STIPEL 20016:2021

Requirements for the preparation and assessment of practical exams for the personal certification of safe working on electrical installations (NEN 3140-3840)

Version 2021 – Final

(Explanation of the amendment: With respect to the standard language use of NEN 3140 and NEN 3840, “doorschakelen en verbreken” ("switching on and off" in section 4.2 has been removed compared to STIPEL 20016:2019)

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Stichting Persoonscertificatie Elektrotechniek

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4. Preparation of practical tests

The practical test is drawn up under the responsibility of the Certification Body. Chapter 4.1 lists examples of practical assignments per certification scheme. The practical test may consist of one or more practical assignments and must comply with the scope as stated in 4.1.

The practical test must be drawn up on the basis of the final attainment levels as specified in the certification scheme. All manners for testing the final attainment levels are indicated in 4.2 in an exhaustive list of assessment points, which are arranged in

categories. Each practical test must be composed of a selection of those assessment points as far as possible for the practical test concerned. One or more assessment points from each category must be included in the practical test, as far as applicable to the certification scheme.

4.1 Description of practical assignments

Instructed technician high-voltage (VOP-HS)

The practical test consists of carrying out one or more practical assignments such as:

a. Simple operation.
b. Installation and removal of earthing devices under direct supervision.
c. Assessing a work situation for safety.
d. Knowing the names of tools, control and switching devices.

The practical test score is 150 points ± 12.5% in accordance with chapter 4.2.

Competent technician high-voltage (VP-HS)

The practical test consists of carrying out one or more practical assignments such as:

a. Disconnecting and securing a cable section for work purposes.
b. Connecting a cable section after work carried out.
c. Disconnecting and securing a transformer for work purposes.
d. Connecting a transformer after work carried out.
e. Disconnecting and securing a substation, distribution board, switchboard for work purposes.
f. Connecting a substation, distribution board, switchboard after work carried out.
g. Disconnecting and securing a power group (because of work on the motor, transformer, cable).
h. Connecting a power group (after work on the motor, transformer, cable).
i. Changing transformers.
j. Changing rails.

The practical test score is 500 points ± 12.5% in accordance with chapter 4.2.

Operational technician high-voltage (BD-HS)

Practical test part A consists of writing one or more operating plans, such as:

a. Disconnecting a cable section.
b. Connecting a cable section.
c. Disconnecting a transformer.
d. Connecting a transformer.
e. Disconnecting a substation, distribution board, switchboard.
f. Connecting a substation, distribution board, switchboard.
g. Disconnecting a power group.

h. Connecting a power group.
i. Changing transformers.
j. Changing rails.

The practical test part A score is 250 points ± 12.5% in accordance with chapter 4.2.

The practical test part B consists of carrying out one or more practical assignments such as:

a. Disconnecting a cable section.
b. Connecting a cable section.
c. Disconnecting a transformer.
d. Connecting a transformer.
e. Disconnecting a substation, distribution board, switchboard.
f. Connecting a substation, distribution board, switchboard.
g. Disconnecting a power group.
h. Connecting a power group.
i. Changing transformers.
j. Changing rails.

Practical test part B shall comprise a total of 500 points ± 12.5% in accordance with chapter 4.2.

Person responsible for a high-voltage installation (IVWV-HS)

Practical test part A consists of writing one or more operating plans, such as:

a. Disconnecting and securing a cable section for work purposes.
b. Connecting a cable section after work carried out.
c. Disconnecting and securing a transformer for work purposes.
d. Connecting a transformer after work carried out.
e. Disconnecting and securing a substation, distribution board, switchboard for work purposes.
f. Connecting a substation, distribution board, switchboard after work carried out.
g. Disconnecting and securing a power group (because of work on the motor, transformer, cable).
h. Connecting a power group (after work on the motor, transformer, cable).

The practical test part A score is 550 points ± 12.5% in accordance with chapter 4.2.

The practical test part B consists of carrying out one or more practical assignments such as:

a. Disconnecting and securing a substation, distribution board, switchboard for work purposes.
b. Connecting a substation, distribution board, switchboard after work carried out.
c. Disconnecting and securing a power group (because of work on the motor, transformer, cable).

d. Connecting a power group (after work on the motor, transformer, cable).
e. Changing transformers.
f. Changing rails.
g. Disconnecting a cable section including selection.
h. Connecting a cable section including testing.

