Schöck Isokorb® T type K-U, K-O

Schöck Isokorb® T type K-U
Load-bearing thermal insulation element for free cantilevered balconies with height offset downwards or wall connection. The element transfers negative moments and positive shear forces.

Schöck Isokorb® T type K-O
Load-bearing thermal insulation element for free cantilevered balconies with height offset upwards or wall connection. The element transfers negative moments and positive shear forces.

T type
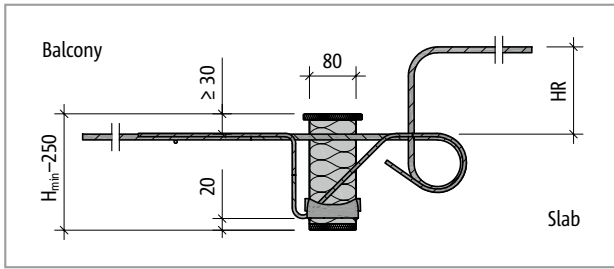K-O
K-U

Reinforced concrete – reinforced concrete

Product change

Old

Balcony ... **Slab**

Fig. 63: Schöck Isokorb® T type K-HV: Product sectiont

New

Balcony ... **Slab**
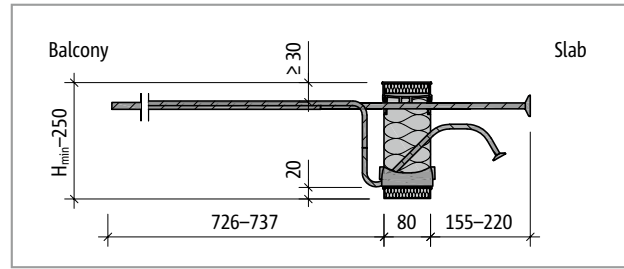
Fig. 64: Schöck Isokorb® T type K-U: Product section

Balcony ... **Slab**
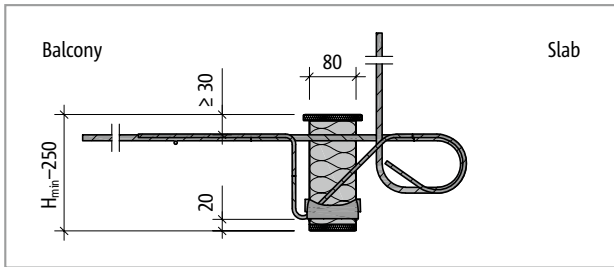
Fig. 65: Schöck Isokorb® T type K-WO: Product section

Old

Balcony ... **Slab**
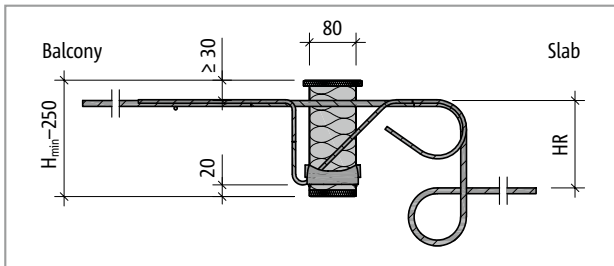
Fig. 66: Schöck Isokorb® T type K-BH: Product section

New

Balcony ... **Slab**
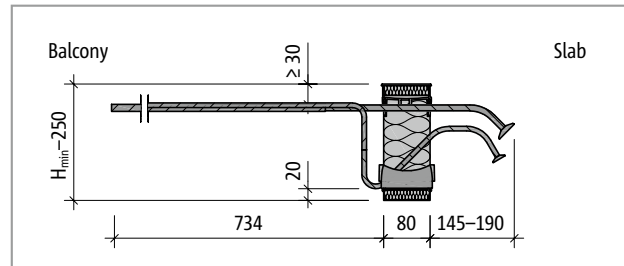
Fig. 67: Schöck Isokorb® T type K-O: Product section

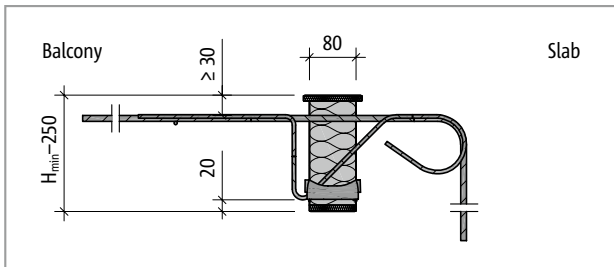**Balcony** ... **Slab**

Fig. 68: Schöck Isokorb® T type K-WU: Product section

ℹ Product change

- The Schöck Isokorb® T type K-HV and the Schöck Isokorb® T type K-WO can be replaced by the Schöck Isokorb® T type K-U.
- The Schöck Isokorb® T type K-BH and the Schöck Isokorb® T type K-WU can be replaced by the Schöck Isokorb® T type K-O.

T type
K-O
K-U

Reinforced concrete – reinforced concrete

Balcony with height offset downwards with Schöck Isokorb® T type K

ℹ Height offset $h_V \leq h_D - c_a - d_s - c_i$

- If $h_V \leq h_D - c_a - d_s - c_i$ then the Schöck Isokorb® T type K with straight tension bar can be selected.

h_V = height offset
h_D = floor thickness
c_a = concrete cover outside
d_s = diameter tension bar Isokorb
c_i = required concrete cover inside
H = Isokorb® height

Example: Schöck Isokorb® T type K-M5-CV35
h_D = 180 mm, c_a = 35 mm, d_s = 8 mm, c_i = 30 mm
max. h_V = 180 - 35 - 8 - 30 = 107 mm

- Recommendation: Downstand beam width at least 220 mm
- With floor-side arrangement of element slabs for c_i the element slab thickness + $\varnothing_s$ is to be applied.
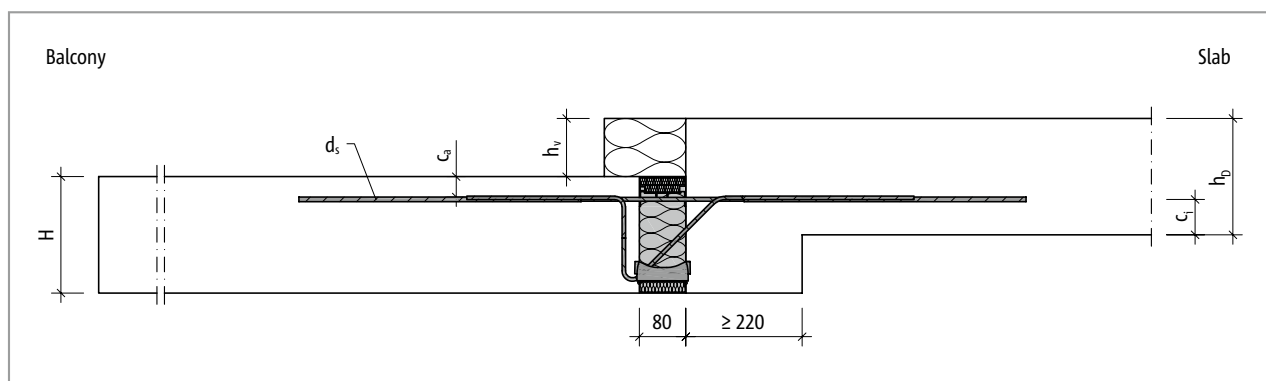

Fig. 69: Schöck Isokorb® T type K: Smaller height offset downwards (balcony lying lower)

ℹ Height offset $h_V > h_D - c_a - d_s - c_i$

If the condition $h_V \leq h_D - c_a - d_s - c_i$ is not met, the connection can be implemented using Schöck Isokorb® T type K-U.

T type
K-O
K-U

Reinforced concrete – reinforced concrete

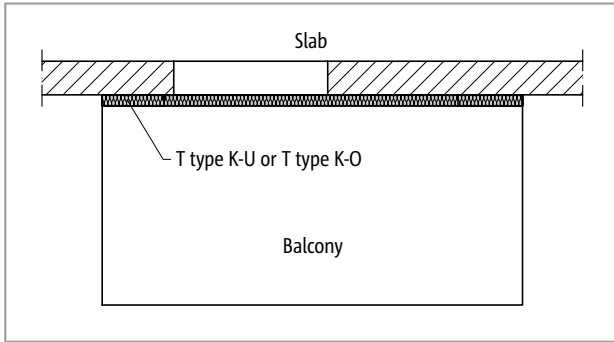# Element arrangement | Installation cross sections

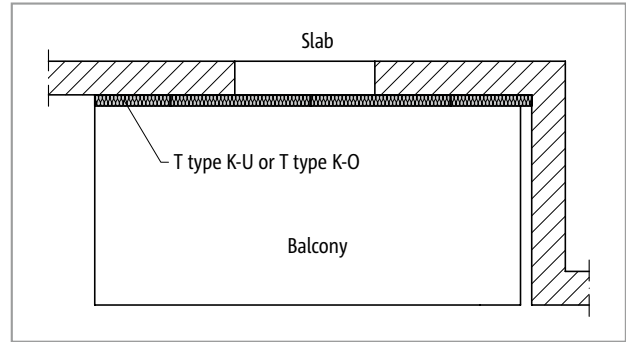*Fig. 70: Schöck Isokorb® T type K-U/K-O: Cantilevered balcony*

Fig. 71: Schöck Isokorb® T type K-U/K-O: Balcony with façade offset
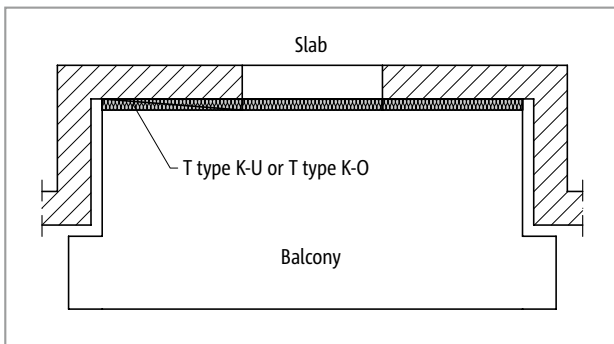
Fig. 72: Schöck Isokorb® T type K-U/K-O: Balcony with façade recess
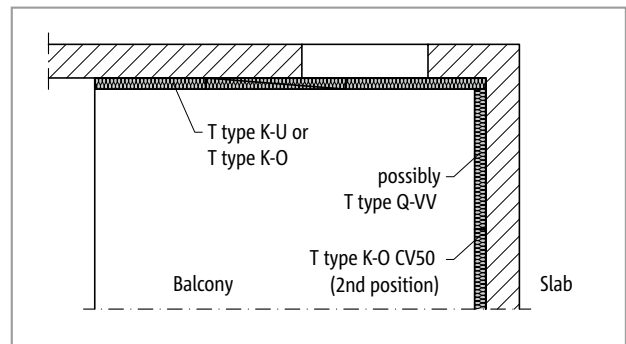
Fig. 73: Schöck Isokorb® T type K-U/K-O, T type Q-VV: Balcony with inside corner, double-faced supported

Balcony with height offset upwards

Fig. 74: Schöck Isokorb® T type K-O: Balcony with height offset upwards and external insulation

Balcony with height offset downwards
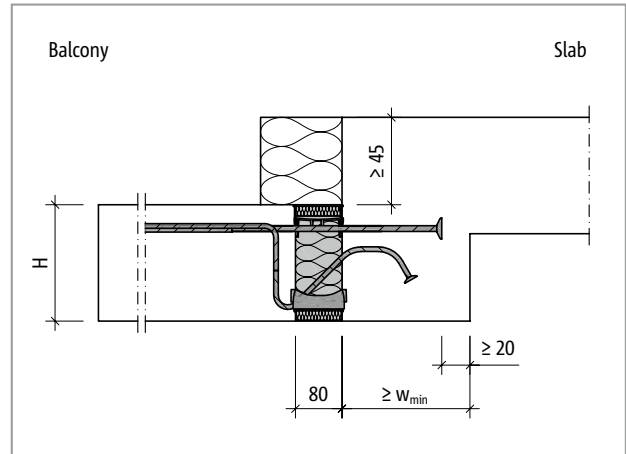
Fig. 75: Schöck Isokorb® T type K-U: Balcony with height offset downwards and external insulation

T type
K-O
K-U

Reinforced concrete – reinforced concrete

Installation cross sections

Wall connection upwards
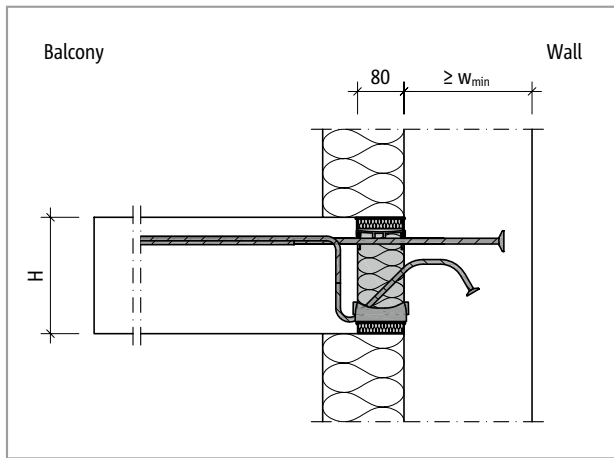
Fig. 76: Schöck Isokorb® T type K-U: Wall connection upwards with external insulation

