Schöck Isokorb® T type K

Schöck Isokorb® T type K
Suitable for cantilever balconies. It transfers negative moments and positive shear forces. The Schöck Isokorb® type K with the secondary load-bearing level VV transmits negative moments, positive and negative shear forces.

Element arrangement | Installation cross sections

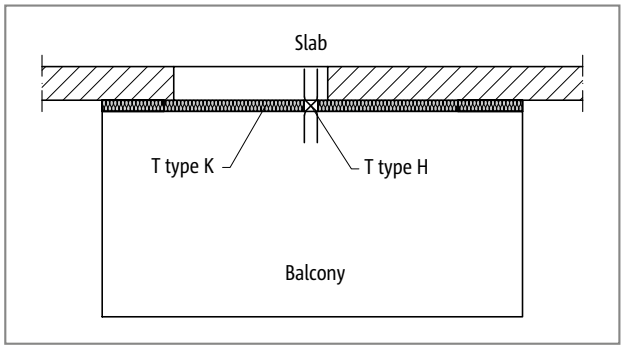


Fig. 21: Schöck Isokorb® T type K: Balcony freely cantilevered, optional with T type H (from page 125) with planned horizontal loads, e.g. closed balustrades

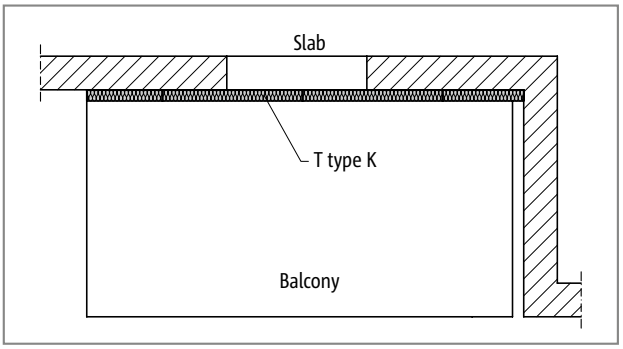


Fig. 22: Schöck Isokorb® T type K: Balcony with facade offset

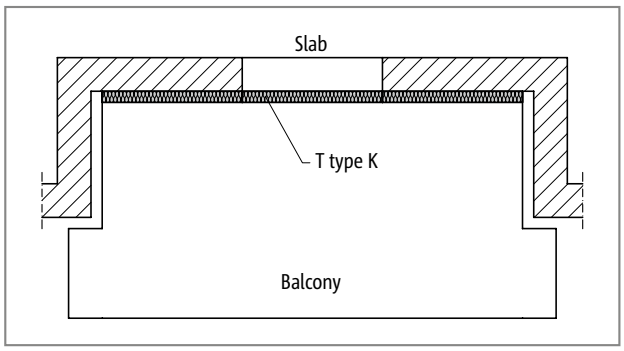


Fig. 23: Schöck Isokorb® T type K: Balcony with facade recess

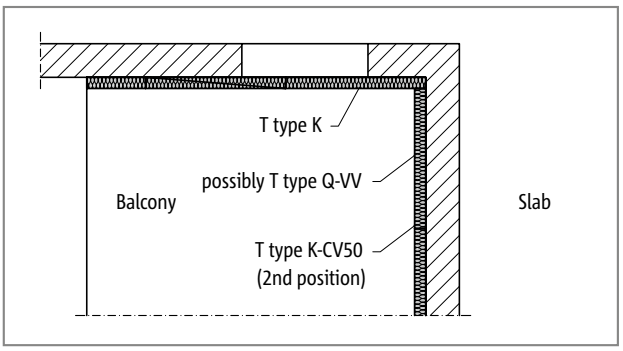


Fig. 24: Schöck Isokorb® T type K, Q-VV: Balcony with inside corner, freely supported on two sides

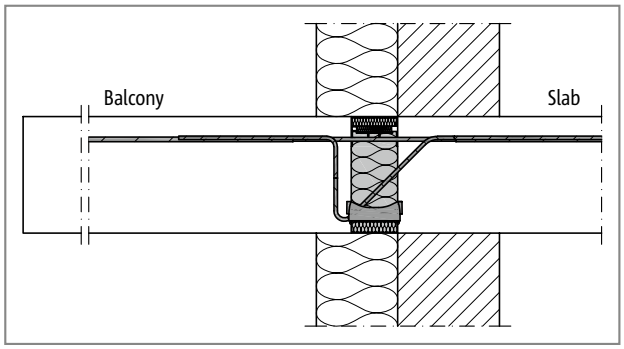


Fig. 25: Schöck Isokorb® T type K: Connection with thermal insulation composite system (WDVS)

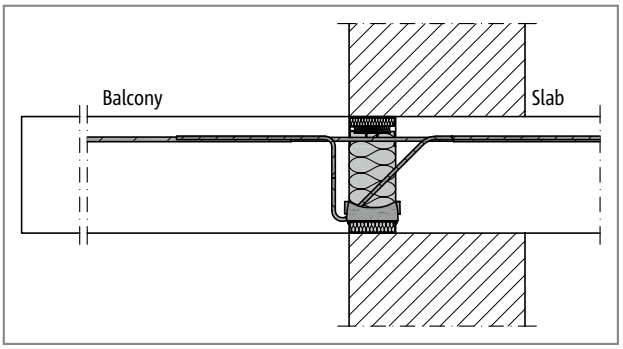


Fig. 26: Schöck Isokorb® T type K: Connection with single-leaf masonry

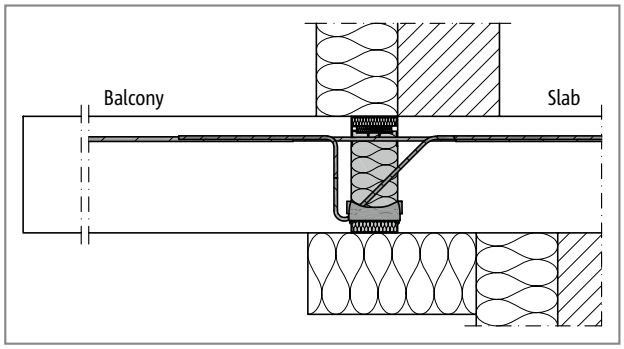


Fig. 27: Schöck Isokorb® T type K: Connection with indirectly positioned floor and WDVS

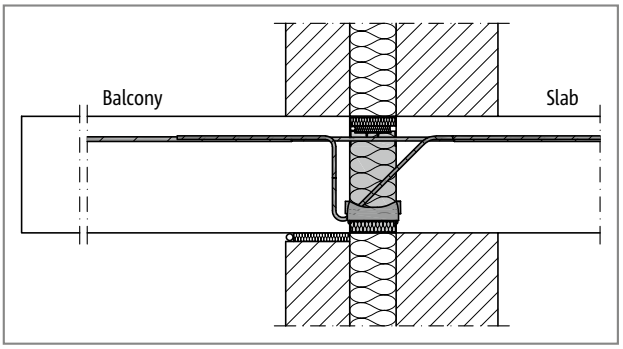


Fig. 28: Schöck Isokorb® T type K: Cavity wall with a balcony at inner slab level

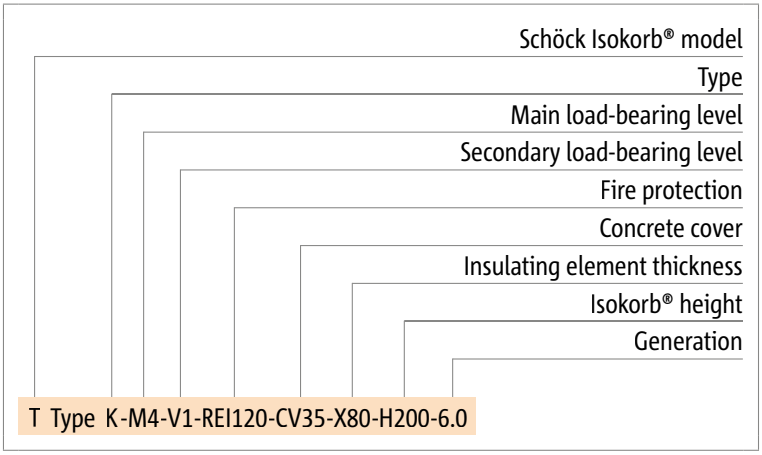
Product selection | Type designations | Special designs

Schöck Isokorb® T type K variants

The configuration of the Schöck Isokorb® T type K can be varied as follows:

- Main load-bearing level:
  M1 to M13
- Secondary load-bearing level:
  V1 to V3, VV1
- Fire resistance class:
  REI120 (standard): M1 to M11
  REI120 (Standard): M12 and M13: Projection upper fire protection board, both sides 10 mm
- Concrete cover of the tension bars:
  CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm
- Insulating element thickness:
  X80 = 80 mm
- Isokorb® height:
  H = 160 - 250 mm for concrete cover CV30, CV35
  H = 180 - 250 mm for concrete cover CV50
- Generation:
  6.0

Type designations in planning documents



Special designs

Please contact the design support department if you have connections that are not possible with the standard product variants shown in this information (contact details on page 3).
In accordance with approval heights up to 500 mm are possible.
This also applies with additional requirements as a result of precast concrete construction. For additional requirements determined by manufacturing or transportation there are solutions available with coupler bars.

