Properties of used Materials

Material	Product	Temperature Resistance			Temperature Range to Maintain IP Rating	Flammability Rating acc. to DIN EN 60695	
		Short-Term	Constant	Min. Temp.		UL 94	VDE 0471
Polystyrene, flame resistant, impact resistant	TK//AK/AKL and Abox series	80° C 176° F	70° C 158° F	-40° C -40° F	-35 – 40° C -31 – 104° F	HB	650° C 1202° F
Polycarbonate, glass fiber reinforced, flame-impact resistant	TK/TG/AK-i/AKL/EK and Abox-i series	130° C 266° F	120° C 248° F	-40° C -40° F	-35 – 80° C -31 – 176° F	V - 2 (5V)[1]	960° C 1706° F
Polycarbonate, transparent	TK/TG/EK/AK/AKL hinged door and transparent lid	130° C 266° F	120° C 248° F	-40° C -40° F	-35 – 80° C -31 – 176° F	V - 2 (5V)[1]	850° C 1562° F
ABS, flame resistant, impact resistant	TG Series	90° C 194° F	80° C 176° F	-40° C -40° F	-35 – 40° C -31 – 104° F	HB	650° C 1202° F
Thermoplastic Elastomer	Membrane plugs, membranes Abox 025/040	110° C 230° F	80° C 176° F	-30° C -22° F	NA	HB	750° C 1382° F
Polyethylene, flame resistant	Entry Spouts	100° C 212° F	70° C 158° F	-40° C -40° F	NA	HB	650° C 1202° F
Aluminum Al 12Si	AL series	130° C 266° F	100° C 212° F	-40° C -40° F	-35 – 75° C -31 – 167° F	–	–
Polypropylene, flame resistant	HP series	120° C 248° F	100° C 212° F	-30° C -22° F	-25 – 40° C -13 – 104° F	V - 2	960° C 1760° F

All data given according to specifications of manufacturers; no guarantee from Altech/Spelsberg can be claimed.
[1]Approved for TK and TG enclosures.

Maximum permissible number of terminals and conductors to DIN 57606/VDE 0606

The table below indicates the numbers of terminals and conductors which can be used in the respective Altech/Spelsberg junction box:

Box Size Rated Cross-Section mm²	Minimum Box Volume cm³	Applies to Altech/Spelsberg Box Models	Number of Terminals and Conductors	Conductor cross section mm²					
				1.5	2.5	4	6	10	16
2.5 mm2	115 cm3	HP 70/80 Abox 025	Terminal Conductor	6 20	5 15				
4 mm2	200 cm3	HP 90 Abox 040	Terminal Conductor	8 24	6 20	5 15			
6 mm2	300 cm3	HP 100 Abox 060	Terminal Conductor	10 30	8 24	6 20	5 15		
10 mm2	500 cm3	Abox 100	Terminal Conductor	12 36	10 30	8 24	6 20	5 15	
16 mm2	825 cm3	Abox 160	Terminal Conductor	18 54	15 45	12 36	8 24	6 20	5 15

Chemical Resistance Materials

Material	Product	water	weak acid	strong acid	weak alkali	strong alkali	alcohol	petrol	benzene	mineral oil	diesel	vegetable fat	animal fat	Ammonia
Polystyrene, flame resistant, impact resistant	TK/AK/AKL and Abox series	●	●	◒	●	●	●	⊗	⊗	◒	⊗	◒	◒	●
ABS	TG ABS	●	●	◒	●	●	●	⊗	⊗	●	●	◒	◒	⊗
Polycarbonate, glass fiber reinforced, flame-, impact resistant	TK/AK-i/AKL/EK and Abox-i series	●	●	●	⊗	⊗	●	●	⊗	●	◒	●	●	⊗
Polycarbonate	TG PC	●	●	●	⊗	⊗	●	●	⊗	●	◒	●	●	⊗
Polycarbonate, transparent	TK/EK/AK/AKL/TG hinged door and transparent lid	●	●	●	⊗	⊗	◒	◒	⊗	●	◒	●	●	⊗
Thermoplastic Elastomer	Membrane plug, membranes Abox 025/040	●	●	◒	●	◒	●	◒	◒	◒	◒	●	●	◒
Polyethylene, flame resistant	Entry Spouts	●	●	●	●	●	●	◒	⊗	◒	◒	●	●	●
Polyurethane	Lid seals for all models	●	◒	◒	◒	◒	◒	◒	◒	●	◒	●	●	◒
Aluminum Al 12 Si	AL series	●	●	◒	●	●	◒	●	⊗	●	●	◒	◒	●
Polypropylene, flame resistant	HP series	●	●	◒	●	◒	●	◒	◒	●	◒	●	●	●

● = resistant ◒ = limited resistance ⊗ = non-resistant

UV - Resistance

The degree of weather resistance given by the polycarbonate enclosures used is generally adequate. The enclosures have been tested under practical conditions in tropical regions for many years. If transparent lids are used, it is recommended to protect them against the direct effects of sun radiation.