Wall connection downwards

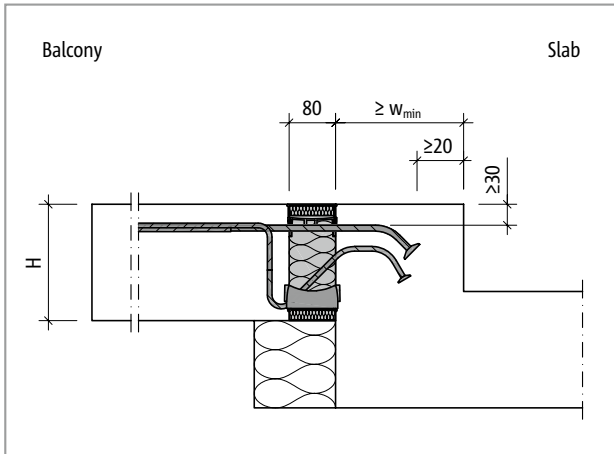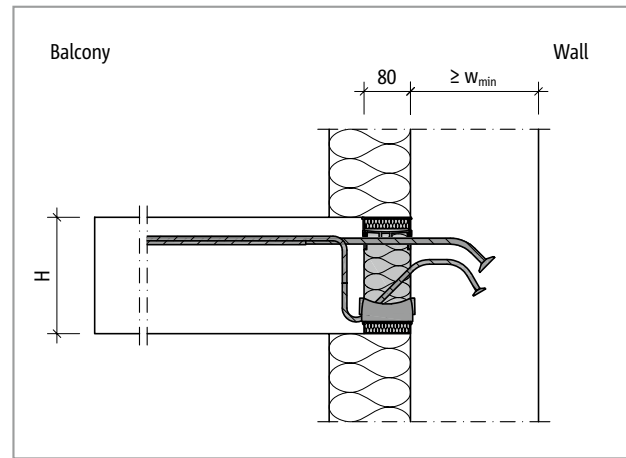Fig. 77: Schöck Isokorb® T type K-O: Wall connection downwards with external insulation
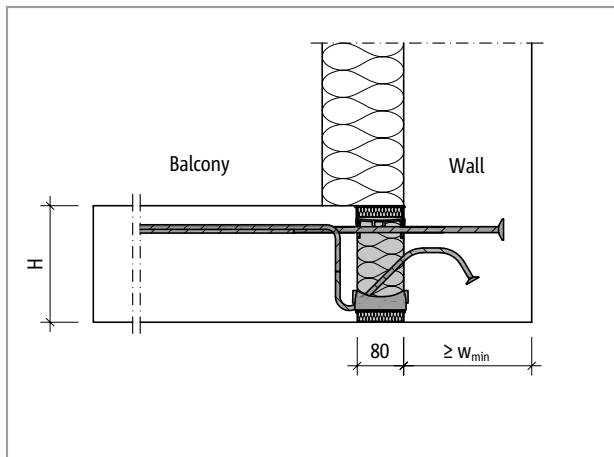
Fig. 78: Schöck Isokorb® T type K-U: Wall connection upwards with external insulation
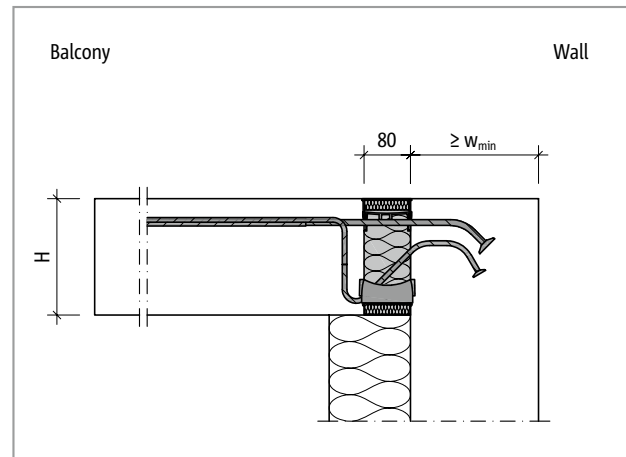
Fig. 79: Schöck Isokorb® T type K-O: Wall connection downwards with external insulation

ℹ Geometry

- The use of the Schöck Isokorb® T types K-U and K-O requires a minimum wall thicknesss and a minimum girder width of 175 mm.
- Depending on the Schöck Isokorb® type selected and on the selected Isokorb® height, a minimum component dimension of w_{min} is required (see page 58).
- A minimum concrete cover of 60 mm above the anchor head must be complied with.

T type
K-O
K-U

Reinforced concrete – reinforced concrete

Product selection | Type designations | Special designs

Schöck Isokorb® T type K-U variants

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

- Main load-bearing level: M1 to M4
- Secondary load-bearing level: V1
- Fire resistance class:
  REI120 (standard):
- Concrete cover of the tension bars:
  CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm
- Embedded length: LR = 155 mm to 220 mm; depends on the Isokorb® height, see page 58.
- Insulating element thickness:
  X80 = 80 mm
- Isokorb® height:
  H = 160 to 250 mm for concrete cover CV30, CV35
  H = 180 to 250 mm for concrete cover CV50
- Generation: 7.2

Type designations in planning documents

Schöck Isokorb® model	
Type	
Connection variant	
Main load-bearing level	
Secondary load-bearing level	
Fire protection	
Concrete cover	
Embedded length	
Insulating element thickness	
Isokorb® height	
Generation	

T Type K‑U‑M1‑V1‑REI120‑CV35‑LR180‑X80‑H200‑7.2

ℹ **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).
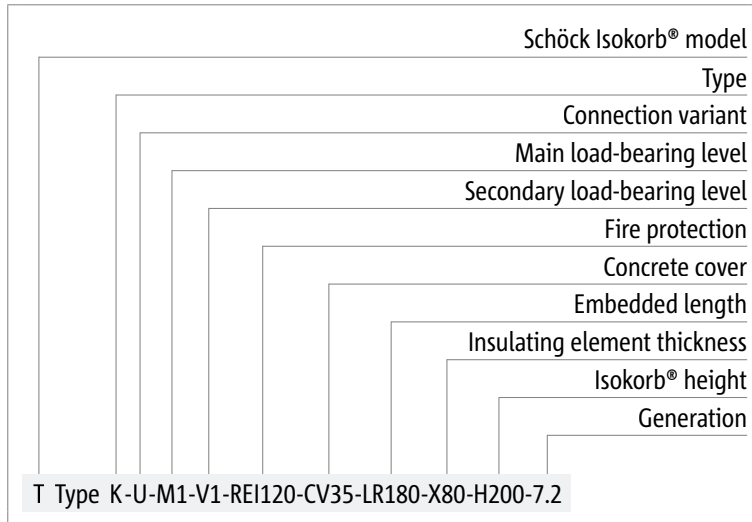
Product selection | Type designations | Special designs

Schöck Isokorb® T type K-O variants

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

- Main load-bearing level: M1 to M4
- Secondary load-bearing level: V1
- Fire resistance class:
  REI120 (standard):
- Concrete cover of the tension bars:
  CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm
- Embedded length: LR = 145 mm to 190 mm; depends on the Isokorb® height, see page 58.
- Insulating element thickness:
  X80 = 80 mm
- Isokorb® height:
  H = 160 to 250 mm for concrete cover CV30, CV35
  H = 180 to 250 mm for concrete cover CV50
- Generation: 7.2

Type designations in planning documents

		Schöck Isokorb® model
		Type
		Connection variant
		Main load-bearing level
		Secondary load-bearing level
		Fire protection
		Concrete cover
		Embedded length
		Insulating element thickness
		Isokorb® height
		Generation

T Type K-O-M1-V1-REI120-CV35-LR145-X80-H200-7.2

ℹ 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).
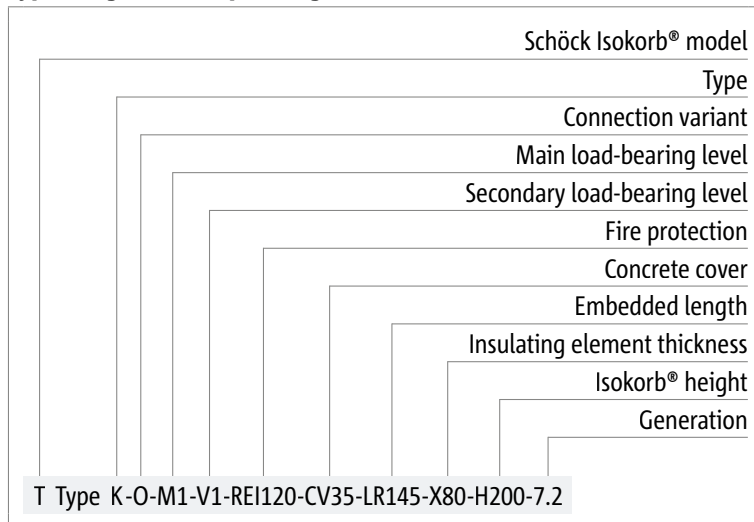
T type
K-O
K-U

Reinforced concrete – reinforced concrete

Minimum component dimensions

Schöck Isokorb® T type K-O		M1–M4			
Minimum structural component dimension for		CV30/CV35		CV50	
		w_{min} [mm]	LR [mm]	w_{min} [mm]	LR [mm]
Isokorb® height H [mm]	160	175	145	-	-
	170	175	145	-	-
	180	175	145	175	145
	190	175	145	175	145
	200	175	145	175	145
	210	175	145	175	145
	220	190	170	175	145
	230	190	170	175	145
	240	210	190	190	170
	250	210	190	190	170

Schöck Isokorb® T type K-U		M1–M4			
Minimum structural component dimension for		CV30/CV35		CV50	
		w_{min} [mm]	LR [mm]	w_{min} [mm]	LR [mm]
Isokorb® height H [mm]	160	175	155	-	-
	170	175	155	-	-
	180	175	155	175	155
	190	175	155	175	155
	200	200	180	175	155
	210	200	180	175	155
	220	220	200	200	180
	230	220	200	200	180
	240	240	220	220	200
	250	240	220	220	200

T type
K-O
K-U

Reinforced concrete – reinforced concrete

Design

ℹ Notes on design

- With CV50, H = 180 mm is the lowest Isokorb® height, this requires a minimum slab thickness of h = 180 mm.
- The use of the Schöck Isokorb® T types K-U and K-O requires a minimum wall thicknesss and a minimum girder width of 175 mm.
- The employment of the Schöck Isokorb® T types K-U and K-O with further connection situations (175 mm ≤ $w_{previously}$ < w_{min}) is possible taking into consideration reduced load-bearing capacity. Please make contact the Schöck Design Department (see page3).
- Depending on the Schöck Isokorb® type selected and on the selected Isokorb® height, a minimum component dimension of w_{min} is required (see page 58).
- The design values for Schöck Isokorb® T type K-U depend on the exisiting girder width and wall thickness (w_{exist}).
- A minimum concrete cover of 60 mm above the anchor head must be complied with.
- Direction of the load application in the neighbouring structural element determines the Isokorb® connection variant.
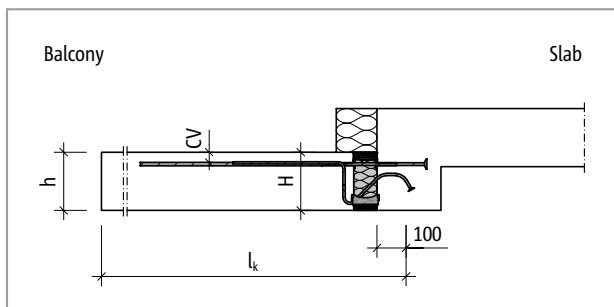

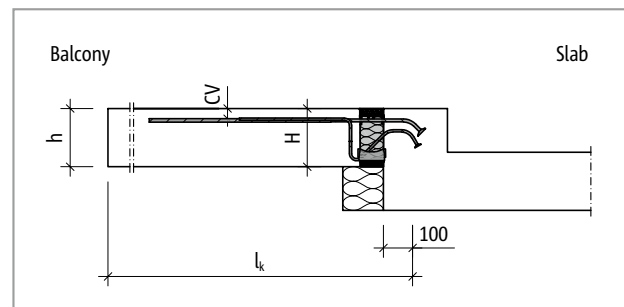Fig. 80: Schöck Isokorb® T type K-U: Static system