Practical test part B score is 500 points ± 12.5% in accordance with chapter 4.2.

Instructed technician low-voltage (VOP-LS)

The practical test consists of carrying out one or more practical assignments such as:

a. Simple operation.
b. Installation and removal of earthing devices under direct supervision.
c. Assessing a work situation for safety.
d. Knowing the names of tools, control and switching devices.

The practical test score is 200 points ± 12.5% in accordance with chapter 4.2.

Competent technician low-voltage (VP-LS)

The practical test consists of carrying out one or more practical assignments such as:

a. Disconnecting and securing a cable section for work purposes.
b. Connecting a cable section after work carried out.
c. Disconnecting and securing a transformer for work purposes.
d. Connecting a transformer after work carried out.
e. Disconnecting and securing a substation, distribution board, switchboard for work purposes.
f. Connecting a substation, distribution board, switchboard after work carried out.
g. Disconnecting and securing a power group (because of work on the motor, transformer, cable).
h. Connecting a power group (after work on the motor, transformer, cable).
i. Disconnecting and securing a UPS.
j. Connecting a UPS.

The practical test score is 300 points ± 12.5% in accordance with chapter 4.2.

Competent technician low-voltage (VP-LS) + high-voltage end groups

The practical test consists of carrying out one or more practical assignments such as:

a. Disconnecting and securing a cable section for work purposes.
b. Connecting a cable section after work carried out.
c. Disconnecting and securing a transformer for work purposes.
d. Connecting a transformer after work carried out.
e. Disconnecting and securing a substation, distribution board, switchboard for work purposes.
f. Connecting a substation, distribution board, switchboard after work carried out.

g. Disconnecting and securing a power group (because of work on the motor, transformer, cable).
h. Connecting a power group (after work on the motor, transformer, cable).
i. Disconnecting and securing a UPS.
j. Connecting a UPS.
k. Disconnecting and securing a high-voltage power group (because of work on the motor, transformer, cable).
l. Connecting a high-voltage power group (after work on the motor, transformer, cable).

The practical test must contain both low-voltage and high-voltage elements.
The practical test score is 325 points ± 12.5% in accordance with chapter 4.2.

Person responsible for a low-voltage electrical installation (IVWV-LS)
Practical test part A consists of writing one or more operating plans, such as:

a. Disconnecting and securing a cable section for work purposes.
b. Connecting a cable section after work carried out.
c. Disconnecting and securing a transformer for work purposes.
d. Connecting a transformer after work carried out.
e. Disconnecting and securing a substation, distribution board, switchboard for work purposes.
f. Connecting a substation, distribution board, switchboard after work carried out.
g. Disconnecting and securing a power group (because of work on the motor, transformer, cable).
h. Connecting a power group (after work on the motor, transformer, cable).

The practical test part A score is 350 points ± 12.5% in accordance with chapter 4.2.

The practical test part B consists of carrying out one or more practical assignments such as:

a. Disconnecting and securing a substation, distribution board, switchboard for work purposes.
b. Connecting a substation, distribution board, switchboard after work carried out.
c. Disconnecting and securing a power group (because of work on the motor, transformer, cable).
d. Connecting a power group (after work on the motor, transformer, cable).
e. Disconnecting and securing a UPS.
f. Connecting a UPS.
g. Disconnecting a cable section including selection.
h. Connecting a cable section including testing.

The practical test part B score is 300 points ± 12.5% in accordance with chapter 4.2.

Person responsible for a low-voltage electrical installation (IVWV-LS) + high-voltage power groups

Practical test part A consists of writing one or more operating plans, such as:

a. Disconnecting and securing a cable section for work purposes.
b. Connecting a cable section after work carried out.
c. Disconnecting and securing a transformer for work purposes.
d. Connecting a transformer after work carried out.
e. Disconnecting and securing a substation, distribution board, switchboard for work purposes.
f. Connecting a substation, distribution board, switchboard after work carried out.
g. Disconnecting and securing a power group (because of work on the motor, transformer, cable).
h. Connecting a power group (after work on the motor, transformer, cable).
i. Disconnecting and securing a power group high-voltage (because of work on the motor, transformer, cable).
j. Connecting a high-voltage power group (after work on the motor, transformer, cable).

The practical test must contain both low-voltage and high-voltage elements.
The practical test part A score is 375 points ± 12.5% in accordance with chapter 4.2.

