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Technical Product Documentation

Product / Product Range:
Power Switchgear and Controlgear Assemblies in accordance with IEC 61439-2
Rated operational voltage (U_e) **400 V** – Rated insulation voltage (U_i) **1,000 V** – Rated frequency (f_n) **50 Hz** – Rated current of the assembly (I_{nA}) **up to 630 A** – Rated conditional short-circuit current (I_{cc}) **25 kA (MCCBs) / 50 kA (fuse links)**

Designation: **Outdoor Cabinets for univers N (plain)**

Manufacturer: **Hager Electro GmbH & Co. KG**
Zum Gunterstal
66440 Blieskastel
Germany

The results verify the requirements given by the above-mentioned standard.

The results of test reports listed in this certificate are exclusively linked to the tested samples and compared or assessed variants.
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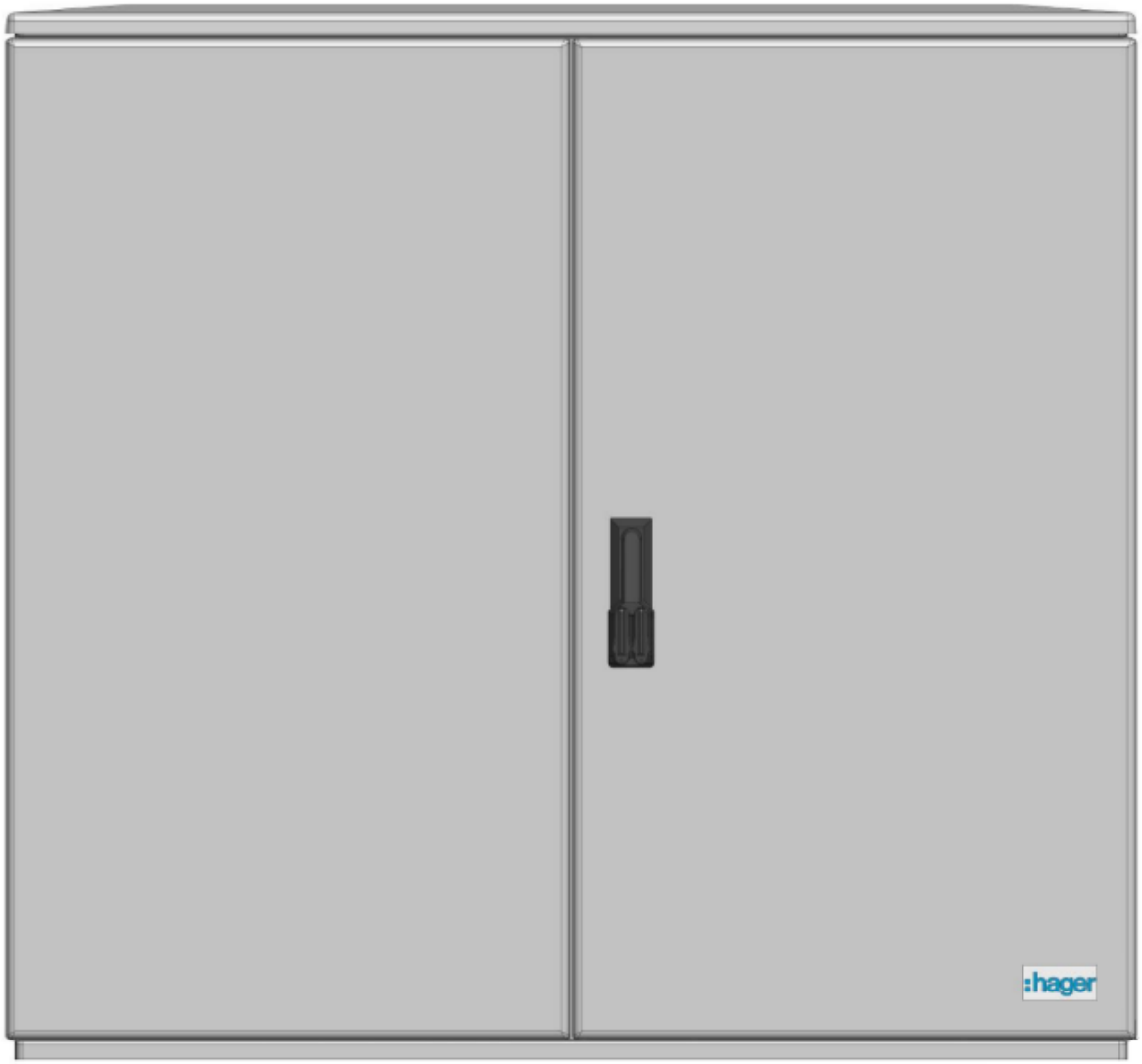
Pascal Polster
SDM PM Enclosures

Date: 02/07/25 Ver. 1.1

Outdoor Cabinets for univers N (plain)

ZAL…UE



General Safety Instructions

Any other or additional use that is not described in the documentation provided by Hager as well as changes and modifications, either mechanical or otherwise, to the enclosure is considered **misuse**. Hager does not assume any liability for damages resulting from misuse.