Fig. 81: Schöck Isokorb® T type K-O: Static system

C25/30 design

Design table T type K-U

Schöck Isokorb® T type K-U				M1	M2	M3	M4
Design values with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30			
				200 mm > downstand beam width ≥ 175 mm 200 mm > wall thickness ≥ 175 mm			
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]		160		-16.3	-20.9	-27.6	-31.6
	160		180	-17.3	-22.2	-29.4	-33.5
		170		-18.3	-23.5	-31.1	-35.5
	170		190	-19.3	-24.8	-32.8	-37.4
		180		-20.3	-26.1	-34.5	-39.4
	180		200	-21.3	-27.4	-36.2	-41.3
		190		-22.3	-28.7	-37.9	-43.3
	190		210	-23.3	-30.0	-39.6	-45.2
				$v_{Rd,z}$ [kN/m]			
Secondary load-bearing level		V1		61.7	92.5	92.5	92.5

Schöck Isokorb® T type K-U				M1	M2	M3	M4
Design values with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30			
				220 mm > downstand beam width ≥ 200 mm 220 mm > wall thickness ≥ 200 mm			
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]		160		-16.6	-22.9	-30.2	-34.5
	160		180	-17.6	-24.3	-32.1	-36.7
		170		-18.7	-25.7	-33.9	-38.8
	170		190	-19.8	-27.1	-35.8	-40.9
		180		-20.9	-28.5	-37.7	-43.1
	180		200	-22.0	-30.0	-39.5	-45.2
		190		-23.1	-31.4	-41.4	-47.3
	190		210	-24.2	-32.8	-43.3	-49.5
		200		-25.3	-34.2	-45.1	-51.6
	200		220	-26.4	-35.6	-47.0	-53.7
		210		-27.6	-37.0	-48.9	-55.9
	210		230	-28.7	-38.4	-50.7	-58.0
				$v_{Rd,z}$ [kN/m]			
Secondary load-bearing level		V1		61.7	92.5	92.5	92.5

ℹ Notes on design

- Static system and information on the design see page 59.

C25/30 design

Design table T type K-U

Schöck Isokorb® T type K-U				M1	M2	M3	M4
Design values with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30			
				240 mm > downstand beam width ≥ 220 mm 240 mm > wall thickness ≥ 220 mm			
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]		160		-16.6	-24.4	-32.2	-36.8
	160		180	-17.6	-25.9	-34.2	-39.1
		170		-18.7	-27.4	-36.2	-41.3
	170		190	-19.8	-28.9	-38.2	-43.6
		180		-20.9	-30.4	-40.2	-45.9
	180		200	-22.0	-31.9	-42.1	-48.2
		190		-23.1	-33.4	-44.1	-50.4
	190		210	-24.2	-34.9	-46.1	-52.7
		200		-25.3	-36.4	-48.1	-55.0
	200		220	-26.4	-37.9	-50.1	-57.2
		210		-27.6	-39.4	-52.1	-59.5
	210		230	-28.7	-40.9	-54.1	-61.8
		220		-29.9	-42.5	-56.1	-64.1
	220		240	-31.0	-44.0	-58.0	-66.3
		230		-32.2	-45.5	-59.6	-68.1
	230		250	-33.3	-47.0	-59.6	-68.1
				$v_{Rd,z}$ [kN/m]			
Secondary load-bearing level	V1			61.7	92.5	92.5	92.5

ℹ Notes on design
- Static system and information on the design see page 59.

T type K-O K-U

Reinforced concrete – reinforced concrete

C25/30 design

Design table T type K-U

Schöck Isokorb® T type K-U				M1	M2	M3	M4
Design values with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30			
				Downstand beam width ≥ 240 mm wall thickness ≥ 240 mm			
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]		160		-16.6	-24.5	-32.5	-39.0
	160		180	-17.6	-26.1	-34.5	-41.4
		170		-18.7	-27.7	-36.6	-43.8
	170		190	-19.8	-29.3	-38.7	-46.2
		180		-20.9	-30.9	-40.8	-48.6
	180		200	-22.0	-32.5	-42.9	-51.0
		190		-23.1	-34.1	-45.1	-53.4
	190		210	-24.2	-35.7	-47.2	-55.8
		200		-25.3	-37.4	-49.3	-58.3
	200		220	-26.4	-39.0	-51.5	-60.7
		210		-27.6	-40.7	-53.7	-63.1
	210		230	-28.7	-42.3	-55.8	-65.5
		220		-29.9	-44.0	-58.0	-67.9
	220		240	-31.0	-45.6	-60.1	-70.3
		230		-32.2	-47.3	-62.4	-72.2
	230		250	-33.3	-49.0	-63.2	-72.2
		240		-34.5	-50.7	-63.2	-72.2
	240			-35.6	-52.3	-63.2	-72.2
		250		-36.8	-54.1	-63.2	-72.2
	250			-38.0	-55.7	-63.2	-72.2
$v_{Rd,z}$ [kN/m]							
Secondary load-bearing level		V1		61.7	92.5	92.5	92.5

Schöck Isokorb® T type K-U	M1	M2	M3	M4
Placement with	Isokorb® length [mm]			
	1000	1000	1000	1000
Tension bars	4 Ø 12	6 Ø 12	8 Ø 12	10 Ø 12
Anchor bars	4 Ø 10	6 Ø 10	8 Ø 10	10 Ø 10
Shear force bars V1	4 Ø 8	6 Ø 8	6 Ø 8	6 Ø 8
Pressure bearing [piece]	7	9	14	16
Special stirrup [piece]	-	-	4	4

ℹ **Notes on design**

■ Static system and information on the design see page 59.

C25/30 design

Design table T type K-O

Schöck Isokorb® T type K-O				M1	M2	M3	M4
Design values with	Concrete cover CV [mm]			Concrete strength class ≥ C25/30			
				Downstand beam width ≥ 175 mm wall thickness ≥ 175 mm			
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]		160		-16.6	-24.3	-30.4	-40.4
	160		180	-17.6	-25.8	-32.2	-42.9
		170		-18.7	-27.3	-34.1	-45.6
	170		190	-19.8	-28.8	-36.0	-48.1
		180		-20.9	-30.3	-37.8	-50.8
	180		200	-22.0	-31.8	-39.7	-53.3
		190		-23.1	-33.3	-41.6	-56.0
	190		210	-24.2	-34.8	-43.5	-58.6
		200		-25.3	-36.3	-45.3	-61.3
	200		220	-26.4	-37.8	-47.2	-63.9
		210		-27.6	-39.3	-49.1	-66.6
	210		230	-28.7	-40.8	-51.0	-69.2
Design values with	Concrete cover CV [mm]			Downstand beam width ≥ 190 mm wall thickness ≥ 190 mm			
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]		220		-29.9	-42.3	-52.8	-71.7
	220		240	-31.0	-43.8	-54.7	-74.3
		230		-32.2	-45.3	-56.6	-76.8
	230		250	-33.3	-46.8	-58.4	-79.4
Design values with	Concrete cover CV [mm]			Downstand beam width ≥ 210 mm wall thickness ≥ 210 mm			
	CV30	CV35	CV50	$m_{Rd,y}$ [kNm/m]			
Isokorb® height H [mm]		240		-34.5	-48.3	-60.3	-81.9
	240			-35.6	-49.8	-62.2	-84.5
		250		-36.8	-51.3	-64.1	-87.0
	250			-38.0	-52.8	-65.9	-89.6
				$v_{Rd,z}$ [kN/m]			
Secondary load-bearing level		V1		61.7	92.5	92.5	92.5

Schöck Isokorb® T type K-O	M1	M2	M3	M4
Placement with	Isokorb® length [mm]			
	1000	1000	1000	1000
Tension bars	4 Ø 12	6 Ø 12	8 Ø 12	10 Ø 12
Anchor bars	4 Ø 10	6 Ø 10	8 Ø 10	10 Ø 10
Shear force bars	4 Ø 8	6 Ø 8	6 Ø 8	6 Ø 8
Pressure bearing [piece]	6	8	10	16
Special stirrup [piece]	-	-	-	4

ℹ **Notes on design**

■ Static system and information on the design see page 59.

T type K-O K-U

Reinforced concrete – reinforced concrete

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®

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

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)

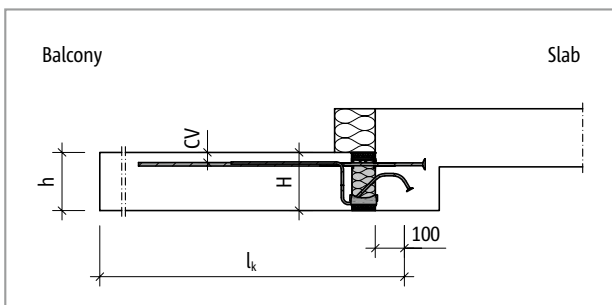m_{Rd} = maximum design moment [kNm/m] of the Schöck Isokorb®

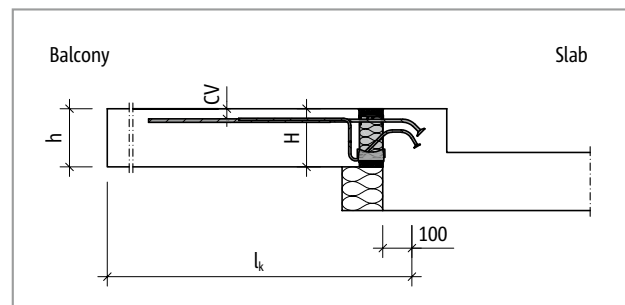Fig. 82: Schöck Isokorb® T type K-U: Static system

Fig. 83: Schöck Isokorb® T type K-O: Static system

T type
K-O
K-U

Reinforced concrete – reinforced concrete

Deflection/Camber

Schöck Isokorb® T type		K-O		
Deflection factors when		CV30	CV35	CV50
		$w_{exist} \geq 175$ mm		
		tan α [%]		
Isokorb® height	160	1.1	1.1	-
	170	0.9	1.0	-
	180	0.9	0.9	1.1
	190	0.8	0.8	0.9
	200	0.7	0.7	0.9
	210	0.7	0.7	0.8
	220	0.7	0.6	0.7
	230	0.6	0.6	0.7
	240	0.5	0.6	0.6
	250	0.5	0.5	0.6

Schöck Isokorb® T type		K-U		
Deflection factors when		CV30	CV35	CV50
		$w_{exist} \geq 175$ mm		
		tan α [%]		
Isokorb® height	160	1.0	1.1	-
	170	0.9	1.0	-
	180	0.8	0.9	1.0
	190	0.8	0.8	0.9
	200	0.7	0.7	0.8
	210	0.6	0.7	0.8
	220	0.6	0.6	0.7
	230	0.6	0.6	0.6
	240	0.5	0.5	0.6
	250	0.5	0.5	0.6

Notes on deformation

- The design values for Schöck Isokorb® T type K-U depend on the exisiting downstand beam width and wall thickness (w_{exist}).
- The minimum structural element dimension w_{min} = 240 mm for CV30 and CV35 is to be complied with for H ≥ 240 mm.

Slenderness

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-U K-O		
Maximum cantilever length with		CV30	CV35	CV50
		$l_{k,max}$ [m]		
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
- Concrete weight density γ = 25 kN/m³
- Dead weight of the balcony surfacing $g_2 \leq 1.2$ kN/m²
- Balcony rail $g_R \leq 0.75$ kN/m
- Service load q = 4.0 kN/m² with the coefficient $\psi_{2,i}$ = 0.3 for the quasi-permanent combination

ℹ 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 structural element length exceeds the maximum expansion joint spacing e, then expansion joints must be incorporated into the external concrete components at right angles to the insulating layer in order to limit the effect as a result of temperature changes. The maximum expansion joint spacing e/2 applies to fixed points such as balcony corners or to the use of the Schöck Isokorb® T types H.

