Contents

1. Connectors

1.1 Anderson Power

1.1.1 E Series

The Anderson™ family of Euro Battery Connectors (EBC) are expertly designed for ease of use and incorporate an innovative contact carrier to simplify assembly. The EBC connectors include the industry standard 80, 160, and 320 sizes, all in accordance with DIN 43589-1. Design and materials offer performance that meets or exceeds all the requirements of EN1175-1. All materials chosen are RoHS compliant and selected to ensure years of reliability in adverse industrial environments. These attributes make the EBC DIN connectors the ideal choice for a wide range of industrial applications in the Material Handling, Battery Charging, Utility Vehicles, Motive Power, and Sweeper/Scrubbers markets amongst many others.

E-80   E-160   E-320
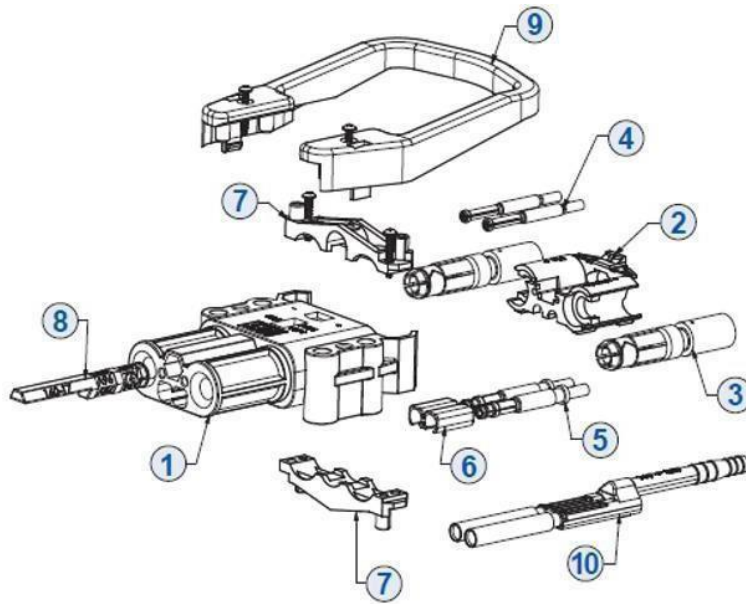
Female connector E80		
Item	Ordering code	Description
1+2+6+7+8	E80500-0009	Housing APP type "E" 80 – Female – Grey Coding Pin
3	EC80-1110	Main Contact APP DIN 80 Female – 10 mm² (8 AWG)
	EC80-1116	Main Contact APP DIN 80 Female – 16 mm² (6 AWG)
	EC80-1125	Main Contact APP DIN 80 Female – 25 mm² (4 AWG)
	EC80-1135	Main Contact APP DIN 80 Female – 35 mm² (2 AWG)
4	EHC80-33	Upper Auxiliary Contact APP DIN type 80 "E" Female – 1,5 mm²
5*	EPC80-31	Lower Pilot Auxiliary Contact APP DIN type 80 "E" Female – 1,5 mm²
6	NA	Not applicable on E80
8	EVKS80-9	Coding Pin DIN 80 Grey – Wet
	EVKD80-17	Coding Pin DIN 80 Green – Dry
	EVKS80-23F	Coding Pin DIN 80 Red – Wet – High Current
	EVKD80-22F	Coding Pin DIN 80 Blue – Dry – High Current
9	EHDL80-8	Handle APP DIN 80 Low Profile with 2 screws
	EHDL80-8-R	Red Handle APP DIN 80 Low Profile with 2 screws
10*	ETAT80-21	Air Adapter APP DIN type 80 – Female
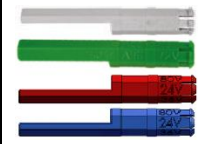
* Lower pilot auxiliary contacts use the same housing location as air tubes so they cannot be used together
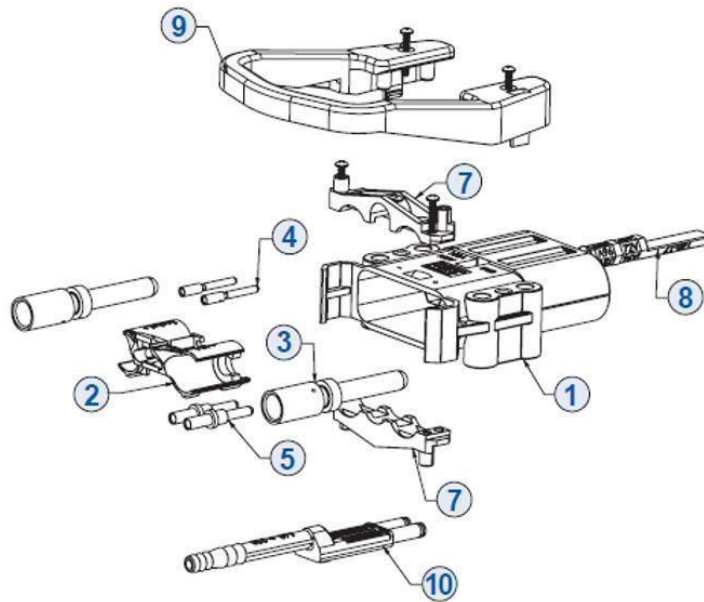
Male connector E80		
Item	Ordering code	Description
1+2+7+8	E80400-0009	Housing APP type "E" 80 – Male – Grey Coding Pin
3	EC80-1010	Main Contact APP DIN 80 Male – 10 mm² (8 AWG)
	EC80-1016	Main Contact APP DIN 80 Male – 16 mm² (6 AWG)
	EC80-1025	Main Contact APP DIN 80 Male – 25 mm² (4 AWG)
	EC80-1035	Main Contact APP DIN 80 Male – 35 mm² (2 AWG)
4	EHC80-32	Upper Auxiliary Contact APP DIN type 80 "E" Male – 1,5 mm²
5*	EPC80-30	Lower Pilot Auxiliary Contact APP DIN type 80 "E" Male – 2,5 mm²
8	EVKS80-9	Coding Pin DIN 80 Grey – Wet
	EVKD80-17	Coding Pin DIN 80 Green – Dry
	EVKU80-19	Coding Pin DIN 80 Yellow – Universal
	EVKS80-23M	Coding Pin DIN 80 Red – Wet – High Current
	EVKD80-22M	Coding Pin DIN 80 Blue – Dry – High Current
9	EHDL80-8	Handle APP DIN 80 Low Profile with 2 screws
	EHDL80-8-R	Red Handle APP DIN 80 Low Profile with 2 screws
10*	ETAT80-20	Air Adapter APP DIN 80 – Male

* Lower pilot auxiliary contacts use the same housing location as air tubes so they cannot be used together

Ordering code

	E80535-1009
Example:	

Series:
E80

Gender:
4 – Male
5 – Female

Main contacts:
00 – Non – order separately
10 – 10 mm² (8 AWG)
16 – 16 mm² (6 AWG)
25 – 25 mm² (4 AWG)
35 – 35 mm² (2 AWG)

Handle:
0 – None
1 – Black*
2 – Red*
*E80 comes with the low-profile T handle.

Coding key:
0 – Grey, wet cell
2 – Green, dry cell
3 – Yellow, universal (only on male housing)
4 – Blue, dry cell, high current
5 – Red, wet cell, high current

Auxiliary contacts & Air Tubes:
0 – None
1 – Lower pilot auxiliary contacts
2 – Upper auxiliary contacts
4 – Lower pilot auxiliary & upper auxiliary contacts
5 – Air Tube
6 – Air Tube & Upper auxiliary contacts

Packing:
9 – Individual
8 – Bulk

**Female connector E160**		
Item	**Ordering code**	**Description**
1+2+6+7+8	E16500-0009	Housing APP type "E" 160 – Female – Grey Coding Pin
3	EC160-1116	Main Contact APP DIN 160 Female – 16 mm² (6 AWG)
	EC160-1125	Main Contact APP DIN 160 Female – 25 mm² (4 AWG)
	EC160-1135	Main Contact APP DIN 160 Female – 35 mm² (2 AWG)
	EC160-1150	Main Contact APP DIN 160 Female – 50 mm² (1 to 1/0 AWG)
4	EHC160-33	Upper Auxiliary Contact APP DIN type 160 "E" Female – 4,0 mm²
5*	EPC160-13	Lower Pilot Auxiliary Contact APP DIN 160/320 "E" Female – 6,00 mm²
6	EACH320-38	Auxiliary Contact Holder APP DIN 160/320
8	EVKS160-9	Coding Pin DIN 160/320 Grey – Wet
	EVKD160-17	Coding Pin DIN 160/320 Green – Dry
	EVKS160-23F	Coding Pin DIN 160/320 Red – Wet – High Current
	EVKD160-22F	Coding Pin DIN 160/320 Blue – Dry – High Current
9	EHDL160-320-H	Handle APP DIN 160/320 High Profile with 2 screws
	EHDL160-320-L	Handle APP DIN 160/320 Low Profile with 2 screws
10*	ETAT160-21	Air Adapter APP DIN type 160 – Female

8

Male connector E160		
Item	**Ordering code**	**Description**
1+2+7+8	E16400-0009	Housing APP type "E" 160 – Male – Grey Coding Pin
3	EC160-1016	Main Contact APP DIN 160 Male – 16 mm² (6 AWG)
	EC160-1025	Main Contact APP DIN 160 Male – 25 mm² (4 AWG)
	EC160-1035	Main Contact APP DIN 160 Male – 35 mm² (2 AWG)
	EC160-1050	Main Contact APP DIN 160 Male – 50 mm² (1 to 1/0 AWG)
4	EHC160-32	Upper Auxiliary Contact APP DIN type 160 "E" Male – 4,0 mm²
5*	EPC160-12	Lower Pilot Auxiliary Contact APP DIN 160/320 "E" Male – 6,0 mm²
8	EVKS160-9	Coding Pin DIN 160/320 Grey – Wet
	EVKD160-17	Coding Pin DIN 160/320 Green – Dry
	EVKU160-19	Coding Pin DIN 160/320 Yellow – Universal
	EVKS160-23M	Coding Pin DIN 160/320 Red – Wet – High Current
	EVKD160-22M	Coding Pin DIN 160/320 Blue – Dry – High Current
9	EHDL160-320-H	Handle APP DIN 160/320 High Profile with 2 screws
	EHDL160-320-L	Handle APP DIN 160/320 Low Profile with 2 screws
10*	ETAT160-20	Air Adapter APP DIN 160 – Male

9

Accessories E160		
Picture	**Ordering code**	**Description**
	993G4 994G4	Manual Release E160/320 with hardware kit – Battery Manual Release E160/320 with hardware kit – Charger/Truck
	A320LP-MK	Latch Plate E160/320
	A320HL-MK	Handle & Lever Assembly E160/320

10

Ordering code

	Example:	**E16550-1009**

Series:
E160

Gender:
4 – Male
5 – Female

Main contacts:
00 – Non – order separately
16 – 16 mm² (6 AWG)
25 – 25 mm² (4 AWG)
35 – 35 mm² (2 AWG)
50 – 50 mm² (1/0 AWG to 1 AWG)

Handle:
0 – None
1 – Black*
*E160 comes standard with the low-profile handle.

Coding key:
0 – Grey, wet cell
2 – Green, dry cell
3 – Yellow, universal (only on male housing)
4 – Blue, dry cell, high current
5 – Red, wet cell, high current

Auxiliary contacts & Air Tubes:
0 – None
1 – Lower pilot auxiliary contacts
2 – Upper auxiliary contacts
4 – Lower pilot auxiliary & upper auxiliary contacts
5 – Air Tube
6 – Air Tube & Upper auxiliary contacts

Packing:
9 – Individual
8 – Bulk

11

Female connector E320		
Item	**Ordering code**	**Description**
1+2+6+7+8	E32500-0009	Housing APP type "E" 320 – Female – Grey Coding Pin
3	EC320-1150	Main Contact APP DIN 320 Female – 50 mm² (1 to 1/0 AWG)
	EC320-1170	Main Contact APP DIN 320 Female – 70 mm² (2/0 to 3/0 AWG)
	EC320-1195	Main Contact APP DIN 320 Female – 95 mm² (3/0 to 4/0 AWG)
	EC320-1104	Main Contact APP DIN 320 Female – 120 mm² (4/0 AWG)
4	EHC320-35	Upper Auxiliary Contact APP DIN type 320 "E" Female – 4,0 mm²
5*	EPC160-13	Lower Pilot Auxiliary Contact APP DIN 160/320 "E" Female – 6,00 mm²
6	EACH320-38	Auxiliary Contact Holder APP DIN 160/320
8	EVKS160-9	Coding Pin DIN 160/320 Grey – Wet
	EVKD160-17	Coding Pin DIN 160/320 Green – Dry
	EVKS160-23F	Coding Pin DIN 160/320 Red – Wet – High Current
	EVKD160-22F	Coding Pin DIN 160/320 Blue – Dry – High Current
9	EHDL160-320-H	Handle APP DIN 160/320 High Profile with 2 screws
	EHDL160-320-L	Handle APP DIN 160/320 Low Profile with 2 screws
10*	ETAT320-21	Air Adapter APP DIN type 320 – Female

Male connector E320		
Item	Ordering code	Description
1+2+7+8	E32400-0009	Housing APP type "E" 320 – Male – Grey Coding Pin
3	EC320-1050	Main Contact APP DIN 320 Male – 50 mm² (1 to 1/0 AWG)
	EC320-1070	Main Contact APP DIN 320 Male – 70 mm² (2/0 to 3/0 AWG)
	EC320-1095	Main Contact APP DIN 320 Male – 95 mm² (3/0 to 4/0 AWG)
	EC320-1004	Main Contact APP DIN 320 Male – 120 mm² (4/0 AWG)
4	EHC320-34	Upper Auxiliary Contact APP DIN type 320 "E" Male – 4,0 mm²
5*	EPC160-12	Lower Pilot Auxiliary Contact APP DIN 160/320 "E" Male – 6,0 mm²
8	EVKS160-9	Coding Pin DIN 160/320 Grey – Wet
	EVKD160-17	Coding Pin DIN 160/320 Green – Dry
	EVKU160-19	Coding Pin DIN 160/320 Yellow – Universal
	EVKS160-23M	Coding Pin DIN 160/320 Red – Wet – High Current
	EVKD160-22M	Coding Pin DIN 160/320 Blue – Dry – High Current
9	EHDL160-320-H	Handle APP DIN 160/320 High Profile with 2 screws
	EHDL160-320-L	Handle APP DIN 160/320 Low Profile with 2 screws
10*	ETAT320-20	Air Adapter APP DIN 320 – Male

13

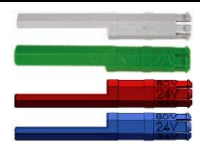| Accessories E320		
Picture	**Ordering code**	**Description**
	993G4 994G4	Manual Release E160/320 with hardware kit – Battery Manual Release E160/320 with hardware kit – Charger/Truck
	A320LP-MK	Latch Plate E160/320
	A320HL-MK	Handle & Lever Assembly E160/320

14

Ordering code

Example:	E32550-1009

Series:
E320

Gender:
4 – Male
5 – Female

Main contacts:
00 – Non – order separately
50 – 50 mm² (1/0 AWG to 1 AWG)
70 – 70 mm² (2/0 AWG to 3/0 AWG)
95 – 95 mm² (3/0 AWG to 4/0 AWG)
04 – 120 mm² (4/0 AWG)

Handle:
0 – None
1 – Black*
*E320 comes standard with the high-profile handle.

