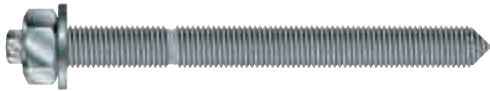


Chemical Anchor V



Threaded Stud V-A



Chemical Capsule V-P

Range of loading: 3,0 kN - 80,6 kN

Range of concrete quality: C12/15 - C50/60

Material: Steel, zinc plated, Steel, hot dip galvanized, Stainless steel A4, HCR

Description

The Chemical Anchor V with ETA approval consists of a glass capsule filled with resin, hardener and filler-material, as well as the Threaded Stud V-A. The components in the capsule are mixed to a fast curing resin-mortar when the threaded stud is inserted into the drill-hole. This stress free anchoring system has been tried and tested for decades and allows for mounting of heavy loads even with smaller spacings and edge distances in non-cracked concrete. All Sizes of Threaded Stud V-A are also available in grade 8.8 steel on demand.

Advantages:

- Anchor-rods with external hexagon for fast and easy installation
- every package includes an adapter for the drilling machine
- excellent suitability for high volume fixing
- sealed drill-hole
- extensive product range for all uses
- usable in damp and dry concrete
- also with large washer for crash-barrier mounting
- economic special lengths without external hexagon available



Applications

Anchoring of heavy loads in non-cracked concrete: trusses, foot and headplates, consoles, crash-barriers, noise-protection walls.

Chemical Capsule V-P



→ Two component glass capsule

→ Approved for non-cracked concrete

Description	Ref. No.	Capsule		Content of master box	Weight per master box	Package content	Weight per package
		Ø	length				
		mm	mm	pcs.	kg	pcs.	kg
V-P 8	25100801	9	80	500	7,02	10	0,13
V-P 10	25101001	11	80	500	8,50	10	0,16
V-P 12	25101201	13	95	500	12,30	10	0,25
V-P 14 ¹⁾	25101401	15	95	500	15,82	10	0,27
V-P 16	25101601	17	95	500	19,36	10	0,36
V-P 20	25102001	22	175	-	-	10	1,20
V-P 24	25102401	24	210	-	-	5	0,87
V-P 30 ¹⁾	25103001	33	265	-	-	5	2,64

¹⁾ Not part of approval.

Threaded Stud V-A



- May be used in structures subject to dry internal conditions
- Steel, zinc plated 5.8
- Approved for non-cracked concrete

Description	Ref. No.	Drill hole Ø x depth	Fixture thickness t _{fix}	Usable length (VMUplus/VME)	Package content	Weight per package
		mm	mm	mm	pcs.	kg
V-A 8-20/110	21101101	10 x 80	20	99	10	0,43
V-A 8-60/150	21105101	10 x 80	60	139	10	0,53
V-A 10-15/115	21202101	12 x 90	15	101	10	0,73
V-A 10-30/130	21203101	12 x 90	30	116	10	0,81
V-A 10-65/165	21207101	12 x 90	65	151	10	0,98
V-A 10-90/190	21210101	12 x 90	90	176	10	1,11
V-A 10-150/250	21216101	12 x 90	150	236	10	1,42
V-A 10-200/300	21221101	12 x 90	200	282	10	1,71
V-A 12-10/135	21304101	14 x 110	10	117	10	1,19
V-A 12-35/160	21306101	14 x 110	35	142	10	1,37
V-A 12-85/210	21312101	14 x 110	85	192	10	1,73
V-A 12-95/220	21313101	14 x 110	95	202	10	1,82
V-A 12-125/250	21316101	14 x 110	125	232	10	2,02
V-A 12-175/300	21321101	14 x 110	175	278	10	2,83
V-A 14-35/170 ¹⁾	21408101	16 x 120	35	151	10	1,91
V-A 16-20/165	21507101	18 x 125	20	140	10	2,77
V-A 16-45/190	21510101	18 x 125	45	165	10	2,96
V-A 16-85/230	21514101	18 x 125	85	205	10	3,65
V-A 16-105/250	21516101	18 x 125	105	225	10	3,91
V-A 16-155/300	21521101	18 x 125	155	273	10	4,58
V-A 20-20/220	21613101	25 x 170	20	188	10	5,56
V-A 20-60/260	21617101	25 x 170	60	228	10	6,39
V-A 20-100/300	21621101	25 x 170	100	266	10	7,23
V-A 24-15/260	21717101	28 x 210	15	221	5	4,89
V-A 24-55/300	21721101	28 x 210	55	259	5	5,54
V-A 30-70/380 ^{1) 2)}	21829101	35 x 280	70	345	5	10,00

Other lengths and grade 8.8 on demand.

