



# Accessories

Carefully selected accessories complement the Altech/Spelsberg Enclosure family. A full line, including connectors for wire, cable, or conduit; ground/neutral busbars, mounting plates and hardware, locks, hinge kits, DIN rails, terminal block assemblies and more are available to enhance the overall design capabilities.

Altech/Spelsberg has the right accessories to make your job easier.

- Liquid Tight Strain Relief connectors and connector assemblies
- Mounting plates
- DIN rail support racks
- DIN rails
- Enclosure mounting screws
- Key lock sets
- Hinge kits
- Cover plates
- Combination kits, flange type
- Ground/neutral busbars



**Combination Kits**

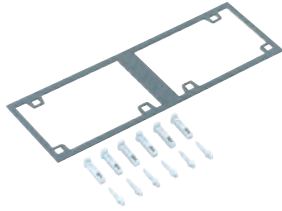
Used to combine series specific enclosures to make larger units. Connect horizontally or vertically.

**Fitting Type Combination Kit**

Threaded with locknut seal for connecting sidewalls. Fits standard Metric knockouts. Drilling template included to ensure enclosure ingress integrity.

**Pin Type Combination Set**

For combining AK and AKL Series Enclosures for 150mm and 300mm sides.



**Din Rails**

DIN rails allow for mounting DIN Terminal Blocks and other control components. All required hardware included.

**TS15x5 mm / for TK+Abox Series**

**TS15x5 mm / for TG Series**  
(mounting hardware comes with enclosure)



**TS35x7.5 mm / for TK+Abox Series**

**TS35x7.5 mm / for TG Series**  
(mounting hardware comes with enclosure)

**TS35x7.5 mm / Special Variants**

**TS35x7.5 mm / for AL Series**



**Component Mounting Screws**

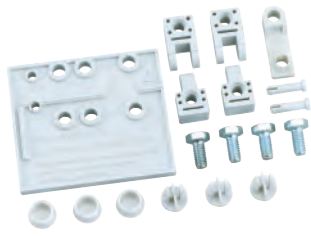
For mounting DIN rails, mounting plates, etc. into molded base holes.

- Select appropriate length
- Self tapping

Type	Wall Thickness For Series	Cat. No.	Std. Pack
CK/M20	2x3 mm	192-020	1
CK/M25	2x3 mm	192-025	1
CK/M32	2x3.5 mm	192-032	1
CK/AKII	AK, AKL	791-001	1

Type	For Series	Cat. No.	Std. Pack
TS15/49.5	TK77, 97	197-049	1
TS15/80	TK97, 99	197-080	1
TS15/92	TK1111	197-092	1
TS15/111	TK1309, 1313	197-111	1
TS15/154	TK1809	197-154	1
TS15/68	TG88	197-069	1
TS15/106	TG1208	197-107	1
TS15/110	TG1212	197-110	1
TS15/146	TG1608, 1612	197-146	1
TS15/186	TG2012	197-186	1
TS15/170	TG2015	197-170	1
TS15/222	TG2516	197-222	1
TS15/285	TG3023	197-285	1
TS35/81	TK1111, Abox060	198-081	1
TS35/106	TK1309, 1313, Abox100, HP150	198-106	1
TS35/144	TK1809, 1811, 1813, 1818, HP190	198-144	1
TS35/144	Abox160	894-016	1
TS35/216	TK2518	198-216	1
TS35/216	Abox350	894-035	1
TS35/336	TK3625	198-336	1
TS35/68	TG88	198-068	1
TS35/106	TG1208	198-107	1
TS35/110	TG1212	198-110	1
TS35/146	TG1608, 1612	198-146	1
TS35/186	TG2012	198-186	1
TS35/170	TG2015	198-170	1
TS35/222	TG2516	198-222	1
TS35/285	TG3023	198-285	1
CITS35/250	AKII, AKL	562-735	1
NS35/216-3	AKII, AKL, EK12, 24	795-030	1
TS35/110	AL1212	162-009	1
TS35/208	AL2212	162-010	1
TS35/145	AL1616	162-011	1
TS35/245	AL2616	162-012	1
TS35/345	AL3616	162-013	1
TS35/186	AL2023	162-014	1
TS35/266	AL2823	162-015	1
TS35/316	AL3323	162-016	1

Type	For Series	Cat. No.	Std. Pack
ST/3.9x9 mm	For	D-409	100
ST/3.9x13 mm	All Plastic	D-413	100
ST/3.9x17 mm	Series	D-417	100
ST/3.9x28 mm		D-428	100



**Hinge Kits**

Attach the enclosure cover and base together for easy opening and closing of the enclosure. All required hardware and instructions are included.

