t$ supervision, current supervision or power supervision (f/P function). Only their influence on the frequency protection function is covered in this document.

Frequency and rate of change of frequency measurement outputs provided by protection devices are not in the scope of this document.

Additionally, this document does not explicitly cover the frequency relays based on current as the input energizing quantity but the principles covered by this document can be extended to provide guidance for these applications.

The general requirements for measuring relays and protection equipment are defined in IEC 60255-1.