The American UL testing laboratories have approved several types of the PC series. A part of this examination is the test for UV resistance (UL 746 C).

The weather proof test according to DIN 53 387 / 1000 hours was conducted at the "National Materials Testing Authority" in Dortmund.

Materials tested: Polycarbonate, 15% GV, gray
Polycarbonate, transparent
Polycarbonate, tinted
Polypropylene, gray

Approval through «Bureau Veritas»

The following program series have been approved (Nr. 2661/2869/BO/OD) and are consequently suitable for installation in ships and shipyards:

- EK- Series distribution boards
- TK- Series empty enclosures

Polyurethane - sealing material

All enclosure types utilize a seal composed of a dual-component, specialty mixture. The seals are halogen-free, chemically resistant and especially temperature resistant. The seals are inserted by robots, are exactly evenly distributed, and have a solid grip on the upper section of the enclosure. Consequently, a secure and safe respect reliable function of the seals is guaranteed.

Protection against condensation

The more tightly sealed the equipment, for example junction boxes or distributor housings, the greater the likelihood of condensation forming. This is especially the case at locations where highly fluctuating temperatures are to be expected. These effects are intensified by the power loss generated in the enclosures.

Owing to the differences in temperature, a difference also arises in the pressure conditions, which causes the enclosure to draw in air when the temperature changes. The next time the temperature increases, the humidity in this air condenses on the cold surface of the housing, for example on the lid. This process is only reversible to a limited extent, so the water collects in the housing.

Since this effect occurs regularly, even daily to an extent, a considerable volume of water may collect internally. If this housing has an increased protection rating, it no longer discharges this water.

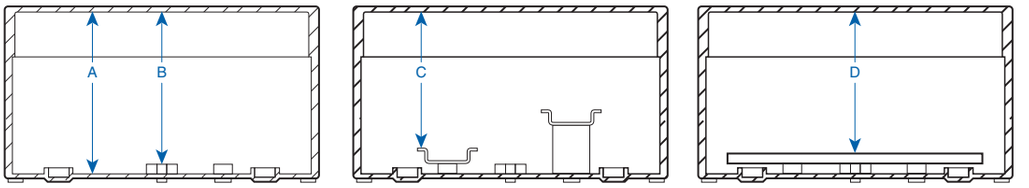
Precautions must be taken with respect to drainage of water if water collects or condensation can occur. We recommend the use of ventilation seals. (see page 150)

Protection against rain / snow (precipitation)

The protection rating tests carried out under DIN EN 60529 and UL 746 C are used as comparative tests and for classification of properties. The tests are limited to a few minutes and cannot emulate frequent exposure to rain / snow or cleaning with water jets. In addition, the local conditions may differ so greatly that a general exposure test cannot be defined.

Installations should be done in protected outdoor areas so that damage cannot be caused by condensation or ingress of water.

Clearance Installation Heights for Spelsberg Enclosures



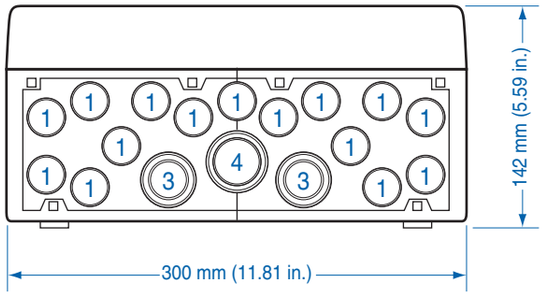
A) from base bottom
B) from standoffs in base
C) from top of mounting rail NS 35 (mounted on base standoffs)
D) from top of plastic mounting plate

[all dimensions in mm (in)]