- Small Plastic**
- Large Plastic**
- TG Internal Plastic**
- Metal**



**Enclosure Lid Screws**

Replacements for existing screws.

- Short-Gray**
- Long-Gray**
- Short-Black**
- Long-Black**

**Thumb Screw Caps**

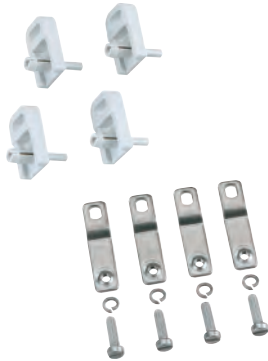


**Locksets**

Locksets prevent the unauthorized opening of enclosure lids or doors.

KL Locksets with two keys easily install into hinged transparent doors.

Enclosure Padlock and Hinge set with all mounting accessories.



**Mounting Tabs**

Enables enclosure to be surface mounted. 1 set = 4 mounting tabs

**Plastic**

**Metal**



**Snap In Double Membrane Entry Seals**

- Fits and seals removed Pg knockouts
- IP66
- Features two integral sealing membranes



**Universal Snap In Entry Seal**

- IP55
- Polyethylene
- Cut steps to fit desired cable size



**Snap In Air Vents**

- Allows moisture to escape from the enclosure
- Labyrinth seal to prevent water formation
- IPX4



**Threaded Vent - M12x1.5**

- Provides pressure compensation
- Air permeable and water-tight membrane
- Reduces condensation formation
- IP68

Type	For Series	Cat. No.	Std. Pack
HK1	TK77 - 1809, EK002	190-002	1
HK2	TK1811 - 3625, EK004 - 024, AK, AKL	190-005	1
TGISS	TGxx12 and TG2015-TG3023	182-001	1
HK-AL	AL1212 - AL3323	154-210	1

Type	For Series	Cat. No.	Std. Pack
TKLS-SG	TK - low cover, gray	190-010	1
TKLS-LG	TK - high cover, gray	190-011	1
TKLS-SB	TK - low cover, transparent	190-012	1
TKLS-LB	TK - high cover, transparent	190-013	1
TS	TK, EK, AK, AKL	190-001	1

Type	For Series	Cat. No.	Std. Pack
KL2	AK	706-102	1
PL	AK, AKL, TK1811 & up	190-100	1

Type	For Series	Cat. No.	Std. Pack
MT1	TK, EK	194-001	1
TGABL	TG	182-002	1
MT2	AKL, AK14 and up	793-004	1
MT-AL1	AL66-3 to AL1010-8	154-004	1
MT-AL2	AL1212-8 to AL3323-11	154-006	1

Mounting Hole Type	Cable Dia. mm (in.)	Cat. No.	Std. Pack
M16	5 - 9 (.20 - .35)	260-416	50
M20	7 - 12 (.28 - .47)	260-420	50
M25	9 - 16 (.35 - .63)	260-425	50
M32	14 - 21 (.55 - .83)	260-432	25
M20	5 - 16 (.20 - .63)	216-420	100
M25	5 - 21 (.20 - .83)	216-425	50
M32	13 - 26.5 (.51 - 1.04)	216-432	25
M20	N/A	262-420	100
M12	N/A	262-412	5

**Mounting Plates**

**TK Series**

Complete with screws.  
Hole patterns match mounting provisions in enclosure base.



