

## SM1KA101



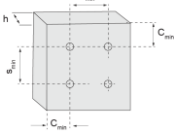
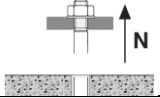
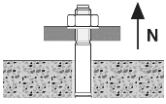
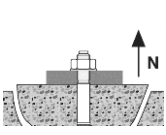
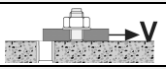
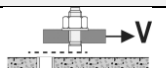
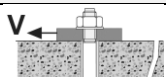
- *Unique identification code of the product-type:*  
**SMART-KAH, SMART-KAH HCR**
- *Type or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4):*  
**See annex 1 to this document**
- *Intended uses of the construction product, in accordance with the applicable harmonized technical specification as foreseen by the manufacturer:*

Beoogd gebruik volgens ETAG 001 parts 1 - 2	
Generic type	Torque controlled expansion anchor
Base material	Cracked and non-cracked concrete Reinforced or unreinforced normal weight concrete C20/25 to C50/60 acc. to EN 206-1:2003
Material:	S-KAH : Stainless steel A4 S-KAH HCR : High corrosion resistant stainless steel
Durability	S-KAH : internal conditions and external atmospheric exposure (including industrial and marine environments) S-KAH HCR : internal conditions, external atmospheric exposure and in permanently damp internal conditions or in other particular aggressive conditions (splash zone of sea water, chloride atmosphere of indoor swimming pools etc)
Loading	Static or quasi-static loads Seismic actions for Performance Category C1 Fire exposure
Fire Resistance	R30-R120
Reaction to fire	A1, in acc. with 96/603/EC
Assumed working life	50 years

- *Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11 (5):*  
**pgb-Polska sp. z o.o. – Ul. F.W. Redena 3 – 41-807 Zabrze – Polska**
- *System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:*  
**System 1**
- *In case of the declaration of performance concerning a construction product for which European Technical Assessment has been issued:*

ETA - 10/0472 issued by	VTT EXPERT SERVICES OY
Body nr	NB 0809
On the basis of	ETAG 001, part 1 and 2
Under System	1
And issued	09/05/2017

Declared performance – Essential characteristics – Performances

STANDARD EMBEDMENT DEPTH							
Installation parameters (ETAG001 part 1 and 2)				M8	M10	M12	M16
	$d_0$	Nominal diameter of drill bit	[mm]	8	10	12	16
	$h_{ef}$	Effective standard embedment depth	[mm]	45	60	70	85
	$d_f$	Fixture clearance hole diameter	[mm]	9	12	14	18
	$T_{inst}$	Nominal installation torque	[Nm]	20	35	70	120
	$h_1$	Depth of drilled hole	[mm]	60	75	90	110
	$h_{min}$	Min. thickness of concrete member	[mm]	100	120	140	170
	$S_{min}$	Minimum spacing	[mm]	50	50	60	70
	$C_{min}$	Minimum edge distance	[mm]	50	50	55	85
<b>Tension load: steel failure</b>							
	$N_{Rk,s}$	Tension steel characteristic resistance	[kN]	15	24	35	75
	$\gamma_{Ms}$	Partial safety factor <sup>1</sup>	[-]	1,40			
<b>Tension load: concrete cone or splitting failure in concrete</b>							
	$N_{Rk,p}$	Tension characteristic resistance in CRACKED concrete C20/25	[kN]	5	9	12	20
	$N_{Rk,p}$	Tension characteristic resistance in NON-CRACKED concrete C20/25	[kN]	9	16	20	35
	$\gamma_{Mp}$	Partial safety factor	[-]	1,80 <sup>2</sup>			
	$\psi_c$	Increasing factor C25/30	[-]	1,04			
		Increasing factor C30/37	[-]	1,10			
Increasing factor C40/50		[-]	1,20				
Increasing factor C50/60		[-]	1,28				
<b>Tension load: concrete cone or splitting failure in concrete</b>							
	$S_{cr,N}$	Critical spacing	[mm]	135	180	210	255
	$S_{cr,sp}$	Critical spacing (splitting)	[mm]	180	240	280	340
	$C_{cr,N}$	Critical edge distance	[mm]	68	90	105	128
	$C_{cr,sp}$	Critical edge distance (splitting)	[mm]	90	120	140	170
	$\gamma_{Mc}$	Partial safety factor <sup>2</sup>	[-]	1,80 <sup>3</sup>			
<b>Tension load: displacements</b>							
Cracked and non-cracked concrete C20/25 – C50/60	$N$	Tension service load	[kN]	2	3,6	4,8	9,5
	$\delta_{N0}$	Displacements under short term tension loads	[mm]	0,3	0,6	0,6	0,7
	$\delta_{N\infty}$	Displacements under long term tension loads	[mm]	1,8	1,6	2,0	1,4
<b>Shear load: steel failure without lever arm</b>							
	$V_{Rk,s}$	Characteristic resistance	[kN]	11	17	25	47
	$\gamma_{Ms}$	Partial safety factor <sup>2</sup>	[-]	1,25			
<b>Shear load: steel failure with lever arm</b>							
	$M^0_{Rk,s}$	Characteristic resistance	[kN]	22	45	79	200
	$\gamma_{Ms}$	Partial safety factor <sup>3</sup>	[-]	1,25			
<b>Shear load: concrete pryout failure</b>							
	$K$	K factor	[-]	1	2		
	$\gamma_{Mpr}$	Partial safety factor <sup>2</sup>	[-]	1,50			
<b>Installation parameters (ETAG001 part 1 and 2) - continued</b>				<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>
<b>Shear load: concrete edge failure</b>							
	$l_f$	Effective anchorage depth under shear loads	[mm]	45	60	70	85
	$d_{nom}$	Outside anchor diameter	[mm]	8	10	12	16

