

CONTENTS

FOREWORD.....	4
1 Scope and object.....	6
2 Normative references	6
3 Terms and definitions	6
4 Specification of the function.....	8
4.1 General	8
4.2 Input energising quantities/Energising quantities	8
4.3 Binary input signals	9
4.4 Functional logic	9
4.4.1 Operating characteristics	9
4.4.2 Reset characteristics	13
4.5 Binary output signals	14
4.5.1 Start (pick-up) signal	14
4.5.2 Operate (trip) signal.....	15
4.5.3 Other binary output signals	15
5 Performance specification	15
5.1 Accuracy related to the characteristic quantity.....	15
5.2 Accuracy related to the operate time	15
5.3 Accuracy related to the reset time	16
5.4 Transient performance	16
5.4.1 Overshoot time	16
5.4.2 Response to time varying value of the characteristic quantity	16
5.5 Voltage transformer requirements	16
6 Functional test methodology	16
6.1 General	16
6.2 Determination of steady state errors related to the characteristic quantity	17
6.2.1 Accuracy of setting (start) value	17
6.2.2 Reset ratio determination.....	18
6.3 Determination of steady state errors related to the start and operate time	18
6.4 Determination of steady state errors related to the reset time	19
6.5 Determination of transient performance	20
6.5.1 Overshoot time for undervoltage protection	20
6.5.2 Response to time varying value of the characteristic quantity for dependent time relays	20
7 Documentation requirements	21
7.1 Type test report.....	21
7.2 Other user documentation	22
Annex A (informative) Reset time determination for relays with trip output only.....	23
Bibliography.....	24
 Figure 1 – Simplified protection function block diagram.....	8
Figure 2 – Overvoltage independent time characteristic	9
Figure 3 – Undervoltage independent time characteristic	10
Figure 4 – Dependent time characteristic for overvoltage protection	11
Figure 5 – Dependent time characteristic for undervoltage protection	12

Figure 6 – Definite time reset characteristic 14

Figure 7 – Definite time reset characteristic (alternative solution with instantaneous reset after relay operation)..... 14

Figure 8 – Test waveform21

Figure A.1 – Dependent reset time determination23

Table 1 – Test points for overvoltage elements 19

Table 2 – Test points for undervoltage elements 19

Table 3 – Test points for overvoltage elements20

Table 4 – Test points for undervoltage elements20

Table 5 – Recommended values for the test21