Coding key:
0 – Grey, wet cell
2 – Green, dry cell
3 – Yellow, universal (only on male housing)
4 – Blue, dry cell, high current
5 – Red, wet cell, high current

Auxiliary contacts & Air Tubes:
0 – None
1 – Lower pilot auxiliary contacts
2 – Upper auxiliary contacts
4 – Lower pilot auxiliary & upper auxiliary contacts
5 – Air Tube
6 – Air Tube & Upper auxiliary contacts

Packing:
9 – Individual
8 – Bulk

15

1.1.2 A Series

The Anderson™ family of A Series Battery Connectors are expertly designed for ease of use and incorporate an innovative contact carrier to simplify assembly. The A Series connectors include standard 80, 160, and 320 sizes. Robust design and materials offer superior performance. All Materials chosen are RoHS compliant and selected to ensure years of reliability in adverse industrial environments. These attributes make the A Series connectors the ideal choice for a wide range of industrial applications in Material Handling, Battery Charging, Utility Vehicles, Motive Power, and Sweepers/Scrubbers amongst many others.

A-80   **A-160**   **A-320**

16
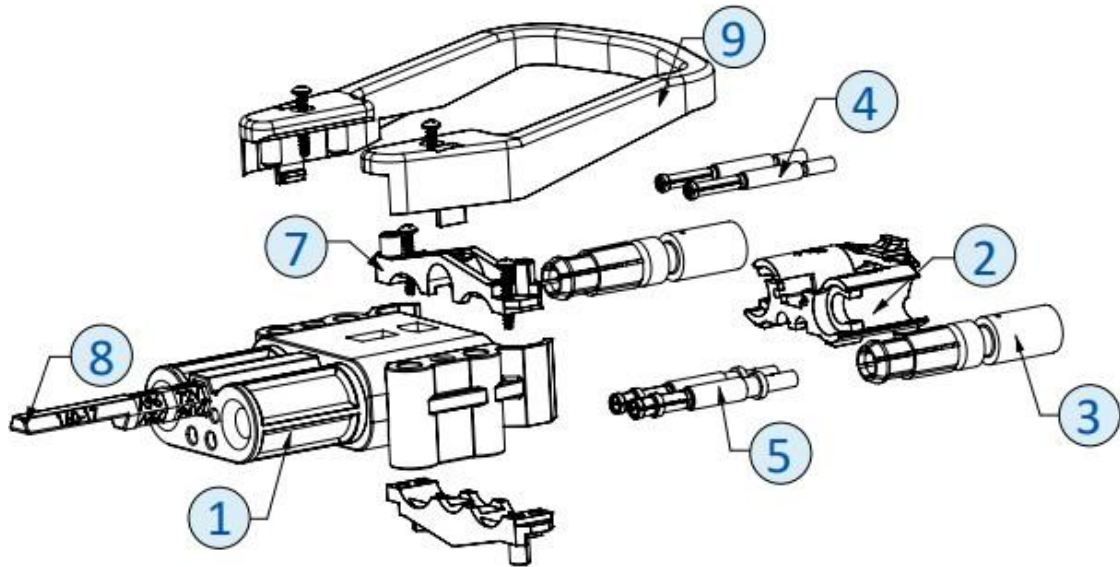
A80 Female connector		
Item	Ordering code	Description
1+2+7+8	A80500-0009	Housing APP type "A" 80 – Female – Gray Coding Pin
3	EC80-1110	Main Contact APP DIN 80 Female – 10 mm² (8 AWG)
	EC80-1116	Main Contact APP DIN 80 Female – 16 mm² (6 AWG)
	EC80-1125	Main Contact APP DIN 80 Female – 25 mm² (4 AWG)
	EC80-1135	Main Contact APP DIN 80 Female – 35 mm² (2 AWG)
4	EHC80-33	Upper Auxiliary Contact APP DIN 80 Female – 18/14 AWG
5	EPC80-31	Lower Pilot Auxiliary Contact APP DIN 80 Female – 18/14 AWG
8	EVKS80-9	Coding Pin APP DIN 80 Gray – Wet
	EVKD80-17	Coding Pin APP DIN 80 Green – Dry
9	EHDLA80	Handle APP DIN 80 Low Profile with 2 screws
	EHDLA80-R	Red Handle APP DIN 80 Low Profile with 2 screws

A80 Male connector		
Item	Ordering code	Description
1+2+7+8	A80400-0009	Housing APP type "A" 80 – Male – Gray Coding Pin
3	EC80-1010	Main Contact APP DIN 80 Male – 10 mm² (8 AWG)
	EC80-1016	Main Contact APP DIN 80 Male – 16 mm² (6 AWG)
	EC80-1025	Main Contact APP DIN 80 Male – 25 mm² (4 AWG)
	EC80-1035	Main Contact APP DIN 80 Male – 35 mm² (2 AWG)
4	EHC80-32	Upper Auxiliary Contact APP DIN 80 Male – 18/14 AWG
5	EPC80-30	Lower Pilot Auxiliary Contact APP DIN 80 Male – 18/14 AWG
8	EVKS80-9	Coding Pin APP DIN 80 Gray – Wet
	EVKD80-17	Coding Pin APP DIN 80 Green – Dry
	EVKU80-19	Coding Pin APP DIN 80 Yellow – Universal
9	EHDLA80	Handle APP DIN 80 Low Profile with 2 screws
	EHDLA80-R	Red Handle APP DIN 80 Low Profile with 2 screws

Ordering code

Example:	A80535-1009

Series:
A80

Gender:
4 – Male
5 – Female

Main contacts:
00 – Non – order separately
10 – 10 mm² (8 AWG)
16 – 16 mm² (6 AWG)
25 – 25 mm² (4 AWG)
35 – 35 mm² (2 AWG)

Handle:
0 – None
1 – Black*
2 – Red*
*A80 comes with the low profile T handle.

Coding key:
0 – Gray, wet cell
2 – Green, dry cell
3 – Yellow, universal (only on male housing)

Auxiliary contacts & Air Tubes:
0 – None
1 – Lower pilot auxiliary contacts
2 – Upper auxiliary contacts
4 – Lower pilot auxiliary & upper auxiliary contacts

Packing:
9 – Individual
8 – Bulk

A160 Female connector		
Item	Ordering code	Description
1+2+7+8	A16500-0009	Housing APP type "A" 160 – Female – Gray Coding Pin
3	EC160-1116	Main Contact APP DIN 160 Female – 16 mm² (6 AWG)
	EC160-1125	Main Contact APP DIN 160 Female – 25 mm² (4 AWG)
	EC160-1135	Main Contact APP DIN 160 Female – 35 mm² (2 AWG)
	EC160-1150	Main Contact APP DIN 160 Female – 50 mm² (1 to 1/0 AWG)
4	AHC160-15	Upper Auxiliary Contact APP DIN 160/320 Female – 12 AWG
	AHC320-25*	Upper Auxiliary Contact APP DIN 160/320 Female – 18/14 AWG
5	EPC160-13	Lower Pilot Auxiliary Contact APP DIN 160/320 Female – 10 AWG Lower
	APC320-23*	Pilot Auxiliary Contact APP DIN 160/320 Female – 18/14 AWG
8	EVKS160-9	Coding Pin APP DIN 160/320 Gray – Wet
	EVKD160-17	Coding Pin APP DIN 160/320 Green – Dry
9	EHDLA320-H	Handle APP DIN 160/320 "A" High Profile with 2 screws
	EHDLA320-L	Handle APP DIN 160/320 "A" Low Profile with 2 screws

A160 Male connector		
Item	Ordering code	Description
1+2+7+8	A16400-0009	Housing APP type "A" 160 – Male – Gray Coding Pin
3	EC160-1016 EC160-1025 EC160-1035 EC160-1050	Main Contact APP DIN 160 Male – 16 mm² (6 AWG) Main Contact APP DIN 160 Male – 25 mm² (4 AWG) Main Contact APP DIN 160 Male – 35 mm² (2 AWG) Main Contact APP DIN 160 Male – 50 mm² (1 to 1/0 AWG)
4	AHC160-14 AHC320-24*	Upper Auxiliary Contact APP DIN 160/320 Male – 12 AWG Upper Auxiliary Contact APP DIN 160/320 Male – 18/14 AWG
5	EPC160-12 APC320-22*	Lower Pilot Auxiliary Contact APP DIN 160/320 Male – 10 AWG Lower Pilot Auxiliary Contact APP DIN 160/320 Male – 18/14 AWG
8	EVKS160-9 EVKD160-17 EVKU160-19	Coding Pin APP DIN 160/320 Gray – Wet Coding Pin APP DIN 160/320 Green – Dry Coding Pin APP DIN 160/320 Yellow – Universal
9	EHDLA320-H EHDLA320-L	Handle APP DIN 160/320 "A" High Profile with 2 screws Handle APP DIN 160/320 "A" Low Profile with 2 screws

Accessories		
Picture	**Ordering code**	**Description**
	993G4￼
994G4	Manual Release DIN 160/320 with hardware kit – Battery Manual Release DIN 160/320 with hardware kit – Charger/Truck
	A320LP-MK	Latch Plate DIN 160/320
	A320HL-MK	Handle & Lever Assembly DIN 160/320

Ordering code

Example:	A16550-1009

Series:
A160

Gender:
4 – Male
5 – Female

Main contacts:
00 – Non – order separately
16 – 16 mm² (6 AWG)
25 – 25 mm² (4 AWG)
35 – 35 mm² (2 AWG)
50 – 50 mm² (1/0 AWG to 1 AWG)

Handle:
0 – None
1 – Black*
*A160 comes standard with the low profile handle.

Coding key:
0 – Gray, wet cell
2 – Green, dry cell
3 – Yellow, universal (only on male housing)

Auxiliary contacts & Air Tubes:
0 – None
1 – Lower pilot auxiliary contacts (18/14 AWG)
2 – Upper auxiliary contacts (18/14 AWG)
4 – Lower pilot auxiliary & upper auxiliary contacts (18/14 AWG)

Packing:
9 – Individual
8 – Bulk

23

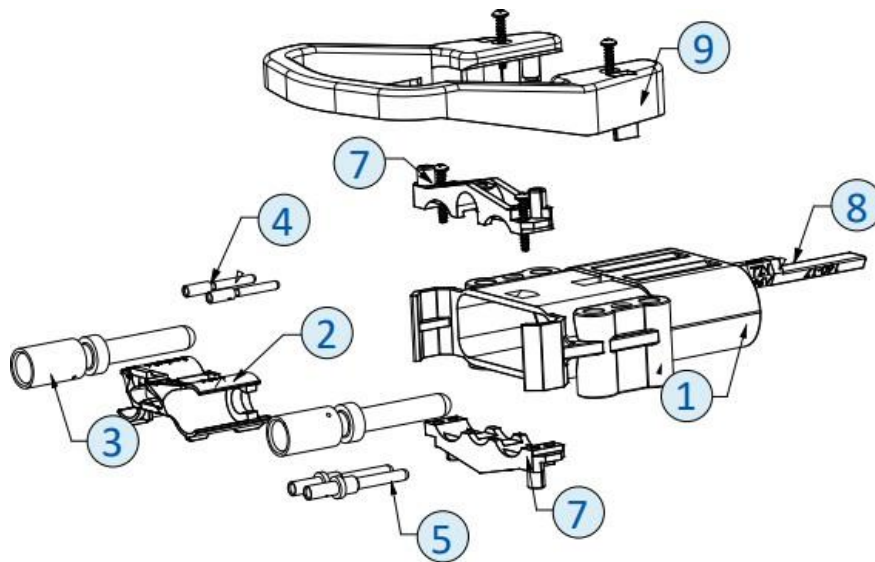| A320 Female connector		
Item	**Ordering code**	**Description**
1+2+7+8	A32500-0009	Housing APP type "A" 320 – Female – Gray Coding Pin
3	EC320-1150 EC320-1170 EC320-1195 EC320-1104	Main Contact APP DIN 320 Female – 50 mm² (1 to 1/0 AWG) Main Contact APP DIN 320 Female – 70 mm² (2/0 to 3/0 AWG) Main Contact APP DIN 320 Female – 95 mm² (3/0 to 4/0 AWG) Main Contact APP DIN 320 Female – 120 mm² (4/0 AWG)
4	AHC160-15 AHC320-25*	Upper Auxiliary Contact APP DIN 160/320 Female – 12 AWG Upper Auxiliary Contact APP DIN 160/320 Female – 18/14 AWG
5	EPC160-13 APC320-23*	Lower Pilot Auxiliary Contact APP DIN 160/320 Female – 10 AWG Lower Pilot Auxiliary Contact APP DIN 160/320 Female – 18/14 AWG
8	EVKS160-9 EVKD160-17	Coding Pin APP DIN 160/320 Gray – Wet Coding Pin APP DIN 160/320 Green – Dry
9	EHDLA320-H EHDLA320-L	Handle APP DIN 160/320 "A" High Profile with 2 screws Handle APP DIN 160/320 "A" Low Profile with 2 screws

24

A320 Male connector		
Item	Ordering code	Description
1+2+7+8	A32400-0009	Housing APP type "A" 320 – Male – Gray Coding Pin
3	EC320-1050 EC320-1070 EC320-1095 EC320-1004	Main Contact APP DIN 320 Male – 50 mm² (1 to 1/0 AWG) Main Contact APP DIN 320 Male – 70 mm² (2/0 to 3/0 AWG) Main Contact APP DIN 320 Male – 95 mm² (3/0 to 4/0 AWG) Main Contact APP DIN 320 Male – 120 mm² (4/0 AWG)
4	AHC160-14 AHC320-24*	Upper Auxiliary Contact APP DIN 160/320 Male – 12 AWG Upper Auxiliary Contact APP DIN 160/320 Male – 18/14 AWG
5	EPC160-12 APC320-22*	Lower Pilot Auxiliary Contact APP DIN 160/320 Male – 10 AWG Lower Pilot Auxiliary Contact APP DIN 160/320 Male – 18/14 AWG
8	EVKS160-9 EVKD160-17 EVKU160-19	Coding Pin APP DIN 160/320 Gray – Wet Coding Pin APP DIN 160/320 Green – Dry Coding Pin APP DIN 160/320 Yellow – Universal
9	EHDLA320-H EHDLA320-L	Handle APP DIN 160/320 "A" High Profile with 2 screws Handle APP DIN 160/320 "A" Low Profile with 2 screws

Accessories		
Picture	**Ordering code**	**Description**
	993G4 994G4	Manual Release DIN 160/320 with hardware kit – Battery Manual Release DIN 160/320 with hardware kit – Charger/Truck
	A320LP-MK	Latch Plate DIN 160/320
	A320HL-MK	Handle & Lever Assembly DIN 160/320

26

Ordering code

Example:	A32550-1009

Series:
A320

Gender:
4 – Male
5 – Female

Main contacts:
00 – Non – order separately
50 – 50 mm² (1/0 AWG to 1 AWG)
70 – 70 mm² (2/0 AWG to 3/0 AWG)
95 – 95 mm² (3/0 AWG to 4/0 AWG)
04 – 120 mm² (4/0 AWG)

Handle:
0 – None
1 – Black*
*A320 comes standard with the high profile handle.

Coding key:
0 – Gray, wet cell
2 – Green, dry cell
3 – Yellow, universal (only on male housing)

Auxiliary contacts & Air Tubes:
0 – None
1 – Lower pilot auxiliary contacts (18/14 AWG)
2 – Upper auxiliary contacts (18/14 AWG)
4 – Lower pilot auxiliary & upper auxiliary contacts (18/14 AWG)

Packing:
9 – Individual
8 – Bulk

1.1.3 SB Series

Based off the design pioneered by Anderson™ in 1953, the two pole SB connectors set the standard for DC power distribution and battery connections. SB 50 connectors feature a one-piece plastic housing using stainless steel springs to hold low resistance contacts in place. Wires sizes from 16 to 6 AWG (1.5 to 13.3 mm²) are held in the smallest of the SB series housings.