<sup>1</sup> In absence of other national regulations

<sup>2</sup> The installation safety factor of  $\gamma_2 = 1,2$  is included

<sup>3</sup> The installation safety factor of  $\gamma_2 = 1,0$  is included

# DECLARATION OF PERFORMANCE



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	$\Psi_{ucr,V}$	CRACKED concrete without edge reinforcement	[-]	1,00			
		CRACKED concrete with straight edge reinforcement > $\varnothing$ 12mm		1,20			
		CRACKED concrete with edge reinforcement and closely spaced stirrups ( $a \leq 100$ mm) or non-cracked concrete		1,40			
	$\gamma_{Mc}$	Partial safety factor <sup>2</sup>	[-]	1,50			
<b>Shear load: displacements</b>							
Cracked and non-cracked concrete C20/25 – C50/60	V	Service shear load	[kN]	5,7	10,3	13,1	25,1
	$\delta_{V0}$	Short term displacement under shear loads	[mm]	1,7	1,7	2,4	3,2
	$\delta_{V\infty}$	Long term displacement under shear loads	[mm]	2,6	2,6	3,6	4,8

Characteristic tension resistance in cracked and non-cracked concrete C20/25 to C50/60 under fire exposure																	
SMART THROUGH BOLT		M8				M10				M12				M16			
Fire resistance duration	R.... [min]	30	60	90	120	30	60	90	120	30	60	90	120	30	60	90	120
<b>Steel failure</b>																	
Characteristic resistance	$N_{Rk,s,fi}$ [kN]	5,7	3,9	2,0	1,1	9,1	6,1	3,2	1,8	13,2	8,9	4,7	2,6	24,5	16,6	8,7	4,8
<b>Pull-out failure</b>																	
Characteristic resistance	$N_{Rk,p,fi}$ [kN]	1,3		1,0		2,3		1,8		3,0		2,4		5,0		4,0	
<b>Concrete cone failure</b>																	
Characteristic resistance	$N^0_{Rk,p,fi}$ [kN]	2,4		2,0		5,0		4,0		7,4		5,9		12,0		9,6	
Spacing	$S_{cr,N}$ [mm]	4 x $h_{ef}$															
	$S_{min}$ [mm]	50				55				60				70			
Edge distance	$C_{cr,N}$ [mm]	2 x $h_{ef}$															
	$C_{min}$ [mm]	Fire attack from one side:								Fire attack from more than one side:							
		$C_{min} = 2xh_{ef}$								$C_{min} \geq 300$ mm							

In absence of other national regulations the partial safety factor for resistance under fire exposure  $\gamma_{M,fi} = 1,0$  is recommended.