Wearing **safety gloves** and **long clothing** when working with enclosures made of glass fibre reinforced plastic is recommended.

Only qualified **electrically skilled persons** may assemble, install, commission switchgear and controlgear assemblies, perform extensions, troubleshooting or maintenance and disassemble and dispose of them.

The necessary **degree of protection (IP)** must be ensured by closing the doors properly and remounting all panels or covers that were possibly removed during installation. All interior covers and separators must be mounted to prevent the accidental contact with live parts.

Ensure secure **transportation** using suitable auxiliary equipment and lifting tools like forklifts or pallet trucks. The enclosures must be properly secured at all times.

During installation, consider the **weight** of the enclosure and handle with proper means. Handling with at least two persons is advised for mounting the enclosures on their socles. Doors can be removed without the use of a tool to reduce the overall weight.

While **storing**, take the ambient atmosphere (temperatures, moisture, corrosive environments, etc.) into consideration and protect the enclosure from harmful influences. The product packaging is designed to protect the products until installation.

Regular preventative **maintenance** is important for the safe operation of switchgear and controlgear assemblies. Follow the recommendations by the national or insurance regulations, and relevant standards.

Comply with the European directive 2012/19/EU for WEEE (waste electrical and electronic equipment) when **disposing** of devices marked with this symbol.

List of Design Verifications

No.	Characteristic to be verified	Clause or sub-clause	Verification by	Applicable document(s)	Verified product / range / series
1	Resistance to corrosion	10.2.2	Test	HPB18040315 HPB20044415 TGM-VA EE 38010 SFT TGM-VA EE 36007 SFT	ZAL…UE
	Thermal stability	10.2.3.1	Test	TGM-VA EE 38010 SFT TGM-VA EE 36007 SFT	
	Resistance to abnormal heat and fire due to internal electric effects	10.2.3.2	Test	TGM-VA EE 38010 SFT TGM-VA EE 36007 SFT univers N system	
	Resistance to ultra-violet (UV) radiation	10.2.4	Test	TGM-VA EE 38010 SFT TGM-VA EE 36007 SFT	
	Lifting	10.2.5	N/A	-	
	Mechanical Impact	10.2.6	Test	TGM-VA EE 38010 SFT TGM-VA EE 36007 SFT	
	Marking	10.2.7	Test	TGM-VA EE 38010 SFT TGM-VA EE 36007 SFT	
2	Degree of protection of enclosures	10.3	Test	TGM-VA EE 38010 SFT TGM-VA EE 36007 SFT	
3	Clearances	10.4	Test	univers N system	

4	Creepage distances	10.4	Drawing	univers N system	
5	Effective continuity between the exposed conductive parts of the assembly and the protective circuit	10.5.2	Test	univers N system	
	Short-circuit withstand strength of the protective circuit	10.5.3	Test	univers N system	
6	Incorporation of switching devices and components	10.6	Manufacturer	univers N system up to 630 A and devices accordingly (exceptions see MCCB list)	
7	Internal electrical circuits and connections	10.7	Manufacturer	univers N system	
8	Terminals for external conductors	10.8	Manufacturer	univers N system	
9	Power frequency withstand voltage	10.9.2	Test	univers N system	
	Impulse withstand voltage	10.9.3	Test	univers N system	
10	Temperature-rise limits	10.10	Calculation	See values in chapter Thermal Power Dissipation	
11	Short-circuit withstand strength	10.11	Test	318102-TL3-1	
12	Electromagnetic compatibility (EMC)	10.12	N/A	-	
13	Mechanical operation	10.13	Test	TGM-VA EE 38010 SFT TGM-VA EE 36007 SFT	

10.2 Strength of materials and parts

10.2.2 Resistance to corrosion

The ferrous metallic constructional parts of the listed assemblies were subjected to the damp heat cycling test of IEC 60028-2-30: Severity A – Temperature 55 °C, 6 cycles and variant 1. After the test, no inacceptable deteriorations were observed, in compliance with ISO 628-3:2016.