**Plastic laminate** 2.5 mm (.10 in) thick.  
Color: Gray

**Steel** 2.0 mm (.08 in) thick.

**TG Series\***

**Plastic laminate** 2.5 mm (.10 in) thick.  
Color: Gray



**Steel** 2.0 mm (0.08 in) thick.

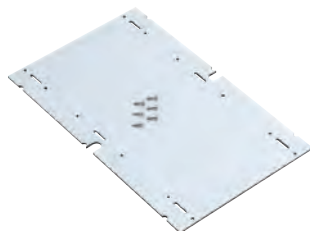
**Abox Series**

Plastic laminate  
Color: Gray



**Aluminum Series**

Steel plates for the mounting and installation of large / heavy devices and components.  
- For AL Series only



**AK Series**

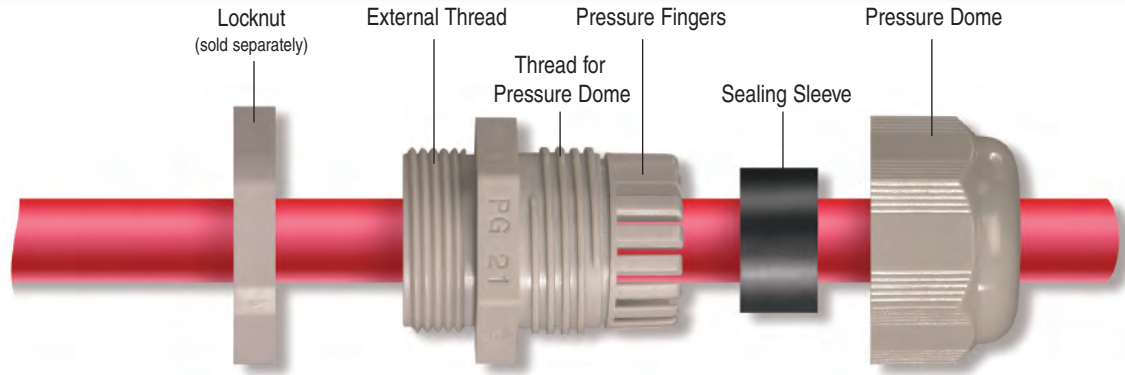
**Plastic laminate** 4 mm (.16 in) thick  
Color: Gray

**Steel** 2.0 mm (0.08 in) thick.

\*Mounting hardware included with enclosure.