¹⁾ Not part of approval.

²⁾ Setting tool V-A 30-70/380 ref. no. 27805160 to be ordered separately.

Threaded Stud V-A A4



- May be used in structures subject to dry internal conditions or external atmospheric exposure
- Stainless Steel A4
- Approved for non-cracked concrete

Description	Ref. No.	Drill hole Ø x depth	Fixture thickness t _{fix}	Usable length (VMUplus/VME)	Package content	Weight per package
		mm	mm	mm	pcs.	kg
V-A 8-20/110 A4	21101501	10 x 80	20	99	10	0,43
V-A 8-60/150 A4	21105501	10 x 80	60	139	10	0,53
V-A 10-15/115 A4	21202501	12 x 90	15	101	10	0,73
V-A 10-30/130 A4	21203501	12 x 90	30	116	10	0,81
V-A 10-65/165 A4	21207501	12 x 90	65	151	10	0,98
V-A 10-90/190 A4	21210501	12 x 90	90	176	10	1,11
V-A 10-150/250 A4	21216501	12 x 90	150	236	10	1,42
V-A 10-200/300 A4	21221501	12 x 90	200	282	10	1,71
V-A 12-10/135 A4	21304501	14 x 110	10	117	10	1,19
V-A 12-35/160 A4	21306501	14 x 110	35	142	10	1,37
V-A 12-55/180 A4	21309501	14 x 110	55	162	10	1,51
V-A 12-85/210 A4	21312501	14 x 110	85	192	10	1,73
V-A 12-95/220 A4	21313501	14 x 110	95	202	10	1,82
V-A 12-125/250 A4	21316501	14 x 110	125	232	10	2,02
V-A 12-175/300 A4	21321501	14 x 110	175	278	10	2,83
V-A 14-35/170 A4 ¹⁾	21408501	16 x 120	35	151	10	1,91
V-A 16-5/150 A4	21505501	18 x 125	5	125	10	2,38
V-A 16-20/165 A4	21507501	18 x 125	20	140	10	2,77
V-A 16-45/190 A4	21510501	18 x 125	45	165	10	2,96
V-A 16-65/210 A4	21512501	18 x 125	65	185	10	3,20
V-A 16-85/230 A4	21514501	18 x 125	85	205	10	3,65
V-A 16-105/250 A4	21516501	18 x 125	105	225	10	3,91
V-A 16-155/300 A4	21521501	18 x 125	155	273	10	4,58
V-A 20-20/220 A4	21613501	25 x 170	20	188	10	5,56
V-A 20-60/260 A4	21617501	25 x 170	60	228	10	6,39
V-A 20-100/300 A4	21621501	25 x 170	100	266	10	7,23
V-A 24-15/260 A4	21717501	28 x 210	15	221	5	4,89
V-A 24-55/300 A4	21721501	28 x 210	55	259	5	5,54
V-A 30-70/380 A4 ^{1) 2)}	21829501	35 x 280	70	345	5	10,00

Other lengths on demand.

¹⁾ Not part of approval.

²⁾ Setting tool V-A 30-70/380 ref. no. 27805160 to be ordered separately.

Threaded Stud V-A fvz



- Improved corrosion protection
- Steel, hot dip galvanized 5.8 (≥ 40µm, EN ISO 1461)
- Approved for non-cracked concrete

Description	Ref. No.	Drill hole Ø x depth	Fixture thickness t _{fix}	Usable length (VMUplus/VME)	Package content	Weight per package
		mm	mm	mm	pcs.	kg
V-A 8-20/110 fvz	21101201	10 x 80	20	99	10	0,43
V-A 10-30/130 fvz	21203201	12 x 90	30	116	10	0,81
V-A 10-90/190 fvz	21210201	12 x 90	90	176	10	1,11
V-A 12-35/160 fvz	21306201	14 x 110	35	142	10	1,37
V-A 12-95/220 fvz	21313201	14 x 110	95	202	10	1,82
V-A 16-20/165 fvz	21507201	18 x 125	20	140	10	2,77
V-A 16-45/190 fvz	21510201	18 x 125	45	165	10	2,96
V-A 16-65/210 fvz	21512201	18 x 125	65	185	10	3,20
V-A 20-20/220 fvz	21613201	25 x 170	20	188	10	5,56
V-A 20-60/260 fvz	21617201	25 x 170	60	228	10	6,39
V-A 24-15/260 fvz	21717201	28 x 210	15	221	5	4,89
V-A 24-55/300 fvz	21721201	28 x 210	55	259	5	5,54

Other lengths and grade 8.8 on demand.