10.2.3 Properties of insulating materials

10.2.3.1 Thermal stability

The listed enclosures were tested in accordance with IEC 60068-2-2:2007, Test Bb, at a temperature of 70 °C, with natural air circulation, for a duration of 168 h and a recovery of 96 h. There appeared no cracks or other deteriorations on the housing surface.

10.2.3.2 Resistance of insulating materials to abnormal heat and fire due to internal electric effects

All insulating materials used in the listed references were subjected to the glow-wire test according to IEC 60695-2-10/-11. All requirements were fulfilled. The temperature of the glow-wire tip was

- 960 °C for parts necessary to retain current-carrying parts in position (housing material)
- 650 °C for all other parts, including parts necessary to retain the protective conductor

10.2.4 Resistance to ultraviolet (UV) radiation

Specimens of the housing material of the listed enclosures were UV tested in accordance with ISO 4892-2:2013, method A, cycle 1 for an overall duration of 500 h. The samples fulfilled the requirements and retained their values of flexural strength (ISO 178) and Charpy impact (ISO 179) for at least 70 %.

10.2.5 Lifting

This clause is not applicable to the product range since there are no lifting devices for the enclosures.

10.2.6 Mechanical Impact

The verification of the protection degree against mechanical impacts (IK code) was carried out in accordance with IEC 62262. While the enclosure was fixed as in the normal use case, all exposed surfaces whose largest dimensions are less than or equal to 1 m were hit three times with the described hammer applying an impact energy of 20 J (IK10). All other surfaces whose largest dimensions exceed 1 m were hit 5 times accordingly. The impacts were evenly distributed over the face of the enclosure. The specimens passed since the degree of protection (IP code) was not impaired after the test. The dielectric properties maintained and the function of the doors and covers was not impacted.

10.2.7 Marking

The wipe test was done in sequence with water and a solvent, and the marking was still legible afterwards.

10.3 Degree of protection

The listed enclosures were inspected in accordance with IEC 60529:1989, IEC 60529:1989/AMD1:1999, and IEC 605291989/AMD2:2013. The value IPX4 is fulfilled by all assemblies since no water can enter the protected area inside the cabinets. The value IP4X is also fulfilled by all enclosures.

10.4 Clearances and creepage distances
The clearances and creepage distances are in accordance with the requirements (electrical clearances ≥ 8 mm, creepage distances ≥ 11 mm).

10.5 Protection against electric shock and integrity of protective circuits
10.5.2 Effective earth continuity between the exposed-conductive-parts of the class I assembly and the protective circuit
This test is not applicable to this product range.

10.5.3 Short-circuit withstand strength of the protective circuit
The short-circuit tests were performed and the results can be seen on page 8, clause 10.11.

10.6 Incorporation of switching devices and components
These enclosures are designed to incorporate the internal distribution system univers N and the corresponding devices. All devices must be tested in accordance with their respective product standard.
The assembly manufacturer is responsible for the selection of the equipment and design of the assembly according to the requirements of the application and the installation site.

10.7 Internal electrical circuits and connections
The products are designed to fulfill the requirements of section 8.6 of IEC 61439-1:2020.

10.8 Terminals for external conductors
The applicable requirements of cl. 8.8 are fulfilled. Further details are listed in annex A of IEC 61439-1:2020 and the respective product sections.

10.9 Dielectric properties
10.9.2 Power-frequency withstand voltage
All test specimens were subjected to the test voltage of 2,200 V (from table 8, IEC 61439-1:2020, Ui ≤ 1.000 V) for a duration of 60 s

a) between all live parts of the connected main circuit (including the auxiliary circuits connected to the main circuit) and exposed-conductive-parts, with the main contacts of all switching devices in the closed position or bridged by a suitable low resistance link.

b) between each live part of different potential of the main circuit and, the other live parts of different potential and exposed-conductive-parts connected, with the main contacts of all switching devices in the closed position or bridged by a suitable low resistance link.

During the test, there was no detectable current flow and no disruptive discharge.

10.9.3 Impulse withstand voltage
All specimens were subjected to a test voltage of 9.6 kV (400 VAC application) (from table 10, IEC 61439-1:2020, U_{imp} = 8 kV)

a) between all the live parts of different potential of the main circuit connected together (including the auxiliary circuits connected to the main circuit) and exposed-conductive parts, with the main contacts of all switching devices in the closed position or bridged by a suitable low-resistance link.

b) between each live part of different potential of the main circuit and the other live parts of different potential and exposed-conductive-parts connected, with the main contacts of all switching devices in the closed position or bridged by a suitable low resistance link.

10.9.4 Testing of enclosures made of insulating material
An insulation test was performed where an AC test voltage of 1.5 times of the above-mentioned value (3,300 V) was applied between a metal foil laid on outer surface of the enclosure over openings and joints, and the interconnected live and exposure-conductive parts within the assembly located next to the openings and joints.