The shear force transmission in the expansion joint can be ensured using a longitudinally displaceable shear force dowel, e.g. Schöck Dorn.
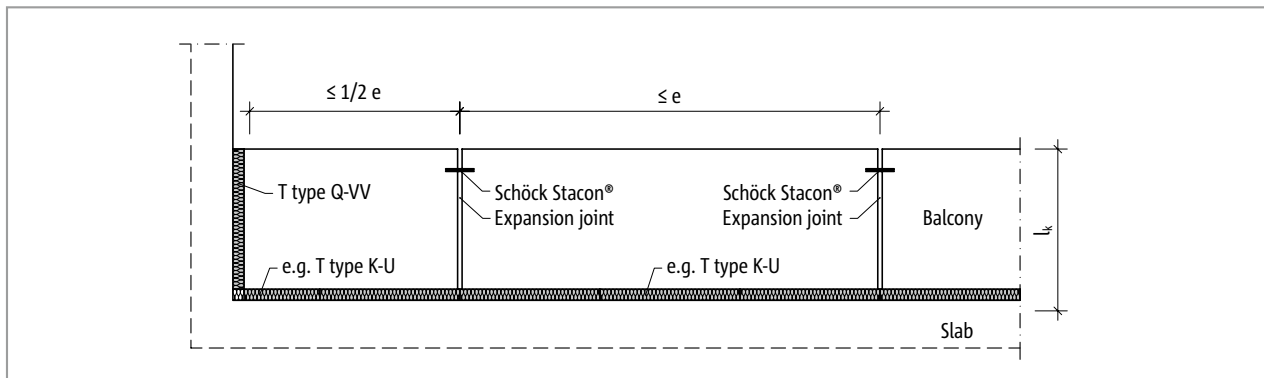

Fig. 84: Schöck Isokorb® T type K-U: Expansion joint layout

Schöck Isokorb® T type K-U/O		M1–M4
Maximum expansion joint spacing when		e [m]
Insulating element thickness [mm]	80	13.0

ℹ 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 expansion joint the following applies: $e_R \geq 50$ mm and $e_R \leq 150$ mm.
- For the centre distance of the shear force bars from the free edge or from the expansion joints the following applies: $e_R \geq 100$ mm and $e_R \leq 150$ mm.
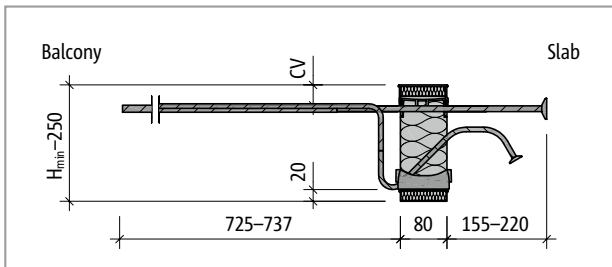
Product description

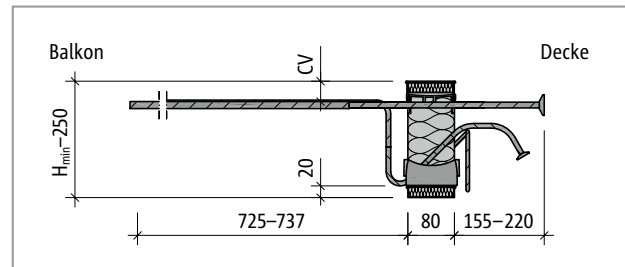Fig. 85: Schöck Isokorb® T type K-U-M2: Product section

Fig. 86: Schöck Isokorb® T type K-U-M4: Product section

Fig. 87: Schöck Isokorb® T type K-U-M2: Product layout

Fig. 88: Schöck Isokorb® T type K-U-M4: Product layout

ℹ Product information

- Download further product plan views and cross-sections at www.schoeck.com/en-gb/download
- Minimum height Schöck Isokorb® T type K-U: H_{min} = 160 mm
- On-site spacing of the Schöck Isokorb® type K-U possible at the unreinforced points; take into account reduced load-bearing capacity due to spacing; take into account required edge distances
- Concrete cover of the tension bars: CV30 = 30 mm, CV35 = 35 mm, CV50 = 50 mm

T type
K-O
K-U

Reinforced concrete – reinforced concrete

Product description
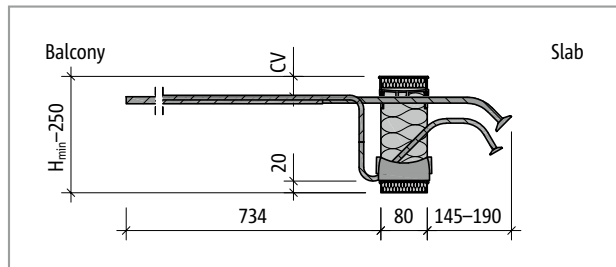
Fig. 89: Schöck Isokorb® T type K-O-M2: Product section
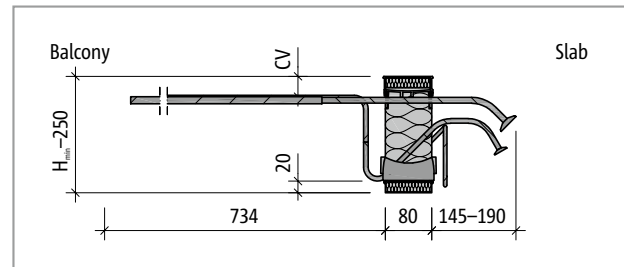
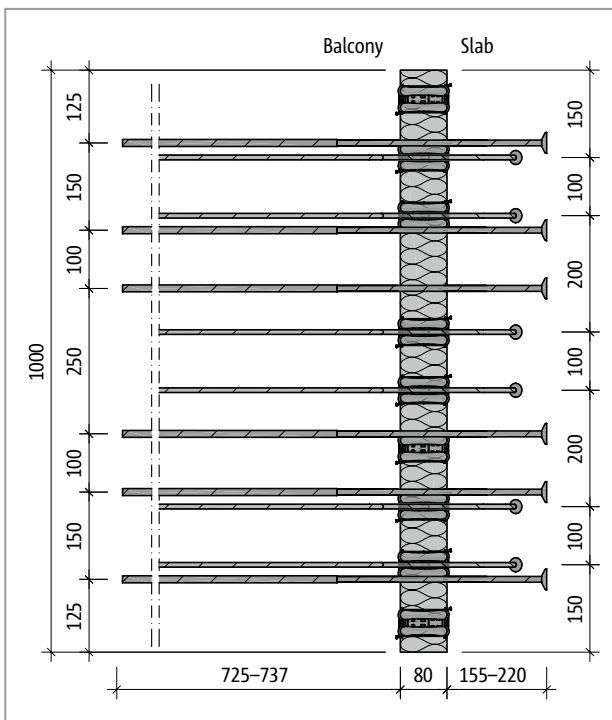Fig. 90: Schöck Isokorb® T type K-O-M4: Product section
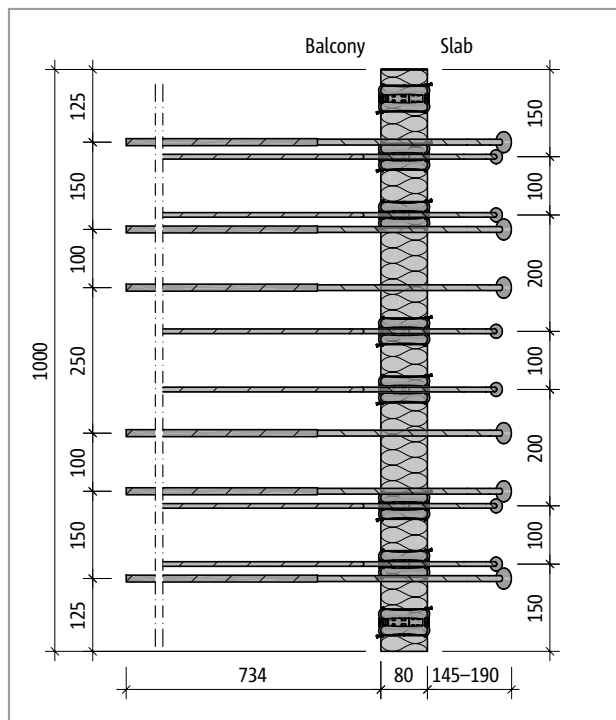
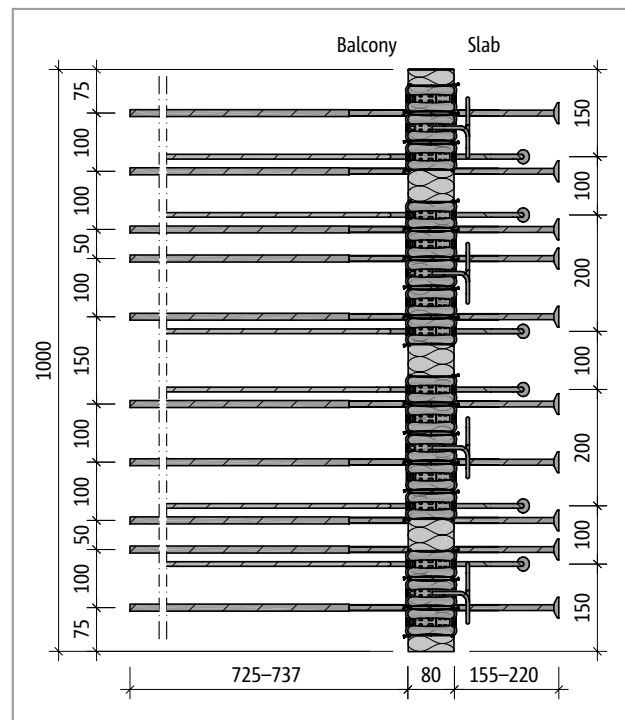

Fig. 91: Schöck Isokorb® T type K-O-M2: Product layout
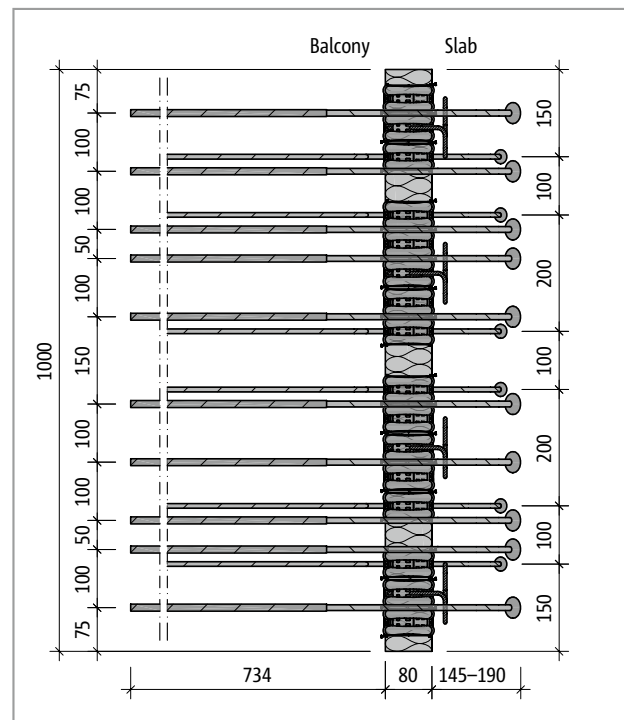
Fig. 92: Schöck Isokorb® T type K-O-M4: Product layout

ℹ Product information

- Download further product plan views and cross-sections at www.schoeck.com/en-gb/download
- Minimum height Schöck Isokorb® T type K-O: H_{min} = 160 mm
- On-site spacing of the Schöck Isokorb® type K-O possible at the unreinforced points; take into account reduced load-bearing capacity due to 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 – Schöck Isokorb® T type K

Fig. 93: Schöck Isokorb® T type K: On-site reinforcement for small height offset

On-site reinforcement – Schöck Isokorb® T type K

Recommendation for the on-site connection reinforcement

Information on the on-site reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment and the shear force with C25/30. The required reinforcement cross-section depends on the bar diameter of the steel bar or wire-mesh reinforcement.

