

DIN EN ISO 19659-4:2026-11 (E)

Railway applications - Heating, ventilation and air conditioning systems for rolling stock - Part 4: Design parameters, and test and inspection items for the HVAC unit (ISO 19659-4:2026)

Contents	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviated terms	2
3.1 Terms and definitions.....	2
3.2 Abbreviated terms.....	2
4 Prerequisites (design parameters) for the HVAC unit	3
4.1 General.....	3
4.2 Design parameters to be provided to the HVAC unit manufacturer.....	3
4.2.1 HVAC unit installation requirements.....	3
4.2.2 Air flow requirements.....	3
4.2.3 Cooling and heating performance requirements.....	5
4.2.4 Electric and electronic requirements.....	7
4.2.5 Control requirements.....	9
4.2.6 Structure requirements.....	11
4.2.7 Strength requirements.....	11
4.2.8 Component requirements.....	12
4.2.9 Maintenance requirements.....	12
4.2.10 Environmental requirements.....	13
4.2.11 Noise and vibration requirements.....	13
4.3 Summary of design parameters.....	13
5 Specification	13
5.1 General.....	13
5.2 Test or inspection items and requirement specifications by the HVAC unit manufacturer.....	13
5.2.1 Air volume flow rate and system pressure drop test.....	13
5.2.2 Cooling and heating tests.....	14
5.2.3 Functional test.....	14
5.2.4 Cooling and heating operation and safety checks.....	14
5.2.5 Noise test.....	14
5.2.6 Blocked forces (if applicable).....	15
5.2.7 Shock and vibration test.....	15
5.2.8 Water tightness test.....	15
5.2.9 Air tightness test (if applicable).....	15
5.2.10 Air leakage test (if applicable).....	16
5.2.11 Electrical insulation resistance and dielectric test.....	16
5.2.12 Starting characteristics test.....	16
5.2.13 Refrigerant circuit tightness test.....	16
5.2.14 Mass and centre of gravity measurement.....	16
5.2.15 Visual, dimensional and constructional inspection.....	16
5.2.16 Maintainability demonstration.....	16
5.2.17 Marking and labelling inspection.....	16
5.2.18 EMC test.....	17
5.2.19 Specific materials and parts tests.....	17
5.3 Classification of test and inspection items.....	17
6 Validation and verification	18
6.1 General.....	18

6.2	Recording and measuring instruments	19
6.2.1	General	19
6.2.2	Recording.....	19
6.2.3	Measuring instruments.....	19
6.3	Test and inspection procedures including test facility and equipment, data to be recorded, position of measuring points and criteria.....	19
6.3.1	Air volume flow rate and system pressure drop test.....	19
6.3.2	Cooling and heating tests	22
6.3.3	Functional test.....	28
6.3.4	Cooling and heating operation and safety checks.....	30
6.3.5	Noise test.....	32
6.3.6	Blocked forces test.....	36
6.3.7	Shock and vibration test.....	38
6.3.8	Water tightness test	40
6.3.9	Air tightness test.....	43
6.3.10	Air leakage test.....	45
6.3.11	Electrical insulation resistance and dielectric test.....	47
6.3.12	Starting characteristics test (if applicable).....	48
6.3.13	Refrigerant circuit tightness test.....	50
6.3.14	Mass and centre of gravity measurement	52
6.3.15	Visual, dimensional and constructional inspection.....	53
6.3.16	Maintainability demonstration.....	55
6.3.17	Marking and labelling inspection.....	55
6.3.18	EMC test.....	55
6.3.19	Specified materials and parts tests.....	58
6.4	Test or inspection report.....	60
6.4.1	General information	60
6.4.2	Type test report.....	60
6.4.3	Routine test report.....	61

Annex A (informative) List of the design parameters to be provided to the HVAC unit manufacturer	62
---	-----------

Bibliography.....	68
--------------------------	-----------