During the test, there was no current and no disruptive discharge.

10.9.5 External door or cover mounted operating handles of insulating material
In analogy, an insulation test was performed for the door handles of the enclosures where the voltage was applied between the active parts and a metal foil completely enfolding the housing.

During the test, there was no current and no disruptive discharge.

10.10. Temperature-rise limits
See the respective section on page 17ff.

10.11 Short-circuit withstand
The test was performed as described in IEC 61439-1:2020, clause 10.11.5. The test specimens represent the most critical enclosures in the most critical configuration in accordance with table 13.

Tested devices and respective rated conditional short-circuit current I_{CC} values.

Devices	**Verified I_{CC}**
MCCBs (**see exception matrix on page 19)** --> only for designation 1. HHS160DC HNT250DR	25 kA
Fuse switch disconnectors Devices with fuse links up to 630 A gG	50 kA

10.12 Electromagnetic compatibility (EMC)
The assemblies are designed in accordance with IEC 61439-1:2020, Annex J.9.4.2, and fulfill the following conditions:

a) the incorporated devices and components are in compliance with the requirements for EMC for the stated environment (see J.9.4.1) as required by the relevant product or generic EMC standard.
b) the internal installation and wiring is carried out in accordance with the devices and components' manufacturer’s instructions (arrangement with regard to mutual influences, cable, screening, earthing, etc.).

A dedicated verification as described in J.10.12 is not necessary. The documentation of the devices’ manufacturers must be considered.

10.13 Mechanical operation

After 200 mechanical cycles of the closing mechanism and the door, the protection degree of the enclosure was not affected. The force necessary for using the door did not change after the test.

Overview of series univers N Enclosures Outdoor (ZAL…UE)

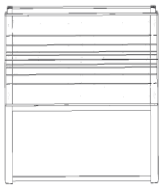
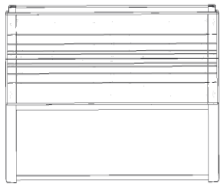
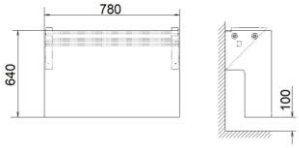
Cable Distribution Cabinets KVS (CDC) - plain			
Size	1	2	3
Width in mm	785	1115	1445
Height in mm	**Depth: 320 mm**		
1080			--
Empty enclosure for univers N:	**ZAL53UE**	**ZAL64UE**	
1350			
Empty enclosure for univers N:	**ZAL83U**	**ZAL84U**	**ZAL85UE**
Necessary Amount of ZAY95075:	**3 bags**	**4 bags**	**5 bags**

Reference table outdoor enclosures for univers N, plain (ZAL…UE)

Reference	Description
ZAL53UE	CDC, size 1/1080, for univers N system, plain
ZAL64UE	CDC, size 2/1080, for univers N system, plain
ZAL83UE	CDC, size 1/1350, for univers N system, plain
ZAL84UE	CDC, size 2/1350, for univers N system, plain
ZAL85UE	CDC, size 3/1350, for univers N system, plain

Measurements in accordance with DIN 43629-1

Pedestals

Cable Distribution Cabinets KVS (CDC) - plain			
Size	1	2	3
Width in mm	785	1115	1445
Necessary Amount of ZAY95075:	**3 bags**	**4 bags**	**5 bags**
Pedestal ZAX - Standard			
950	 **ZAX006E**	 **ZAX007E**	 **ZAX103E**
Pedestal ZAX - Wall Console			
640	 **ZAX012E**	 **ZAX013E**	--
Pedestal ZAX - On-ground pedestal			
250	 **ZAX015E**	 **ZAX016E**	 **ZAX203E**

Reference table Pedestals for Cable Distribution Cabinets, plain

Reference	Description
ZAX006E	Embedded pedestal, size 1, height: 950 mm, plain
ZAX007E	Embedded pedestal, size 2, height: 950 mm, plain
ZAX103E	Embedded pedestal, size 3, height: 950 mm, plain
ZAX012E	Wall console, size 1, height: 640 mm, plain
ZAX013E	Wall console, size 2, height: 640 mm, plain
ZAX015E	Surface-mounted base, size 1, height: 250 mm, plain
ZAX016E	Surface-mounted base, size 2, height: 250 mm, plain
ZAX203E	Surface-mounted base, size 2, height: 250 mm, plain