The practical test part B consists of carrying out one or more practical assignments such as:

a. Disconnecting and securing a substation, distribution board, switchboard for work purposes.
b. Connecting a substation, distribution board, switchboard after work carried out.
c. Disconnecting and securing a power group (because of work on the motor, transformer, cable).
d. Connecting a power group (after work on the motor, transformer, cable).
e. Disconnecting and securing a UPS.
f. Connecting a UPS.
g. Disconnecting and securing a power group (because of work on the motor, transformer, cable).
h. Connecting a power group (after work on the motor, transformer, cable).
i. Disconnecting a cable section including selection.
j. Connecting a cable section including testing.

The practical test must contain both low-voltage and high-voltage elements.
The practical test part B score is 325 points ± 12.5% in accordance with chapter 4.2.

Person responsible for a high-voltage installation (IVWV-HS) + Person responsible for a low-voltage electrical installation (IVWV-LS)

Practical test part A consists of writing one or more work and operation plans, as indicated in person responsible for a high-voltage installation (IVWV-HS) and person responsible for a low-voltage electrical installation (IVWV-LS)
The practical test part A score is 550 points ± 12.5% in accordance with chapter 4.2.

Practical test part B consists of carrying out one or more practical assignments, composed of parts as indicated in IVWV-HS and IVWV-LS.
The practical test part B score is 550 points ± 12.5% in accordance with chapter 4.2.

Competent technician high-voltage (VP-HS) + Competent technician low-voltage (VP-LS)
The practical test consists of carrying out one or more practical assignments, composed of parts as indicated in VP-HS and VP-LS.
The practical test score is 550 points ± 12.5% in accordance with chapter 4.2.

Person responsible for a low-voltage electrical installation (IVWV-LS) + Competent technician high-voltage (VP-HS)
Practical test part A consists of writing one or more work and operation plans, as indicated in IVWV-LS.
The practical test part A score is 350 points ± 12.5% in accordance with chapter 4.2.

Practical test part B consists of carrying out one or more practical assignments, composed of parts as indicated in IVWV-LS and VP-HS.
The practical test part B score is 550 points ± 12.5% in accordance with chapter 4.2.

Person responsible for a high-voltage installation (IVWV-HS) + Competent technician low-voltage (VP-LS)
Practical test part A consists of writing one or more work and operation plans, as indicated in IVWV-LS.
The practical test part A score is 550 points ± 12.5% in accordance with chapter 4.2.

The practical test part B consists of carrying out one or more practical assignments, composed of parts as indicated in IVWV-HS and VP-LS.
The practical test part B score is 550 points ± 12.5% in accordance with chapter 4.2.

Competent technician end-user (VP-EG)
The practical test consists of carrying out one or more practical assignments such as:

a. Disconnecting and/or connecting a power group.
b. Disconnecting and/or connecting an end-user installation

The practical test score is 1.000 points ± 12.5% in accordance with chapter 4.2.

Person responsible for an electrical installation (IV)-EG
The practical test part A consists of drawing up one or more working procedures, such as:

a. Disconnecting and/or connecting a power group.
b. Disconnecting and/or connecting an end-user installation

The practical test score is 1.000 points ± 12.5% in accordance with chapter 4.2.

The practical test part B consists of carrying out one or more practical assignments such as:

a. Disconnecting and/or connecting a power group.
b. Disconnecting and/or connecting an end-user installation

The practical test score is 1.000 points ± 12.5% in accordance with chapter 4.2.

4.2 Assessment of practical test.

Deduction points are given for incorrect parts. Each practical assignment has 100 points at the start. The number of deduction points is indicated for each part if it is incorrect. 31 deduction points means the candidate will be rejected. Any **intervention** or causing **a dangerous situation** will result in 40 deduction points.

Deduction points exams low and high voltage and end-users All points are deductions.