Threaded Stud V-A HCR

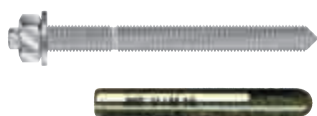


- For use in particularly corrosive environments
- High corrosion resistant steel 1.4529 (HCR)
- Approved for non-cracked concrete

Description	Ref. No.	Drill hole Ø x depth	Fixture thickness t _{fix}	Usable length (VMUplus/VME)	Package content	Weight per package
		mm	mm	mm	pcs.	kg
V-A 8-20/110 HCR	21101651	10 x 80	20	99	10	0,43
V-A 10-30/130 HCR	21203651	12 x 90	30	116	10	0,81
V-A 12-35/160 HCR	21306651	14 x 110	35	142	10	1,37
V-A 16-45/190 HCR	21510651	18 x 125	45	165	10	2,96

Other lengths on demand.

Chemical Anchor V-L



→ Steel, hot dip galvanized; Stainless steel

→ Set, specially designed for crash barriers

Description	Ref. No.	Drill hole Ø x depth mm	Stud Ø x length mm	Fixture thickness t _{fix} mm	Package content pcs.	Weight per set kg
V-L 16-20/165 hot dip galvanized washer DIN125 (Ø=30 mm)	23507201	18x125	M16x165	20	10	3,13
V-L 16-20/165 hot dip galvanized washer DIN9021 (Ø=50 mm)	23507791	18x125	M16x165	20	10	3,32
V-L 16-20/165 stainless steel A4/316 washer DIN125 (Ø=30 mm)	23507501	18x125	M16x165	20	10	3,13

Cleaning Brush RB M6



→ With connection thread M6 – extension for large depths of drill hole and/or for through-setting installation

→ For drilling machines with keyed chuck or with SDS plus adaptor for SDS plus drills

Description	Ref. No.	Suitable for drill hole Ø mm	Suitable for	Package content pcs.	Weight per piece kg
RB 10 M6	33510101	10	V M8	1	0,05
RB 12 M6	33512101	12	V M10	1	0,05
RB 14 M6	33514101	14	V M12/V-IG M8	1	0,05
RB 16 M6	33516101	16	V M14/V-IG M10	1	0,05
RB 18 M6	33518101	18	V M16/V-IG M12	1	0,05
RB 26 M6	33526101	25, 26	V M20/V-IG M16	1	0,06
RB 28 M6	33528101	28	V M24	1	0,06
RB 35 M6	33535101	35	V M30	1	0,08
RBL M6	33968101	Brush extension 150 mm with connection thread M6		1	0,09
RBL M6 SDS	33350101	SDS Plus adapter for cleaning brush (M6)		1	0,06

Blow-out pump VM-AP



→ Drill hole cleaning

Description	Ref. No.	Suitable for drill hole Ø mm	Length mm	max. depth drill hole mm	Package content pcs.	Weight per piece kg
VM-AP 270	29990002	12-35	270	200	1	0,22
VM-AP 360	33200101	10-35	360	330	1	0,27

Setting Tool V-M



→ Only needed for special length and studs without external Hexagon

Description	Ref. No.	Suitable for threaded stud	Package content pes.	Weight per piece kg
V-M 8	27105160	M8	1	0,02
V-M 10	27205160	M10	1	0,03
V-M 12	27305160	M12	1	0,05
V-M 14	27405160	M14	1	0,05
V-M 16	27505160	M16	1	0,06
V-M 20	27605160	M20	1	0,20
V-M 24	27705160	M24	1	0,33
V-M 30	27805160	M30	1	0,63



Extract from Permissible Service Conditions of ETA-05/0231

Approved loads for single anchor without influence of spacing and edge distance for temperature range -40 °C to +80 °C²⁾. Total safety factor as per ETAG 001 included (γ_M and γ_P).