Measurements in accordance with DIN 43629-2

General characteristics

Technical Characteristic	Technical Value
Dimensional Standard	DIN 43629-1/-2/-3
Product Standards	IEC 62208:2011-08 IEC 61439-1:2020-05 IEC 61439-2:2020-07 IEC 61439-3:2012-02
Classification according to IEC 62208	
Type of Material	Insulating
Method of Fixing	Floor standing (on-ground / in-ground)
Intended Location	Outdoor
Degree of Protection (IP)	IP44 (IEC 60529)
Protection against Mechanical Impact (IK)	IK10 (IEC 62262)
Rated Insulation Voltage U_i	1,000 V AC
Enclosure Material	
Material Type	Glass-fibre reinforced polyester
Colour	RAL 7035
Material Conformity	Low-Voltage Directive 2014/35/EU RoHS Directive 2011/65/EU + RoHS 2015/863/EU (Amendment) REACH Regulation EC 1907/2006
General Characteristics	
Surface Structure	Plain
Surface Treatment	Untreated
Protection Class	II
Degree of Protection (IP)	IP44
Protection against Mechanical Impact (IK)	IK10
Permissible Loads	See chapter *Permissible Loads*
Environmental Conditions	
Ambient temperature min./max./24 h average	-25 °C / 40 °C / 35 °C **Working temperatures for devices must be considered.**
Maximum relative humidity	100 % at -25 °C to +27 °C 60% at 35 °C 46 % at 40 °C
Pollution Degree	3
Electrical Characteristics	
Volume Resistivity	10^{14} Ohm cm (IEC 60093)
Dielectric Strength	Min. 130 kV/cm (IEC 60243-1)
Tracking Resistance	CTI 600
Thermal Characteristics	
Glow-wire test	960 °C (IEC 60095-2-12)
Flammability	HB 40a, b (IEC 60695-11-10)
Heat Resistance of pressed domes and slugs	Min. 200 °C (ISO 75-2 Method A)
Chemical Characteristics	
Halogen content	Halogen free

Resistance against termites	Termite resistant
Resistance against acids	10 % hydrochloric acid 10 % sulfuric acid 10 % acetic acid
Resistance against salts	Sodium chloride Calcium chloride Road salt Sea water
Resistance against other elements	Oil, alcohol, bitumen mixtures, acid and basic reactants in the soil, urine
UV and Corrosion Resistance	
UV resistance, mechanical	> 70 % retaining values of flexural strength (ISO 178) and Charpy impact (ISO 179)
UV resistance, optical	No spill of glass fibres (Q-UVB-Test 800 h)
Corrosion Resistance of Metal Parts	Damp heat cycling test (IEC 60028-2-30), Severity A, 55 °C, 6 cycles and variant 1
Further Requirements according to IEC 62208	
Axial Loads of Metal Inserts	Compliant to section 9.6
Thermal Stability (9.9.1)	Dry heat IEC 60068-2-2 Test Bb / 70 °C
Resistance to Normal Heat (9.9.2)	IEC 60085
Resistance to Abnormal Heat and to Fire (9.9.3)	960 °C IEC 60695-2-10 / -11
Dielectric Strength (9.10)	1.5 times 2,200 VAC

Interface Characteristics

In respect IEC 61439-1:2020 & IEC 61439-2:2020

Characteristic	Value
Voltage Ratings	
Rated voltage U_n	400 V AC
Rated operational voltage U_e	400 V AC
Rated insulation voltage U_i	1,000 V AC
Rated impulse withstand voltage U_{imp}	up to 12 kV **consider the values of the devices**
Current Ratings	
Rated current of the assembly I_{nA}	up to 630 A **consider the necessary verification of temperature-rise**
Rated conditional short-circuit current of an ASSEMBLY I_{cc}	MCCBs: 25 kA Fuse switch disconnectors: 50 kA
Rated diversity factor RDF	none
Rated frequency f_n	50 Hz

Other characteristics

In respect IEC 61439-1:2020 & IEC 61439-2:2020

a) additional requirements depending on the specific service conditions of a functional unit (e.g. type of coordination, overload characteristics)
None

b) pollution degree (see 3.6.9)
III

c) types of system earthing for which the ASSEMBLY is designed
TN, TT

d) indoor and/or outdoor installation (see 3.5.1 and 3.5.2)
Outdoor installation

e) stationary or movable (see 3.5.3 and 3.5.4)
Stationary

f) degree of protection, IP code
IP44 (see drawing for protected space)

g) intended for use by skilled or ordinary persons (see 3.7.12 and 3.7.14)
Skilled persons

h) electromagnetic compatibility (EMC) classification (see Annex J)

i) special service conditions, if applicable (see 7.2)
no special service conditions

j) external design (see 3.3)
enclosed assembly (IP44)

k) mechanical impact protection, if applicable (see 8.2.1)
IK10

l) the type of construction – fixed or removable parts (see 8.5.1 and 8.5.2.)
Fixed parts

m) the nature of short-circuit protective device(s) (see 9.3.2)
MCCBs, vertical switchgear devices, circuit breakers, etc.