SB50 Connectors = Standard housing + wire contacts (set)			
Color	6 AWG	8 AWG	12-10 AWG
Yellow	6331G7	6322G7	6331G8
Orange	6331G11	6331G13	6331G12
Red	6331G1	6332G2	6331G2
Gray	6319	6319G2	6319G1
Blue	6331G5	6332G5	6331G6
Green	6331G9	6332G10	6331G10
Black	6331G3	6332G4	6331G4
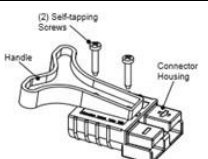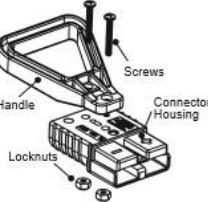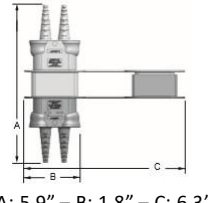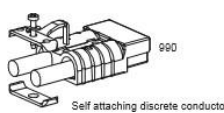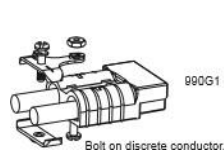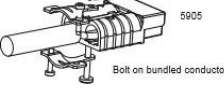
SB50 Standard housings		
Color	Ordering code	Description
Yellow	992G5-BK	Housing SB 50 – Yellow
Orange	992G7-BK	Housing SB 50 – Orange
Red	992G1-BK	Housing SB 50 – Red
Gray	992-BK	Housing SB 50 – Gray
Blue	992G4-BK	Housing SB 50 – Blue
Green	992G6-BK	Housing SB 50 – Green
Black	992G2-BK	Housing SB 50 – Black

Note: SB 50 black and grey housings have the same keying features and can be intermated

29
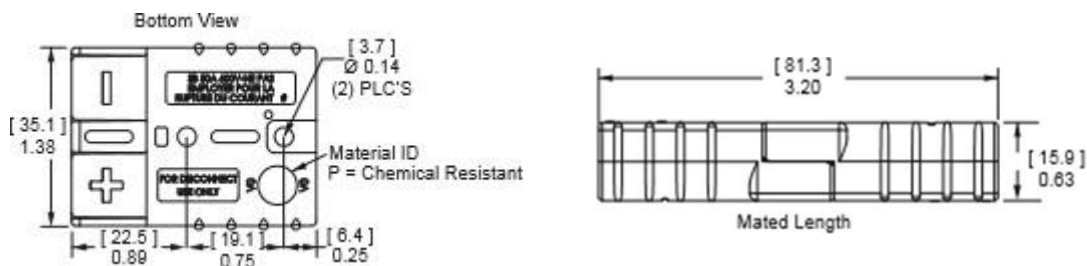
Silver plated wire contacts		
Section	**Ordering code**	**Description**
12 to 10 AWG	5915-BK	Main Contact SB 50/PP 75 – 12-10 AWG (3,3 – 5,3 mm²)
8 AWG	5952-BK	Main Contact SB 50/PP 75 – 8 AWG (8,4 mm²)
6 AWG	5900-BK	Main Contact SB 50/PP 75 – 6 AWG (13,3 mm²)

Accessories		
Picture	**Ordering code**	**Description**
	5912-BK 5910-BK 5913-BK	Reducing Bushing APP 6 AWG – 8 AWG Reducing Bushing APP 6 AWG – 12-10 AWG Reducing Bushing APP 6 AWG – 16-14 AWG
	SB50-HDL-RED	Handle T-shaped SB 50 – **Red**
	997G1-GRAY	Handle SB 50/SB 120 – Gray
	134G1-B 134G1-R	Dust Cover SB 50 – **Black** Dust Cover SB 50 – **Red**
 A: 5.9" – B: 1.8" – C: 6.3"	3-6054P2 3-6055P2	Environmental Boot with cover SB 50 – Load Environmental Boot with cover SB 50 – Source
	990 990G2	Cable Clamp, self-attaching for discrete conductor – AWG 8-6 Cable Clamp, self-attaching for discrete conductor – AWG 12-10
	990G1	Cable Clamp for discrete conductor – AWG 12-6
	5905	Cable Clamp for bundled conductor – 0.32"-0.45"

SB120 Connectors = Housing + wire contacts (set)			
Color	1 AWG	2 AWG	4 AWG	6 AWG
Red	6802	6802G1	6802G2	6802G3
Gray	6800	6800G1	6800G2	6800G3
Blue	6801	6801G1	6801G2	6801G3

SB120 Standard housings		
Color	Ordering code	Description
Red	6810G3-BK	Housing SB 120 – Red
Gray	6810G1-BK	Housing SB 120 – Gray
Blue	6810G2-BK	Housing SB 120 – Blue
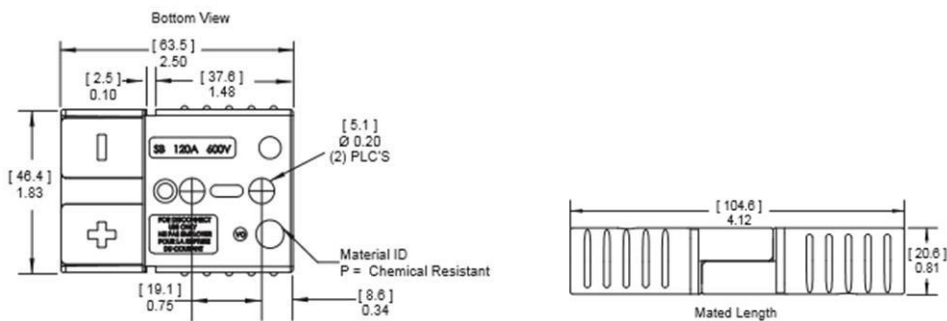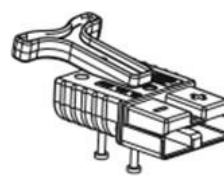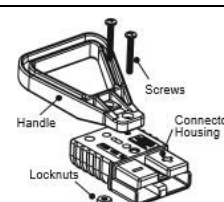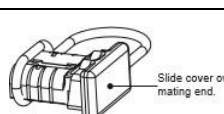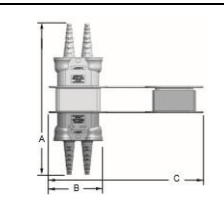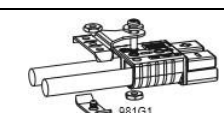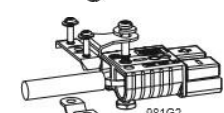
Silver plated wire contacts		
Section	**Ordering code**	**Description**
6 AWG	1319G6-BK	Main Contact SB 120/PP 120 – 6 AWG (13,3 mm²)
4 AWG	1319G4-BK	Main Contact SB 120/PP 120 – 4 AWG (21,2 mm²)
2 AWG	1319-BK	Main Contact SB 120/PP 120 – 2 AWG (33,6 mm²)
1 AWG	1323G1-BK	Main Contact SB 120/PP 120 – 1 AWG (42,4 mm²)

Accessories		
Picture	**Ordering code**	**Description**
	5919-BK 5920-BK 5921-BK	Reducing Bushing APP 2 AWG – 4 AWG Reducing Bushing APP 2 AWG – 6 AWG Reducing Bushing APP 2 AWG – 10-8 AWG
	SB120-HDL-RED	Handle T-shaped SB 120 – **Red**
	997G1-GRAY	Handle SB 50/SB 120 – **Grey**
	134G4-B 134G4-R	Dust Cover SB 120 – **Black** Dust Cover SB 120 – **Red**
A: 7.9" – B: 2.8" – C: 8.0"	3-6035P1 3-6034P1	Environmental Boot with cover SB 120 – Load Environmental Boot with cover SB 120 – Source
	981G1 981G2	Cable Clamp for discrete conductor – 0.70"-0.23" Cable Clamp for bundled conductor – 0.73"-0.29"

32

SB175 Connectors = Housing + wire contacts (set)					
Color	1/0 AWG	1 AWG	2 AWG	4 AWG	6 AWG
Yellow	6328G1	6328G3	6328G5	6328G6	6328G8
Orange	6327G1	6327G3	6327G5	6327G6	6327G8
Red	6329G1	6329G3	6329G5	6329G6	6329G8
Gray	6325G1	6325G3	6325G5	6325G6	6325G8
Blue	6326G1	6326G3	6326G5	6326G6	6326G8
Black (keyless)	6330G1	6330G3	6330G5	6330G6	6330G8

SB175 Standard housings		
Color	Ordering code	Description
Yellow	943-BK	Housing SB 175 – Yellow
Orange	942-BK	Housing SB 175 – Orange
Red	949-BK	Housing SB 175 – Red
Gray	940-BK	Housing SB 175 – Gray
Blue	941-BK	Housing SB 175 – Blue
Black	2-7252G11	Housing SB 175 – Black
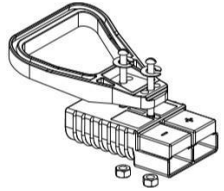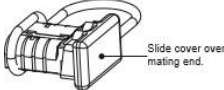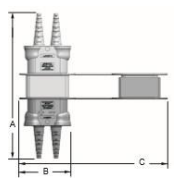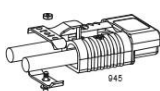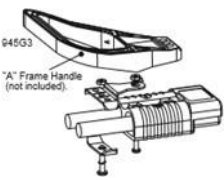
Note: SB 175 black is keyless and can be mated with all other colors.

Bottom View

[79.6]
3.13

[55.6]
2.19

SB*
175A-600V

[6.5]
Ø 0.26
(2) PLC'S

Material ID
P = Chemical
Resistant

[28.6]
1.13

[11.3]
0.45

Mated Length

[133.4]
5.25

[25.4]
1.00

33
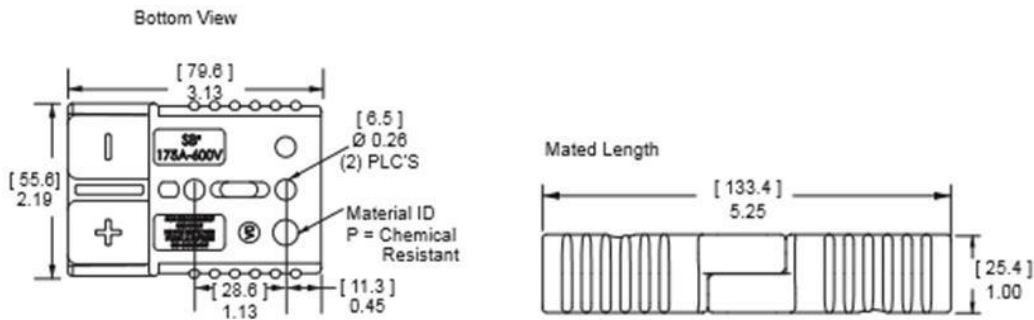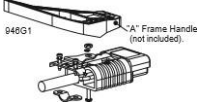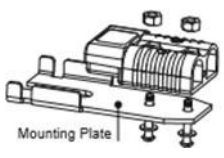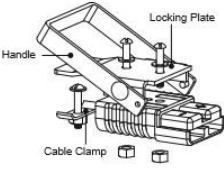
Silver plated wire contacts		
Section	**Ordering code**	**Description**
6 AWG	1348-BK	Main Contact SB 175/PP 180 – 6 AWG (13,3 mm²)
4 AWG	1384-BK	Main Contact SB 175/PP 180 – 4 AWG (21,1 mm²)
2 AWG	1383-BK	Main Contact SB 175/PP 180 – 2 AWG (33,6 mm²)
1 AWG	1347-BK	Main Contact SB 175/PP 180 – 1 AWG (42,4 mm²)
1/0 AWG	1382-BK	Main Contact SB 175/PP 180 – 1/0 AWG (53,5 mm²)

Accessories		
Picture	**Ordering code**	**Description**
	5687-BK 5690-BK 5693-BK 5663-BK 5648-BK	Reducing Bushing APP 1/0 AWG – 1 AWG Reducing Bushing APP 1/0 AWG – 2 AWG Reducing Bushing APP 1/0 AWG – 4 AWG Reducing Bushing APP 1/0 AWG – 6 AWG Reducing Bushing APP 1/0 AWG – 10-8 AWG
	995G1-GRAY 995G3-RED	Handle SB 175/SBE 160 – Gray Handle SB 175/SBE 160 – **Red**
	134G2-B 134G2-R	Dust Cover SB 175 – **Black** Dust Cover SB 175 – **Red**
A: 9.5" – B: 3.2" – C: 9.3"	3-6037P1 3-6036P1	Environmental Boot with cover SB 175 – Load Environmental Boot with cover SB 175 – Source
	945	Cable clamp, self-attaching for discrete conductor – 0.55"-0.24"
	945G3	Cable Clamp for discrete conductor – 0.66"-0.24"

34

	946G1	Cable Clamp for bundled conductor – 0.75"-0.29"
	SB175-LOCKOUT	Lockout SB 175
	924G1	Manual Release SB 175, Mounting Half with Clamps
	923G1	Manual Release SB 175, Locking Half with Clamps

SB350 Connectors = Housing + wire contacts (set)				
Color	300 MCM	4/0 AWG	3/0 AWG	2/0 AWG	1/0 AWG
Yellow	6323G4	6323G2	6323G5	6323G1	6323G6
Orange	6400G4	6400G2	6400G5	6400G1	6400
Red	6322G4	6322G2	6322G5	6322G1	6322G6
Gray	6320G4	6320G2	6320G5	6320G1	6320G6
Blue	6321G4	6321G2	6321G5	6321G1	6321
Green	6324G4	6324G2	6324G5	6324G1	6324G6
Black	6321G10	6321G9	6321G6	6321G8	6321G7

SB350 Standard housings		
Color	Ordering code	Description
Yellow	914-BK	Housing SB 350 – Yellow
Orange	932-BK	Housing SB 350 – Orange
Red	913-BK	Housing SB 350 – Red
Gray	906-BK	Housing SB 350 – Gray
Blue	912-BK	Housing SB 350 – Blue
Green	931-BK	Housing SB 350 – Green
Black	2-7250G8	Housing SB 350 – Black

Note: SB 350 black and blue housings have the same keying features and can be intermated.