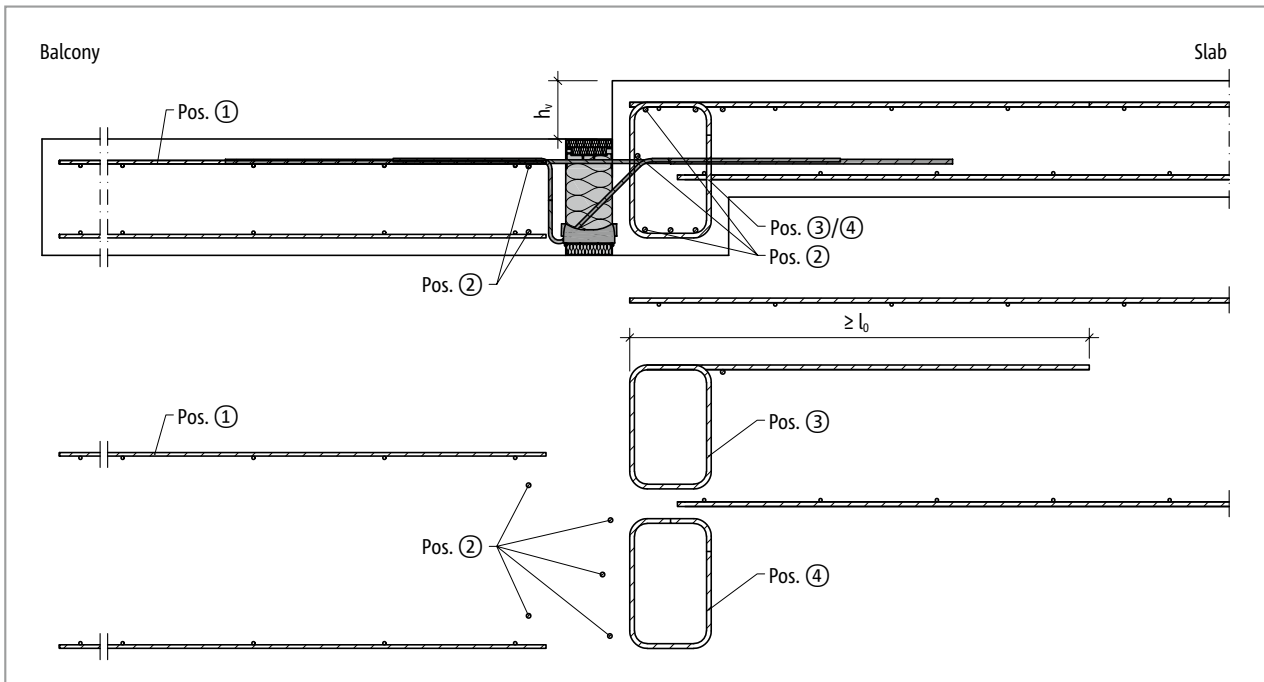| Schöck Isokorb® T type K			M1		M2		M3		
			V1	V2	V1	V2	V1	V2	V3
On-site reinforcement	Location	Height [mm]	Floor (XC1) concrete strength class ≥ C25/30 Balcony (XC4) concrete strength class ≥ C25/30						
Overlap reinforcement depending on bar diameter									
Pos. 1 with H8 [mm²/m]	Balcony side	160–250	242	215	443	416	578	544	564
Pos. 1 with H10 [mm²/m]			271	252	476	457	619	596	641
Pos. 1 with H12 [mm²/m]			325	302	571	548	743	715	769
Steel bars along the insulation joint									
Pos. 2	Balcony side	160–250	2 · H8						
	Floor side		3 · H8						
Stirrup reinforcement for redirection of the tension force (single-shear chargeable)									
Pos. 3 [mm²/m]	Floor side	160	235	266	422	453	510	549	621
		250	375	406	698	730	845	884	969
Stirrup reinforcement acc. to shear force design									
Pos. 4	Floor side	160–250	Stirrup reinforcement according to BS EN 1992-1-1 (EC2), 6.2.3, 9.2.2						

Schöck Isokorb® T type K			M4				M5				M6			
			V1	V2	V3	VV1	V1	V2	V3	VV1	V1	V2	V3	VV1
On-site reinforcement	Location	Height [mm]	Floor (XC1) concrete strength class ≥ C25/30 Balcony (XC4) concrete strength class ≥ C25/30											
Overlap reinforcement depending on bar diameter														
Pos. 1 with H8 [mm²/m]	Balcony side	160–250	655	622	622	704	757	724	775	754	861	827	844	880
Pos. 1 with H10 [mm²/m]			698	675	699	717	802	779	856	768	908	884	915	880
Pos. 1 with H12 [mm²/m]			838	810	839	861	963	934	1027	922	1089	1061	986	880
Steel bars along the insulation joint														
Pos. 2	Balcony side	160–250	2 · H8											
	Floor side		3 · H8											
Stirrup reinforcement for redirection of the tension force (single-shear chargeable)														
Pos. 3 [mm²/m]	Floor side	160	582	621	674	480	679	718	821	528	780	819	889	653
		250	970	1009	1062	926	1140	1179	1320	1012	1319	1356	1441	1233
Stirrup reinforcement acc. to shear force design														
Pos. 4	Floor side	160–250	Stirrup reinforcement according to BS EN 1992-1-1 (EC2), 6.2.3, 9.2.2											

T type K-O K-U

Reinforced concrete – reinforced concrete

On-site reinforcement – Schöck Isokorb® T type K

Schöck Isokorb® T type K			M7			M8		
			V1	V2	VV1	V1	V2	VV1
On-site reinforcement	Location	Height [mm]	Floor (XC1) concrete strength class ≥ C25/30 Balcony (XC4) concrete strength class ≥ C25/30					
Overlap reinforcement depending on bar diameter								
Pos. 1 with H8 [mm²/m]	Balcony side	160–250	959	959	990	1068	1068	1100
Pos. 1 with H10 [mm²/m]			1013	1030	990	1130	1139	1100
Pos. 1 with H12 [mm²/m]			1066	1102	990	1192	1210	1100
Steel bars along the insulation joint								
Pos. 2	Balcony side	160–250	2 · H8					
	Floor side		3 · H8					
Stirrup reinforcement for redirection of the tension force (single-shear chargeable)								
Pos. 3 [mm²/m]	Floor side	160	970	1005	819	1102	1120	935
		250	1615	1651	1490	1841	1859	1704
Stirrup reinforcement acc. to shear force design								
Pos. 4	Floor side	160–250	Stirrup reinforcement according to BS EN 1992-1-1 (EC2), 6.2.3, 9.2.2					

ℹ Information about on-site reinforcement

- Due to the reinforcement density in the beam application is only recommended up to T type K-M8.
- 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.
- For the redirection of the tension force on the floor-side, a stirrup reinforcement Pos. 3 is required in the floor edge beam (upper side length $l_{0,bü}$). This stirrup reinforcement Pos.3 safeguards the load transmission from the Schöck Isokorb®.
- The shear force reinforcement Pos. 4 is based on the loading of balcony, floor and the supporting width of the downstand/upstand beam. Therefore, the shear force reinforcement is to be verified by the structural engineer case by case.
- The required lateral reinforcement in the overlap area is to be verified according to BS EN 1992-1-1 (EC2), 8.7 to 8.8 and BS EN 1992-1-1/NA, NDPs nd NCIs to 8.7 and 8.8.
- The Schöck Isokorb® T type K is to be placed as necessary before the installation of the downstbeam and or upstand beam reinforcement.
- Pos. 3: Values for the Isokorb® height between 160 mm and 250 mm may be interpolated.
- Pos. 3: For larger downstand beam widths a reduction of the required reinforcement acc. to the structural engineer's details is possible.
- The indicative minimum concrete strength class of the external structural component is C32/40.

On-site reinforcement – Schöck Isokorb® T type K-U

Fig. 94: Schöck Isokorb® T type K-U: On-site reinforcement for balcony with height offset downwards with minimum structural element dimension (w_{exist}= w_{min})

Fig. 95: Schöck Isokorb® T type K-U: On-site reinforcement for balcony with height offset downwards with larger structural element dimension (w_{exist}= w_{min})

T type
K-O
K-U

Reinforced concrete – reinforced concrete

On-site reinforcement – Schöck Isokorb® T type K-U

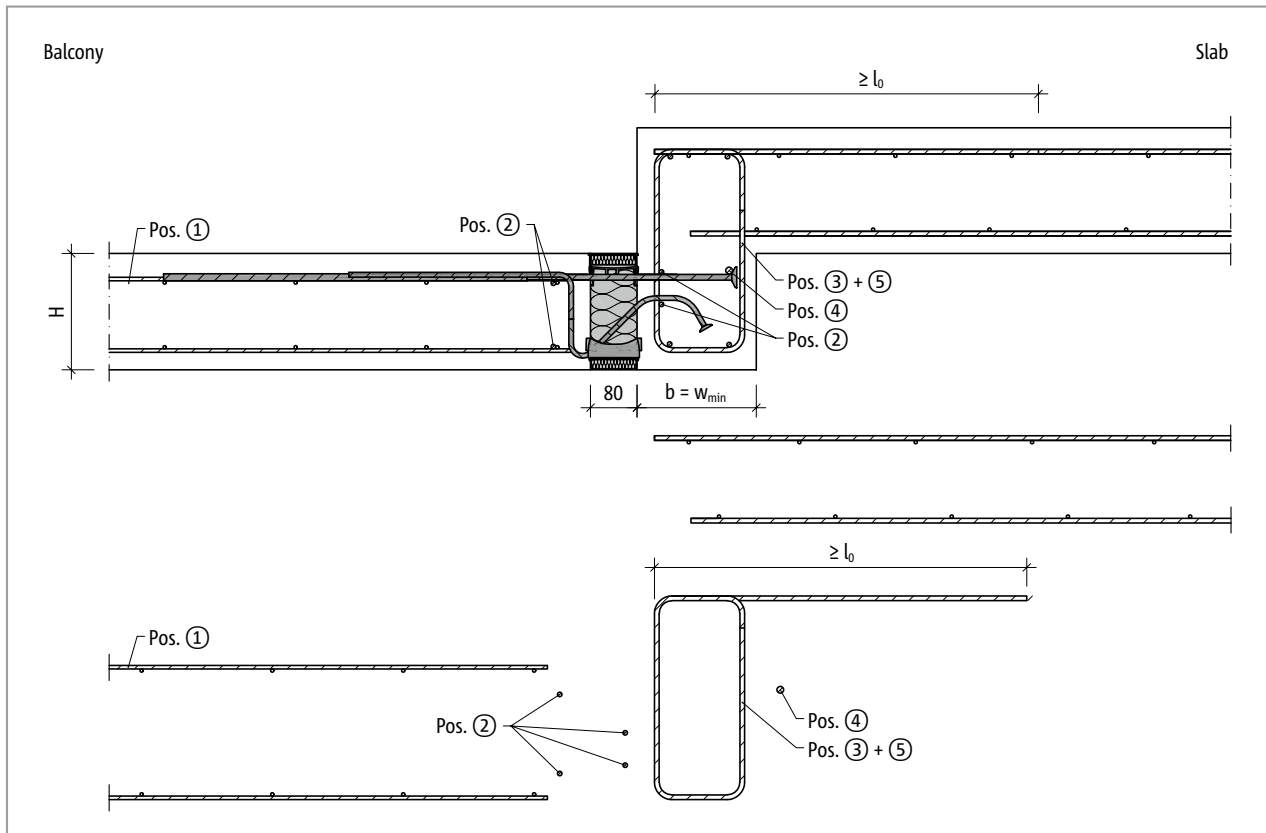*Fig. 96: Schöck Isokorb® T type K-U: On-site reinforcement for wall connection with minimum structural element dimension ($w_{exist} = w_{min}$)*