Loads and performance data				Chemical Anchor V, steel, zinc plated / hot dip galvanized							
				M 8	M 10	M 12	M 14 ¹⁾	M 16	M 20	M 24	M 30 ¹⁾
non-cracked concrete											
Mean ultimate loads, tension (steel 5.8) C25/30	N _{um}	[kN]		18,3	29,0	42,1	57,7	78,3	123,0	177,0	280,3
Mean ultimate loads, shear (steel 5.8) C25/30	V _{um}	[kN]		11,0	17,4	25,3	34,6	47,0	73,8	106,2	168,2
Mean ultimate loads, tension (steel 8.8) C25/30	N _{um}	[kN]		27,0	38,6	58,2	73,5	104,3	169,8	250,2	442,9
Mean ultimate loads, shear (steel 8.8) C25/30	V _{um}	[kN]		15,0	23,2	33,7	46,2	63,0	98,0	141,0	224,3
Recommended loads, tension	C12/15 ¹⁾ rec. N	[kN]		3,0	5,0	7,0	8,0	10,0	19,0	26,0	42,0
Approved loads, tension	≥ C20/25 appr. N	[kN]		7,9	11,9	15,9	12,0	19,8	29,8	35,7	60,0
Recommended loads, shear	C12/15 ¹⁾ rec. V	[kN]		3,0	5,0	7,0	8,0	10,0	19,0	26,0	42,0
Approved loads, shear	≥ C20/25 appr. V	[kN]		5,1	8,0	12,0	12,0	22,3	34,9	50,3	60,0
Approved loads, shear (steel, grade 8.8)	≥ C20/25 appr. V	[kN]		8,6	13,1	18,9	-	36,0	56,0	80,6	-
Approved bending moments (steel, grade 5.8)	appr. M	[Nm]		10,9	21,1	37,1	59,4	94,9	185,7	320,6	642,0
Approved bending moments (steel, grade 8.8)	appr. M	[Nm]		17,1	34,3	60,0	-	152,0	296,6	513,1	-

				M 8	M 10	M 12	M 14 ¹⁾	M 16	M 20	M 24	M 30 ¹⁾
non-cracked concrete											
Mean ultimate loads, tension C25/30	N _{um}	[kN]		26,0	38,6	58,2	73,5	104,3	169,8	247,0	280,3
Mean ultimate loads, shear C25/30	V _{um}	[kN]		13,0	20,3	29,5	40,4	55,0	86,0	124,0	140,2
Recommended loads, tension	C12/15 ¹⁾ rec. N	[kN]		3,0	5,0	7,0	8,0	10,0	19,0	26,0	42,0
Approved loads, tension	≥ C20/25 appr. N	[kN]		7,9	11,9	15,9	12,0	19,8	29,8	35,7	60,0
Recommended loads, shear	C12/15 ¹⁾ rec. V	[kN]		3,0	5,0	7,0	8,0	10,0	19,0	26,0	42,0
Approved loads, shear	≥ C20/25 appr. V	[kN]		6,0	9,2	13,3	12,0	25,2	39,4	56,8	60,0
Approved bending moments	appr. M	[Nm]		11,9	23,8	42,1	66,9	106,7	207,9	359,4	402,0

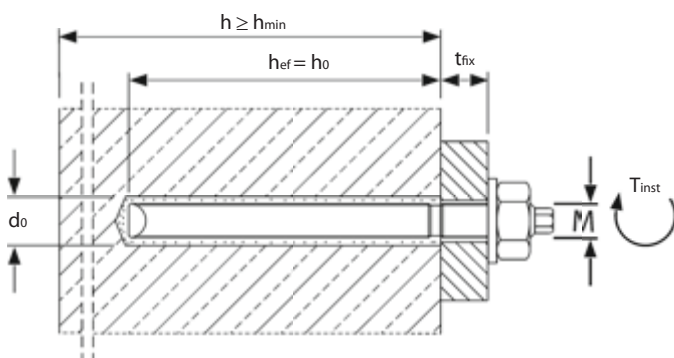
Spacing and edge distance			
Effective anchorage depth	h _{ef}	[mm]	80 90 110 120 125 170 210 280
Spacing	s _{cr,N}	[mm]	240 180 220 300 250 340 420 700
Edge distance	c _{cr,N}	[mm]	120 90 110 150 125 170 210 350
Minimum spacing	s _{min}	[mm]	40 45 55 120 65 85 105 280
Minimum edge distance	c _{min}	[mm]	40 45 55 60 65 85 105 140
Minimum thickness of concrete slab	h _{min}	[mm]	110 120 140 170 160 220 260 330