n) measures for protection against electric shock
Protection class II

o) overall dimensions (including projections e.g handles, covers, doors), if required
Not required

p) the weight, if required
Not required

q) installation method
in-ground pedestal, on-ground pedestal, wall console (see overview for ZAL…UE)

r) external conductor type
cable

s) direction of external conductors
from below

t) external phase conductor, cross sections and terminations
according to Annex A, termination depending on setup, mostly on clamps / terminals

u) external PEN conductor, cross sections and terminations
according to table 5, IEC 61439-1, termination depending on setup mostly on clamps / terminals

aa) form of internal separation and associated degree of protection(s), IP code
back side: mounting plate; side: univers N vertical separator parts (polystyrene); top and bottom: univers N Stirnteile (polyamide); front: univers N front covers closed or slotted (polystyrene); IP code with open door: IP3X

bb) types of electrical connections of functional units
cables and terminals

cc) mounting orientation (horizontal, vertical, etc.) if the assembly can be mounted in different positions from vertical
devices can be mounted horizontally or vertically depending on the univers N installation kit

Definition of Protected Space

The complete interior width and height of the cabinet is defined as protected space. The distance of the protected space from exterior front and exterior back side is defined as 50 mm.

These figures are representative for all cabinet sizes.

Thermal Power Dissipation

The overview of these values are shown in the table below, indicating the maximum power dissipation capability of the cabinet at a temperature increase of ΔT = 35 K at an ambient temperature of 35 °C, with the maximum temperature at 100 % cabinet height. This is therefore the worst-case value for the assembly.

Reference	Outer dimensions H x W x D / mm	Usable clearances H x W x D / mm	P_{max} / W	Weight / kg
ZAL53UE	1,080 x 785 x 320	972 x 713 x 253	267	27
ZAL83UE	1,350 x 785 x 320	1,256 x 713 x 253	318	38
ZAL64UE	1,080 x 1,115 x 320	972 x 1,043 x 253	376	36
ZAL84UE	1,350 x 1,115 x 320	1,256 x 1,043 x 253	441	50
ZAL85UE	1,350 x 1,445 x 320	1,256 x 1,373 x 253	557	63

The verification of temperature-rise according to IEC 61439-1 can be achieved via calculation as described in sub-clause 10.10.4.2 in that standard. When designing the assembly, the temperature-rise limits must be respected. It falls to the assembly manufacturer to fulfil this verification when designing the assembly.

The general requirements described in sub-clause 10.10.4.1 must be fulfilled for the calculation to be valid. If this is the case, the following values are representative for the maximum power dissipation capability of the cabinets. Thus, the sum of all power dissipation values of all installed electrical equipment like cables, devices, meters, etc. must be smaller than the values below in the tables below. The installation situation, ambient temperature and the installed device with the lowest maximum operating temperature determine which value must be considered for the assembly.

Example: The device in the assembly with the lowest maximum operating temperature might be a residual-current circuit breaker (RCCB) which might have a maximum operating temperature of 55°C. It might be placed at 75% of the height of the cabinet. The cabinet might be placed free standing at a location with an ambient temperature of 35°C. This would mean for a cabinet ZAL53UE that the maximum ΔT would be 20 K. At 75 % cabinet height in a free standing assembly, the maximum admissible power dissipation would therefore be 160 W. The sum of the power losses of all installed electrical components would need to be below 160 W for the assembly to respect the temperature rise limits.

Following, the tables show the calculated values for all cabinets in accordance with IEC 60890.

Key:
Location of temperature reference point:
- t1,0: at 100 % height of the cabinet
- t0,75: at 75% height of the cabinet
- t0,5: at 50 % height of the cabinet

Type of installation:
- FR: free standing enclosure
- AP: wall mounting enclosure

ZAL53UE

ΔT	t1,0		t0,75		t0,5	
	FR	AP	FR	AP	FR	AP
+5K	23 W	20 W	28 W	24 W	35 W	30 W
+10K	56 W	49 W	67 W	58 W	84 W	72 W
+15K	93 W	81 W	112 W	97 W	139 W	119 W
+20K	133 W	117 W	160 W	139 W	199 W	170 W
+25K	175 W	154 W	211 W	183 W	263 W	224 W
+30K	220 W	194 W	265 W	230 W	330 W	282 W
+35K	267 W	235 W	321 W	279 W	400 W	341 W