Design

Notes on design

- Minimum height H_{min} Schöck Isokorb® T type K-M1 to M11 for CV50: H_{min}=180mm, T type K-M12 and K-M13 see page33.
- For cantilever slab structures Schöck Isokorb® T type K-M1 to K-M11 without live load, stressed from moment loading without direct shear force activity or light structures, please use Schöck design software or contact our application engineering dept.

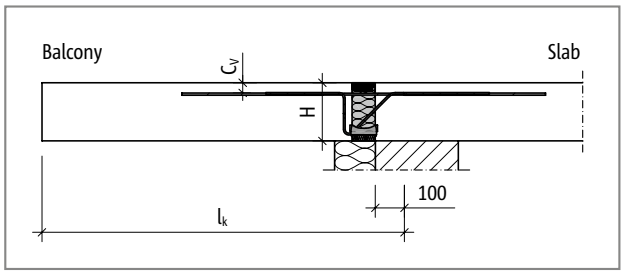


Fig. 29: Schöck Isokorb® T type K: Static system

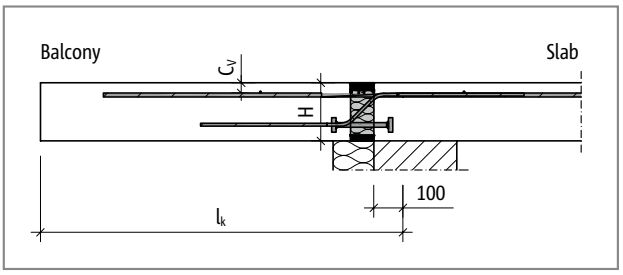


Fig. 30: Schöck Isokorb® T type K-M12: Static system

C25/30 design

Schöck Isokorb® T type K:				M1	M2	M3	M4	M5	M6
Design values with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30					
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]					
Isokorb® height H [mm]	-	160	-	-8.0	-15.7	-20.5	-23.8	-26.1	-28.7
	160	-	180	-8.5	-16.6	-21.7	-25.2	-27.7	-30.4
	-	170	-	-8.9	-17.5	-23.0	-26.5	-29.3	-32.3
	170	-	190	-9.4	-18.4	-24.2	-27.9	-30.8	-34.0
	-	180	-	-9.9	-19.3	-25.5	-29.2	-32.4	-35.9
	180	-	200	-10.3	-20.2	-26.7	-30.6	-34.0	-37.7
	-	190	-	-10.8	-21.1	-27.9	-31.9	-35.6	-39.6
	190	-	210	-11.3	-22.0	-29.1	-33.3	-37.1	-41.4
	-	200	-	-11.8	-23.0	-30.3	-34.6	-38.7	-43.2
	200	-	220	-12.2	-23.9	-31.5	-36.0	-40.3	-45.1
	-	210	-	-12.7	-24.8	-32.7	-37.3	-41.9	-47.0
	210	-	230	-13.2	-25.7	-33.8	-38.7	-43.4	-48.8
	-	220	-	-13.7	-26.6	-35.0	-40.0	-45.0	-50.7
	220	-	240	-14.2	-27.5	-36.2	-41.4	-46.6	-52.6
	-	230	-	-14.7	-28.5	-37.4	-42.7	-48.2	-54.5
	230	-	250	-15.1	-29.4	-38.6	-44.1	-49.7	-56.4
	-	240	-	-15.6	-30.3	-39.8	-45.4	-51.3	-58.3
	240	-	-	-16.1	-31.2	-40.9	-46.8	-52.9	-60.2
	-	250	-	-16.6	-32.2	-42.1	-48.1	-54.4	-62.2
	250	-	-	-17.1	-33.1	-43.3	-49.5	-56.0	-64.0
				$v_{Rd,z}$ [kN/m]					
	V1			34.8	34.8	43.5	43.5	43.5	43.5
	V2			61.8	61.8	77.3	77.3	77.3	77.3
	V3			-	-	123.6	123.6	123.6	123.6
	VV1			-	-	-	±61.8	±61.8	±61.8

Schöck Isokorb® T type K:	M1	M2	M3	M4	M5	M6
Isokorb® length [mm]	1000	1000	1000	1000	1000	1000
Tension bars V1/V2/V3	4 ⌀ 8	8 ⌀ 8	10 ⌀ 8	12 ⌀ 8	14 ⌀ 8	15 ⌀ 8
Tension bars VV1	-	-	-	14 ⌀ 8	15 ⌀ 8	8 ⌀ 12
Shear force bars V1	4 ⌀ 6	4 ⌀ 6	5 ⌀ 6	5 ⌀ 6	5 ⌀ 6	5 ⌀ 6
Shear force bars V2	4 ⌀ 8	4 ⌀ 8	5 ⌀ 8	5 ⌀ 8	5 ⌀ 8	5 ⌀ 8
Shear force bars V3	-	-	8 ⌀ 8	8 ⌀ 8	8 ⌀ 8	8 ⌀ 8
Shear force bars VV1	-	-	-	4 ⌀ 8 + 4 ⌀ 8	4 ⌀ 8 + 4 ⌀ 8	4 ⌀ 8 + 4 ⌀ 8
Pressure bearing V1/V2 (piece)	4	6	7	8	7	8
Pressure bearing V3 (piece)	-	-	8	8	8	10
Pressure bearing VV1 (piece)	-	-	-	11	12	13

Notes on design

- Static system and infomation on the design see page 30.
- Schöck Isokorb® T type K-M6-V3 tension bars: 7⌀12
- Schöck Isokorb® T type K-M6-VV1 special stirrup: 4 piece.

C25/30 design

Schöck Isokorb® T type K:				M7	M8	M9	M10	M11	M11
Design values with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30					≥ C30/37
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]					
Isokorb® height H [mm]	-	160	-	-32.5	-36.4	-40.4	-46.4	-46.4	-50.2
	160	-	180	-34.5	-38.7	-43.0	-49.2	-49.2	-53.3
	-	170	-	-36.7	-41.1	-45.6	-52.1	-52.1	-56.4
	170	-	190	-38.7	-43.4	-48.1	-55.0	-55.0	-59.4
	-	180	-	-40.9	-45.8	-50.8	-57.8	-57.8	-62.5
	180	-	200	-42.9	-48.1	-53.3	-60.7	-60.7	-65.6
	-	190	-	-45.1	-50.6	-56.0	-63.5	-63.5	-68.7
	190	-	210	-47.2	-52.9	-58.6	-66.4	-66.4	-71.8
	-	200	-	-49.4	-55.3	-61.3	-69.3	-69.3	-74.9
	200	-	220	-51.5	-57.7	-63.9	-72.1	-72.1	-78.0
	-	210	-	-53.7	-60.1	-66.6	-75.0	-75.0	-81.1
	210	-	230	-55.8	-62.5	-69.2	-77.9	-77.9	-84.2
	-	220	-	-58.0	-65.0	-71.8	-80.7	-80.7	-87.3
	220	-	240	-60.1	-67.4	-74.3	-83.6	-83.6	-90.4
	-	230	-	-62.4	-69.9	-76.8	-86.4	-86.4	-96.5
	230	-	250	-64.5	-72.3	-79.4	-89.3	-89.3	-96.6
	-	240	-	-66.8	-74.7	-81.9	-92.2	-92.2	-99.7
	240	-	-	-68.9	-77.1	-84.5	-95.0	-95.0	-102.8
	-	250	-	-71.2	-79.4	-87.0	-97.9	-97.9	-105.9
	250	-	-	-73.4	-81.7	-89.6	-100.7	-100.7	-109.0
				$v_{Rd,z}$ [kN/m]					
	V1			92.7	108.2	108.2	123.6	139.1	139.1
	V2			123.6	123.6	123.6	139.1	-	-
	VV1			108.2/–61.8	108.2/–61.8	108.2/–61.8	123.6/–61.8	123.6/–61.8	123.6/–61.8

Schöck Isokorb® T type K:	M7	M8	M9	M10	M11	M11
Isokorb® length [mm]	1000	1000	1000	1000	1000	1000
Tension bars V1/V2	8 ⌀ 12	9 ⌀ 12	10 ⌀ 12	12 ⌀ 12	13 ⌀ 12	13 ⌀ 12
Tension bars VV1	9 ⌀ 12	10 ⌀ 12	11 ⌀ 12	12 ⌀ 12	13 ⌀ 12	13 ⌀ 12
Shear force bars V1	6 ⌀ 8	7 ⌀ 8	7 ⌀ 8	8 ⌀ 8	9 ⌀ 8	9 ⌀ 8
Shear force bars V2	8 ⌀ 8	8 ⌀ 8	8 ⌀ 8	9 ⌀ 8	-	-
Shear force bars VV1	7 ⌀ 8 + 4 ⌀ 8	7 ⌀ 8 + 4 ⌀ 8	7 ⌀ 8 + 4 ⌀ 8	8 ⌀ 8 + 4 ⌀ 8	8 ⌀ 8 + 4 ⌀ 8	8 ⌀ 8 + 4 ⌀ 8
Pressure bearing V1/V2 (piece)	11	12	16	18	18	18
Pressure bearing VV1 (piece)	16	17	16	18	18	18
Special stirrup (piece)	4	4	4	4	4	4

Notes on design

- Static system and infomation on the design see page 30.
- The indicative minimum concrete strength class of the external structural component is C32/40.
- With different concrete strength classes (e.g. balcony C32/40, inner slab C25/30) basically the weaker concrete is relevant for the design of the Schöck Isokorb®.
- Note FEM guidelines if a FEM program is to be used for design.