Type	Enclosure Series	Size mm (in.)	Cat. No.	Std. Pack
TKMPI-55	TK55	46x44 (1.81x1.73)	195-055	5
TKMPI-75	TK75	59x44 (2.32x1.73)	195-075	5
TKMPI-77	TK77	45x45 (1.77x1.77)	195-001	1
TKMPI-97	TK97	74x45 (2.91x1.77)	195-002	1
TKMPI-99	TK99	74x74 (2.91x2.91)	195-003	1
TKMPI-1111	TK1111	90x90 (3.54x3.54)	195-004	1
TKMPI-1309	TK1309	110x74 (4.33x2.91)	195-009	1
TKMPI-1313	TK1313	110x110 (4.33x4.33)	195-005	1
TKMPI-1809	TK1809	160x74 (6.30x2.91)	195-010	1
TKMPI-1811	TK1811	150x90 (5.91x3.54)	195-006	1
TKMPI-1813	TK1813	146x100 (5.75x3.94)	195-011	1
TKMPI-1818	TK1818	150x150 (5.91x5.91)	195-007	1
TKMPI-2518	TK2518	220x150 (8.66x5.91)	195-008	1
TKMPI-3625	TK3625	331x220 (13.03x8.66)	195-012	1
TKMPS-77	TK77	45x45 (1.77x1.77)	197-001	1
TKMPS-97	TK97	75x45 (2.95x1.77)	197-002	1
TKMPS-99	TK99	74x74 (2.91x2.91)	197-003	1
TKMPS-1111	TK1111	90x90 (3.54x3.54)	197-004	1
TKMPS-1309	TK1309	110x74 (4.33x2.91)	197-009	1
TKMPS-1313	TK1313	110x110 (4.33x4.33)	197-005	1
TKMPS-1809	TK1809	160x74 (6.30x2.91)	197-010	1
TKMPS-1811	TK1811	150x90 (5.91x3.54)	197-006	1
TKMPS-1813	TK1813	146x100 (5.75x3.94)	197-011	1
TKMPS-1818	TK1818	150x150 (5.91x5.91)	197-007	1
TKMPS-2518	TK2518	220x150 (8.66x5.91)	197-008	1
TKMPS-3625	TK3625	331x220 (13.03x8.66)	197-012	1
TGMPI-88	TG88	73x73 (2.87x2.87)	186-003	1
TGMPI-1208	TG1208	91x73 (3.58x2.87)	186-004	1
TGMPI-1212	TG1212	113x93 (4.45x3.58)	186-005	1
TGMPI-1608	TG1608	131x73 (5.16x2.87)	186-006	1
TGMPI-1612	TG1612	131x113 (5.16x4.45)	186-007	1
TGMPI-2012	TG2012	171x113 (6.73x4.45)	186-008	1
TGMPI-2015	TG2015	171x143 (6.73x5.63)	186-009	1
TGMPI-2516	TG2516	220x152 (8.66x5.98)	186-012	1
TGMPI-3023	TG3023	270x220 (10.63x5.98)	186-013	1
TGMPS-88	TG88	73x73 (2.87x2.87)	187-003	1
TGMPS-1208	TG1208	91x73 (3.58x2.87)	187-004	1
TGMPS-1212	TG1212	113x93 (4.45x3.58)	187-005	1
TGMPS-1608	TG1608	131x73 (5.16x2.87)	187-006	1
TGMPS-1612	TG1612	131x113 (5.16x4.45)	187-007	1
TGMPS-2012	TG2012	171x113 (6.73x4.45)	187-008	1
TGMPS-2015	TG2015	171x143 (6.73x5.63)	187-009	1
TGMPS-2516	TG2516	220x152 (8.66x5.98)	187-012	1
TGMPS-3023	TG3023	270x220 (10.63x5.98)	187-013	1
MP060	Abox060	83x83 (3.27x3.27)	895-006	1
MP100	Abox100	109x109 (4.29x4.29)	895-010	1
MP160	Abox160	149x149 (5.87x5.87)	895-016	1
MP350	Abox350	217x217 (8.54x8.54)	895-035	1
ALMPS-88	AL88	68.8x64 (2.71x2.52)	155-005	1
ALMPS-1308	AL1308	114x68.8 (4.49x2.71)	155-006	1
ALMPS-1808	AL1808	164x68.8 (6.46x2.71)	155-007	1
ALMPS-1010	AL1010	88x88 (3.46x3.46)	155-008	1
ALMPS-1212	AL1212	109x107 (4.29x4.21)	155-009	1
ALMPS-2212	AL2212	207x107 (8.15x4.21)	155-010	1
ALMPS-1616	AL1616	145x143 (5.71x5.63)	155-011	1
ALMPS-2616	AL2616	245x143 (9.65x5.63)	155-012	1
ALMPS-3616	AL3616	345x143 (13.6x5.63)	155-013	1
ALMPS-2023	AL2023	214x184 (8.43x7.24)	155-014	1
ALMPS-2823	AL2823	264x214 (10.4x8.43)	155-015	1
ALMPS-3323	AL3323	314x214 (12.4x8.43)	155-016	1
AKMPI 1	AK, AKL	240x112 (9.45x4.41)	795-001	1
AKMPI 2	AK, AKL	240x240 (9.45x9.45)	795-002	1
AKMPI 3	AK, AKL	240x390 (9.45x15.35)	795-003	1
AKMPI 4	AK, AKL	240x540 (9.45x21.26)	795-004	1
AKMPS 2	AK, AKL	240x240 (9.45x9.45)	795-012	1
AKMPS 3	AK, AKL	240x390 (9.45x15.35)	795-013	1
AKMPS 4	AK, AKL	240x540 (9.45x21.26)	795-014	1





- Increased Cable Range - The specially designed pressure fingers allow for up to 60% wider cable range.
- IP68 achieved without seal rings - The redesigned integral sealing ridge obtains an IP68 protection rating without the use of seal rings.