Bottom View

[107.9]
4.25

SB 350A 600V
FOR DISCONNECT USE ONLY

[69.9]
2.75

NE PAS EMPLOYER POUR LA RUPTURE DU COURANT

[6.6]
Ø 0.26
(2) PLC'S

[28.6]   [34.9]
1.13   1.38

MATERIAL ID
P = Chemical Resistant

[182.6]
7.19

[33.3]
1.31

Mated Length

36
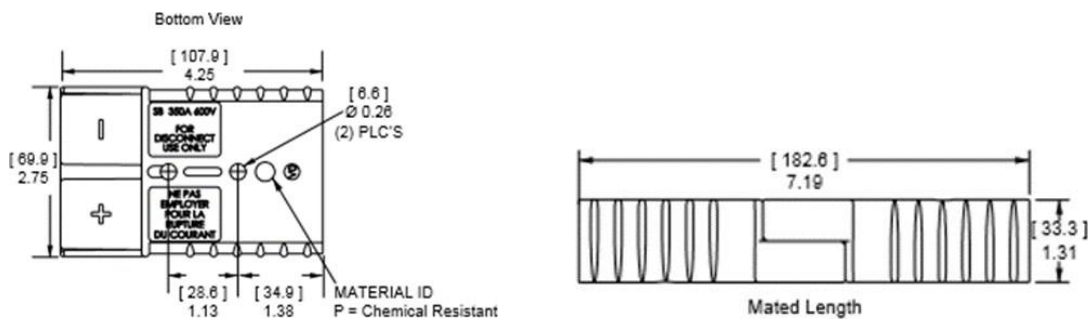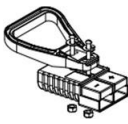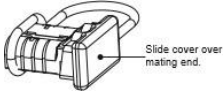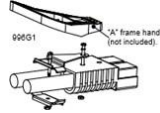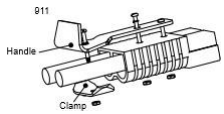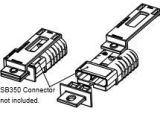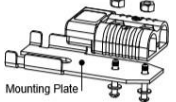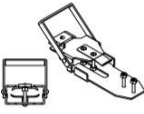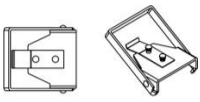
Silver plated wire contacts		
Section	**Ordering code**	**Description**
AWG 1/0	917-BK	Main Contact SB 350 – 1/0 AWG (53,5 mm²)
AWG 2/0	907-BK	Main Contact SB 350 – 2/0 AWG (67,4 mm²)
AWG 3/0	916-BK	Main Contact SB 350 – 3/0 AWG (85 mm²)
AWG 4/0	908-BK	Main Contact SB 350 – 4/0 AWG (107,2 mm²)
300mcm	910-BK	Main Contact SB 350 – 300 MCM (152 mm²)

Accessories		
Picture	**Ordering code**	**Description**
	5918-BK	Reducing Bushing APP 2/0 AWG – 1/0 AWG
	995G2-GRAY 995G4-RED	Handle SB 350/SBE 320 – Gray Handle SB 350/SBE 320 – Red
	134G3-B 134G3-R	Dust Cover SB 350 – Black Dust Cover SB 350 – Red
	996G1	Cable Clamp for discrete conductor – 1"-0.35"
	911	Cable Clamp for discrete conductor w/ handle – 0.76"-0.32"
	SB350-LOCKOUT	Lockout SB 350
	922G1	Manual Release SB 350 Mounting Half with hardware kit
	919	Manual Release SB 350 Locking Half with cable clamp
	919G1	Manual Release SB 350 Locking Half, no cable clamp

37

1.1.4 SBE Series

SBE connectors build on the capability of the SB connectors that handle two primary power contacts with the capacity to have up to 8 auxiliary power / signal contacts. The centers of the connector housing feature a location for either: two PP15-45 housings and contacts, an innovative 1x4 auxiliary accessory, or two PPMX housings that can accommodate up to 8 aux contacts. In addition, the housing meets IEC 60950 & IEC60529 touch safe requirements.

Sequencing within auxiliary positions is possible using the 4 pin lengths available in the 1x4 auxiliary accessory however the auxiliary contacts mate last / un-mate first in relationship to the power contacts. The SBE connector housings are molded from a chemical resistant PBT/PC blend resin allowing them to meet EN1175-1 requirement and are tested to EN1175-1 standards.

ANDERSON POWER™

SBE80

SBE160

SBE320

SBE80 Connectors = Housing + wire contacts (set)		
Color	6 AWG	4 AWG
Yellow	SBE80YEL16MM	SBE80YEL25MM
Orange	SBE80ORN16MM	SBE80ORN25MM
Red	SBE80RED16MM	SBE80RED25MM
Gray	SBE80GRA16MM	SBE80GRA25MM
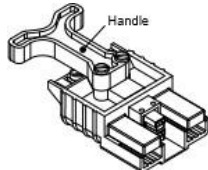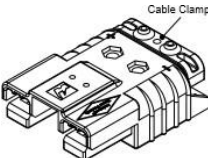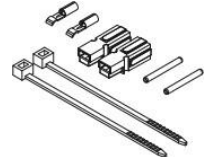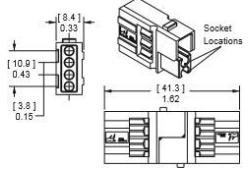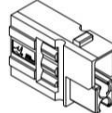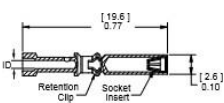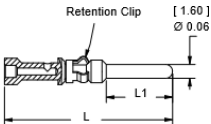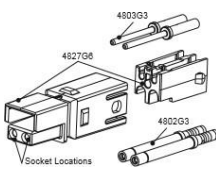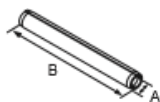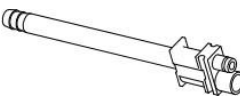
SBE80 Standard housings		
Color	Ordering code	Description
Yellow	SBE80YEL-BK	Housing SBE 80 – Yellow
Orange	SBE80ORN-BK	Housing SBE 80 – Orange
Red	SBE80RED-BK	Housing SBE 80 – Red
Gray	SBE80GRA-BK	Housing SBE 80 – Gray

Top View

[46.0]
1.81

[5.1]
0.20

[49.5]
1.95

[14.6]
0.58

Mated Length

[112.2]
4.42
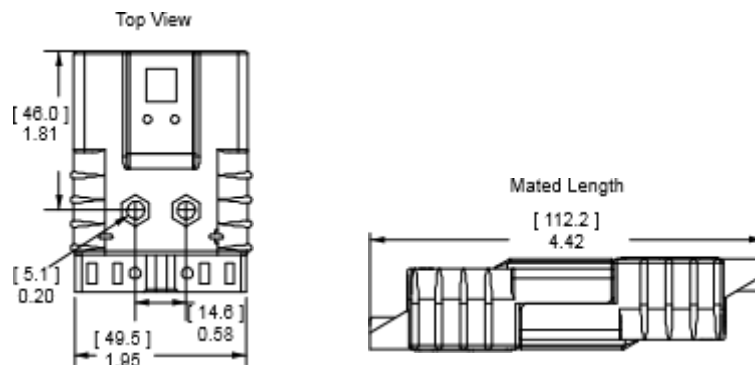
Silver plated wire contacts		
Section	Ordering code	Description
AWG 6	1339G1-BK	Main Contact SBE 80 – 6 AWG (16 mm²)
AWG 4	1339G4-BK	Main Contact SBE 80 – 4 AWG (25 mm²)

Accessories		
Picture	Ordering code	Description
	5912-BK 5910-BK 5913-BK	Reducing Bushing APP 6 AWG - 8 AWG Reducing Bushing APP 6 AWG - 12-10 AWG Reducing Bushing APP 6 AWG - 16-14 AWG
	SBE80HDLRED	Handle SBE 80 – Red
	SBE80CLPYEL SBE80CLPORN SBE80CLPRED SBE80CLPWHT	Cable Clamp SBE80 – Yellow Cable Clamp SBE80 – Orange Cable Clamp SBE80 – Red Cable Clamp SBE80 – White
	6344	Powerpole Auxiliary Kit 16 to 12 AWG Contact
	441G3 441G1 441G2	1x4 Auxiliary Kit 12 AWG 1x4 Auxiliary Kit 16 to 14 AWG 1x4 Auxiliary Kit 20 to 16 AWG * Auxiliary Kits include (1) Auxiliary Housing, (2) Standard Length Pin Contacts, (2) Socket Contacts, (2) Retaining Pins and (1) Retaining Clip.
	444G1	Aux. Holder Housing - SBE/SBX 1x4
	PM16S12S32 PM16S1416S32 PM16S1620S32 PM16S2024S32	*Socket Contacts for 1x4 Auxiliary Connector* PowerMod Socket 12 AWG (2,5 mm²) PowerMod Socket 16-14 AWG (1,0-1,5 mm²) PowerMod Socket 20-16 AWG (0,75-1,0 mm²) PowerMod Socket 24-20 AWG (0,50-0,75 mm²)

	PM16P12S30 PM16P1416S30 PM16P1620S30 PM16P2024S30 PM16P12A30 PM16P1416A30 PM16P1620A30 PM16P2024A30 PM16P12C30 PM16P1416C30 PM16P1620C30 PM16P2024C30	*Pin Contacts for 1x4 Auxiliary Connector* PowerMod Pin12 AWG, Standard Length 7.7 mm PowerMod Pin 16-14 AWG, Standard Length 7.7mm PowerMod Pin 20-16 AWG, Standard Length 7.7mm PowerMod Pin 24-20 AWG, Standard Length 7.7mm PowerMod Pin 12 AWG, Pre-Mate 9.3 mm PowerMod Pin 16-14 AWG, Pre-Mate 9.3mm PowerMod Pin 20-16 AWG, Pre-Mate 9.3mm PowerMod Pin 24-20 AWG, Pre-Mate 9.3mm PowerMod Pin 12 AWG, Post-Mate 6,6mm PowerMod Pin 16-14 AWG, Post-Mate 6,6mm PowerMod Pin 20-16 AWG, Post-Mate 6,6mm PowerMod Pin 24-20 AWG, Post-Mate 6,6mm
	4850G6	PPMX Auxiliary Kit 24 to 20 AWG The PPMX auxiliary connector allows up to 8 auxiliary circuits to be used in the SBE®, SBO®, & SBX® housings. There are 4 auxiliary circuits per PPMX connector and two PPMX housings fit into the auxiliary port in the main connector housing
	4803G3-BK 4802G3-BK	Pin Contact for PPMX – 24 to 20 AWG Socket Contact for PPMX – 24 to 20 AWG
	110G9-BK	Retaining Pin for SBE 80
	6396G1	Air Adapter SBE 80/160/320 – Black

41

SBE160 Connectors = Housing + wire contacts (set)		
Color	1/0 AWG	2 AWG
Yellow	E6377G1	E6377G2
Orange	E6376G1	E6376G2
Red	E6379G1	E6379G2
Gray	E6374G1	E6374G2
Blue	E6375G1	E6375G2
Green	E6391G1	E6391G2
Black	E6389G1	E6389G2

SBE160 Standard housings		
Color	Ordering code	Description
Yellow	E6383G1	Housing SBE 160 – Yellow
Orange	E6382G1	Housing SBE 160 – Orange
Red	E6385G1	Housing SBE 160 – Red
Gray	E6380G1	Housing SBE 160 – Gray
Blue	E6381G1	Housing SBE 160 – Blue
Green	E6390G1	Housing SBE 160 – Green
Black	E6392G1	Housing SBE 160 – Black
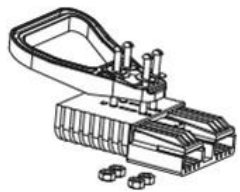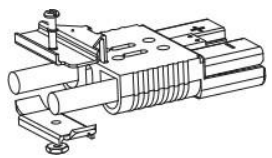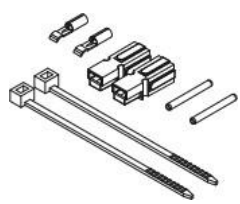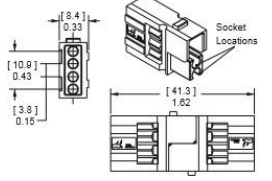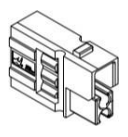
Top View

[49.2] 1.94   [28.6] 1.13   Ø [6.7] 0.27   [71.2] 2.80   [15.9] 0.63   [92.1] 3.63

[146.0] 5.75   [25.4] 1.00   Mated Length

42

✏ Silver plated wire contacts		
Section	**Ordering code**	**Description**
2 AWG	6384G2-BK	Main Contact SBE 160/SBX 175 – 2 AWG (35 mm²)
1/0 AWG	6384G1-BK	Main Contact SBE 160/SBX 175 – 1/0 AWG (50 mm²)

Accessories		
Picture	**Ordering code**	**Description**
	5687-BK 5690-BK 5693-BK 5663-BK 5648-BK	Reducing Bushing APP 1/0 AWG – 1 AWG Reducing Bushing APP 1/0 AWG – 2 AWG Reducing Bushing APP 1/0 AWG – 4 AWG Reducing Bushing APP 1/0 AWG – 6 AWG Reducing Bushing APP 1/0 AWG – 10-8 AWG
	995G1-GRAY 995G3-RED	Handle SBE 160/SBX 175 – Gray Handle SBE 160/SBX 175 – Red
	945G2	Cable Clamp, self-attaching for discrete conductor – 0.62"-0.22"
	6344	Powerpole Auxiliary Kit 16 to 12 AWG Contact
	441G3 441G1 441G2	1x4 Auxiliary Kit 12 AWG 1x4 Auxiliary Kit 16 to 14 AWG 1x4 Auxiliary Kit 20 to 16 AWG * Auxiliary Kits include (1) Auxiliary Housing, (2) Standard Length Pin Contacts, (2) Socket Contacts, (2) Retaining Pins and (1) Retaining Clip.
	444G1	Aux. Holder Housing – SBE/SBX 1x4

43

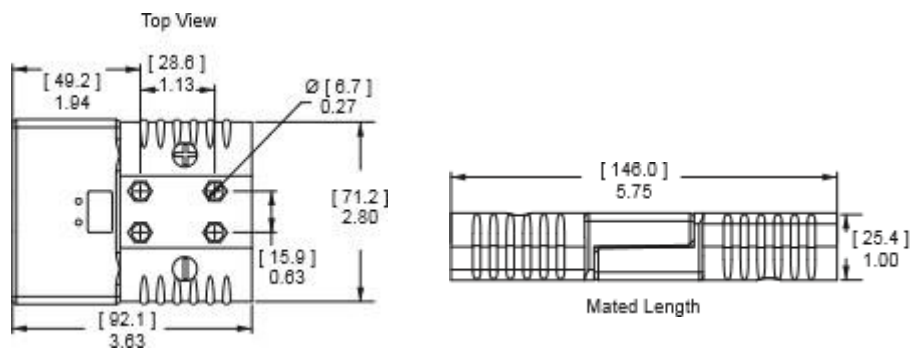|		
	PM16S12S32 PM16S1416S32 PM16S1620S32 PM16S2024S32	*Socket Contacts for 1x4 Auxiliary Connector* PowerMod Socket 12 AWG (2,5 mm²) PowerMod Socket 16-14 AWG (1,0-1,5 mm²) PowerMod Socket 20-16 AWG (0,75-1,0 mm²) PowerMod Socket 24-20 AWG (0,50-0,75 mm²)
	PM16P12S30 PM16P1416S30 PM16P1620S30 PM16P2024S30 PM16P12A30 PM16P1416A30 PM16P1620A30 PM16P2024A30 PM16P12C30 PM16P1416C30 PM16P1620C30 PM16P2024C30	*Pin Contacts for 1x4 Auxiliary Connector* PowerMod Pin12 AWG, Standard Length 7.7 mm PowerMod Pin 16-14 AWG, Standard Length 7.7mm PowerMod Pin 20-16 AWG, Standard Length 7.7mm PowerMod Pin 24-20 AWG, Standard Length 7.7mm PowerMod Pin 12 AWG, Pre-Mate 9.3 mm PowerMod Pin 16-14 AWG, Pre-Mate 9.3mm PowerMod Pin 20- 16 AWG, Pre-Mate 9.3mm PowerMod Pin 24-20 AWG, Pre-Mate 9.3mm PowerMod Pin 12 AWG, Post- Mate 6,6mm PowerMod Pin 16-14 AWG, Post-Mate 6,6mm PowerMod Pin 20-16 AWG, Post-Mate 6,6mm PowerMod Pin 24-20 AWG, Post-Mate 6,6mm
	110G9-BK 2-8675P2	Retaining Pin for SBE 160/SBX 175 Retaining Clip for SBE 160/SBX 175
	4850G6	PPMX Auxiliary Kit 24 to 20 AWG The PPMX auxiliary connector allows up to 8 auxiliary circuits to be used in the SBE®, SBO®, & SBX® housings. There are 4 auxiliary circuits per PPMX connector and two PPMX housings fit into the auxiliary port in the main connector housing
	4803G3-BK 4802G3-BK	Pin Contact for PPMX – 24 to 20 AWG Socket Contact for PPMX – 24 to 20 AWG
	6396G1	Air Adapter SBE 80/160/320 – Black
	993G2	Manual Release SBE 160/SBX 175 with hardware kit – Battery
	994G2	Manual Release SBE 160/SBX 175 with hardware kit – Charger/Truck