C25/30 design

Schöck Isokorb® T type K:				M12	M13
Design values with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30	
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]	
Isokorb® height H [mm]	-	180	-	-59.8	-86.5
	180	-	200	-63.5	-90.9
	-	190	-	-67.1	-95.2
	190	-	210	-70.7	-99.5
	-	200	-	-74.3	-103.8
	200	-	220	-77.9	-108.2
	-	210	-	-81.5	-112.5
	210	-	230	-85.1	-116.8
	-	220	-	-88.7	-121.1
	220	-	240	-92.3	-125.5
	-	230	-	-95.9	-129.8
	230	-	250	-99.5	-134.1
	-	240	-	-103.1	-138.4
	240	-	-	-106.7	-142.8
	-	250	-	-110.3	-147.1
	250	-	-	-113.9	-151.4
				$v_{Rd,z}$ [kN/m]	
	V1			96.6	96.6
	V2			144.9	144.9
	V3			208.6	208.6

Schöck Isokorb® T type K:	M12	M13
Isokorb® length [mm]	1000	1000
Tension bars	12 ⌀ 14	14 ⌀ 14
Pressure bearing / compression bars	10 ⌀ 16	12 ⌀ 16
Shear force bars V1	4 ⌀ 10	4 ⌀ 10
Shear force bars V2	6 ⌀ 10	6 ⌀ 10
Shear force bars V3	6 ⌀ 12	6 ⌀ 12
H_{min} for V3 CV30/35 [mm]	190	190
H_{min} for V1/V2 CV50 [mm]	200	200
H_{min} for V3 CV50 [mm]	210	210

Notes on design

- Static system and infomation on the design see page 30.
- The indicative minimum concrete strength class of the external structural component is C32/40.
- With different concrete strength classes (e.g. balcony C32/40, inner slab C25/30) basically the weaker concrete is relevant for the design of the Schöck Isokorb®.
- Note FEM guidelines if a FEM program is to be used for design.

Deflection/Camber

Deflection

The deflection factors given in the table (tan α [%]) result alone from the deflection of the Schöck Isokorb® under 100% steel utilisation. They serve for the estimation of the required camber. The total arithmetic camber of the balcony slab formwork results from the calculation according to BS EN 1992-1-1 (EC2) and BS EN 1992-1-1/NA plus the deflection from Schöck Isokorb®. The camber of the balcony slab formwork to be given by the structural engineer/designer in the implementation plans (Basis: Calculated total deflection from cantilever slab + floor rotation angle + Schöck Isokorb®) should be so rounded that the scheduled drainage direction is maintained (round up: with drainage to the building facade, round down: with drainage towards the cantilever slab end).

Deflection (p) as a result of Schöck Isokorb®

$p = \tan\alpha \cdot l_k \cdot (m_{pd} / m_{Rd}) \cdot 10$ [mm]

Factors to be applied

$\tan\alpha$ = apply value from table

l_k = cantilever length [m]

m_{pd} = relevant bending moment [kNm/m] in the ultimate limit state for the determination of the p [mm] from Schöck Isokorb®.
The load combination to be applied for the deflection is determined by the structural engineer.
(Recommendation: Load combination for the determination of the camber p : determine g+q/2, m_{pd} in the ultimate limit state)

m_{Rd} = maximum design moment [kNm/m] of the Schöck Isokorb®

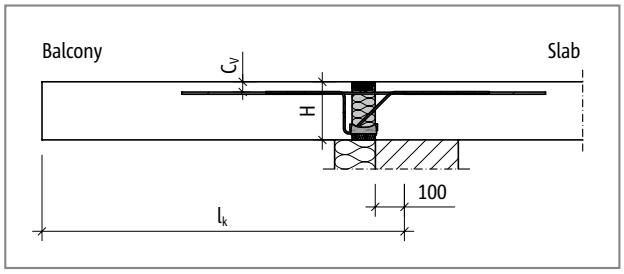


Fig. 31: Schöck Isokorb® T type K: Static system

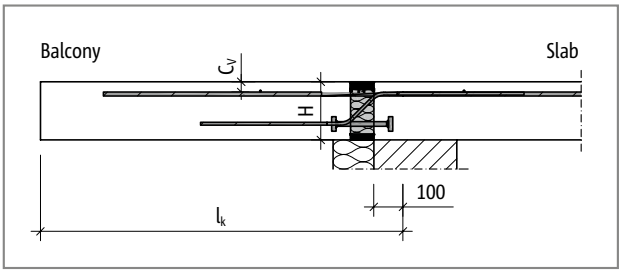


Fig. 32: Schöck Isokorb® T type K-M12: Static system

Schöck Isokorb® T type K:		M1-M5, M6-V1/V2			M6-V3/VV1, M7-M11		
Deflection factors when		tan α [%]			tan α [%]		
		CV30	CV35	CV50	CV30	CV35	CV50
Isokorb® height H [mm]	160	0.9	0.9	-	1.2	1.2	-
	170	0.8	0.8	-	1.0	1.0	-
	180	0.8	0.8	0.9	0.9	0.9	1.1
	190	0.7	0.7	0.8	0.9	0.9	1.0
	200	0.6	0.6	0.7	0.8	0.8	0.9
	210	0.6	0.6	0.7	0.7	0.7	0.8
	220	0.6	0.6	0.6	0.7	0.7	0.8
	230	0.5	0.5	0.6	0.6	0.6	0.7
	240	0.5	0.5	0.5	0.6	0.6	0.7
	250	0.5	0.5	0.5	0.6	0.6	0.6

Deflection/Camber | Slenderness

Schöck Isokorb® T type K:		M12			M13		
Deflection factors when		tan α [%]			tan α [%]		
		CV30	CV35	CV50	CV30	CV35	CV50
Isokorb® height H [mm]	180	0.8	0.8	-	1.2	1.2	-
	190	0.7	0.7	-	1.1	1.1	-
	200	0.7	0.7	0.8	1.0	1.0	1.2
	210	0.6	0.6	0.7	0.9	0.9	1.1
	220	0.6	0.6	0.7	0.9	0.9	1.0
	230	0.5	0.5	0.6	0.8	0.8	0.9
	240	0.5	0.5	0.6	0.8	0.8	0.9
	250	0.5	0.5	0.5	0.7	0.7	0.8

Slenderness

In order to safeguard the serviceability limit state we recommend the limitation of the slenderness to the following maximum cantilever lengths max l_k [m]:

Schöck Isokorb® T type K:		M1-M13		
maximum cantilever length with		$l_{k,max}$ [m]		
		CV30	CV35	CV50
Isokorb® height H [mm]	160	1.81	1.74	-
	170	1.95	1.88	-
	180	2.10	2.03	1.81
	190	2.25	2.17	1.95
	200	2.39	2.32	2.10
	210	2.54	2.46	2.25
	220	2.68	2.61	2.39
	230	2.83	2.76	2.54
	240	2.98	2.90	2.68
	250	3.12	3.05	2.83

Maximum cantilever length

The tabular values are based on the following assumptions:

- Accessible balcony
- Specific weight of concrete γ=25 kN/m^3
- Dead weight of the balcony surfacing $g_2 \leq 1.2$ kN/m^2
- Balcony rail $g_R \leq 0.75$ kN/m

Maximum cantilever length

- The maximum cantilevered length for ensuring the serviceability is a benchmark. It can be limited by the load bearing capacity when using the Schöck Isokorb® T type K.

Expansion joint spacing

Maximum expansion joint spacing

If the length of the structural component exceeds the maximum expansion joint spacing e, then expansion joints must be integrated into the external concrete components at right angles to the insulating layer in order to limit the effect as a result of temperature changes. For fixed points such as corners of balconies, parapets and balustrades or when using the Schöck Isokorb® T type H, half the maximum expansion joint spacing e/2 applies out from the fixed point.