**Material:**

- Body: Polyamide 6
- Seal: Neoprene

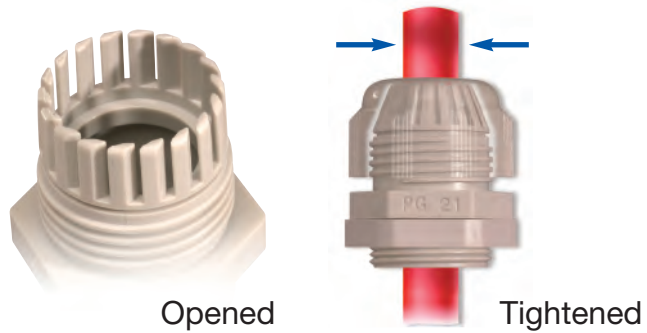
**Technical properties:**

- Maximum strain relief through clamping range
- IP68 achieved without seal rings (PG and metric only)

- Trapezoidal thread with high torque guarantees tight and permanent fit of the dome nut
- Gas- and watertight

**Applications:**

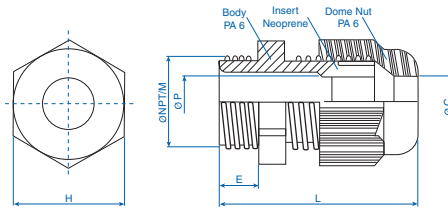
- Machines and devices



**Cable Gland, Polyamide, Metric Thread**

Thread	Cable Range mm	Cat. No. Light grey	Cat. No. Black	Std. Pk.
M 12 x 1.5	1.5-5	5309612	5309712	100
M 12 x 1.5	2.5-6.5	5308950	5308940	100
M 16 x 1.5/9	1.5-6	5309615	5309715	50
M 16 x 1.5/11	2-7	5309616	5309716	50
M 16 x 1.5/9	2.5-8	5308958	5308948	50
M 16 x 1.5/11	3.5-10	5308951	5308941	50
M 20 x 1.5/13	3-9	5309619	5309719	50
M 20 x 1.5/16	5-12	5309620	5309720	50
M 20 x 1.5/13	5-12	5308959	5308949	50
M 20 x 1.5/16	7-14	5308952	5308942	50
M 25 x 1.5/16	5-12	5309624	5309724	50
M 25 x 1.5/21	7-16	5309625	5309725	25
M 25 x 1.5/16	7-14	5308960	5308962	50
M 25 x 1.5/21	9-18	5308953	5308943	25
M 32 x 1.5	11-21	5309632	5309732	20
M 32 x 1.5	14-25	5308954	5308944	20
M 40 x 1.5	13-26	5309640	5309740	10
M 40 x 1.5	18-32	5308955	5308945	10
M 50 x 1.5	17-31	5309650	5309750	5
M 50 x 1.5	24-38.5	5308956	5308946	5
M 63 x 1.5	26-39	5309663	5309763	5
M 63 x 1.5	35-48	5308957	5308947	5

Temperature Range	
PA6	Neoprene
-25 to 100°C (-13 to 212°F)	-25 to 100°C (-13 to 212°F)



Thread Size	Dimensions					
	H mm	E mm	L mm	ØC mm	ØPTM mm	ØThread mm
M12x1.5	15	8	32	6.7	6.8	12.0
M16x1.5/9	19	10	37	8.5	8.5	16.0
M16x1.5/11	22	10	39	10.5	10.5	16.0
M20x1.5/13	24	10	40	12.5	12.5	20.0
M20x1.5/16	27	10	43	14.5	14.5	20.0
M25x1.5/16	27	10	45	14.5	14.5	25.0
M25x1.5/21	33	10	49	18.5	18.5	25.0
M32x1.5	42	10	52	25.5	25.5	32.0
M40x1.5	53	10	62	32.5	32.5	40.0
M50x1.5	60	12	67	39.0	39.0	50.0
M63x1.5	70	12	68	48.5	48.5	63.0

**Lock Nuts, Polyamide, Metric Thread**

**Material:**

- Polyamide 6
- 25 % Glass fiber Reinforced

Thread	Thickness (E) mm	SW mm	Cat. No. Light grey	Cat. No. Black	Std. Pk.
<b>Metric</b>					
M 12 x 1.5	5	19	7211979	7211974	50
M 16 x 1.5	5	22	7211980	7211975	50
M 20 x 1.5	5	24	7211981	7211976	50
M 25 x 1.5	6	30	7211982	7211977	50
M 32 x 1.5	7.5	38	7211983	7211978	50
M 40 x 1.5	8	50	7211984	7211990	20
M 50 x 1.5	9	60	7211985	7211991	10
M 63 x 1.5	10	75	7211986	7211992	5