ZAL83UE

ΔT	t1,0		t0,75		t0,5	
	FR	AP	FR	AP	FR	AP
+5K	28 W	24 W	34 W	30 W	44 W	38 W
+10K	67 W	58 W	82 W	71 W	106 W	90 W
+15K	110 W	97 W	136 W	118 W	175 W	150 W
+20K	158 W	139 W	195 W	169 W	251 W	214 W
+25K	209 W	183 W	258 W	223 W	332 W	283 W
+30K	262 W	230 W	323 W	280 W	416 W	355 W
+35K	318 W	279 W	392 W	340 W	504 W	430 W

ZAL64UE

ΔT	t1,0		t0,75		t0,5	
	FR	AP	FR	AP	FR	AP
+5K	33 W	29 W	39 W	34 W	47 W	40 W
+10K	79 W	69 W	93 W	80 W	112 W	95 W
+15K	131 W	114 W	154 W	133 W	186 W	158 W
+20K	187 W	163 W	220 W	190 W	266 W	226 W
+25K	247 W	216 W	291 W	251 W	352 W	298 W
+30K	310 W	271 W	365 W	315 W	441 W	374 W
+35K	376 W	328 W	443 W	382 W	535 W	453 W

ZAL84UE

ΔT	t1,0		t0,75		t0,5	
	FR	AP	FR	AP	FR	AP
+5K	39 W	34 W	47 W	40 W	58 W	49 W
+10K	92 W	81 W	111 W	96 W	138 W	117 W
+15K	153 W	134 W	184 W	159 W	229 W	194 W
+20K	220 W	192 W	264 W	228 W	327 W	278 W
+25K	290 W	254 W	349 W	302 W	432 W	368 W
+30K	364 W	319 W	438 W	379 W	542 W	461 W
+35K	441 W	387 W	530 W	459 W	657 W	559 W

ZAL85UE

ΔT	t1,0		t0,75		t0,5	
	FR	AP	FR	AP	FR	AP
+5K	49 W	43 W	58 W	51 W	71 W	60 W
+10K	117 W	103 W	138 W	120 W	168 W	143 W
+15K	194 W	171 W	229 W	199 W	278 W	237 W
+20K	277 W	244 W	328 W	285 W	398 W	340 W
+25K	366 W	323 W	433 W	376 W	525 W	449 W
+30K	459 W	405 W	543 W	472 W	659 W	563 W
+35K	557 W	490 W	658 W	572 W	798 W	682 W

Permissible Loads

The overview of these values are shown in the table below.

Hager reference	Outer dimensions H x W x D / mm	Usable clearances H x W x D / mm	Permissible loads / N	
			Cabinet	Door(s)
ZAL53UE	1,080 x 785 x 320	972 x 713 x 253	1,500	100
ZAL83UE	1,350 x 785 x 320	1,256 x 713 x 253	1,500	100
ZAL64UE	1,080 x 1,115 x 320	972 x 1,043 x 253	1,500	100
ZAL84UE	1,350 x 1,115 x 320	1,256 x 1,043 x 253	1,500	100
ZAL85UE	1,350 x 1,445 x 320	1,256 x 1,373 x 253	1,500	100

Application Matrix MCCBs

The MCCBs of the hager range H3+ were tested in combination with the cabinets concerning the short-circuit withstand strength of the assembly. The following application matrix shows which device can be used in which cabinet.

According IEC 61439-2:2020-07

h3+

P1
160 A

Depth: 320 mm

Product Range: Outdoor 160A MCCB

Height / mm	single door	double door	
1.350	ZAL83UE 25kA	ZAL84UE 25kA	ZAL85UE 25kA
1.080	ZAL53UE 25kA	ZAL64UE 25kA	--
	780	1.115	1.445 Width / mm

h3+

P2
250 A

Depth: 320 mm

Product Range: Outdoor 250A MCCB

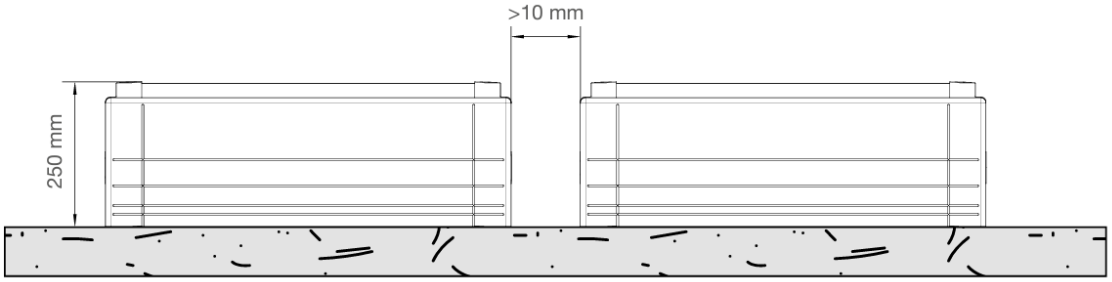
Height / mm	single door	double door	
1.350	ZAL83UE 10kA	ZAL84UE 25kA	ZAL85UE 25kA
1.080	ZAL53UE 10kA	ZAL64UE 25kA	--
	780	1.115	1.445 Width / mm