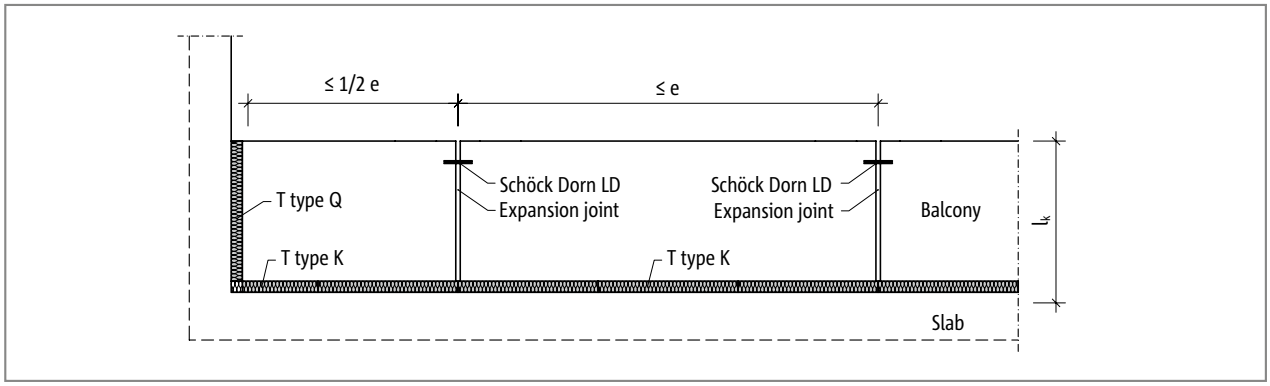


Fig. 33: Schöck Isokorb® T type K: Expansion joint layout

Schöck Isokorb® T type K:		M1 - M6-V1,V2	M6-V3 - M11
Maximum expansion joint spacing		e [m]	
Insulating element thickness [mm]	80	13.5	13.0

Schöck Isokorb® T type K:		M12, M13
Maximum expansion joint spacing e		e [m]
Insulating element thickness [mm]	80	9.2

Edge distances

The Schöck Isokorb® must be so arranged at the expansion joint that the following conditions are met:

- For the centre distance of the tension bars from the free edge or from the expansion joint: $e_R \geq 50$ mm and $e_R \leq 150$ mm applies.
- For the centre distance of the compression elements from the free edge or from the expansion joint: $e_R \geq 50$ mm applies.
- For the centre distance of the shear force bars from the free edge or from the expansion joint: $e_R \geq 100$ mm and $e_R \leq 150$ mm applies.

Product description

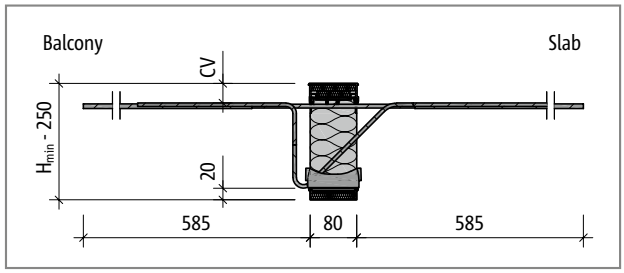


Fig. 34: Schöck Isokorb® T type K-M1 to M4: Product section

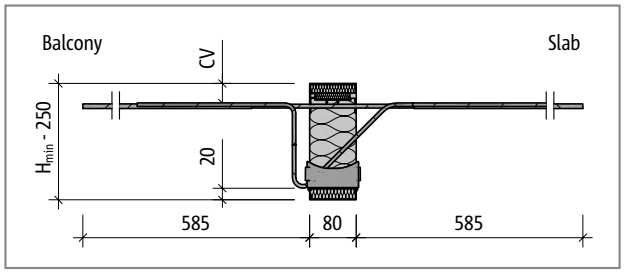


Fig. 35: Schöck Isokorb® T type K-M5 and K-M6: Product section

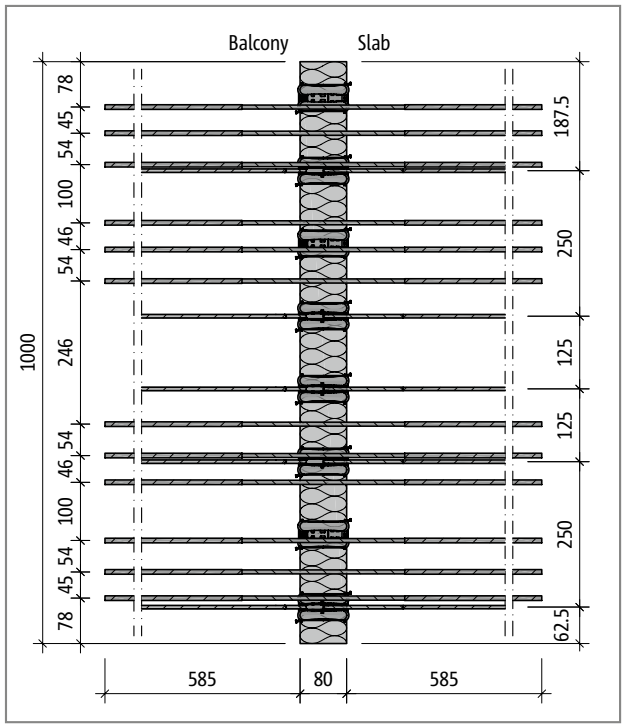


Fig. 36: Schöck Isokorb® T type K-M4-V1: Product layout

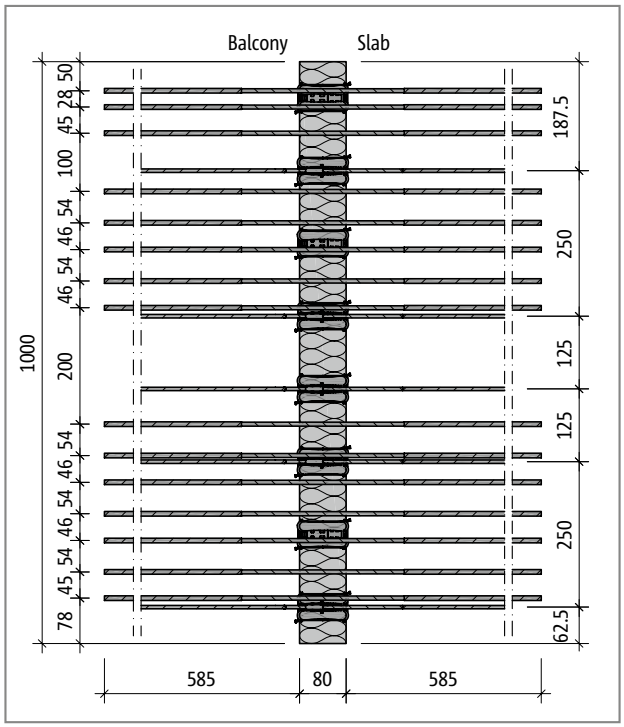


Fig. 37: Schöck Isokorb® T type K-M6-V1: Product layout

Product information

- Download further product plan views and cross-sections at www.schoeck.co.uk/download
- Minimum height Schöck Isokorb® T type K with CV50: H_{min} = 180 mm
- On-site spacing of the Schöck Isokorb® T type K on the unreinforced positions possible; take into account the load-bearing capacity reduced due to the spacing; take into account required edge distances
- Concrete cover of the tension bars: CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm
- Schöck Isokorb® T type K-M6-V3/VV1: Tension bar length L= 725 mm