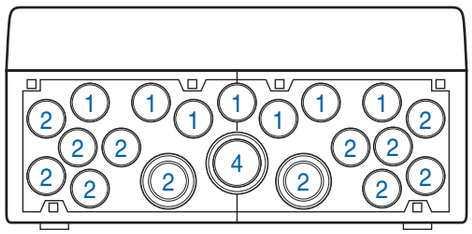
Series	A	B	C	D
HP- Series				
HP 70/80	38.5 (1.52)	31.5 (1.24)		
HP 90	40 (1.57)	33 (1.30)		
HP 100	52.5 (2.07)	46.5 (1.83)		
Abox/Abox-i - Junction boxes				
Abox/Abox-i 025	42 (1.65)	36 (1.42)		
Abox/Abox-i 040	45 (1.77)	39 (1.54)	34 [TS 15] (1.34)	
Abox/Abox-i 060	49 (1.93)	49 (1.93)	41.5 (1.63)	38.5 (1.52)
Abox/Abox-i 100	60 (2.36)	60 (2.36)	52.5 (2.07)	49.5 (1.95)
Abox/Abox-i 160	71 (2.80)	71 (2.80)	63.5 (2.50)	60.5 (2.38)
Abox/Abox-i 350	92 (3.62)	92 (3.62)	84.5 (3.33)	81.5 (3.21)
AK/AKi - Distribution Boxes				
AK/AKi03	85 (3.35)	79 (3.11)	71.5 (2.81)	
AK/AKi05 to 24	111 (4.37)	105 (4.13)	98.5 (3.88)	
AK/AKi14 to 70	117.5 (4.63)	114 (4.49)	96 (3.78)	
AKL/AKi - Enclosures				
AKL/AKi 1 to 4	117.5 (4.63)	114 (4.49)	106.5 (4.19)	110 (4.33)
AKL/AKi 2-h to 4-h	194.5 (7.66)	191 (7.52)	183.5 (7.22)	187 (7.36)
EK- Distribution boxes				
EK 002	69 (2.76)	69 (2.76)	63.5 (2.50)	
EK 004/008/012/024	103 (4.06)	97 (3.82)	89.5 (3.52)	
TK- Enclosures - low cover				
TK 77/97/99/1309/1809	45 (1.77)	45 (1.77)	40 [TS 15] (1.57)	36 (1.42)
TK 1111	53 (2.09)	53 (2.09)	45.5 (1.79)	44 (1.73)
TK 1313	63 (2.48)	63 (2.48)	55.5 (2.19)	54 (2.13)
TK 1811f/1813f/1818f/2518f	55 (2.17)	48 (1.89)	40.5 (1.59)	45 (1.77)
TK 1811/1813/1818/2518	81 (3.19)	75 (2.95)	67.5 (2.66)	72 (2.83)
TK 3625	103 (4.06)	97 (3.82)	89.5 (3.41)	94 (3.70)
TK- Enclosures - high cover				
TK 77/97/99/1309/1809	69 (2.72)	69 (2.72)	64.0 [TS 15] (2.52)	60 (2.36)
TK 1111	77 (3.03)	77 (3.03)	69.5 (2.74)	68 (2.68)
TK 1313	87 (3.43)	87 (3.43)	79.5 (3.13)	78 (3.07)
TK 1811f/1813f/1818f/2518f	76 (2.99)	69 (2.72)	61.5 (2.42)	66 (2.60)
TK 1811/1813/1818/2518	103 (4.06)	97 (3.82)	89.5 (3.52)	94 (3.70)
TK 3625	156 (6.14)	150 (5.90)	142.5 (5.61)	147 (5.79)
TK- Enclosures - extra high cover				
TK 1811f/1813f/1818f/2518f	130 (5.12)	123 (4.84)	115.5 (4.55)	120 (4.72)
TK 1811/1818/2518 – 16	156 (6.14)	150 (5.90)	142.5 (5.61)	147.5 (5.81)
TG - Enclosures				
TG88/1208/1212/1608-6	46.7 (1.84)	39.7 (1.56)	32 (1.26)	37 (1.46)
TG88/1208/1212/1608-9	76.7 (3.02)	69.7 (2.74)	62 (2.44)	67 (2.64)
TG1612/2012/2516/3023-9	81.7 (3.22)	74.7 (2.94)	67 (2.64)	72 (2.83)
TG2012/2015-8	66.7 (2.63)	59.7 (2.35)	52 (2.05)	57 (2.24)
TG2516-12	111.7 (4.40)	104.7 (4.12)	97 (3.82)	102 (4.02)
TG3023-11	101.7 (4.00)	94.7 (3.73)	87 (3.43)	92 (3.62)

AK and AKL Knockout Details

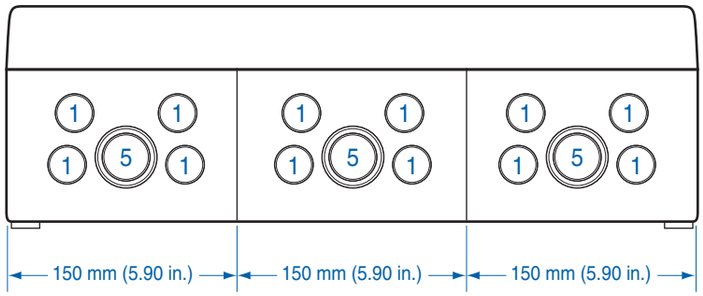
End View
AK - Bottom Only
AKL - Top and Bottom



End View
AK - Top Only



Side View
AK
AKL



(1) = M20 (Knockout)
(2) = M20 (Installed Double Membrane Seal)
(3) = M20/M25 (Knockout)
(4) = M32/M40 (Knockout)
(5) = M25/M32 (Knockout)