44

SBE320 Connectors = Housing + wire contacts (set)								
Color	300/350MCM	4/0 AWG	95 mm²	3/0 AWG	70 mm²	2/0 AWG	50 mm²	35 mm²
Yellow	E6364G11	E6364G3	E6364G9	E6364G2	E6364G8	E6364G1	E6364G7	E6364G6
Orange	E6369G11	E6369G3	E6369G9	E6369G2	E6369G8	E6369G1	E6369G7	E6369G6
Red	E6347G11	E6347G3	E6347G9	E6347G2	E6347G8	E6347G1	E6347G7	E6347G6
Gray	E6345G11	E6345G3	E6345G9	E6345G2	E6345G8	E6345G1	E6345G7	E6345G6
Blue	E6346G11	E6346G3	E6346G9	E6346G2	E6346G8	E6346G1	E6346G7	E6346G6
Green	E6348G11	E6348G3	E6348G9	E6348G2	E6348G8	E6348G1	E6348G7	E6348G6
Black	E6363G11	E6363G3	E6363G9	E6363G2	E6363G8	E6363G1	E6363G7	E6363G6
Brown	E6334G11	E6334G3	E6334G9	E6334G2	E6334G8	E6334G1	E6334G7	E6334G6
Purple	E6365G11	E6365G3	E6365G9	E6365G2	E6365G8	E6365G1	E6365G7	E6365G6
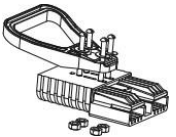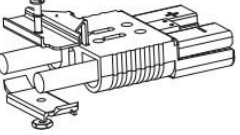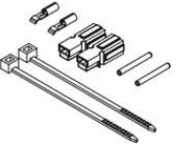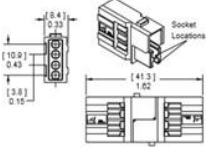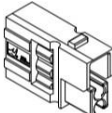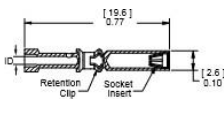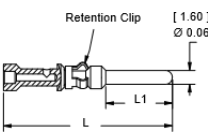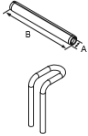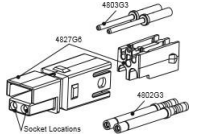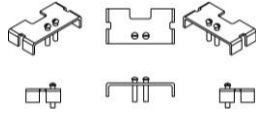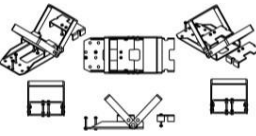
Standard housings		
Color	Ordering code	Description
Yellow	E6362-BK	Housing SBE320 – Yellow
Orange	E6339-BK	Housing SBE320 – Orange
Red	E6352-BK	Housing SBE320 – Red
Gray	E6350-BK	Housing SBE320 – Gray
Blue	E6351-BK	Housing SBE320 – Blue
Green	E6353-BK	Housing SBE320 – Green
Black	E6361-BK	Housing SBE320 – Black
Brown	E6336-BK	Housing SBE320 – Brown
Purple	E6349-BK	Housing SBE320 – Purple

Top View

[61.9] 2.44   [28.6] 1.13   Ø [6.7] 0.27

[83.4] 3.28

[15.9] 0.63

[125.4] 4.94

Mated Length   [200.0] 7.88   [33.3] 1.31

45

Silver plated wire contacts		
Section	**Ordering code**	**Description**
2 AWG	6394-BK	Main Contact SBE320 / SBX350 – 2 AWG (35 mm²)
50 mm²	1341G1-BK	Main Contact SBE320 / SBX350 – 50 mm² "Standard"
70 mm²	1341G2-BK	Main Contact SBE320 / SBX350 – 70 mm² "Standard"
2/0 AWG	6354-BK	Main Contact SBE320 / SBX350 – 2/0 AWG (70 mm²)
95 mm²	1341G3	Main Contact SBE320 / SBX350 – 95 mm² "Standard"
3/0 AWG	6355-BK	Main Contact SBE320 / SBX350 – 3/0 AWG (95 mm²)
4/0 AWG	6356-BK	Main Contact SBE320 / SBX350 – 4/0 AWG (120 mm²)
300/350 MCM	6358-BK	Main Contact SBE320 / SBX350 – 300/350 MCM (150 mm²)

Accessories		
Picture	**Ordering code**	**Description**
	5918-BK	Reducing Bushing APP 2/0 AWG - 1/0 AWG
	5687-BK	Reducing Bushing APP 1/0 AWG - 1 AWG
	5690-BK	Reducing Bushing APP 1/0 AWG - 2 AWG
	5693-BK	Reducing Bushing APP 1/0 AWG - 4 AWG
	5663-BK	Reducing Bushing APP 1/0 AWG - 6 AWG
	5648-BK	Reducing Bushing APP 1/0 AWG - 10-8 AWG
	5920-BK	Reducing Bushing APP 2 AWG - 6 AWG
	995G2-GRAY 995G4-RED	Handle SBE 320/SBX 350 – Gray Handle SBE 320/SBX 350 – Red
	911G2	Cable Clamp, self-attaching for discrete conductor – 0.85"-0.67"
	6305G1 6310G1	Powerpole Auxiliary Kit 16 to 12 AWG Contact Powerpole Auxiliary Kit 20 to 16 AWG Contact
	440G3 440G1 440G2	1x4 Auxiliary Kit 12 AWG 1x4 Auxiliary Kit 16 to 14 AWG 1x4 Auxiliary Kit 20 to 16 AWG * Auxiliary Kits include (1) Auxiliary Housing, (2) Standard Length Pin Contacts, (2) Socket Contacts, (2) Retaining Pins and (1) Retaining Clip.
	444G1	Aux. Holder Housing – SBE/SBX 1x4

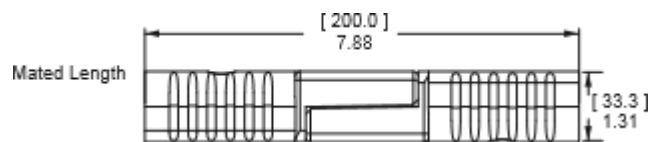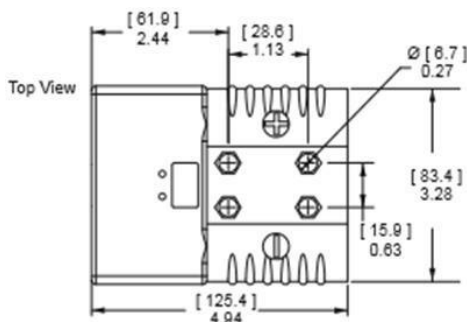|		
	PM16S12S32 PM16S1416S32 PM16S1620S32 PM16S2024S32	*Socket Contacts for 1x4 Auxiliary Connector* PowerMod Socket 12 AWG (2,5 mm²) PowerMod Socket 16-14 AWG (1,0-1,5 mm²) PowerMod Socket 20-16 AWG (0,75-1,0 mm²) PowerMod Socket 24-20 AWG (0,50-0,75 mm²)
	PM16P12S30 PM16P1416S30 PM16P1620S30 PM16P2024S30 PM16P12A30 PM16P1416A30 PM16P1620A30 PM16P2024A30 PM16P12C30 PM16P1416C30 PM16P1620C30 PM16P2024C30	*Pin Contacts for 1x4 Auxiliary Connector* PowerMod Pin12 AWG, Standard Length 7.7 mm PowerMod Pin 16-14 AWG, Standard Length 7.7mm PowerMod Pin 20-16 AWG, Standard Length 7.7mm PowerMod Pin 24-20 AWG, Standard Length 7.7mm PowerMod Pin 12 AWG, Pre-Mate 9.3 mm PowerMod Pin 16-14 AWG, Pre-Mate 9.3mm PowerMod Pin 20-16 AWG, Pre-Mate 9.3mm PowerMod Pin 24-20 AWG, Pre-Mate 9.3mm PowerMod Pin 12 AWG, Post-Mate 6,6mm PowerMod Pin 16-14 AWG, Post-Mate 6,6mm PowerMod Pin 20-16 AWG, Post-Mate 6,6mm PowerMod Pin 24-20 AWG, Post-Mate 6,6mm
	110G59-BK 2-8675P1	Retaining Pin for SBE 320/SBX 350 Retaining Clip for SBE 320/SBX 350
	4850G6	PPMX Auxiliary Kit 24 to 20 AWG The PPMX auxiliary connector allows up to 8 auxiliary circuits to be used in the SBE®, SBO®, & SBX® housings. There are 4 auxiliary circuits per PPMX connector and two PPMX housings fit into the auxiliary port in the main connector housing
	4803G3-BK 4802G3-BK	Pin Contact for PPMX – 24 to 20 AWG Socket Contact for PPMX – 24 to 20 AWG
	6396G1	Air Adapter SBE 80/160/320 – Black
	993G1	Manual Release SBE 320/SBX 350 with hardware kit – Battery
	994G1	Manual Release SBE 320/SBX 350 with hardware kit – Charger/Truck

1.1.5 SBX/SBO Series

SBX and SBO connectors build on the capability of the SB connectors that handle two primary power contacts with the capacity to have up to 8 auxiliary power / signal contacts. The centers of the connector housing feature a location for either: two PP15-45 housings and contacts, an innovative 1x4 auxiliary accessory, or two PPMX housings that can accommodate up to 8 aux contacts. In addition, the housing meets IEC 60950 & IEC60529 touch safe requirements.

Sequencing within auxiliary positions is possible using the 4 pin lengths available in the 1x4 auxiliary accessory however the auxiliary contacts mate last / un-mate first in relationship to the power contacts. SBX are molded from a rugged PC resin that is more impact resistant and are tested to UL/CSA requirements.

ANDERSON POWER™

SBO60

SBX175

SBX350

48

SB060 Connectors = Housing + wire contacts (set)		
Color	6 AWG	4 AWG
Yellow	SBO60YEL16MM	SBO60YEL25MM
Orange	SBO60ORN16MM	SBO60ORN25MM
Red	SBO60RED16MM	SBO60RED25MM
White	SBO60WHT16MM	SBO60GRA25MM

SB060 Standard housings		
Color	Ordering code	Description
Yellow	SBO60YEL	Housing SBO 60 – Yellow
Orange	SBO60ORN	Housing SBO 60 – Orange
Red	SBO60RED	Housing SBO 60 – Red
White	SBO60WHT	Housing SBO 60 – Gray
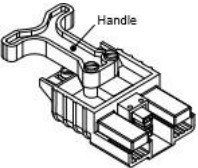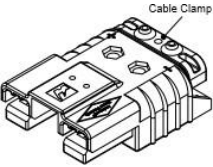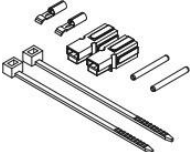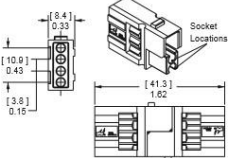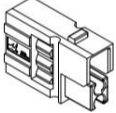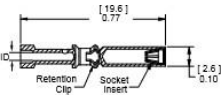
Top View

[46.0]
1.81

[5.1]
0.20

[49.5]
1.95

[14.6]
0.58

Mated Length

[112.2]
4.42

49
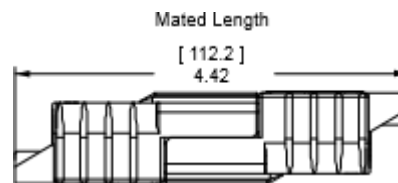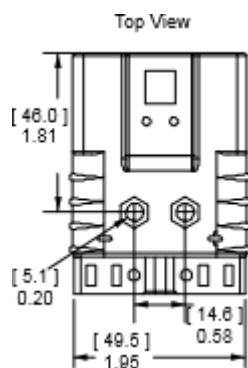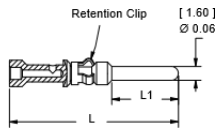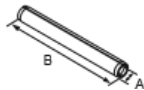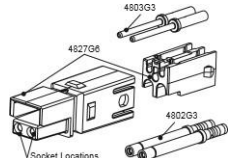
Silver plated wire contacts		
Section	**Ordering code**	**Description**
6 AWG	1339G1-BK	Main Contact SBE 80 – 6 AWG (16 mm²)
4 AWG	1339G4-BK	Main Contact SBE 80 – 4 AWG (25 mm²)

Accessories		
Picture	**Ordering code**	**Description**
	5912-BK 5910-BK 5913-BK	Reducing Bushing APP 6 AWG - 8 AWG Reducing Bushing APP 6 AWG - 12-10 AWG Reducing Bushing APP 6 AWG - 16-14 AWG
	SBO60HDLRED	Handle SBO 60 – **Red**
	SBO60CLPORN SBO60CLPRED SBO60CLPWHT SBO60CLPYEL	Cable Clamp SBO 60 – **Orange** Cable Clamp SBO 60 – **Red** Cable Clamp SBO 60 – White Cable Clamp SBO 60 – **Yellow**
	6344	Powerpole Auxiliary Kit 16 to 12 AWG Contact
	441G3 441G1 441G2	1x4 Auxiliary Kit 12 AWG 1x4 Auxiliary Kit 16 to 14 AWG 1x4 Auxiliary Kit 20 to 16 AWG * Auxiliary Kits include (1) Auxiliary Housing, (2) Standard Length Pin Contacts, (2) Socket Contacts, (2) Retaining Pins and (1) Retaining Clip.
	444G1	Aux. Holder Housing - SBE/SBX 1x4
	PM16S12S32 PM16S1416S32 PM16S1620S32 PM16S2024S32	*Socket Contacts for 1x4 Auxiliary Connector* PowerMod Socket 12 AWG (2,5 mm²) PowerMod Socket 16-14 AWG (1,0-1,5 mm²) PowerMod Socket 20-16 AWG (0,75-1,0 mm²) PowerMod Socket 24-20 AWG (0,50-0,75 mm²)