Product description

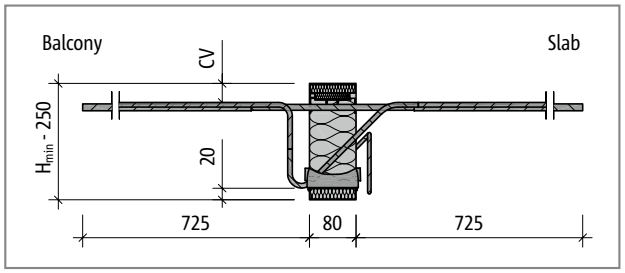


Fig. 38: Schöck Isokorb® T type K-M7 to M11: Product section

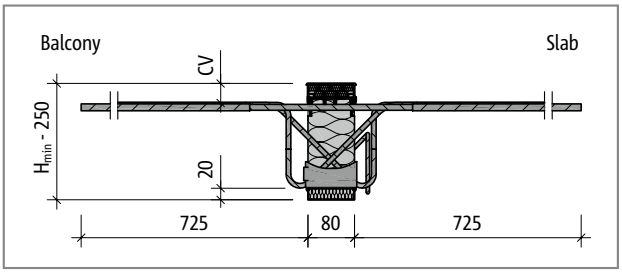


Fig. 39: Schöck Isokorb® T type K-M6-VV1: Product section

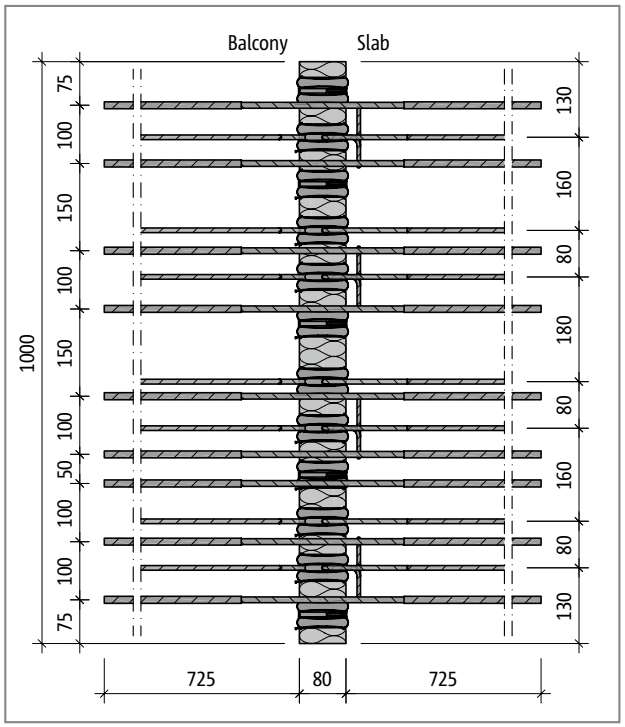


Fig. 40: Schöck Isokorb® T type K-M8-V1: Product layout

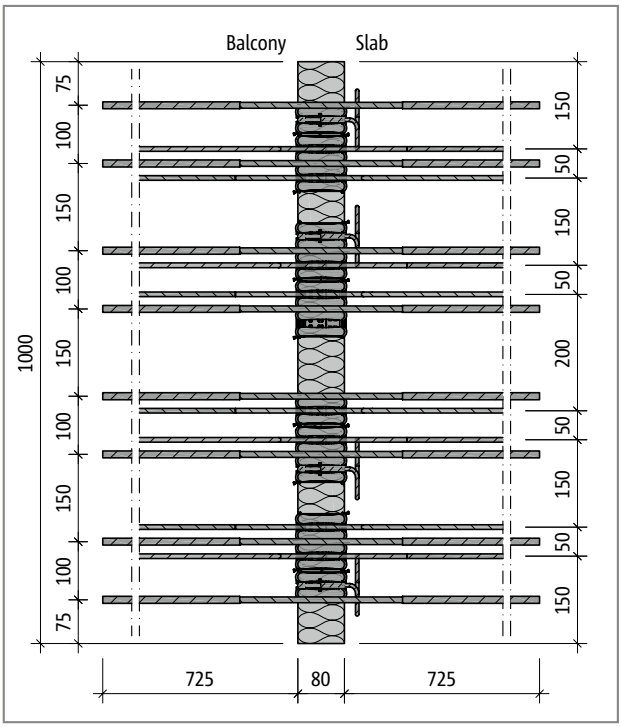


Fig. 41: Schöck Isokorb® T type K-M6-VV1: Product layout

Product information

- Download further product plan views and cross-sections at www.schoeck.co.uk/download
- Minimum height Schöck Isokorb® T type K with CV50: H_{min} = 180 mm
- On-site spacing of the Schöck Isokorb® T type K on the unreinforced positions possible; take into account the load-bearing capacity reduced due to the spacing; take into account required edge distances
- Concrete cover of the tension bars: CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm

Product description

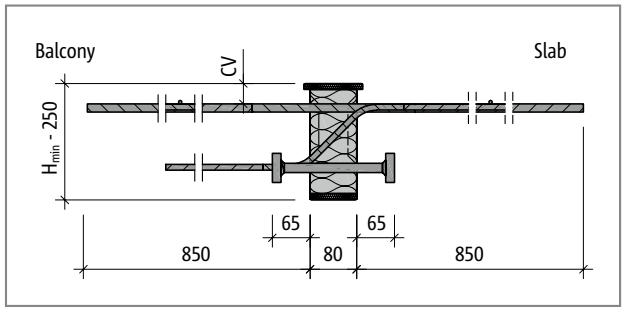


Fig. 42: Schöck Isokorb® T type K-M12: Product section

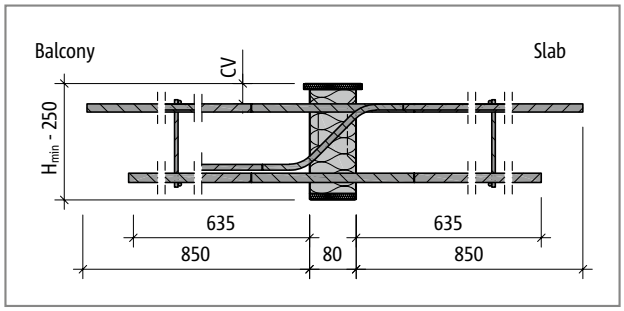


Fig. 43: Schöck Isokorb® T type K-M13: Product section

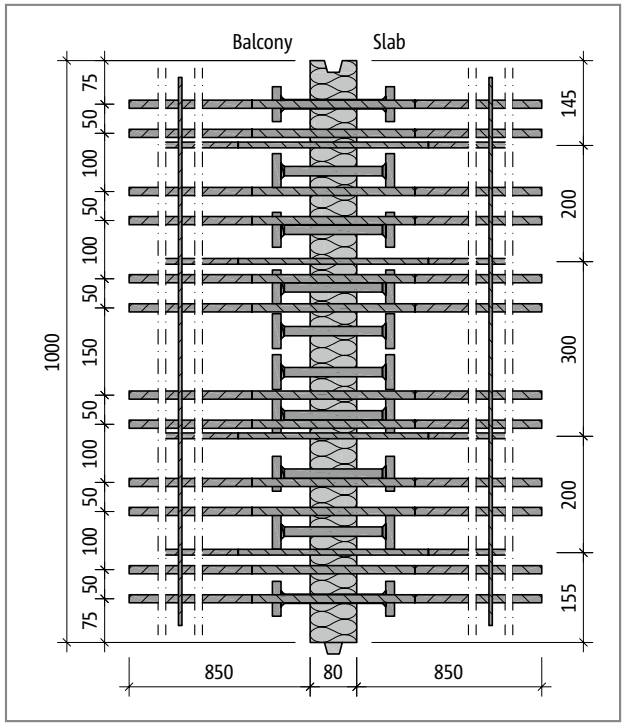


Fig. 44: Schöck Isokorb® T type K-M12-V1: Product layout

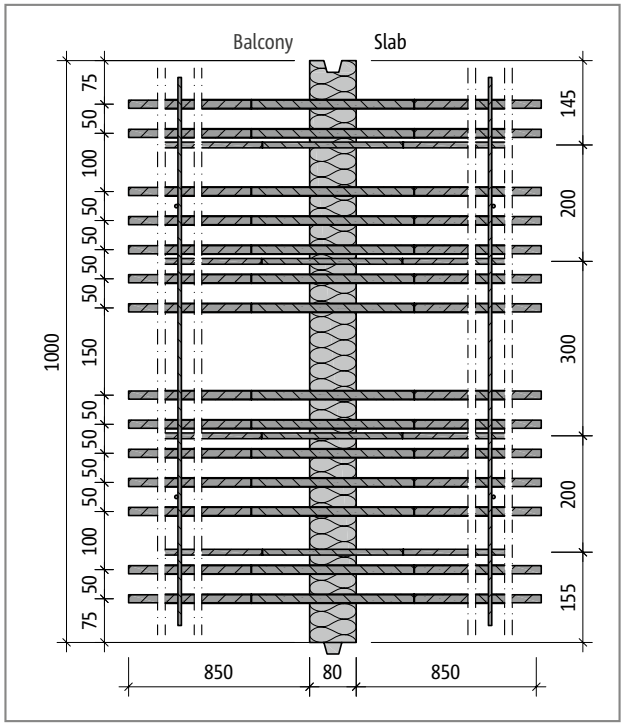


Fig. 45: Schöck Isokorb® T type K-M13-V1: Product layout

Product information

- Download further product plan views and cross-sections at www.schoeck.co.uk/download
- Minimum height H_{min} Schöck Isokorb® T type K-M12 and T type K-M13 see page 33
- On-site spacing of the Schöck Isokorb® T type K on the unreinforced positions possible; take into account the load-bearing capacity reduced due to the spacing; take into account required edge distances
- Concrete cover of the tension bars: CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm

On-site reinforcement

Direct support

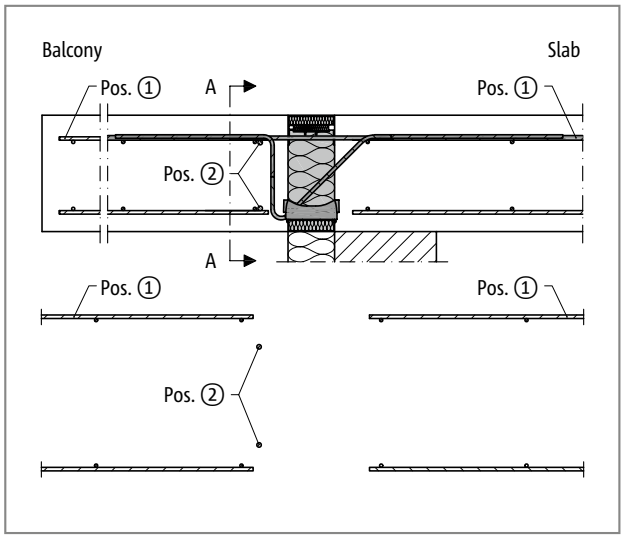


Fig. 46: Schöck Isokorb® T type K: On-site reinfircement with direct support

Indirect support

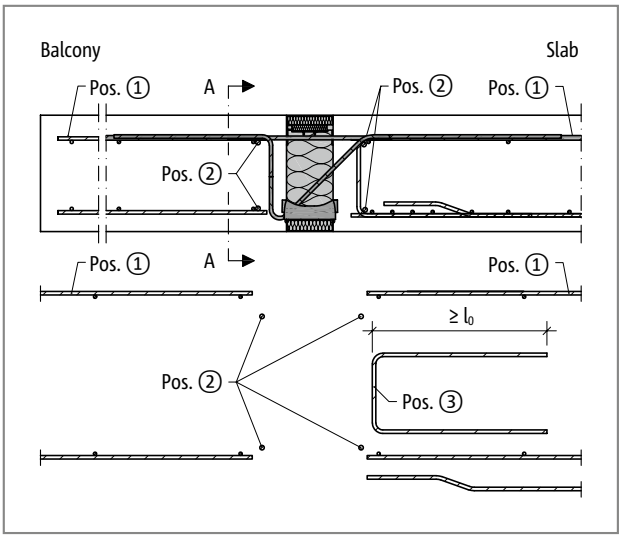


Fig. 47: Schöck Isokorb® T type K: On-site reinforcement with indirect support

Information on side reinforcement

- The side reinforcement of the slab edge parallel to the Schöck Isokorb® is covered on-site by the integrated suspension reinforcement of the Schöck Isokorb®.