Temperature Range PA	
-30 to 120°C (-22 to 248°F)	

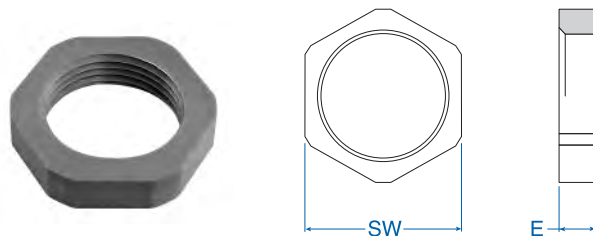


CHART I International Protection (IP) Ratings to IEC 529

Protection Modes to EN 60529 DIN VDE 0470 Part 1			Second Digit – Degree of Water Protection								
			IP X0 No Protection	IP X1 Protection against dripping water falling vertically	IP X2 Protection against dripping water even when tilted 15° vertically	IP X3 Protection against dripping water even when tilted 60°	IP X4 Protection against splashing water from any direction	IP X5 Protection against water jets from any direction	IP X6 Protection against heavy seas from any direction	IP X7 Protection against effects of immersion	IP X8 Protection against submersion
First Digit	Person touching	Protection against penetration of foreign bodies									
	IP 0X	No protection	No protection	IP 00							
IP 1X	Protection against touching with the hand	Protection against large solid bodies > 50mm Ø	IP 10	IP 11	IP 12						
IP 2X	Protection against touching with the finger	Protect. against med., solid bodies > 12.5 mm Ø	IP 20	IP 21	IP 22	IP 23					
IP 3X	Protection against touching with tools, wires, etc., > 2.5 mm Ø	Protection against small, solid bodies > 2.5 mm Ø	IP 30	IP 31	IP 32	IP 33	IP 34				
IP 4X	Protection against touching with tools, wires, etc., > 1 mm Ø	Protection against small, solid bodies > 1 mm Ø	IP 40	IP 41	IP 42	IP 43	IP 44				
IP 5X	Protection against touching with tools, wires, etc., > 1 mm Ø	Protection against internal dust accumulation	IP 50				IP 54	IP 55			
IP 6X	Protection against touching with tools, wires, etc., > 1 mm Ø	Protection against all dust penetration	IP 60					IP 65	IP 66	IP 67	IP 68

In some countries a third digit is added. It gives information about the mechanical properties of the equipment. This designation has not yet been standardized according to current DIN and IEC regulations. Devices in this catalogue correspond to digit IP .7.

CHART II NEMA / IP Cross Reference

The chart below provides a cross-reference from NEMA to International Protection (IP) Ratings. This cross-reference is an approximation based on the most current information available. It is not sanctioned by NEMA, IEC, or any other regulatory body. This chart should be used only as a guideline.

IEC 529 Protection Ratings	NEMA Ratings									
	1	2	3	3R	4	4X	5	6	12	13
IP 00	↓									
IP 10		↓								
IP 11										
IP 20										
IP 21										
IP 22										
IP 23										
IP 30										
IP 31										
IP 32				↓						
IP 33										
IP 40										
IP 41										
IP 42										
IP 43										
IP 50										
IP 51										
IP 52										
IP 53										
IP 54										↓
IP 55							↓			
IP 56										
IP 60										
IP 61										
IP 62										
IP 63			↓							
IP 64										
IP 65										
IP 66					↓	↓				
IP 67								↓	↓	
IP 68										

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) <sup>1</sup>	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) <sup>1</sup>	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.

<sup>1</sup>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 mm <sup>2</sup>	Minimum Box Volume cm <sup>3</sup>	Applies to Altech/Spelsberg Box Models	Number of Terminals and Conductors	Conductor cross section mm <sup>2</sup>					
				1.5	2.5	4	6	10	16
2.5 mm <sup>2</sup>	115 cm <sup>3</sup>	HP 70/80 Abox 025	Terminal Conductor	6 20	5 15				
4 mm <sup>2</sup>	200 cm <sup>3</sup>	HP 90 Abox 040	Terminal Conductor	8 24	6 20	5 15			
6 mm <sup>2</sup>	300 cm <sup>3</sup>	HP 100 Abox 060	Terminal Conductor	10 30	8 24	6 20	5 15		
10 mm <sup>2</sup>	500 cm <sup>3</sup>	Abox 100	Terminal Conductor	12 36	10 30	8 24	6 20	5 15	
16 mm <sup>2</sup>	825 cm <sup>3</sup>	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.

