

DIN EN 17860-5:2025-06 (E)

Carrier cycles - Part 5: Electrical aspects

Contents		Page
European foreword		4
Introduction		5
1	Scope	6
2	Normative references	6
3	Terms and definitions	7
4	General requirements	7
4.1	Risk assessment	7
4.2	Significant hazards and safety functions	7
4.2.1	Significant hazards	7
4.2.2	Safety function for control system of carrier EPAC	8
4.3	Prevention of unauthorized use	8
5	Electrical requirements	8
5.1	Electric system	8
5.2	Controls and symbols	8
5.3	Battery	9
5.4	External battery charger	9
5.5	Electric cables and couplers	9
5.5.1	General	9
5.5.2	Requirements	9
5.5.3	Test method	9
5.6	Wiring	9
5.7	Power cables and conduits	10
5.8	External and internal electrical connections	10
5.9	Moisture resistance	10
5.10	Mechanical strength test of the electrical components	10
5.10.1	General	10
5.10.2	Function related shock test	11
5.10.3	Impact related shock test - Lateral overturning	11
5.11	Maximum speed for which the electric motor gives assistance	11
5.11.1	Requirements	11
5.11.2	Test method	11
5.12	Walk and manoeuvring assistance mode	12
5.12.1	Requirements	12
5.12.2	Test method	12
5.13	Power management	13
5.13.1	Requirements	13
5.13.2	Test method - Auxiliary electric motor management	14
5.14	Measurement of the maximum continuous rated power	15
5.14.1	Requirements	15
5.14.2	Measurement	15
5.14.3	Alternative measurement	15
5.15	Electromagnetic compatibility	16
5.15.1	Emission	16
5.15.2	Immunity	16
5.15.3	Carrier EPAC in mains charging mode	16
5.16	Failure mode	17

5.16.1	Acoustical and / or visual warning	17
5.17	Anti-tampering measures	17
5.18	Thermal hazards	17
5.18.1	Non-continuous contact surface	17
5.18.2	Continuous contact surface	17
5.18.3	Ambient temperature	17
5.19	Recuperative braking	18
5.19.1	Braking	18
5.19.2	Brake light activation by recuperative braking	18
5.20	Electrical requirements for electric cargo trailers	18
5.20.1	Control for electric cargo trailers	18
5.20.2	Handcart mode for electric cargo trailers - Handcart mode speed test	18
5.20.3	Maximum speed test	18
5.20.4	Assistance power for electric cargo trailer	18
5.20.5	Activating the trailer mode	23
5.20.6	Plug connections for electric cargo trailers	23
5.20.7	Performance levels (PLrs) for control system of electric cargo trailers	24
Annex A (normative) Electromagnetic compatibility of carrier EPAC and ESA		26
Annex B (normative) Light, warning device, on/off symbols		27
Annex C (informative) Walk and manoeuvring assistance mode symbols		28
Annex D (informative) Measurement of the maximum continuous rated power -- Alternative measurement		29
Bibliography		31