1 Failure to prepare work (properly)			
End term		*Deduction*	*Does not apply to*
14	1.1 Assess work plan/operating plan on the basis of drawings and documents	15	
2 Failure to apply (properly) the procedure for granting permission			
End term		*Deduction*	*Does not apply to*
14	2.1 Permission IV (BD) to start operation and 2.2 Permission WV to remove earthing	10	IVWV-HS/ IVWV-LS
14	2.3 Permission WV for earthing and 2.4 Permission IV (BD) for "energising"	10	IVWV-HS/ IVWV-LS
14	2.5 Permission WV to start work / report completion of work to WV	10	
14	2.6 Permission to reset malfunction indicators	10	IVWV-HS/ IVWV-LS
3 Failure to apply (properly) the procedure for de-energising			
End term		*Deduction*	*Does not apply to*

13/17/18/19	3.1 Recognising components	10	
13/17/18/19	3.2 Operating components	5	
13/17/18/19	3.3 Naming of components	20	Instructed technician high-voltage (VOP-HS)
14	3.4 Use standard language	10	
13/14	3.5 Separate (switch off + disconnector(s)) and 3.6 Remove separation/energize	10	
13/14	3.7 Reactivation protection and 3.8 Overriding reactivation protection	10	
13/14	3.9 Demonstrating absence of operating voltage / demonstrating absence of voltage	40	
13/14	3.10 Earthing and short-circuiting and 3.11 Remove earthing and short-circuiting	40	
13/14	3.12 Application/removal of working earthing	40	
13/14	3.13 Shielding of live parts and 3.14 Removing shields	20	
13/14	3.15 Visual inspection of the site (including position reports)	10	
4 Not (properly) applying the business measurements			
End term		*Deduction*	*Does not apply to*
16	4.1 Before closing the circuit and 4.2 After opening the ring	10	Instructed technician high-voltage (VOP-HS)
16	4.3 For connecting and 4.4 After disconnection	10	Instructed technician high-voltage (VOP-HS)
16	4.7 For power groups for disconnection and 4.8 For power groups after they have been energised	10	Instructed technician high-voltage (VOP-HS)
5 Not (properly) applying the business operations			
End term		*Deduction*	*Does not apply to*
14	5.1 Closing circuit and 5.2 Opening circuit	10	
14	5.3 Connecting and 5.4 Disconnection	10	
14	5.7 Switching off and 5.8 Apply tension	10	

14	5.9 Sequence error without operational consequences	10	
14	5.10 Sequence error causing unintentional de-energisation	40	
14	5.11 Earthing of live network component and 5.12 Energising an earthed network section	40	
14/16	5.13 Reset short-circuit current indicators	10	
13	5.14 Manual/automatic transformers	10	Instructed technician high-voltage/ Instructed technician low-voltage (VOP-HS/ VOP-LS)
6 Failure to apply (properly) (special) measurements			
End term		*Deduction*	*Does not apply to*
16	6.1 Checking measuring equipment. Suitability, range, data etc.	20	
14	6.2 Phase comparison after assembly	40	
14	6.3 Measurement rotating magnetic field after installation	10	
14	6.4 Selecting a cable	40	
16	6.5 Measuring/Testing without looking at the tester or reading the meter	20	Instructed technician high-voltage (VOP-HS)
14	6.6 Too close to / touching non-earthed parts	40	
16	6.7 Interpreting measurement data/signals	10	Instructed technician high-voltage (VOP-HS)
14/16	6.8 Tests (insulation measurement after installation)	20	
7 Failure to (properly) use correct PPE, tools and aids (including checking)			
End term		*Deduction*	*Does not apply to*
15	7.1 Helmet with face shield	10	Instructed technician high-voltage (VOP-HS)
15	7.2 Gloves	10	Instructed technician high-voltage (VOP-HS)
15	7.3 Fuse pulling tool with sleeve	10	Instructed technician high-voltage (VOP-HS)
15	7.4 Clothing, footwear, hard hat/helmet	10	
15	7.5 Insulating floor mat	10	Instructed technician high-voltage (VOP-HS)

15	7.6 Use of tools and aids	10	Instructed technician high-voltage (VOP-HS)
8 Other general matters			
End term		*Deduction*	*Does not apply to*
15	8.1 Tools/equipment on the floor where you have to stand	10	Instructed technician high-voltage (VOP-HS)
15	8.2 Breaking down tools/equipment/installations through culpable action	40	Instructed technician high-voltage (VOP-HS)
9 Other matters relating to writing the work and/or operating plan			
End term		*Deduction*	*Does not apply to*
14	9.1 Title and date of the assignment	5	VP-HS/VP-LS / VOP-HS/VOP-LS
13/17/18/19	9.2 Designation of parts and areas	10	VP-HS/VP-LS / VOP-HS/VOP-LS
14	9.3 Signature and date	10	VP-HS/VP-LS / VOP-HS/VOP-LS