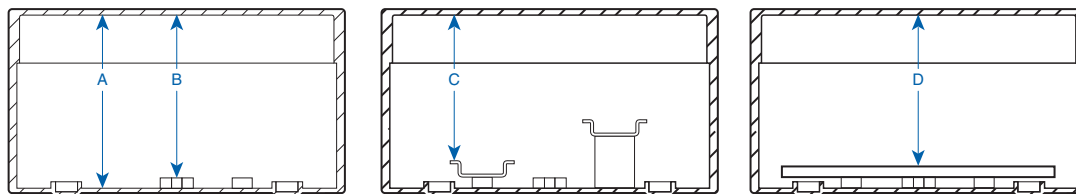
Precautions must be taken with respect to drainage of water if water collects or condensation can occur. We recommend the use of ventilation seals. (see page 150)

### 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**



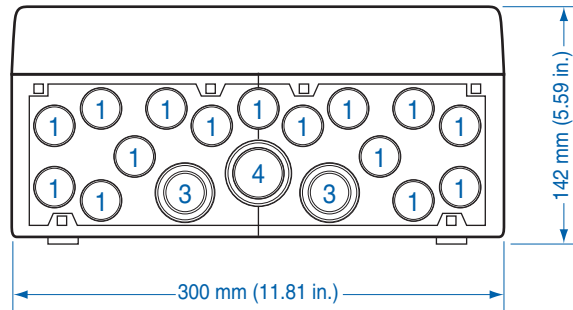
A) from base bottom  
 B) from standoffs in base  
 C) from top of mounting rail NS 35 (mounted on base standoffs)  
 D) from top of plastic mounting plate

[all dimensions in mm (in)]

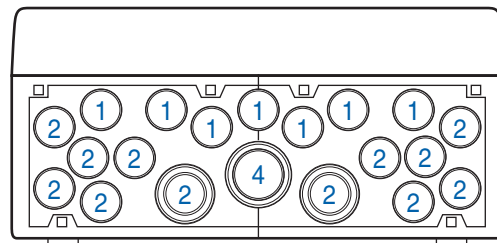
Series	A	B	C	D
<b>HP- Series</b>				
HP 70/80	38.5 (1.52)	31.5 (1.24)		
HP 90	40 (1.57)	33 (1.30)		
HP 100	52.5 (2.07)	46.5 (1.83)		
<b>Abox/Abox-i - Junction boxes</b>				
Abox/Abox-i 025	42 (1.65)	36 (1.42)		
Abox/Abox-i 040	45 (1.77)	39 (1.54)	34 [TS 15] (1.34)	
Abox/Abox-i 060	49 (1.93)	49 (1.93)	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)
<b>AK/AKi - Distribution Boxes</b>				
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)	
<b>AKL/AKi - Enclosures</b>				
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)
<b>EK- Distribution boxes</b>				
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)	
<b>TK- Enclosures - low cover</b>				
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)
<b>TK- Enclosures - high cover</b>				
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)
<b>TK- Enclosures - extra high cover</b>				
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)
<b>TG - Enclosures</b>				
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

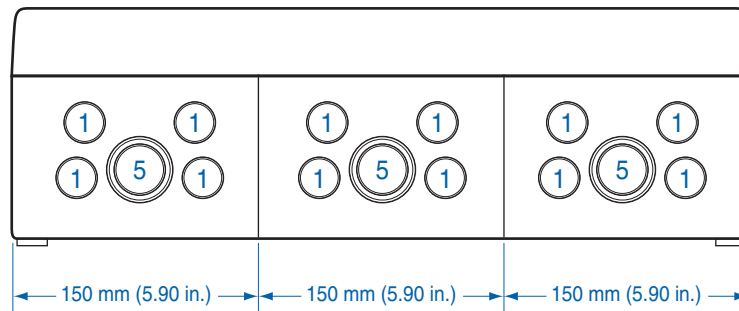
End View  
 AK - Bottom Only  
 AKL - Top and Bottom



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)