Retention Clip [1.60] Ø 0.06	PM16P12S30 PM16P1416S30 PM16P1620S30 PM16P2024S30 PM16P12A30 PM16P1416A30 PM16P1620A30 PM16P2024A30 PM16P12C30 PM16P1416C30 PM16P1620C30 PM16P2024C30	*Pin Contacts for 1x4 Auxiliary Connector* PowerMod Pin12 AWG, Standard Length 7.7 mm PowerMod Pin 16-14 AWG, Standard Length 7.7mm PowerMod Pin 20-16 AWG, Standard Length 7.7mm PowerMod Pin 24-20 AWG, Standard Length 7.7mm PowerMod Pin 12 AWG, Pre-Mate 9.3 mm PowerMod Pin 16-14 AWG, Pre-Mate 9.3mm PowerMod Pin 20-16 AWG, Pre-Mate 9.3mm PowerMod Pin 24-20 AWG, Pre-Mate 9.3mm PowerMod Pin 12 AWG, Post-Mate 6,6mm PowerMod Pin 16-14 AWG, Post-Mate 6,6mm PowerMod Pin 20-16 AWG, Post-Mate 6,6mm PowerMod Pin 24-20 AWG, Post-Mate 6,6mm
	110G9-BK	Retaining Pin for SBE 80
	4850G6	**PPMX Auxiliary Kit 24 to 20 AWG** The PPMX auxiliary connector allows up to 8 auxiliary circuits to be used in the SBE®, SBO®, & SBX® housings. There are 4 auxiliary circuits per PPMX connector and two PPMX housings fit into the auxiliary port in the main connector housing
	4803G3-BK 4802G3-BK	Pin Contact for PPMX – 24 to 20 AWG Socket Contact for PPMX – 24 to 20 AWG

51

SBX175 Connectors = Housing + wire contacts (set)

Color	1/0 AWG	2 AWG
Yellow	6377G1	6377G2
Orange	6376G1	6376G2
Red	6379G1	6379G2
Gray	6374G1	6374G2
Blue	6375G1	6375G2
Green	6391G1	6391G2

SBX175 Standard housings

Color	Ordering code	Description
Yellow	6383G1	Housing SBX 175 – Yellow
Orange	6382G1	Housing SBX 175 – Orange
Red	6385G1	Housing SBX 175 – Red
Gray	6380G1	Housing SBX 175 – Gray
Blue	6381G1	Housing SBX 175 – Blue
Green	6390G1	Housing SBX 175 – Green

Silver plated wire contacts		
Section	**Ordering code**	**Description**
2 AWG	6384G2-BK	Main Contact SBE 160/SBX 175 – 2 AWG (35 mm²)
1/0 AWG	6384G1-BK	Main Contact SBE 160/SBX 175 – 1/0 AWG (50 mm²)

Accessories		
Picture	**Ordering code**	**Description**
	5687-BK 5690-BK 5693-BK 5663-BK 5648-BK	Reducing Bushing APP 1/0 AWG - 1 AWG Reducing Bushing APP 1/0 AWG - 2 AWG Reducing Bushing APP 1/0 AWG - 4 AWG Reducing Bushing APP 1/0 AWG - 6 AWG Reducing Bushing APP 1/0 AWG - 10-8 AWG
	995G1-GRAY 995G3-RED	Handle SBE 160/SBX 175 – Gray Handle SBE 160/SBX 175 – Red
	945G2	Cable Clamp, self-attaching for discrete conductor – 0.62"-0.22"
	6344	Powerpole Auxiliary Kit 16 to 12 AWG contact
	441G3 441G1 441G2	1x4 Auxiliary Kit 12 AWG 1x4 Auxiliary Kit 16 to 14 AWG 1x4 Auxiliary Kit 20 to 16 AWG * Auxiliary Kits include (1) Auxiliary Housing, (2) Standard Length Pin Contacts, (2) Socket Contacts, (2) Retaining Pins and (1) Retaining Clip.
	444G1	Aux. Holder Housing – SBE/SBX 1x4

53

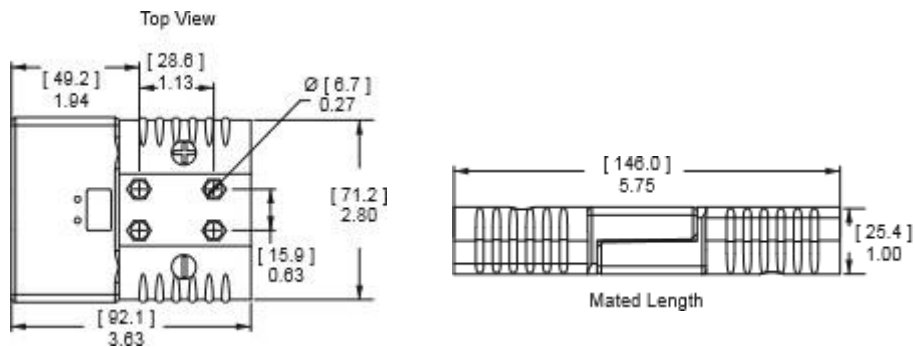|		
	PM16S12S32 PM16S1416S32 PM16S1620S32 PM16S2024S32	*Socket Contacts for 1x4 Auxiliary Connector* PowerMod Socket 12 AWG (2,5 mm²) PowerMod Socket 16-14 AWG (1,0-1,5 mm²) PowerMod Socket 20-16 AWG (0,75-1,0 mm²) PowerMod Socket 24-20 AWG (0,50-0,75 mm²)
	PM16P12S30 PM16P1416S30 PM16P1620S30 PM16P2024S30 PM16P12A30 PM16P1416A30 PM16P1620A30 PM16P2024A30 PM16P12C30 PM16P1416C30 PM16P1620C30 PM16P2024C30	*Pin Contacts for 1x4 Auxiliary Connector* PowerMod Pin12 AWG, Standard Length 7.7 mm PowerMod Pin 16-14 AWG, Standard Length 7.7mm PowerMod Pin 20-16 AWG, Standard Length 7.7mm PowerMod Pin 24-20 AWG, Standard Length 7.7mm PowerMod Pin 12 AWG, Pre-Mate 9.3 mm PowerMod Pin 16-14 AWG, Pre-Mate 9.3mm PowerMod Pin 20-16 AWG, Pre-Mate 9.3mm PowerMod Pin 24-20 AWG, Pre-Mate 9.3mm PowerMod Pin 12 AWG, Post-Mate 6,6mm PowerMod Pin 16-14 AWG, Post-Mate 6,6mm PowerMod Pin 20-16 AWG, Post-Mate 6,6mm PowerMod Pin 24-20 AWG, Post-Mate 6,6mm
	110G9-BK 2-8675P2	Retaining Pin for SBE 160/SBX 175 Retaining Clip for SBE 160/SBX 175
	4850G6	PPMX Auxiliary Kit 24 to 20 AWG The PPMX auxiliary connector allows up to 8 auxiliary circuits to be used in the SBE®, SBO®, & SBX® housings. There are 4 auxiliary circuits per PPMX connector and two PPMX housings fit into the auxiliary port in the main connector housing
	4803G3-BK 4802G3-BK	Pin Contact for PPMX – 24 to 20 AWG Socket Contact for PPMX – 24 to 20 AWG
	993G2	Manual Release SBE 160/SBX 175 with hardware kit – Battery
	994G2	Manual Release SBE 160/SBX 175 with hardware kit – Charger/Truck

SBX350 Connectors = Housing + wire contacts (set)							
Color	300/350MCM	4/0 AWG	95 mm²	3/0 AWG	70 mm²	2/0 AWG	50 mm²	35 mm²
Yellow	6364G11	6364G3	6364G9	6364G2	6364G8	6364G1	6364G7	6364G6
Orange	6369G11	6369G3	6369G9	6369G2	6369G8	6369G1	6369G7	6369G6
Red	6347G11	6347G3	6347G9	6347G2	6347G8	6347G1	6347G7	6347G6
Gray	6345G11	6345G3	6345G9	6345G2	6345G8	6345G1	6345G7	6345G6
Blue	6346G11	6346G3	6346G9	6346G2	6346G8	6346G1	6346G7	6346G6
Green	6348G11	6348G3	6348G9	6348G2	6348G8	6348G1	6348G7	6348G6
Black	6363G11	6363G3	6363G9	6363G2	6363G8	6363G1	6363G7	6363G6
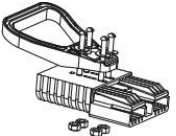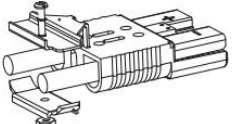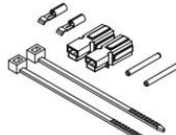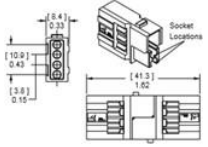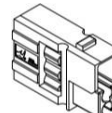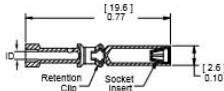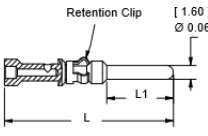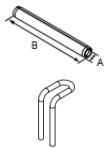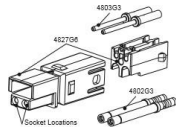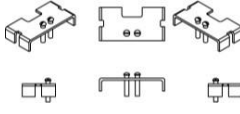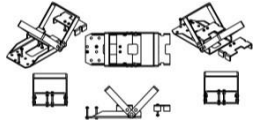
Standard housings		
Color	Ordering code	Description
Yellow	6362-BK	Housing SBX 350 – Yellow
Orange	6339-BK	Housing SBX 350 – Orange
Red	6352-BK	Housing SBX 350 – Red
Gray	6350-BK	Housing SBX 350 – Gray
Blue	6351-BK	Housing SBX 350 – Blue
Green	6353-BK	Housing SBX 350 – Green
Black	6361-BK	Housing SBX 350 – Black

55

	Silver plated wire contacts	
Section	**Ordering code**	**Description**
2 AWG	6394-BK	Main Contact SBE320 / SBX350 – 2 AWG (35 mm²)
50 mm²	1341G1-BK	Main Contact SBE320 / SBX350 – 50 mm² "Standard"
70 mm²	1341G2-BK	Main Contact SBE320 / SBX350 – 70 mm² "Standard"
2/0 AWG	6354-BK	Main Contact SBE320 / SBX350 – 2/0 AWG (70 mm²)
95 mm²	1341G3	Main Contact SBE320 / SBX350 – 95 mm² "Standard"
3/0 AWG	6355-BK	Main Contact SBE320 / SBX350 – 3/0 AWG (95 mm²)
4/0 AWG	6356-BK	Main Contact SBE320 / SBX350 – 4/0 AWG (120 mm²)
300/350 MCM	6358-BK	Main Contact SBE320 / SBX350 – 300/350 MCM (150 mm²)

	Accessories	
Picture	**Ordering code**	**Description**
	5918-BK	Reducing Bushing APP 2/0 AWG - 1/0 AWG
	5687-BK	Reducing Bushing APP 1/0 AWG - 1 AWG
	5690-BK	Reducing Bushing APP 1/0 AWG - 2 AWG
	5693-BK	Reducing Bushing APP 1/0 AWG - 4 AWG
	5663-BK	Reducing Bushing APP 1/0 AWG - 6 AWG
	5648-BK	Reducing Bushing APP 1/0 AWG - 10-8 AWG
	5920-BK	Reducing Bushing APP 2 AWG - 6 AWG
	995G2-GRAY	Handle SBE 320/SBX 350 – Gray
	995G4-RED	Handle SBE 320/SBX 350 – **Red**
	911G2	Cable Clamp, self-attaching for discrete conductor – 0.85"-0.67"

56

	6305G1 6310G1	Powerpole Auxiliary Kit 16 to 12 AWG contact Powerpole Auxiliary Kit 20 to 16 AWG contact
	440G3 440G1 440G2	1x4 Auxiliary Kit 12 AWG 1x4 Auxiliary Kit 16 to 14 AWG 1x4 Auxiliary Kit 20 to 16 AWG * Auxiliary Kits include (1) Auxiliary Housing, (2) Standard Length Pin Contacts, (2) Socket Contacts, (2) Retaining Pins and (1) Retaining Clip.
	444G1	Aux. Holder Housing – SBE/SBX 1x4

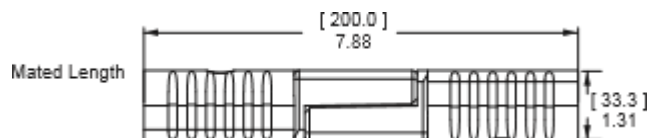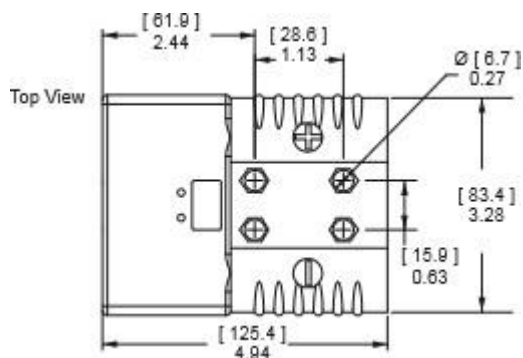|		
	PM16S12S32 PM16S1416S32 PM16S1620S32 PM16S2024S32	*Socket Contacts for 1x4 Auxiliary Connector* PowerMod Socket 12 AWG (2,5 mm²) PowerMod Socket 16-14 AWG (1,0-1,5 mm²) PowerMod Socket 20-16 AWG (0,75-1,0 mm²) PowerMod Socket 24-20 AWG (0,50-0,75 mm²)
	PM16P12S30 PM16P1416S30 PM16P1620S30 PM16P2024S30 PM16P12A30 PM16P1416A30 PM16P1620A30 PM16P2024A30 PM16P12C30 PM16P1416C30 PM16P1620C30 PM16P2024C30	*Pin Contacts for 1x4 Auxiliary Connector* PowerMod Pin12 AWG, Standard Length 7.7 mm PowerMod Pin 16-14 AWG, Standard Length 7.7mm PowerMod Pin 20-16 AWG, Standard Length 7.7mm PowerMod Pin 24-20 AWG, Standard Length 7.7mm PowerMod Pin 12 AWG, Pre-Mate 9.3 mm PowerMod Pin 16-14 AWG, Pre-Mate 9.3mm PowerMod Pin 20-16 AWG, Pre-Mate 9.3mm PowerMod Pin 24-20 AWG, Pre-Mate 9.3mm PowerMod Pin 12 AWG, Post-Mate 6,6mm PowerMod Pin 16-14 AWG, Post-Mate 6,6mm PowerMod Pin 20-16 AWG, Post-Mate 6,6mm PowerMod Pin 24-20 AWG, Post-Mate 6,6mm
	110G59-BK 2-8675P1	Retaining Pin for SBE 320/SBX 350 Retaining Clip for SBE 320/SBX 350
	4850G6	PPMX Auxiliary Kit 24 to 20 AWG The PPMX auxiliary connector allows up to 8 auxiliary circuits to be used in the SBE®, SBO®, & SBX® housings. There are 4 auxiliary circuits per PPMX connector and two PPMX housings fit into the auxiliary port in the main connector housing
	4803G3-BK 4802G3-BK	Pin Contact for PPMX – 24 to 20 AWG Socket Contact for PPMX – 24 to 20 AWG
	993G1	Manual Release SBE 320/SBX 350 with hardware kit – Battery
	994G1	Manual Release SBE 320/SBX 350 with hardware kit – Charger/Truck

1.1.6 PowerPole

This versatile connector series invented by Anderson Power Products (APP) meets a wide range of power connection needs. The four housing sizes in the Powerpole product family can carry a wide range of amperage and wire sizes in the most compact footprint. For currents up to 350A and from wire sizes of #20 AWG (0,75 mm²) to 3/0 (70 mm²). Powerpole can handle them all! A wide range of colored housing options can be stacked together to create a proven reliable custom connector. These housings can be used with different contacts to create wire-to-wire, wire-to board, or wire-to-busbar connections. The Powerpole® connector combines high quality materials with a cost-effective and innovative design for powerful versatility.