Direct and indirect support

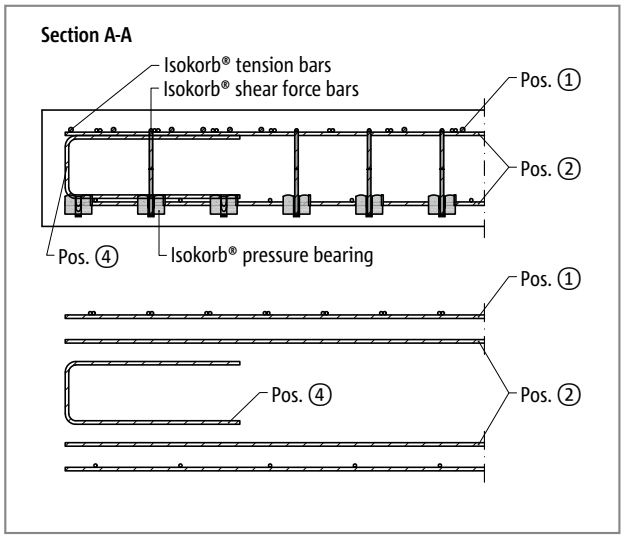


Fig. 48: Schöck Isokorb® T type K: On-site reinforcement on the balcony side in the Section A-A; Pos.4 = side reinforcement on the free edge perpendicular to the Schöck Isokorb®

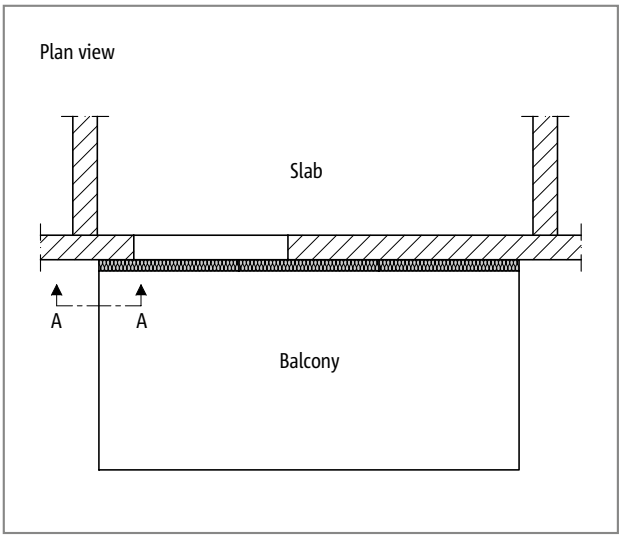


Fig. 49: Schöck Isokorb® T type K: Diagram of the position of Section A-A

On-site reinforcement

Recommendation for on-site connection reinforcement

Details of the lapping reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment with C25/30; variants adapted to load-bearing level. The required reinforcement cross-section depends on the bar diameter of the steel bar or wire mesh reinforcement.

Schöck Isokorb® T type K:			M1		M2		M3			M4			
On-site reinforcement	Secondary load-bearing level		V1	V2	V1	V2	V1	V2	V3	V1	V2	V3	VV1
	Type of bearing	Height [mm]	Concrete strength class ≥ C25/30										
Pos. 1 overlap reinforcement depending on bar diameter													
Pos. 1 with ⌀8 [mm²/m]	direct/indirect	160 - 250	242	215	443	416	578	544	564	655	622	622	704
Pos. 1 with ⌀10 [mm²/m]			271	252	476	457	619	596	641	698	675	699	717
Pos. 1 with ⌀12 [mm²/m]			325	302	571	548	743	715	769	838	810	839	861
Pos. 2 Steel bars along the insulation joint													
Pos. 2	direct	160 - 250	2 • H8										
	indirect	160 - 250	4 • H8										
Pos. 3 vertical reinforcement													
Pos. 3 [mm²/m]	indirect	160 - 250	113		113		113			113			-
Pos. 4 supplementary edge reinforcement													
Pos. 4	direct/indirect	160 - 250	according to BS EN 1992-1-1 (EC2), 9.3.1.4										

Schöck Isokorb® T type K:			M5				M6				M7		
On-site reinforcement	Secondary load-bearing level		V1	V2	V3	VV1	V1	V2	V3	VV1	V1	V2	VV1
	Type of bearing	Height [mm]	Concrete strength class ≥ C25/30										
Pos. 1 overlap reinforcement depending on bar diameter													
Pos. 1 with ⌀8 [mm²/m]	direct/indirect	160 - 250	757	724	775	754	861	827	844	880	959	959	990
Pos. 1 with ⌀10 [mm²/m]			802	779	856	768	908	884	915	880	1012	1030	990
Pos. 1 with ⌀12 [mm²/m]			963	934	1027	922	1089	1061	986	880	1065	1101	990
Pos. 2 Steel bars along the insulation joint													
Pos. 2	direct	160 - 250	2 • H8										
	indirect	160 - 250	4 • H8										
Pos. 3 vertical reinforcement													
Pos. 3 [mm²/m]	indirect	160 - 250	113		120	-	125		130	-	113		-
Pos. 4 supplementary edge reinforcement													
Pos. 4	direct/indirect	160 - 250	according to BS EN 1992-1-1 (EC2), 9.3.1.4										

Information about on-site reinforcement

- Alternative reinforcements are possible. Determine lap length according to BS EN 1992-1-1 (EC2) and BS EN 1992-1-1/NA.A reduction of the required lap length using m_{Ed}/m_{Rd} is permitted.For overlapping (l_0) with the Schöck Isokorb®, with T types K-M1 to K-M6-V2 a length of the tension bars of 545 mm and with T types K-M6-V3 to K-M11 a length of the tension bars of 675 mm can be input in the calculation.
- When reinforcing with different diameters the reinforcement specification for the largest diameter is relevant.
- The mixing of steel bar and wire mesh reinforcement is possible. The corresponding mesh reinforcement can be taken into account when determining the additional reinforcement.
- The reinforcement at the free edges Pos. 4 of the structural component perpendicular to the Schöck Isokorb® should be selected as low as possible so that it can be arranged between the upper and lower reinforcement layer.
- The indicative minimum concrete strength class of the external structural component is C32/40.

On-site reinforcement

Recommendation for on-site connection reinforcement

Details of the lapping reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment with C25/30; variants adapted to load-bearing level. The required reinforcement cross-section depends on the bar diameter of the steel bar or wire mesh reinforcement.

Schöck Isokorb® T type K			M8			M9			M10			M11	
On-site reinforcement	Secondary load-bearing level		V1	V2	VV1	V1	V2	VV1	V1	V2	VV1	V1	VV1
	Type of bearing	Height [mm]	Concrete strength class ≥ C25/30										
Pos. 1 overlap reinforcement depending on bar diameter													
Pos. 1 with ø10 [mm²/m]	direct/indirect	160 - 250	1130	1139	1100	1232	1241	1170	1388	1396	1317	1504	1424
Pos. 1 with ø12 [mm²/m]			1192	1210	1100	1295	1312	1170	1459	1476	1317	1584	1424
Pos. 2 Steel bars along the insulation joint													
Pos. 2	direct	160 - 250	2 • H8										
	indirect	160 - 250	4 • H8										
Pos. 3 vertical reinforcement													
Pos. 3 [mm²/m]	indirect	160 - 250	113		-	113		-	113		-	113	-
Pos. 4 supplementary edge reinforcement													
Pos. 4	direct/indirect	160 - 250	according to BS EN 1992-1-1 (EC2), 9.3.1.4										

Information about on-site reinforcement

- Alternative reinforcements are possible. Determine lap length according to BS EN 1992-1-1 (EC2) and BS EN 1992-1-1/NA.A reduction of the required lap length using m_{Ed}/m_{Rd} is permitted.For overlapping (l_0) with the Schöck Isokorb®, with T types K-M1 to K-M6-V2 a length of the tension bars of 545 mm and with T types K-M6-V3 to K-M11 a length of the tension bars of 675 mm can be input in the calculation.
- When reinforcing with different diameters the reinforcement specification for the largest diameter is relevant.
- The mixing of steel bar and wire mesh reinforcement is possible. The corresponding mesh reinforcement can be taken into account when determining the additional reinforcement.
- The reinforcement at the free edges Pos. 4 of the structural component perpendicular to the Schöck Isokorb® should be selected as low as possible so that it can be arranged between the upper and lower reinforcement layer.
- The indicative minimum concrete strength class of the external structural component is C32/40.