Installation parameters			
Drill hole diameter	d _o	[mm]	10 12 14 16 18 25 28 35
Clearance hole in the fixture	d _f	[mm]	9 12 14 16 18 22 26 33
Depth of drill hole	h _o	[mm]	80 90 110 120 125 170 210 280
Installation torque	T _{inst}	[Nm]	10 20 40 60 80 120 180 400
Width across nut	SW	[mm]	13 17 19 22 24 30 36 46
Width across nut (Threaded Stud)	SW	[mm]	5 6 8 10 12 14 17 -

¹⁾ Not part of approval. Recommended loads for size M 14 and M 30 and in concrete C12/15.

²⁾ max long term temperature +50 °C / max short term temperature +80 °C

For anchor designing an easy to operate CD-ROM is available on request or can be downloaded at www.mkt.de.

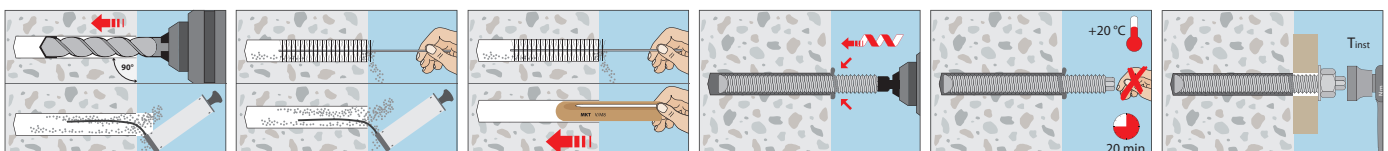


Curing time Chemical Anchor V

→ Cartridge temperature when installing min. +5°C

Temperature (°C) of base material	curing time	
	dry base material	wet base material
-5°C	5:00 h	10:00 h
0°C	5:00 h	10:00 h
+5°C	1:00 h	2:00 h
+10°C	1:00 h	2:00 h
+20°C	20 min	40 min
+30°C	10 min	20 min
+35°C	10 min	20 min

Installation



Chemical Anchor V-IG / V-IG A4



Internally Threaded Sleeve V-IG
steel, zinc plated 5.8



Internally Threaded Sleeve V-IG A4
Stainless steel A4



Chemical Capsule V-P

Range of loading: 5,2 kN - 25,1 kN

Range of concrete quality: C20/25 - C50/60

Material: Steel, zinc plated
Stainless steel A4/316

Description

The Chemical Anchor system V-IG / V-IG A4 is the Internally Threaded Version of the Chemical Anchor system V. The system consists of a glass capsule and a threaded stud. The two components contained in the capsule are mixed while the threaded stud is driven in, forming a fast setting adhesive. This time proven anchoring system does not apply expansion forces and allows for very close anchor spacing and edge distances in non-cracked concrete. The drill hole is sealed by the adhesive..



Applications

No security-relevant heavy duty anchorings in non-cracked concrete of steel supports, base plates, consoles, anti-noise barriers.

Chemical Capsule V-P



→ Two component glass capsule

→ Suitable in non-cracked concrete

Description	Ref. No.	Capsule Ø mm	Capsule-length mm	Content of master box pcs.	Weight per master box kg	Package content pcs.	Weight per package kg
V-P 12	25101201	13	95	500	12,30	10	0,25
V-P 14	25101401	15	95	500	15,82	10	0,27
V-P 16	25101601	17	95	500	19,36	10	0,36
V-P 16 IG ¹⁾	25202201	22	115	-	-	10	0,98

¹⁾ For Internally Threaded Sleeve V-IG M 16.

Accessories for drill hole cleaning see page 134.