59
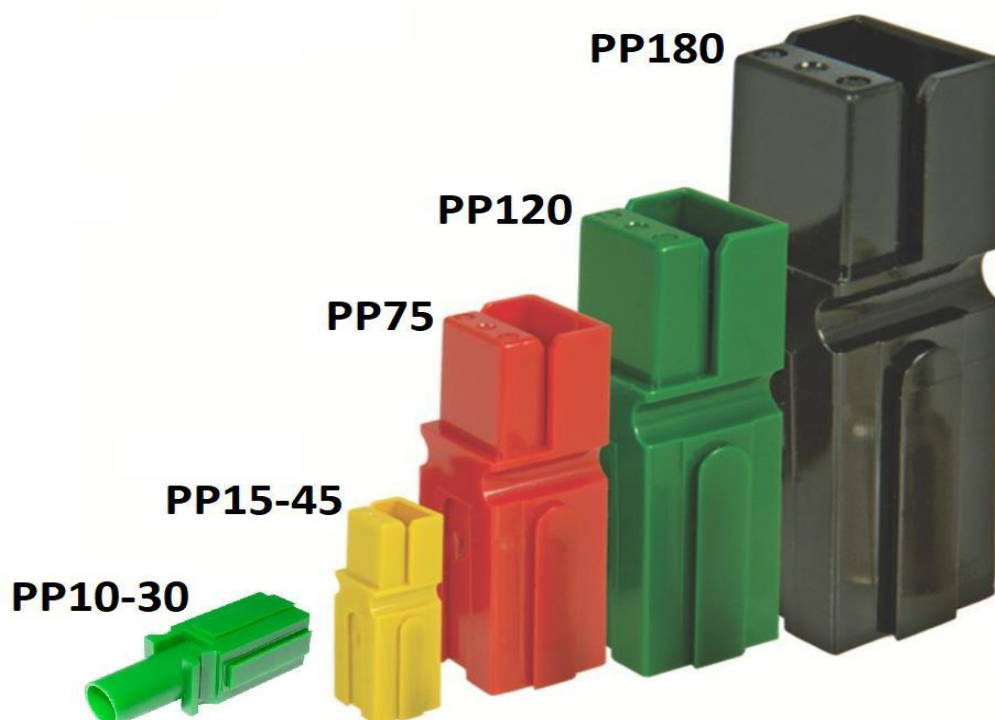
PP10 Standard housings		
Color	**Ordering code**	**Description**
Green	1204G1-BK	Housing PP10 Female – Green
Green	1205G1-BK	Housing PP10 Male – Green

Series	-A- mm	in.	-B- mm	in.	-C- mm	in.	-D- mm	in.
PP10 Pin	7.9	0.31	7.9	0.31	24.5	0.97	41.3	1.63
PP10 Socket	7.9	0.31	7.9	0.31	27.5	1.081	41.3	1.63
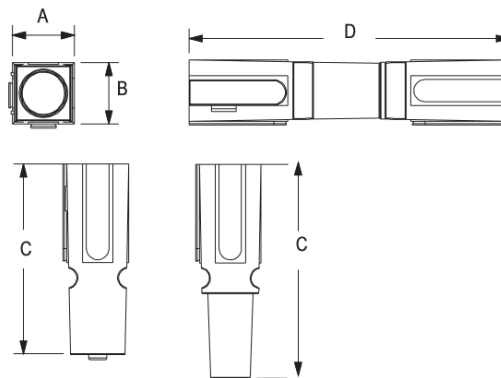
✐ Closed Silver plated wire contacts		
Section	**Ordering code**	**Description**
14/16 AWG	1202G1	PP10 – Socket Contact – 16-14 AWG (1,31-2,08 mm²)
14/16 AWG	1203G1	PP10 – Pin Contact – 16-14 AWG (1,31-2,08 mm²)

60

PP30 Standard housings			
Color	**Ordering code**	**Description**	
Green	PP30GND-S	Housing PP30 Female – Green	
Green	PP30GND-P	Housing PP30 Male – Green	

Series	-A- mm	in.	-B- mm	in.	-C- mm	in.	-D- mm	in.
PP30 Pin	7.9	0.32	7.9	0.32	26.6	0.97	41.2	1.62
PP30 Socket	7.9	0.32	7.9	0.32	26.6	0.97	41.2	1.62
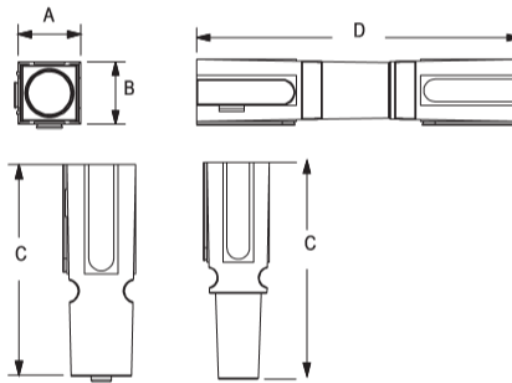
✏ Closed Silver plated wire contacts		
Section	**Ordering code**	**Description**
10 AWG	1230G1	PP30 – Pin Contact – up to 10 AWG (5,26mm²)
10 AWG	1232G1	PP30 – Socket Contact – up to 10 AWG (5,26mm²)

PP15/45 Standard housings

Color	Ordering code	Description
Red	1327-BK	Housing PP15/PP45 – Red
Green	1327G5-BK	Housing PP15/PP45 – Green
Black	1327G6-BK	Housing PP15/PP45 – Black
White	1327G7-BK	Housing PP15/PP45 – White
Blue	1327G8-BK	Housing PP15/PP45 – Blue
Yellow	1327G16-BK	Housing PP15/PP45 – Yellow
Orange	1327G17-BK	Housing PP15/PP45 – Orange
Gray	1327G18-BK	Housing PP15/PP45 – Gray
Brown	1327G21-BK	Housing PP15/PP45 – Brown
Pink	1327G22-BK	Housing PP15/PP45 – Pink
Purple	1327G23-BK	Housing PP15/PP45 – Purple

Standard Housing

[7.9] 0.31   Front View   [7.9] 0.31

[24.6] 0.97   [8.4] 0.33   Mated Length   [41.2] 1.62
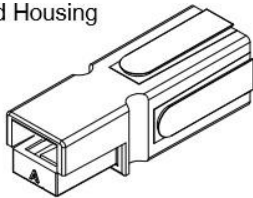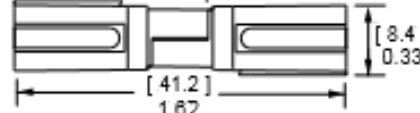
Finger Proof Rib Feature
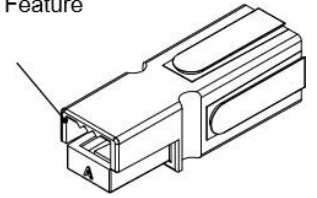
Finger proof housings
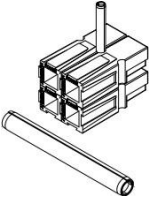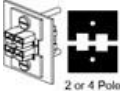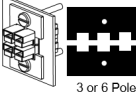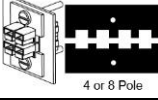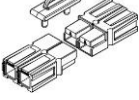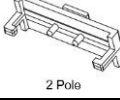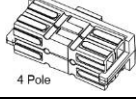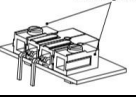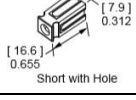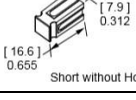
Color	Ordering code	Description
Red	1327FP-BK	Housing PP15/PP45 "fingerproof" – Red
Green	1327G5FP-BK	Housing PP15/PP45 "fingerproof" – Green
Black	1327G6FP-BK	Housing PP15/PP45 "fingerproof" – Black
White	1327G7FP-BK	Housing PP15/PP45 "fingerproof" – White
Blue	1327G8FP-BK	Housing PP15/PP45 "fingerproof" – Blue
Yellow	1327G16FP-BK	Housing PP15/PP45 "fingerproof" – Yellow

Closed Silver plated wire contacts

Section	Ordering code	Description
20 to 16 AWG	1332-BK	Main Contact PP15/45 – 20-16 AWG (0,52 – 1,3 mm²)
16 to 12 AWG	1331-BK	Main Contact PP15/45 – 16-12 AWG (1,3 – 3,3 mm²)

Accessories		
Picture	**Ordering code**	**Description**
	110G16 110G17	PP15/45 – Retaining Pin – 1 High PP15/45 – Retaining Pin – 2 High
	1462G1	PP15/45 – 2&4P Mounting Clamp – Set
	1462G2	PP15/45 – 3&6P Mounting Clamp – Set
	1462G3	PP15/45 – 4&8P Mounting Clamp – Set
	110G68	PP15/45 Retention Clip
	110G21	PP15/45 – 2P Block-Lok
	110G12	PP15/45 – 4P Block-Lok
	1399G9-BK 1399G8-BK	Mounting Wing for PP15/45 – **Red** Mounting Wing for PP15/45 – **Blue**
	1399G1-BK 1399G14-BK	Spacer for PP15/45 – **Red** – Short – With hole Spacer for PP15/45 – **White** – Short – With hole
	1399G6-BK 1399G13-BK	Spacer for PP15/45 – **Red** – Short – Without hole Spacer for PP15/45 – **Blue** – Short – Without hole
	1399G2-BK 1399G10-BK 1399G17-BK 1399G19-BK	Spacer for PP15/45 – **Red** – Long Spacer for PP15/45 – **Black** – Long Spacer for PP15/45 – **White** – Long Spacer for PP15/45 – **Grey** – Long

63

PP75 Standard housings		
Color	Ordering code	Description
Red	5916G7-BK	Housing PP75 – Red
Green	5916G6-BK	Housing PP75 – Green
Black	5916G4-BK	Housing PP75 – Black
White	5916G5-BK	Housing PP75 – White
Blue	5916-BK	Housing PP75 – Blue
Yellow	5916G15-BK	Housing PP75 – Yellow
Orange	5916G14-BK	Housing PP75 – Orange
Gray	5916G16-BK	Housing PP75 – Gray
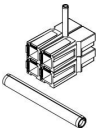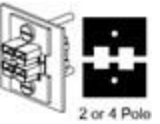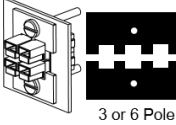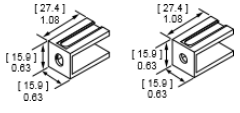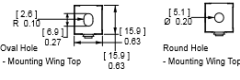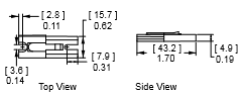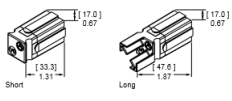
[15.9]
0.62

[15.9]
0.62

[47.9]
1.88

[17.0]
0.67

[81.3]
3.20

Front View   Mated Length
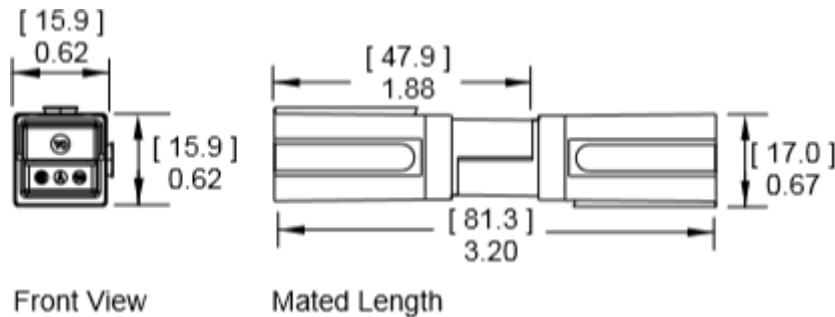
Silver plated wire contacts		
Section	Ordering code	Description
12 to 10 AWG	5915-BK	Contact PP75 – 10 AWG (5,3 mm²)
12 to 10 AWG	5953-BK	Contact PP75 – 10 AWG (5,3 mm²) – low detent force
8 AWG	5952-BK	Contact SB50 / PP75 – 8 AWG (8,4 mm²)
6 AWG	5900-BK	Contact SB50 / PP75 – 6 AWG (13,3 mm²)
6 AWG	1307-BK	Contact SB50 / PP75 – 6 AWG (13,3 mm²) – low detent force

Accessories		
Picture	**Ordering code**	**Description**
	5912-BK 5910-BK 5913-BK	Reducing Bushing APP 6 AWG - 8 AWG Reducing Bushing APP 6 AWG - 12-10 AWG Reducing Bushing APP 6 AWG - 16-14 AWG
	110G19 110G18	PP75/120/180 – Retaining Pin – 1 Block High PP75 – Retaining Pin – 2 Block High
	1463G1	PP75 – 2&4P Mounting Clamp – Set
	1463G2	PP75 – 3&6P Mounting Clamp – Set
	1399G20-BK 1399G7-BK	*Mounting wing for Standard or CR Housings* Mounting Wing for PP75 – Round hole – **Blue** Mounting Wing for PP75 – Oval hole – **Blue**
	75LOKWNGBLU-BK 75LOKWNGBLU-R-BK	*Mounting Wing for Locking Housings* PL75-Wing – Oval Hole – **Blue** PL75-Wing – Round Hole – **Blue**
	75LOKSMTBLU-BK	PL75-Mounting Pad – **Blue**
	1399G23-BK 1399G21-BK	Spacer for PP75 – **Red** – Short Spacer for PP75 – **Red** – Long

65

PP120 Standard housings		
Color	**Ordering code**	**Description**
Red	1321G3-BK	Housing PP120 – Red
Green	1321G4-BK	Housing PP120 – Green
Black	1321G1-BK	Housing PP120 – Black
White	1321G2-BK	Housing PP120 – White
Blue	1321-BK	Housing PP120 – Blue
Yellow	1321G7-BK	Housing PP120 – Yellow
Orange	1321G5-BK	Housing PP120 – Orange
Gray	1321G8-BK	Housing PP120 – Gray
Brown	1321G6-BK	Housing PP120 – Brown
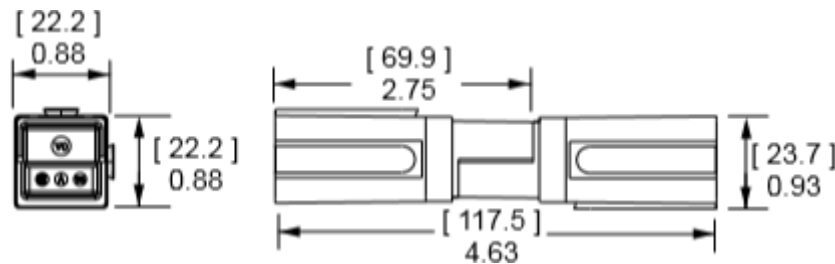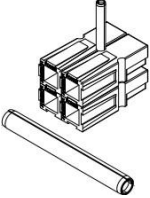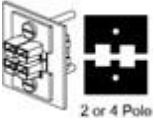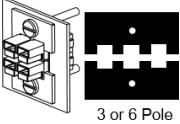
Silver plated wire contacts		
Section	**Ordering code**	**Description**
6 AWG	1319G6-BK	Main Contact SB120 / PP120 – 6 AWG (13,3 mm²)
4 AWG	1319G4-BK	Main Contact SB120 / PP120 – 4 AWG (21,2 mm²)
2 AWG	1319-BK	Main Contact SB120 / PP120 – 2 AWG (33,6 mm²)
1 AWG	1323G1-BK	Main Contact SB120 / PP120 – 1 AWG (42,4 mm²)
1/0 AWG	1323G2-BK	Main Contact PP – 1/0 AWG (53,5 mm²)