On-site reinforcement

Direct support

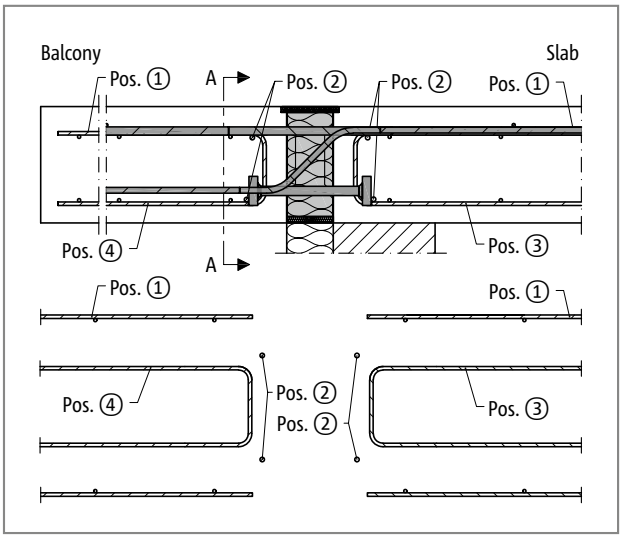


Fig. 50: Schöck Isokorb® T type K-M12: On-site reinforcement with direct support

Indirect support

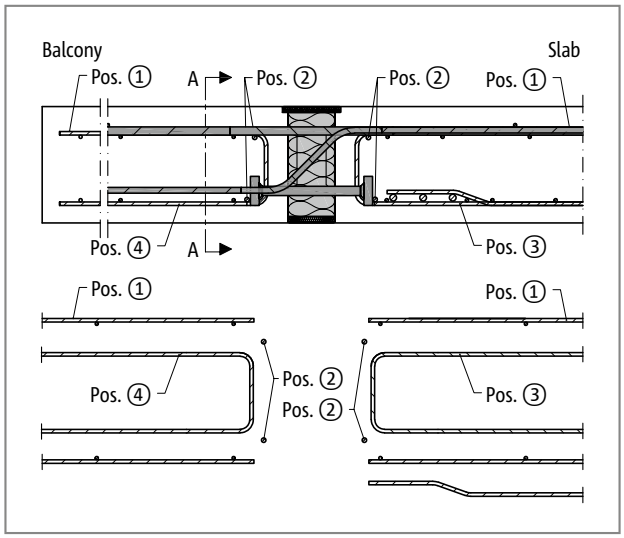


Fig. 51: Schöck Isokorb® T type K-M12: On-site reinforcement with indirect support

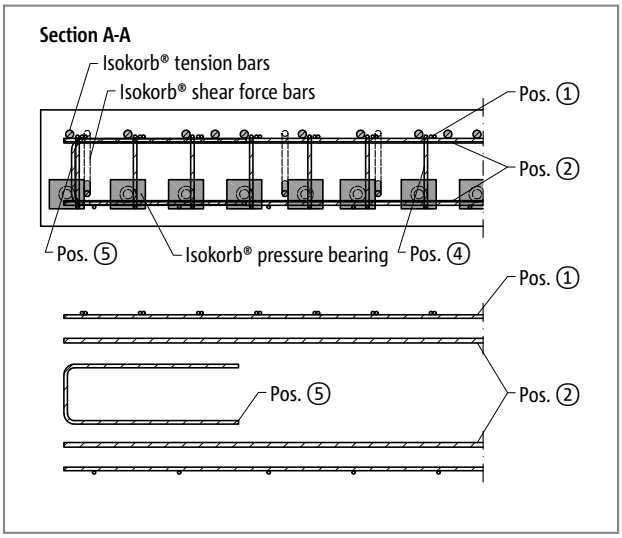


Fig. 52: Schöck Isokorb® T type K-M12: On-site reinforcment on the balcony side in the Section A-A; Pos.5 = structural edging at the free edge perpendicular to the Schöck Isokorb®

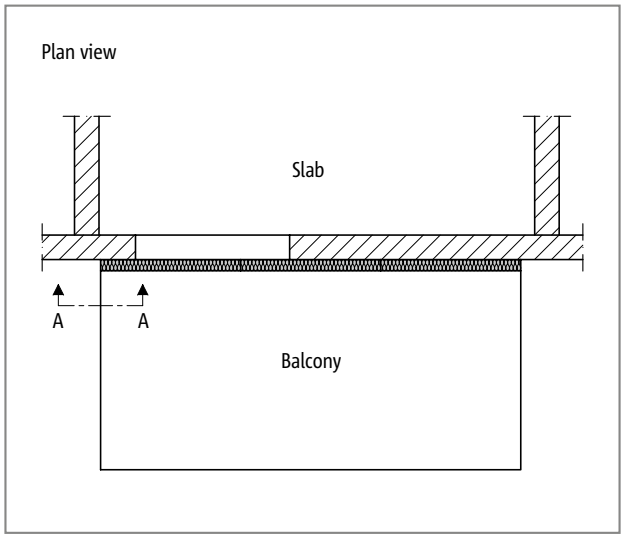


Fig. 53: Schöck Isokorb® T type K: Diagram of the position of Section A-A

On-site reinforcement

Schöck Isokorb® T type K:			M12-V1	M12-V2	M12-V3	M13V1	M13-V2	M13-V3
On-site reinforcement	Type of bearing	Height [mm]	Concrete strength class ≥ C25/30					
Pos. 1 Lapping reinforcement								
Pos. 1 [mm²/m]	direct/indirect	180 - 250	1848			2156		
Pos. 1 Variant	direct/indirect	180 - 250	H16@80 mm			H16@70 mm		
Pos. 2 Steel bars along the insulation joint								
Pos. 2	direct	180 - 250	2 • H8			2 • H8		
	indirect	180 - 250	2 • H8			2 • H8		
Pos. 3 Edge- and splitting tension reinforcement								
Pos. 3 [mm²/m]	direct	180 - 250	-			-	-	-
	indirect	180 - 250	226			113		
Pos. 4 Edge and splitting tension reinforcement								
Pos. 4 [mm²/m]	direct	180 - 250	448	559	706	222	333	480
	indirect	180 - 250						
Pos. 5 Side reinforcement at the free edge								
Pos. 5	direct/indirect	180 - 250	according to BS EN 1992-1-1 (EC2), 9.3.1.4					

Information about on-site reinforcement

- Alternative reinforcements are possible. Determine lap length according to BS EN 1992-1-1 (EC2) and BS EN 1992-1-1/NA. A reduction of the required lap length using m_{Ed}/m_{Rd} is permitted. For overlapping (l_0) with the Schöck Isokorb®, with T types K-M12 a length of the tension bars of 710 mm and with T types K-M13 a length of the tension bars of 730 mm can be in put in the calculation.
- The side reinforcement Pos. 5 should be selected so low that it can be arranged between the upper and lower reinforcement position.
- The indicative minimum concrete strength class of the external structural component is C32/40.

Tight fit/Concreting section | Precast/Compression joints

Tight fit/Concreting section

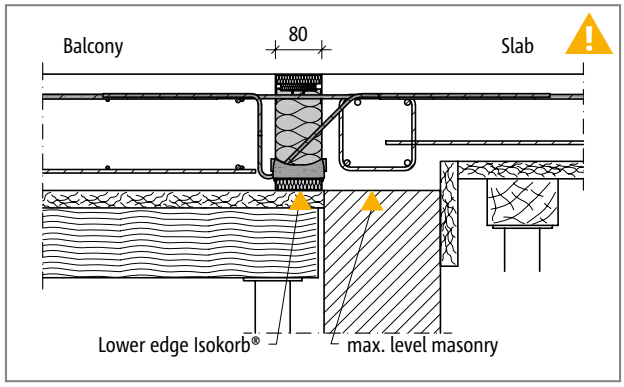


Fig. 54: Schöck Isokorb® T type K: In situ concrete with height offset floor on masonry wall

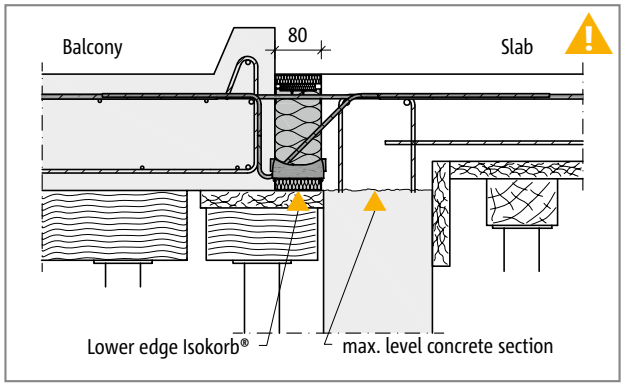


Fig. 55: Schöck Isokorb® T type K: Fully-finished balcony with height offset floor on fully-finished reinforced concrete wall

⚠ Hazard note: Tight fit with different height levels

The tight fit of the pressure bearings to the freshly poured concrete is to be ensured, therefore the upper edge of the masonry respectively of the concreting section is to be arranged below the lower edge of the Schöck Isokorb®. This is to be taken into account above all with a different height level between inner slab and balcony.

- The concreting joint and the upper edge of the masonry are to be arranged below the lower edge of the Schöck Isokorb®.
- The position of the concreting section is to be indicated in the formwork and reinforcement drawing.
- The joint planning is to be coordinated between precast concrete plant and construction site.