Internally Threaded Sleeve V-IG



→ Steel, zinc plated, grade 5.8

→ Fixture easy to remove; sealed drill hole

Description	Ref. No.	Suitable for capsule	Outer-Ø x Anchor length mm	Drill hole Ø x depth mm	Thread mm	Package content pcs.	Weight per package kg
V-IG M 8	24105101	V-P 12	12 x 90	14x90	M 8x25	10	0,50
V-IG M 10	24205101	V-P 14	14 x 90	16x90	M 10x30	10	0,65
V-IG M 12	24305101	V-P 16	16 x 100	18x100	M 12x35	10	1,00
V-IG M 16	24505101	V-P 16 IG	22 x 120	25x120	M 16x40	10	1,65

One setting tool is enclosed in every Internally Threaded Sleeve package.

Internally Threaded Sleeve V-IG A4



→ Stainless steel A4/316

→ Fixture easy to remove; sealed drill hole

Description	Ref. No.	Suitable for capsule	Outer-Ø x Anchor length mm	Drill hole Ø x depth mm	Thread mm	Package content pcs.	Weight per package kg
V-IG M 8 A4	24105501	V-P 12	12 x 90	14x90	M 8x25	10	0,50
V-IG M 10 A4	24205501	V-P 14	14 x 90	16x90	M 10x30	10	0,65
V-IG M 12 A4	24305501	V-P 16	16 x 100	18x100	M 12x35	10	1,00
V-IG M 16 A4	24505501	V-P 16 IG	22 x 120	25x120	M 16x40	10	1,65

One setting tool is enclosed in every Internally Threaded Sleeve package.

Recommended loads for single anchor without influence of spacing and edge distance for temperature range -40 °C to +80 °C¹⁾. Total safety factor as per ETAG 001 included (γ_M and γ_p).

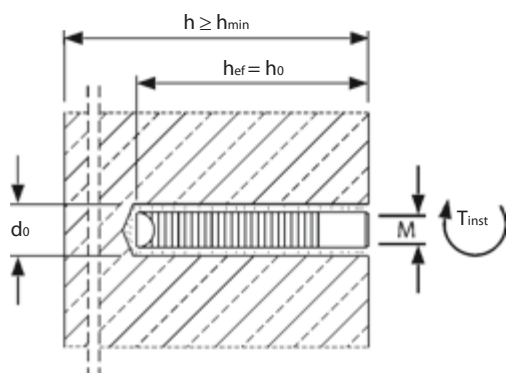
Loads and performance data	Chemical Anchor V-IG	M 8		M 10		M 12		M 16	
		non-cracked concrete C20/25							
		steel 5.8	A4-70	steel 5.8	A4-70	steel 5.8	A4-70	steel 5.8	A4-70
Mean ultimate loads, tension	N _{um} [kN]	20,4	46,7	31,9	54,6	46,2	77,4	86,4	96,8
Mean ultimate loads, shear	V _{um} [kN]	12,1	15,5	19,1	24,4	27,8	35,4	51,7	65,8
Recommended loads, tension	rec. N [kN]	8,8	9,9	13,2	13,2	16,0	16,0	18,8	18,8
Recommended loads, shear	rec. V [kN]	5,2	5,9	8,3	9,3	12,0	13,5	22,4	25,1
Recommended bending moments	rec. M [Nm]	10,7	12,1	21,4	24,1	37,4	41,9	94,9	107,0
Spacing and edge distance									
Effective anchorage depth	h _{ef} [mm]	90		90		100		120	
Characteristic spacing	s _{cr, N} [mm]	225		225		250		480	
Characteristic edge distance	c _{cr, N} [mm]	115		115		125		240	
Minimum spacing	s _{min} [mm]	45		45		50		75	
Minimum edge distance	c _{min} [mm]	45		45		50		75	
Minimum thickness of concrete slab	h _{min} [mm]	140		160		180		260	
Installation parameters									
Drill hole diameter	d _o [mm]	14		16		18		25	
Clearance hole in the fixture	d _f [mm]	9		12		14		18	
Depth of drill hole	h ₁ [mm]	90		90		100		120	
Installation torque	≤T _{inst} [Nm]	10		20		40		80	

¹⁾ max long term temperature +50 °C / max short term temperature +80 °C

Curing Time Chemical Anchor V-IG

→ Capsule temperature when installing min. +5°

Temperature (°C) of the base material	Curing time	
	dry concrete	wet concrete
-5°C	5:00 h	10:00 h
0°C	5:00 h	10:00 h
+5°C	1:00 h	2:00 h
+10°C	1:00 h	2:00 h
+20°C	20 min	40 min
+30°C	10 min	20 min
+35°C	10 min	20 min



Installation