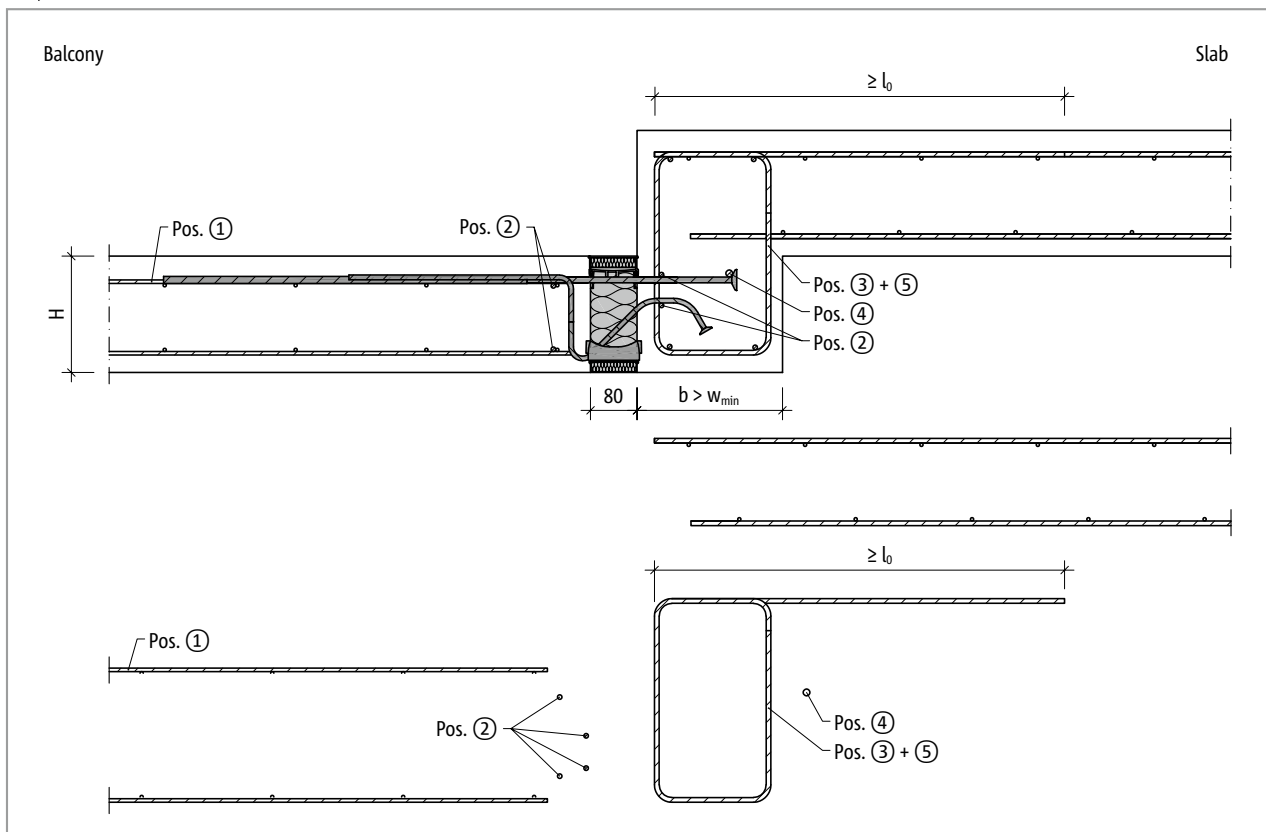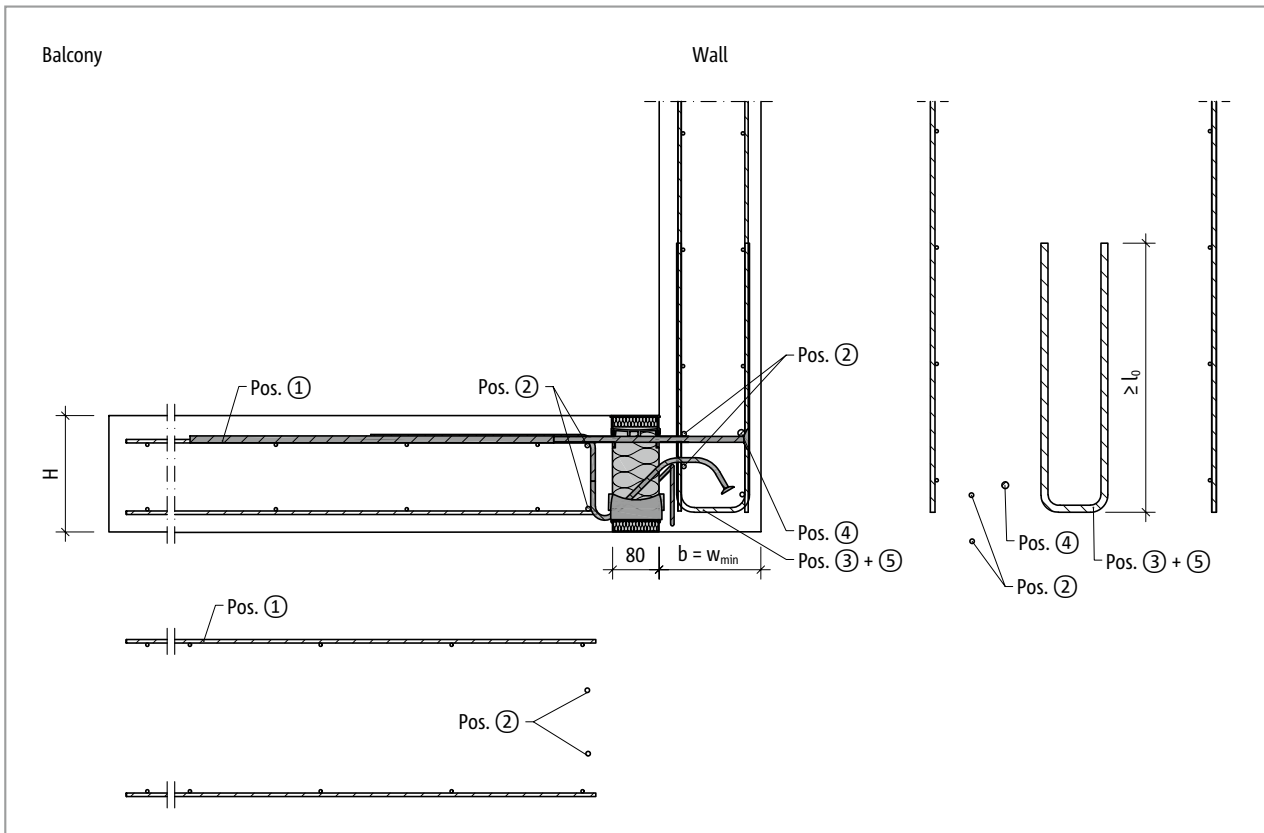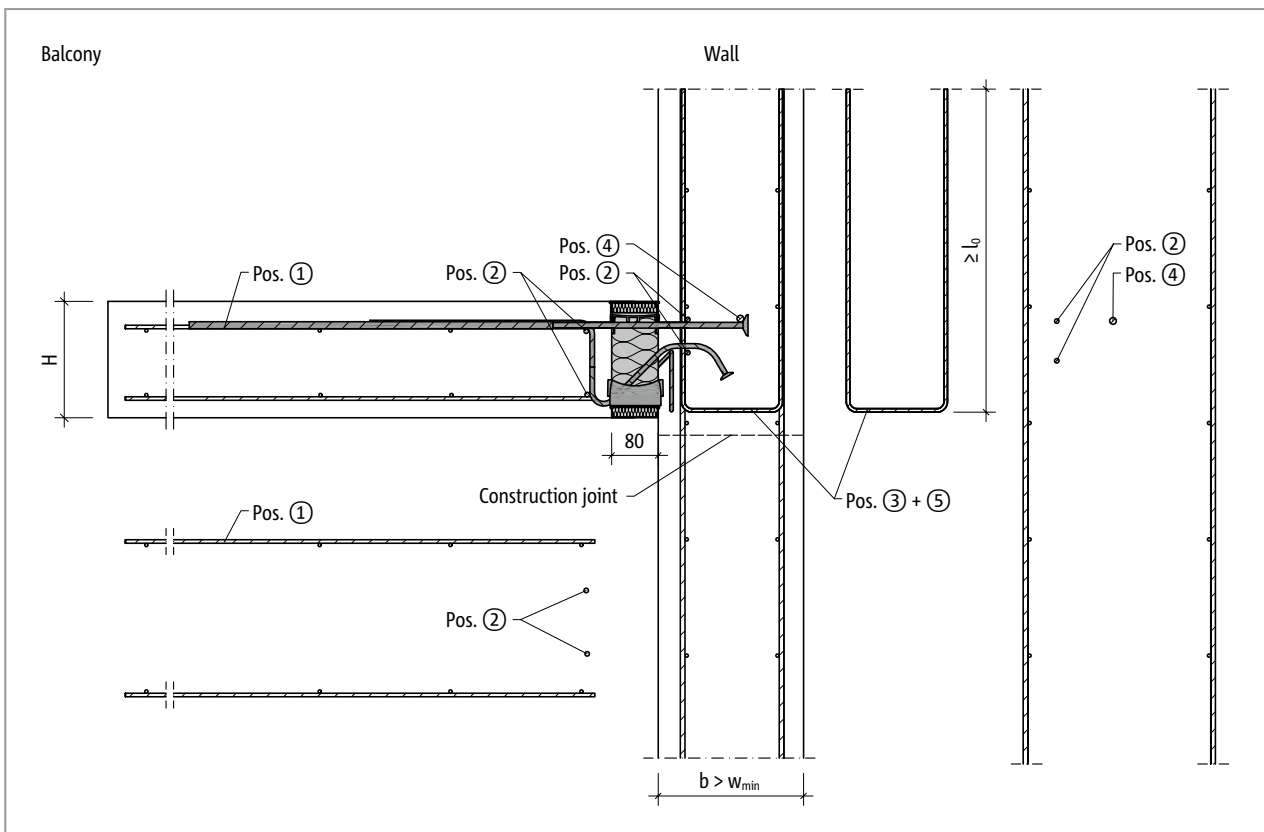*Fig. 97: Schöck Isokorb® T type K-U: On-site reinforcement for wall connection upwards with larger structural element dimension ($w_{exist} = w_{min}$)*

On-site reinforcement – Schöck Isokorb® T type K-U

Recommendation for the on-site connection reinforcement

Information on the on-site reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment and the shear force with C25/30. The required reinforcement cross-section depends on the bar diameter of the steel bar or wire-mesh reinforcement.

Schöck Isokorb® T type K-U			M1	M2	M3	M4
On-site reinforcement	Location	Height [mm]	Concrete strength class ≥ C25/30			
			200 mm > downstand beam width ≥ 175 mm 200 mm >wall thickness ≥ 175 mm			
Overlap reinforcement depending on bar diameter						
Pos. 1 with H8 [mm²/m]	Balcony side	160–210	440	594	785	897
Pos. 1 with H10 [mm²/m]						
Pos. 1 with H12 [mm²/m]						
Steel bars along the insulation joint						
Pos. 2	balcony side/ downstand beam, wall	160–210	2 · 2 · H8			
Vertical reinforcement						
Pos. 3 [mm²/m] minimum reinforcement	downstand beam, wall	160–210	≥ 640	≥ 895	≥ 1086	≥ 1198
Pos. 3 structural element design	downstand beam, wall	160–210	Taking into account the moments and shear forces provided by the structural engineer			
Steel bars along the insulation joint						
Pos. 4	downstand beam, wall	160–210	≥ 1 · H12			
Splitting tensionreinforcement (allowable single shear)						
Pos. 5 [mm²/m]	downstand beam, wall	160–210	130			

Schöck Isokorb® T type K-U			M1	M2	M3	M4
On-site reinforcement	Location	Height [mm]	Concrete strength class ≥ C25/30			
			220 mm > downstand beam width ≥ 200 mm 220 mm >wall thickness ≥ 200 mm			
Overlap reinforcement depending on bar diameter						
Pos. 1 with H8 [mm²/m]	Balcony side	160–230	440	650	858	981
Pos. 1 with H10 [mm²/m]						
Pos. 1 with H12 [mm²/m]						
Steel bars along the insulation joint						
Pos. 2	balcony side/ downstand beam, wall	160–230	2 · 2 · H8			
Vertical reinforcement						
Pos. 3 [mm²/m] minimum reinforcement	downstand beam, wall	160–230	≥ 640	≥ 951	≥ 1159	≥ 1281
Pos. 3 structural element design	downstand beam, wall	160–230	Taking into account the moments and shear forces provided by the structural engineer			
Steel bars along the insulation joint						
Pos. 4	downstand beam, wall	160–230	≥ 1 · H12			
Splitting tensionreinforcement (allowable single shear)						
Pos. 5 [mm²/m]	downstand beam, wall	160–230	130			

T type
K-O
K-U

Reinforced concrete – reinforced concrete

On-site reinforcement – Schöck Isokorb® T type K-U

Recommendation for the on-site connection reinforcement

Information on the on-site reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment and the shear force with C25/30. The required reinforcement cross-section depends on the bar diameter of the steel bar or wire-mesh reinforcement.

Schöck Isokorb® T type K-U			M1	M2	M3	M4
On-site reinforcement	Location	Height [mm]	Concrete strength class ≥ C25/30			
			240 mm > downstand beam width ≥ 220 mm 240 mm > wall thickness ≥ 220 mm			
Overlap reinforcement depending on bar diameter						
Pos. 1 with H8 [mm²/m] Pos. 1 with H10 [mm²/m] Pos. 1 with H12 [mm²/m]	Balcony side	160–250	440	660	880	1045
Steel bars along the insulation joint						
Pos. 2	balcony side/ downstand beam, wall	160–230	2 · 2 · H8			
Vertical reinforcement						
Pos. 3 [mm²/m] minimum reinforcement	downstand beam, wall	160–250	≥ 640	≥ 960	≥ 1180	≥ 1346
Pos. 3 structural element design	downstand beam, wall	160–250	Taking into account the moments and shear forces provided by the structural engineer			
Steel bars along the insulation joint						
Pos. 4	downstand beam, wall	160–250	≥ 1 · H12			
Splitting tensionreinforcement (allowable single shear)						
Pos. 5 [mm²/m]	downstand beam, wall	160–250	130			

Schöck Isokorb® T type K-U			M1	M2	M3	M4
On-site reinforcement	Location	Height [mm]	Concrete strength class ≥ C25/30			
			Downstand beam width ≥ 240 mm wall thickness ≥ 240 mm			
Overlap reinforcement depending on bar diameter						
Pos. 1 with H8 [mm²/m] Pos. 1 with H10 [mm²/m] Pos. 1 with H12 [mm²/m]	Balcony side	160–250	440	660	880	1099
Steel bars along the insulation joint						
Pos. 2	balcony side/ downstand beam, wall	160–250	2 · 2 · H8			
Vertical reinforcement						
Pos. 3 [mm²/m] minimum reinforcement	downstand beam, wall	160–250	≥ 640	≥ 960	≥ 1180	≥ 1400
Pos. 3 structural element design	downstand beam, wall	160–250	Taking into account the moments and shear forces provided by the structural engineer			
Steel bars along the insulation joint						
Pos. 4	downstand beam, wall	160–250	≥ 1 · H12			
Splitting tensionreinforcement (allowable single shear)						
Pos. 5 [mm²/m]	downstand beam, wall	160–250	130			

T type
K-O
K-U

Reinforced concrete – reinforced concrete

On-site reinforcement – Schöck Isokorb® T type K-U

ℹ Information about on-site reinforcement

- 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.
- When reinforcing with different diameters the reinforcement specification for the largest diameter is relevant.
- The minimum reinforcement of Pos. 3 serves for the transfer of the active bar axial forces from the Isokorb®. This minimum reinforcement must be complied with.
  The required reinforcement from the structural element design as a result of the loading of the balcony, floors, walls and the supporting width of the downstand/upstand beam is to be verified by the structural engineer. The reinforcement determined from this must be compared with the minimum reinforcement of Pos, 3.
   The greater of the two values is relevant.
- Isokorb® height for CV30 and CV35: H = 160–190 mm for downstand beam width w_{min} < 200mm
  H = 160–210 mm downstand beam width w_{min} < 220 mm
  H = 160–230 mm downstand beam width w_{min} < 240 mm
- Anchorage and closing of stirrup to be determined as per EC2.
- The required lateral reinforcement in the overlap area is to be verified according to BS EN 1992-1-1 (EC2), 8.7 to 8.8 and BS EN 1992-1-1/NA, NDPs nd NCIs to 8.7 and 8.8.
- Pos. 3 Vertical reinforcement (stirrup): At least one stirrup is to be arranged between as well as alongside the outer lying tension or compression bars.
- l_0 for l_0 (H10) ≥ 570 mm, l_0 for l_0 (H12) ≥ 680 mm and l_0 (H16) ≥ 910 mm.
- Further reinforcement values for concrete strength class C20/25 under www.schoeck.com/en-gb/download
- With the selection of the Isokorb® type channels and inclinations must be taken into account, in order to maintain the required concrete cover.
- The indicative minimum concrete strength class of the external structural component is C32/40.
- For the safe transmisson of forces the instructions with regard to construction joints are to be observed, see page82.