# DECLARATION OF PERFORMANCE



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Characteristic shear resistance in cracked and non-cracked concrete C20/25 to C50/60 under fire exposure																	
SMART THROUGH BOLT		M8				M10				M12				M16			
Fire resistance duration	R.... [min]	30	60	90	120	30	60	90	120	30	60	90	120	30	60	90	120
<b>Steel failure without lever arm</b>																	
Characteristic resistance	$V_{Rk,s,fi}$ [kN]	5,7	3,9	2,0	1,1	9,1	6,1	3,2	1,8	13,2	8,9	4,7	2,6	24,5	16,6	8,7	4,8
<b>Steel failure with lever arm</b>																	
Characteristic resistance	$M^0_{Rk,s,fi}$ [Nm]	5,8	4,0	2,1	1,1	11,7	7,9	4,2	2,3	20,4	13,9	7,3	4,0	52,0	35,2	18,5	10,2
<b>Concrete pryout failure</b>																	
K factor	K [-]	1,0				2,0				2,0				2,0			
Characteristic resistance	$V^0_{Rk,cp,fi}$ [kN]	2,4		2,0		10,0		8,0		14,8		11,8		24,0		19,2	
<b>Concrete edge failure</b>																	
The initial value $V^0_{Rk,c,fi}$ of the characteristic resistance in concrete C20/25 to C50/60 under fire exposure may be determined by: $V^0_{Rk,c,fi} = 0,25 \times V^0_{Rk,c}$ ( $\leq R90$ ) $V^0_{Rk,c,fi} = 0,20 \times V^0_{Rk,c}$ (R120) With $V^0_{Rk,c}$ initial value of the characteristic resistance in cracked concrete C20/25 under normal temperature.																	

In absence of other national regulations the partial safety factor for resistance under fire exposure  $\gamma_{M,fi} = 1,0$  is recommended.

Characteristic values for seismic category C1 (EOTA TR 045)						
SMART S-KA, S-KAK		M8	M10	M12	M16	
<b>Steel failure for tension load</b>						
$N_{Rk,s,seis}$	Characteristic resistance	[kN]	15	24	35	75
$\gamma_{Ms,seis}$	Partial safety factor	[-]	1,40			
<b>Pull-out failure</b>						
$N_{Rk,p,seis}$	Characteristic tension load in cracked concrete C20/25	[kN]	5	9	12	20
$\gamma_{Mp,seis}$	Partial safety factor	[-]	1,80		1,50	
<b>Concrete cone failure (see TR 045)</b>						
$h_{ef}$	Effective anchorage depth	[mm]	45	60	70	85
$\gamma_{Mc,seis}$ $\gamma_{Msp,seis}$	Partial safety factor	[-]	1,80		1,50	
<b>Steel failure for without lever arm</b>						
$V_{Rk,s,seis}$	Characteristic resistance	[kN]	8,7	11,2	18,3	31,5
$\gamma_{Ms,seis}$	Partial safety factor	[-]	1,25			
<b>Concrete edge failure (see TR 045)</b>						
$l_f = h_{ef}$	Effective anchor length	[mm]	45	60	70	85
$d_{nom}$	Outside anchor diameter	[mm]	1,50			

- The performances of the product identified by the above identification code are in conformity with the declared performance. This declaration of performance is issued under the sole responsibility of pgb-Europe nv. Signed for and behalf of the manufacturer by:

Plaats en datum van uitgave	Ondertekend voor en namens de fabrikant door
Melle, 09/05/2017	nv pgb-Europe sa Gontrode Heirweg 170 9090 MELLE BE 0425 888 396  Johannes Heye, product manager



## Annex 1 : Product overview

### S-KAH

SM1KA/08072 A4  
SM1KA/08092 A4  
SM1KA/08112 A4  
SM1KA/10092 A4  
SM1KA/10102 A4  
SM1KA/10112 A4

SM1KA/10132 A4  
SM1KA/12103 A4  
SM1KA/12118 A4  
SM1KA/12128 A4  
SM1KA/12148 A4  
SM1KA/12163 A4

SM1KA/16123 A4  
SM1KA/16138 A4  
SM1KA/16168 A4  
SM1KA/16178 A4

### S-KAH HCR

SM1KA308072 A4H  
SM1KA310092 A4H  
SM1KA310112 A4H  
SM1KA312118 A4H  
SM1KA316138 A4H