Legend	
dark-green	**tested** with the specified Icc current and test report
light-green	**derivated** from tested version to the specified current
grey	**exempt** up to Icc=10kA

General Remarks

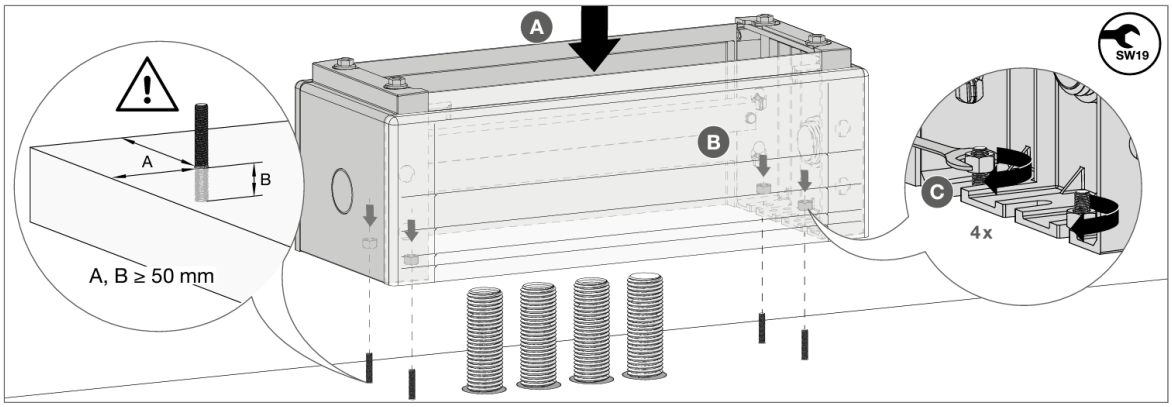
The built-in switching devices and components have to be chosen considering the requirements of outdoor application (e.g. concerning humidity and temperature conditions). Consultation of the manufacturer's technical documentation is mandatory. Should it be impossible to guarantee the ambient temperature limits defined in IEC 61439-1, it is imperative that the assembly manufacturer ensures the operating conditions for the switchgear assembly. Possible actions include, but are not limited to, installation in the shade, the use of a protective plate above the enclosure, the correct configuration of the switching devices concerning thermal tripping characteristics. Additionally, the rated diversity factor has to be considered.

When installing more than one enclosure next to and/or behind each other, a minimum distance of 10 mm has to be maintained to avoid frost damage.

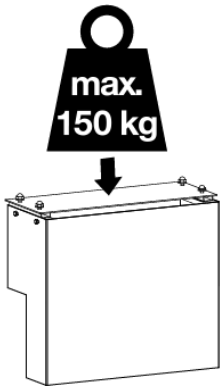


On-ground socles must be mounted on a suitable flat foundation. The gap between socle and foundation should be less than 1 mm to ensure the protection against ingress of solid objects of IP4X in this area. The following table shows the recommended frame conditions.

Quality of the concrete	C25 / 30 B5 (frost resistant)
Additional information	Sufficient reinforcement necessary
Fastening material	4 x impact anchor M12, with large washers or discs with min. outside Ø of 35 mm or 40 mm square washers
Anchoring depth	min. 50 mm
Pull-out force of the screw connection	min. 6 kN (600 kg)



The wall consoles are designed to carry a maximum load of 150 kg.



Depending on the wall surface and type (plasterboard, bricks, concrete, etc.), suitable fastening material must be used. It is recommended to use max. Ø 12 mm screws and corresponding washers in combination with suitable dowels for the respective type of wall.

Wall consoles shall not be used for a fully equipped cabinet ZAL83UE since the fixation of the console and cabinet will collide with the integrated univers N interface (Stirnteil). In this combination, the interface must be placed one row higher for a maximum number of 7 rows.

Generally, when using the cabinet ZAL83UE in combination with in-ground socle ZAX006E or on-ground socle ZAX015E, the standard socle/cabinet fixation is replaced with the clamp solution shown below (included in the delivery form of ZAL83UE).