⚠ Hazard warning - missing connection bar

- For the given load-bearing capacity, the transverse reinforcement bar is absolutely necessary. This transverse reinforcement bar must be fitted directly to the anchor head.

ℹ Design example

- Numerical example for stirrup design (Pos. 3 + 5):

Geometry:	Isokorb® height H = 200 mm
	Downstand width w_{exist} = 220 mm
	Concrete cover CV30
concrete strength:	C25/30
internal forces from balcony:	m_{Ed} = 45.3 kNm/m
	v_{Ed} = 35.0 kN/m

selected: T type K-U-M3-V1-REI120-CV35-LR180-X80-H200-7.0

Vertical reinforcement (considered singly):

Minimum reinforcement for Pos. 3: $a_{s,min}$ = 1163 mm²/m

Required reinforcement from structural element design: $a_{s,req}$ = 528 mm²/m < 1163 mm²/m = $a_{s,min}$

⇒ The minimum reinforcement $a_{s,min}$ = 1163 mm²/m is relevant!

Required splitting tensile reinforcement Pos. 5: $a_{s,req}$ = 130 mm²/m

⇒ Required stirrup cross-section (single-shear): $a_{s,req}$ = 1163 mm²/m + 130 mm²/m = 1293 mm²/m
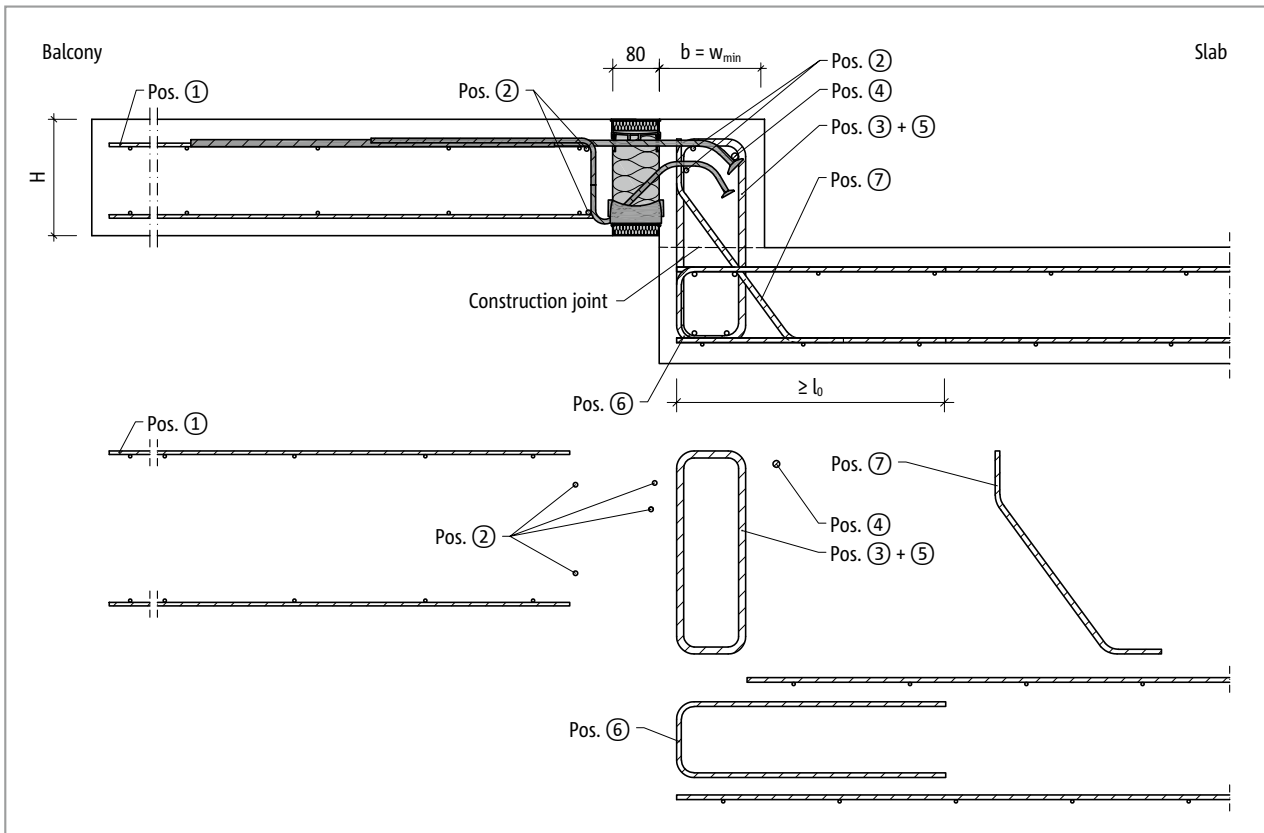
On-site reinforcement – Schöck Isokorb® T type K-O

Fig. 98: Schöck Isokorb® T type K-O: On-site reinforcement for balcony with height offset upwards with minimum structural element dimension (wexist= wmin)

Fig. 99: Schöck Isokorb® T type K-O-F: On-site reinforcement for balcony with height offset upwards with larger structural element dimension ($w_{exist} >= w_{min}$)

On-site reinforcement – Schöck Isokorb® T type K-O

Fig. 100: Schöck Isokorb® T type K-O: On-site reinforcement for wall connection downwards with minimum structural element dimension (w_{exist}= w_{min})
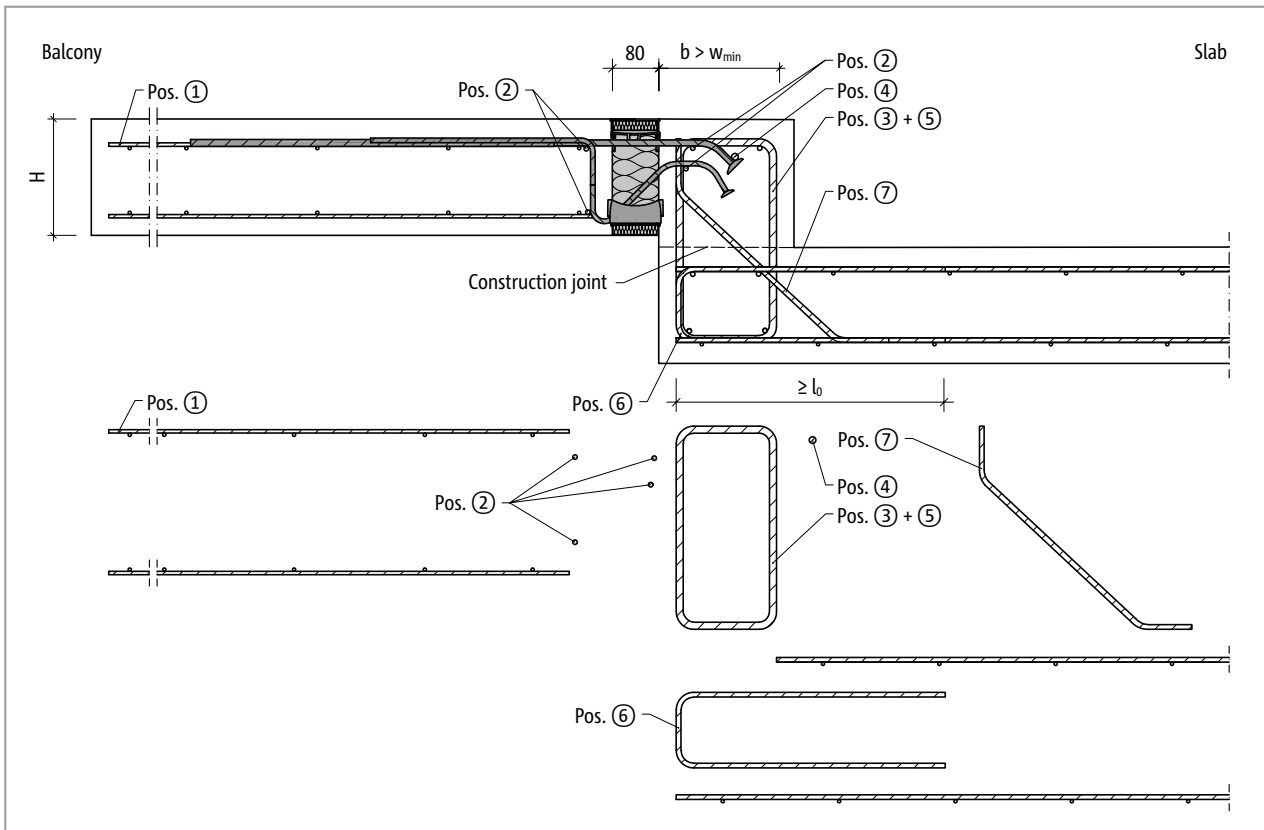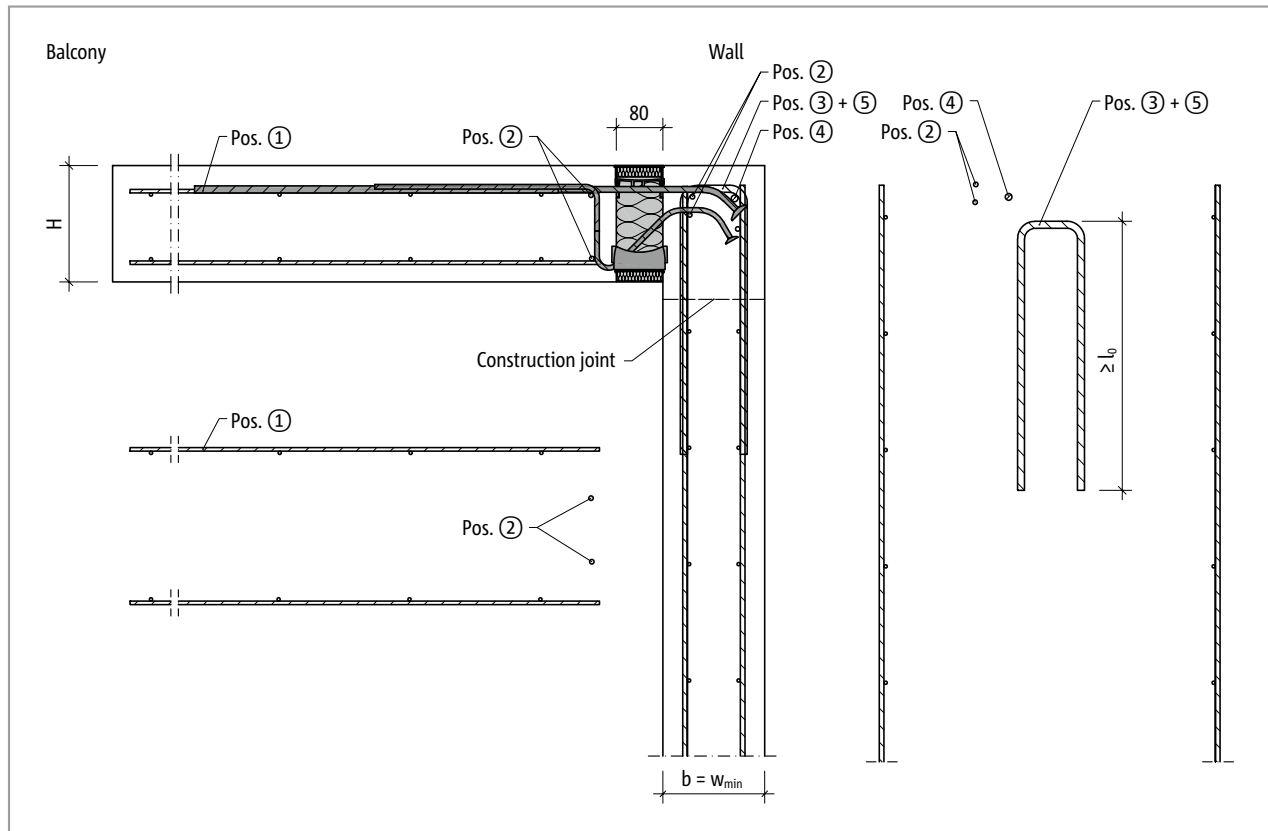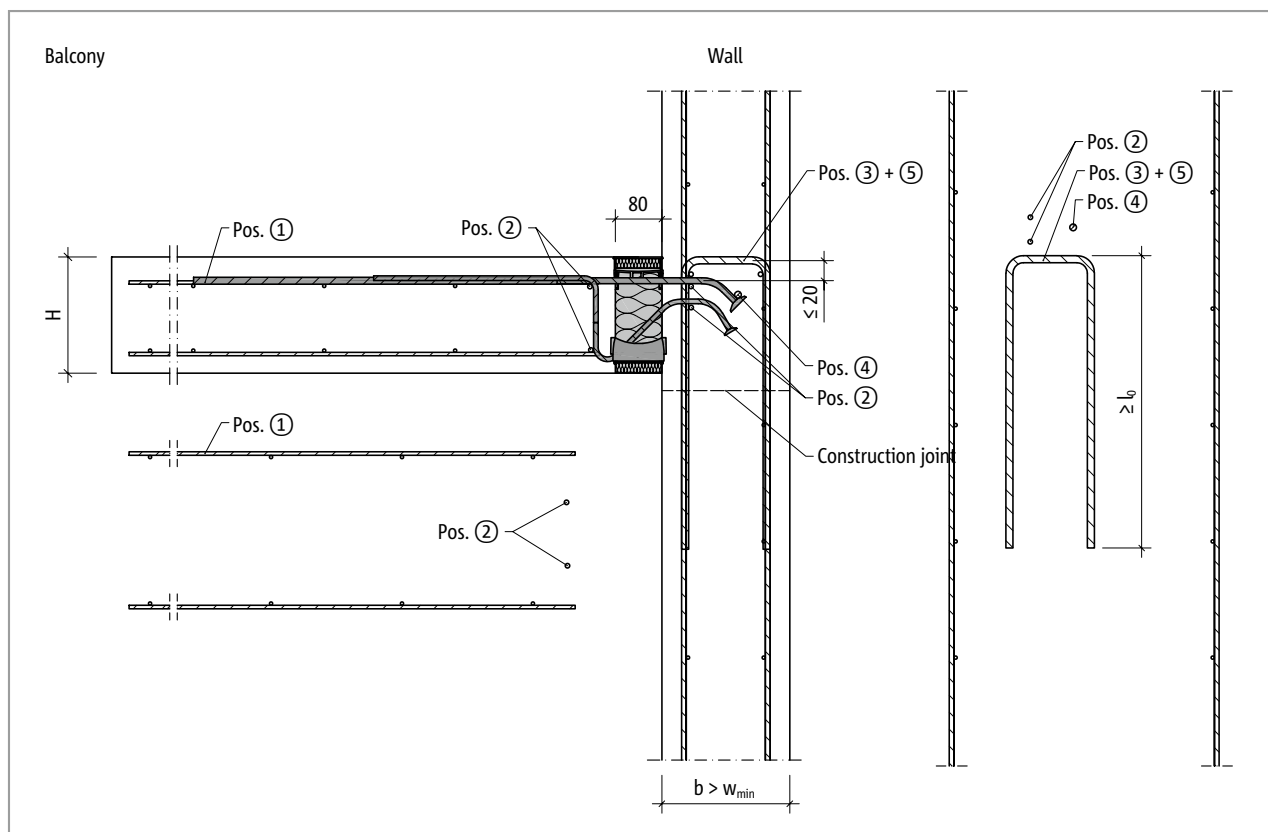