Precast/Compression joints

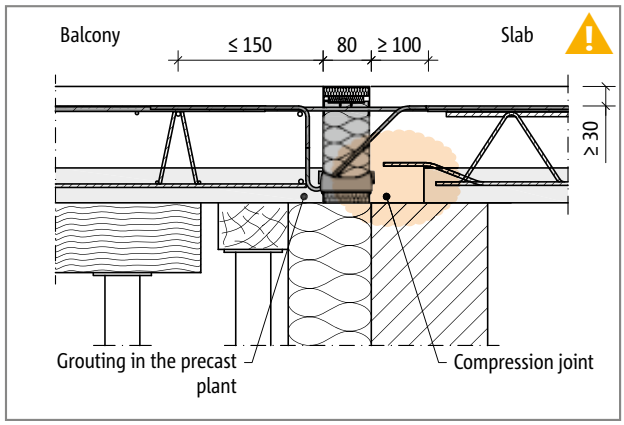


Fig. 56: Schöck Isokorb® T type K/KF: Direct support, installation in conjunction with prefabricated slabs (here: h ≤ 170 mm), compression joint on the floor side

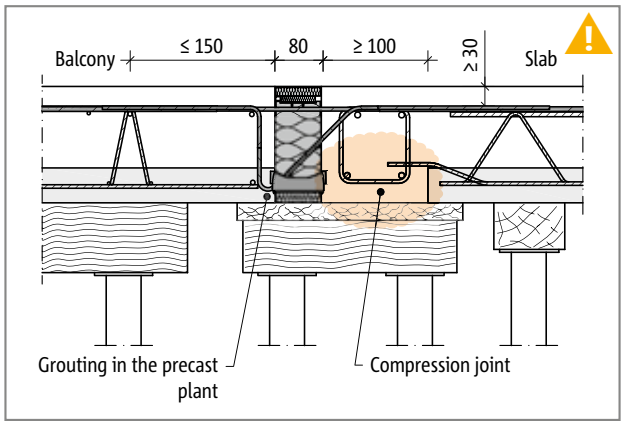


Fig. 57: Schöck Isokorb® T type K/KF: Indirect support, installation in conjunction with prefabricated slabs(here: h ≤ 170 mm), compression joint on the floor side

⚠ Hazard note: Compression joints

Compression joints are joints which, with unfavourable loading combination, remain always in compression. The underside of a cantilever balcony is always a compression zone. If the cantilever balcony is a precast part or an element slab, and/or the floor is an element slab, then the definition of the standard is effective.

- Compression joints are to be indicated in the formwork and reinforcement drawing!
- Compression joints between precast parts are always to be grouted using in-situ concrete. This also applies for compression joints with the Schöck Isokorb®!
- With compression joints between precast parts (on the inner slab or balcony side) and the Schöck Isokorb® an in-situ concrete resp. pour of ≥ 100 mm width is to be cast. This is to be entered in the working drawings.
- We recommend the installation of the Schöck Isokorb® and the pouring of the balcony-side compression joint already in the precast concrete plant.

Design example

Example calculation

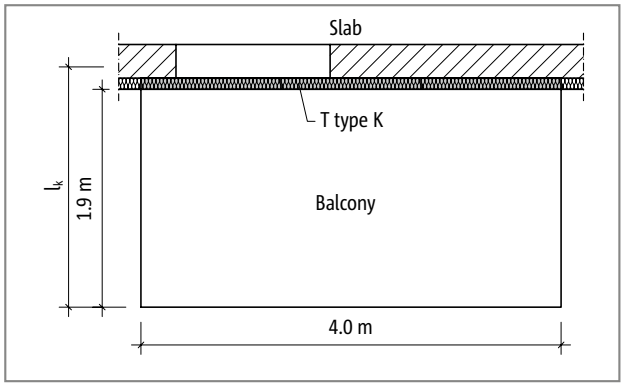


Fig. 58: Schöck Isokorb® T type K: Plan layout

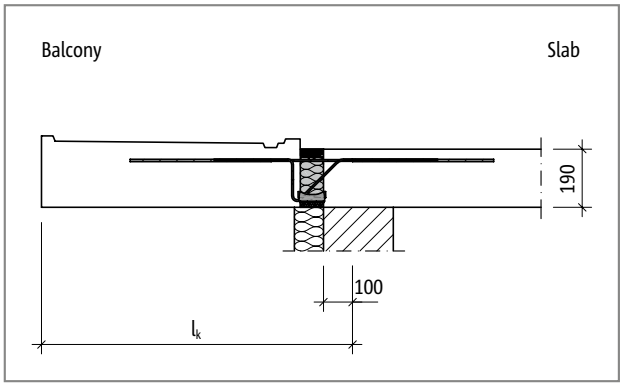


Fig. 59: Schöck Isokorb® T type K: Static system

Static system and load assumptions

Geometry:	Projection length	l_k = 2.06 m
	Balcony slab thickness	h = 190 mm
Design loads:	Balcony slab and screed	g = 6.25 kN/m²
	Service load	q = 2.5 kN/m²
	Edge load (balustrade)	g_R = 1.5 kN/m
Explosure classes:	External XC 4	
	Internal XC 1	
Selected:	Concrete strength class C25/30 for floor and C32/ 40 for balcony	
	Concrete cover c_v = 35 mm for Isokorb® tension bars	
Connection geometry:	No height offset, no floor downstand beam, no balcony upstand	
Support floor:	Floor edge directly supported	
Support balcony:	Restraint of cantilever slab using type K	

Recommendation on slenderness

Geometry:	Projection length	l_k = 2.06 m
	Balcony slab thickness	h = 190 mm
	Concrete cover	CV35
	Maximum projection length	$l_{k,max}$ = 2.17 m (from table, see page 35) > l_k

Proof of limits of load-bearing capacity (moment stress and shear force)

Internal forces:	m_{Ed}	$= -[(\gamma_G \cdot g_Q + \gamma \cdot q) \cdot l_k^2/2 + \gamma_G \cdot g_R \cdot l_k)]$
	m_{Ed}	$= -[(1.35 \cdot 6.25 + 1.5 \cdot 2.5) \cdot 2.06^2/2 + 1.35 \cdot 1.5 \cdot 2.06)] = -30.0$ kNm/m
	v_{Ed}	$= +(\gamma_G \cdot g + \gamma_q \cdot q) \cdot l_k + \gamma_G \cdot g_R$
	v_{Ed}	$= +(1.35 \cdot 6.25 + 1.5 \cdot 2.5) \cdot 2.06 + 1.35 \cdot 1.5 = +27.1$ kN/m
Selected:	**Schöck Isokorb® T type K-M6-V1-REI120-CV35-X80-H190**	
	m_{Rd}	= −31.9 kNm/m (see page 30) > m_{Ed}
	v_{Rd}	= +43.5 kN/m (see page 30) > v_{Ed}
	tan α	= 0.7 % (see page 34)

Design example | Installation instructions

Serviceability limit state (deflection/precamber)

Deflection factor: $\tan \alpha$ = 0.7 (from table, see page 34)

Selected load combination: g + q/2

(Recommendation for the determination of the precamber from Schöck Isokorb®)

Determine $m_{üd}$ in the ultimate limit state

$m_{pd} = -[(\gamma_G \cdot g + \gamma_Q \cdot q/2) \cdot l_k^2/2 + \gamma_G \cdot g_R \cdot l_k]$

$m_{pd} = -[(1.35 \cdot 6.25 + 1.5 \cdot 2.5/2) \cdot 2.06^2/2 + 1.35 \cdot 1.5 \cdot 2.06] = -26.0$ kNm/m

$p = [\tan \alpha \cdot l_k \cdot (m_{pd}/m_{Rd})] \cdot 10$ [mm]

$p = [0.7 \cdot 2.06 \cdot (26.0/31.9)] \cdot 10 = 11.8$ mm

Arrangement of expansion joint: Length of balcony : 4.00 m < 11.30 m

=> No expansion joints required

Installation manual

- Installation manual see Technical Information Schöck Isokorb® XT for reinforced concrete structures.

Check list

- ☐ Have the loads on the Schöck Isokorb® connection been specified at design level?
- ☐ Has the cantilevered system length or the system support width been taken as a basis?
- ☐ Has the additional proportionate deflection resulting from the Schöck Isokorb® been taken into account?
- ☐ Is the drainage direction taken into account with the resulting camber information? Is the degree of camber entered in the working drawings?
- ☐ Is the minimum slab thickness H_{min} for the respective Schöck Isokorb® type taken into account?
- ☐ Are the recommendations for the limitation of the slenderness observed?
- ☐ Are the maximum allowable expansion joint spacings taken into account?
- ☐ Are the Schöck FEM guidelines taken into account with the calculation using FEM?
- ☐ With the selection of the design table is the relevant concrete cover taken into account?
- ☐ Have existing horizontal loads e.g. from wind pressure been taken into account as planned? Are additional Schöck Isokorb® T type H required for this?
- ☐ Are the requirements with regard to fire protection explained and is the appropriate addendum entered in the Isokorb® type description in the implementation plans?
- ☐ Have the required in-situ concrete strips for the T type K in conjunction with inner slab elements (width ≥ 100 mm from compression element), been charted in the implementation plans?
- ☐ Have the requirements for on-site reinforcement of connections been defined in each case?
- ☐ With precast balconies are possibly necessary gaps for the front side transportation anchors and downpipes with internal drainage taken into account? Is the maximum centre distance of 300 mm for the Isokorb® bars observed?
- ☐ Is the increased minimum slab thickness (≥ 180 mm) and the required 2nd position (-CV50) been taken into account with the corner balcony?
  Is a T type K-CV50 (2nd position) planned in the connection to the T type C sub-member?
- ☐ Is the T type K-U, K-O or a special construction required instead of Isokorb® T type K for connections with height offset or to a wall?