Fig. 101: Schöck Isokorb® T type K-O: On-site reinforcement for wall connection with larger structural element dimension (w_{exist}= w_{min})

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On-site reinforcement – Schöck Isokorb® T type K-O

Recommendation for the on-site connection reinforcement

Information on the on-site reinforcement for Schöck Isokorb® with a loading of 100 % of the maximum design moment and the shear force with C25/30. The required reinforcement cross-section depends on the bar diameter of the steel bar or wire-mesh reinforcement.

Schöck Isokorb® T type K-O			M1	M2	M3	M4
On-site reinforcement	Location	Height [mm]	Concrete strength class ≥ C25/30			
			Downstand beam width ≥ 175 mm wall thickness ≥ 175 mm			
Overlap reinforcement depending on bar diameter						
Pos. 1 with H8 [mm²/m]	Balcony side	160–250	440	660	862	1099
Pos. 1 with H10 [mm²/m]						
Pos. 1 with H12 [mm²/m]						
Steel bars along the insulation joint						
Pos. 2	balcony side/ downstand beam, wall	160–250	2 · 2 · H8			
Pos. 3 structural element design	downstand beam, wall	160–250	Taking into account the moments and shear forces provided by the structural engineer			
Vertical reinforcement						
Pos. 3 [mm²/m] minimum reinforcement	downstand beam, wall	160–250	≥ 640	≥ 960	≥ 1163	≥ 1583
Steel bars along the insulation joint						
Pos. 4	downstand beam, wall	160–250	≥ 1 · H12			
Splitting tensionreinforcement (allowable single shear)						
Pos. 5 [mm²/m]	downstand beam, wall	160–250	130			
Slip in bracket						
Pos. 6	Floor side	160–250	acc. to the specifications of the structural engineer			
Inclined reinforcement						
Pos.7	Downstand beam	160–250	acc. to the specifications of the structural engineer			

ℹ Information about on-site reinforcement
- Information on the on-site reinforcement see page 81.
- The indicative minimum concrete strength class of the external structural component is C32/40.

⚠ Hazard warning - missing connection bar
- For the given load-bearing capacity, the transverse reinforcement bar is absolutely necessary. This transverse reinforcement bar must be fitted directly to the anchor head.

On-site reinforcement – Schöck Isokorb® T type K-O

ℹ Information about on-site reinforcement

- 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.
- When reinforcing with different diameters the reinforcement specification for the largest diameter is relevant.
- The minimum reinforcement of Pos. 3 serves for the transfer of the active bar axial forces from the Isokorb®. This minimum reinforcement must be complied with.
  The required reinforcement from the structural element design as a result of the loading of the balcony, floors, walls and the supporting width of the downstand/upstand beam is to be verified by the structural engineer. The reinforcement determined from this must be compared with the minimum reinforcement of Pos, 3.
  The greater of the two values is relevant.
- Isokorb® height for CV30 and CV35: H = 160–210 mm for downstand beam width w_{min} < 190 mm
  H = 160–230 mm for downstand beam width w_{min} < 210 mm
- Pos. 3 and Pos. 5 are to be brought as close as possible over the tension bar of the Schöck Isokorb®. The distance between the on-site stirrup reinforcement and the upper edge of the tension bar is smaller than 2 cm.
- Anchorage and closing of stirrup to be determined as per EC2.
- The required lateral reinforcement in the overlap area is to be verified according to BS EN 1992-1-1 (EC2), 8.7 to 8.8 and BS EN 1992-1-1/NA, NDPs nd NCIs to 8.7 and 8.8.
- Pos. 3 Vertical reinforcement (stirrup): At least one stirrup is to be arranged between as well as alongside the outer lying tension or compression bars.
- l_0 for l_0 (H10) ≥ 570 mm, l_0 for l_0 (H12) ≥ 680 mm and l_0 (H16) ≥ 910 mm.
- Further reinforcement values for concrete strength class C20/25 under www.schoeck.com/en-gb/download
- With the selection of the Isokorb® type channels and inclinations must be taken into account, in order to maintain the required concrete cover.
- For the safe transmisson of forces the instructions with regard to construction joints are to be observed, see page82.
- The indicative minimum concrete strength class of the external structural component is C32/40.

⚠ Hazard warning - missing connection bar

- For the given load-bearing capacity, the transverse reinforcement bar is absolutely necessary. This transverse reinforcement bar must be fitted directly to the anchor head.

ℹ Design example

- Numerical example for stirrup design (Pos. 3 + 5):

Geometry:	Isokorb® height H = 230 mm
	Downstand width w_{exist} = 175 mm
	Concrete cover in the downstand beam CV30
concrete strength:	C25/30
internal forces from balcony:	m_{Ed} = -69.2 kNm/m
	v_{Ed} = 21.6 kN/m

selected: T type K-O-M4-V1-REI120-CV50-LR145-X80-H230-7.0

Vertical reinforcement (considered singly):

Minimum reinforcement for Pos. 3: $a_{s,min}$ = 1583 mm²/m

Required reinforcement from structural element design: $a_{s,req}$ = 1600 mm²/m > 1583 mm²/m = $a_{s,min}$

⇒ The required reinforcement from structural element design $a_{s,req}$ = 1600 mm²/m is relevant!

Required splitting tensile reinforcement Pos. 5: $a_{s,req}$ = 130 mm²/m

⇒ Required stirrup cross-section (single-shear): $a_{s,req}$ = 1600 mm²/m + 130 mm²/m = 1730 mm²/m

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Tight fit/Concreting section | Installation instructions
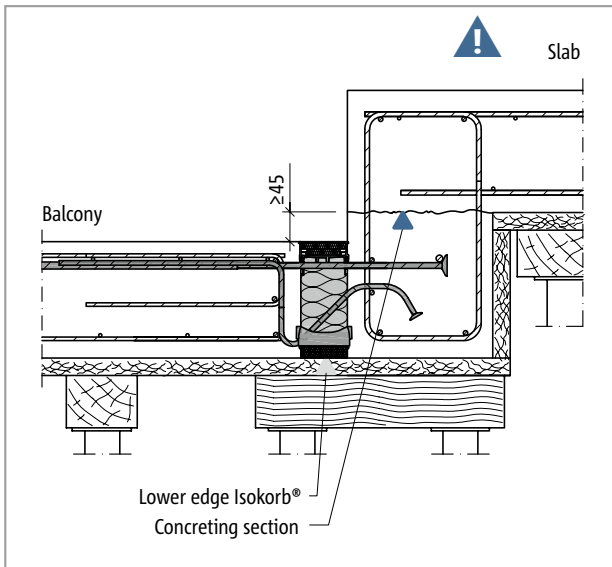
Tight fit/Concreting section

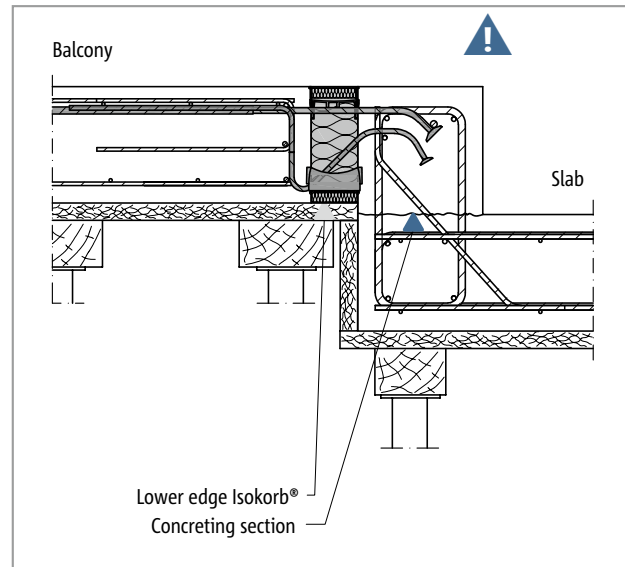*Fig. 102: Schöck Isokorb® T type K-U: Cast-in-place concrete balcony with height offset downwards*

Fig. 103: Schöck Isokorb® T type K-O: Cast-in-place concrete balcony with height offset upwards

⚠ 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.

ℹ Installation instructions

The current installation instruction can be found online under:

- Schöck Isokorb® XT/T type K-U: www.schoeck.com/view/2736
- Schöck Isokorb® XT/T type K-O: www.schoeck.com/view/2738

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☑ 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 deformation due to 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 increased minimum slab thickness taken into account with CV50?

☐ 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?

☐ Is the required component geometry present with the connection to a floor or a wall? Is a special design required?

☐ Have the requirements for on-site reinforcement of connections been defined in each case?

☐ Is the on-site supplementary bar (Pos. 4) incorporated?

☐ 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?

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