66

Accessories		
Picture	**Ordering code**	**Description**
	5919-BK 5920-BK 5921-BK	Reducing Bushing APP 2 AWG - 4 AWG (33,6 - 21,2 mm²) Reducing Bushing APP 2 AWG - 6 AWG (33,6 - 13,3 mm²) Reducing Bushing APP 2 AWG - 8 AWG (33,6 - 8,4 mm²)
	110G19 110G20	PP75/120 – Retaining Pin – 1 Block High PP120 – Retaining Pin – 2 Block High
	1464G1	PP120 – 2&4P Mounting Clamp – Set
	1464G2	PP120 – 3&6P Mounting Clamp – Set

PP180 Standard housings

Color	Ordering code	Description
Red	1381G3-BK	Housing PP180 – Red
Green	1381G4-BK	Housing PP180 – Green
Black	1381G1-BK	Housing PP180 – Black
White	1381G2-BK	Housing PP180 – White
Blue	1381-BK	Housing PP180 – Blue

Front View   Mated Length
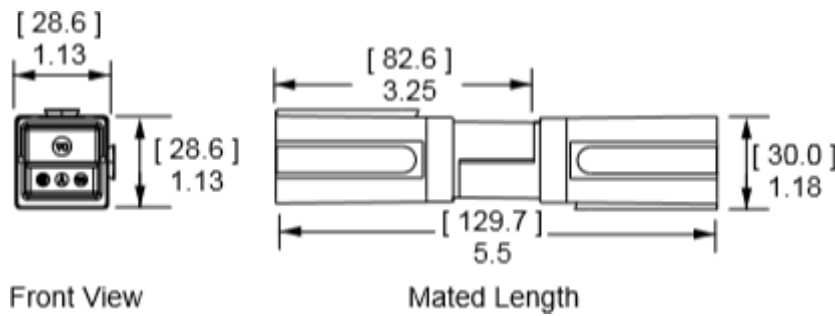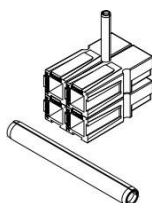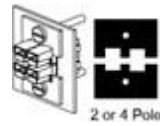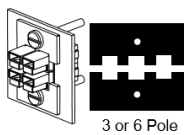
Silver plated wire contacts

Section	Ordering code	Description
6 AWG	1348-BK	Main Contact PP180 / SB175 – 6 AWG (13,3 mm²)
4 AWG	1384-BK	Main Contact PP180 / SB175 – 4 AWG (21,2 mm²)
2 AWG	1383-BK	Main Contact PP180 / SB175 – 2 AWG (33,6 mm²)
1 AWG	1347-BK	Main Contact PP180 / SB175 – 1 AWG (42,4 mm²)
1/0 AWG	1382-BK	Main Contact PP180 / SB175 – 1/0 AWG (53,5 mm²)
2/0 AWG	1328G1-BK	Main Contact PP180 – 2/0 AWG (67,4 mm²)
3/0 AWG	1328G2-BK	Main Contact PP180 – 3/0 AWG (85,0 mm²)

Accessories		
Picture	**Ordering code**	**Description**
	5648-BK 5663-BK 5690-BK 5687-BK	Reducing Bushing APP AWG 1/0 - 10 AWG (53,5 - 5,3 mm²) Reducing Bushing APP AWG 1/0 - 6 AWG (53,5 - 13,3 mm²) Reducing Bushing APP AWG 1/0 - 2 AWG (53,5 - 33,62 mm²) Reducing Bushing APP AWG 1/0 - 1 AWG (53,5 - 42,4 mm²)
	110G18 110G20	PP180 – Retaining Pin – 1 Block High PP120/180 – Retaining Pin – 2 Block High
	1465G1	PP180 – 2&4P Mounting Clamp – Set
	1465G2	PP180 – 3&6P Mounting Clamp – Set

1.2 Rema

1.2.1 Euro Din Connectors

REMA is the leading supplier of DIN-style (DIN standard 43589) quick disconnect power connectors. These quick disconnect power connectors are used in a variety of applications, including:

Materials Handling - Aerial Lift - Sweeper/Scrubber - Utility Vehicles - Motive Power - Battery Chargers.

In order to withstand the frequent use in these rough environments it is imperative that the construction of these connectors be extremely robust. The REMA brand DIN-style connectors exceed the requirement of the DIN Standard 43589 for both mechanical and electrical durability.

To meet the demands of newer high-current applications, including "fast charging", REMA has developed a

larger capacity DIN 640 A connector.

Contacts are made from E-Cu copper optimized for crimp connection. Crimp tooling and dies are contained in this catalogue. Only the use of REMA crimp equipment results in full warranty.

Features of the REMA DIN-style connector include:

-Housing constructed of glass fiber reinforced composite material for extreme durability and resistance battery acid

-REMA engineered contacts made of high-grade electrolyte copper and silver plated for corrosion protection

-UL 1977 certified component

-Meets or exceeds the following industry standards: DIN 43589, EN 1175-1, IEC 20989, UL1977

-In compliance with machinery directive 2006/42 EG and therefore with „CE"Marking

-Accepts REMA DIN-Style Connector Options including coding/locking pins, air supply, auxiliary contacts, and handles

-Small number of parts

-Easy, intuitive assembly

DIN 80 Female connector		
Item	**Ordering code**	**Description**
5(2x)/6/7/ 8/9/10*	95306-00 95309-00 95309-10	REMA DIN 80 Female – 16 mm² REMA DIN 80 Female – 25 mm² REMA DIN 80 Female – 35 mm²
5/6/7/9	95425-01	Housing REMA DIN 80 Female – incl. Cable Clamp
8	75317-00 75318-00 75319-00	Main Contact REMA DIN 80 Female – 16 mm² Main Contact REMA DIN 80 Female – 25 mm² Main Contact REMA DIN 80 Female – 35 mm²
10	75435-00 75438-00	REMA DIN 80 Coding Pin – Grey REMA DIN 80 Coding Pin – Green
14	75070-42	Air Adapter REMA DIN 80 Female
15	75289-00	Pilot Contacts (2 pcs.+ adapter) REMA DIN 80 Female
16	75240-02	Auxiliary Contact REMA DIN 80 – Female
5(2x)/6/8/ 9/10/18*	95306-01 95342-01 95309-01	REMA DIN 80 Female – 16 mm² – with Molded Handle REMA DIN 80 Female – 25 mm² – with Molded Handle REMA DIN 80 Female – 35 mm² – with Molded Handle
18	95425-05	Housing REMA DIN 80 Female with Molded Handle and Cable Clamp
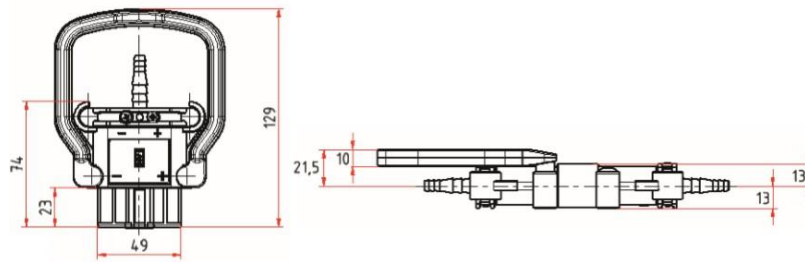
DIN 80 Male connector		
Item	**Ordering code**	**Description**
1/2/3/4/ 5(2x)/6*	95198-10	REMA DIN 80 Male – 10 mm²
	95198-00	REMA DIN 80 Male – 16 mm²
	95199-00	REMA DIN 80 Male – 25 mm²
	95199-10	REMA DIN 80 Male – 35 mm²
1/3/5(2x)/6	95427-01	Housing REMA DIN 80 Male – incl. Cable Clamp
2	75314-10	Main Contact REMA DIN 80 Male – 10 mm²
	75314-00	Main Contact REMA DIN 80 Male – 16 mm²
	75315-00	Main Contact REMA DIN 80 Male – 25 mm²
	75316-00	Main Contact REMA DIN 80 Male – 35 mm²
4	75435-00	REMA DIN 80 Coding Pin – Grey
	75438-00	REMA DIN 80 Coding Pin – Green
	75436-00	REMA DIN 80 Coding Pin – Yellow
11	75070-43	Air Adapter REMA DIN 80 Male
12	75243-00	Pilot Contacts (2 pcs.+ adapter) REMA DIN 80 Male
13	75070-02	Auxiliary Contact REMA DIN 80/160 Male

72

Accessories		
Picture	Ordering code	Description
	79811-00 79812-00 75327-01	Reducing Bushing REMA 16 mm² - 10 mm² Reducing Bushing REMA 25 mm² - 10 mm² Reducing Bushing REMA 35 mm² - 10 mm²
	95244-01 95244-00 75229-00	Handle REMA DIN 80 – with screws M6x30 – Grey Snap-on Handle REMA DIN 80 – Standard (Click-on) Handle REMA DIN 80 – Red
	LV80 H1/S	Handle SCHALTBAU DIN 80 with 2 screws – Black
	80283-10	Locking Plate – REMA DIN 80

DIN 160 Female connector		
Item	**Ordering code**	**Description**
5(2x)/6/7/ 8/9/10*	95001-08	REMA DIN 160 Female – 16 mm²
	95007-08	REMA DIN 160 Female – 25 mm²
	95012-08	REMA DIN 160 Female – 35 mm²
	95017-08	REMA DIN 160 Female – 50 mm²
	95022-08	REMA DIN 160 Female – 70 mm²
5/6/7/9	95026-01	Housing REMA DIN 160 Female- incl. Cable Clamp
8	75021-01	Main Contact REMA DIN 160 Female – 16 mm²
	75022-01	Main Contact REMA DIN 160 Female – 25 mm²
	75023-01	Main Contact REMA DIN 160 Female – 35 mm²
	75024-01	Main Contact REMA DIN 160 Female – 50 mm²
	75024-05	Main Contact REMA DIN 160 Female – 70 mm²
10	75057-01	REMA DIN 160/320 Coding Pin – Grey
	75233-01	REMA DIN 160/320 Coding Pin – Green
	75057-95	REMA DIN 160/320 Coding Pin – Blue (Li)
14	75070-12	Air Adapter REMA DIN 160 Female
15	75068-03	Pilot Contacts (2 pcs.+ adapter) REMA DIN 160 Female
16	77640-00	Auxiliary Contact REMA DIN 160 – Female
5(2x)/6/8/ 9/10/18*	95001-01	REMA DIN 160 Female – 16 mm² – with Molded Handle
	95007-01	REMA DIN 160 Female – 25 mm² – with Molded Handle
	95012-01	REMA DIN 160 Female – 35 mm² – with Molded Handle
	95017-01	REMA DIN 160 Female – 50 mm² – with Molded Handle
	95017-05	REMA DIN 160 Female – 70 mm² – with Molded Handle
18	95026-04	Housing REMA DIN 160 Female with Molded Handle and Cable Clamp
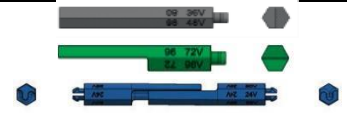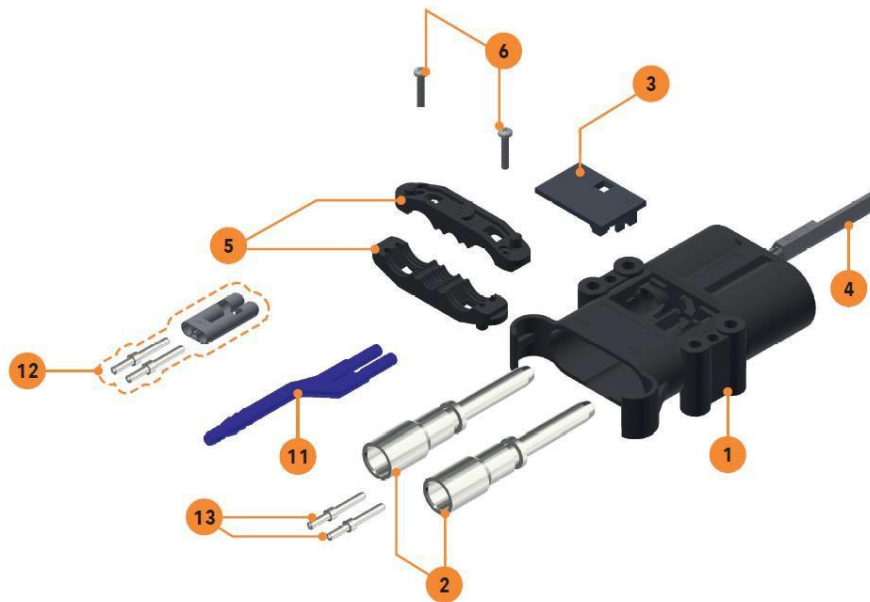
DIN 160 Male connector		
Item	**Ordering code**	**Description**
1/2/3/4/ 5(2x)/6*	95029-01	REMA DIN 160 Male – 16 mm²
	95034-01	REMA DIN 160 Male – 25 mm²
	95039-01	REMA DIN 160 Male – 35 mm²
	95044-01	REMA DIN 160 Male – 50 mm²
	95044-04	REMA DIN 160 Male – 70 mm²
1/3/4/5(2x)/6	95053-01	Housing REMA DIN 160 Male – incl. Cable Clamp
2	75048-10	Main Contact REMA DIN 160 Male – 10 mm²
	75048-01	Main Contact REMA DIN 160 Male – 16 mm²
	75049-01	Main Contact REMA DIN 160 Male – 25 mm²
	75050-01	Main Contact REMA DIN 160 Male – 35 mm²
	75051-01	Main Contact REMA DIN 160 Male – 50 mm²
	75051-05	Main Contact REMA DIN 160 Male – 70 mm²
4	75057-01	REMA DIN 160/320 Coding Pin – Grey
	75233-01	REMA DIN 160/320 Coding Pin – Green
	75057-90	REMA DIN 160/320 Coding Pin – Blue (Li)
	75231-01	REMA DIN 160/320 Coding Pin – Yellow
11	75070-13	Air Adapter REMA DIN 160 Male
12	75070-03	Pilot Contacts (2 pcs.+ adapter) REMA DIN 160 Male
13	75070-02	Auxiliary Contact REMA DIN 80/160 Male
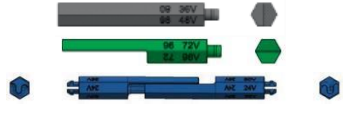
75

Accessories		
Picture	**Ordering code**	**Description**
	79811-00 79812-00 75327-01	Reducing Bushing REMA 16 mm² - 10 mm² Reducing Bushing REMA 25 mm² - 10 mm² Reducing Bushing REMA 35 mm² - 10 mm²
	95066-65 95066-68 75066-66	Screwed Handle DIN 160 – Standard with 4 screws Handle REMA DIN 160/320 (8 screws) Handle REMA DIN 160 – Red (4 screws)
	95239-07	Screwed Flat Handle DIN 160 A – 2 bolts 43 mm, security nuts
	EHDL-EN	Handle DIN 160-320 A – Long Steel – PVC
	EHDL-TOY	Handle DIN 160-320 – Steel – with PVC-coating
	LV160/320 H1/S	Handle Schaltbau LV/LB-L 160/320 A with screws – Black
	80283-11	Locking Plate – REMA DIN 160
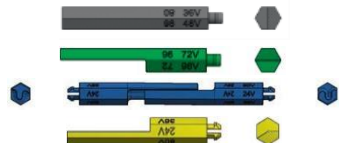
DIN 320 Female connector		
Item	**Ordering code**	**Description**
5(2x)/6/7/ 8/9/10*	95601-01 95605-01 95610-01	REMA DIN 320 Female – 50 mm² REMA DIN 320 Female – 70 mm² REMA DIN 320 Female – 95 mm²
5/6/7/9	95700-01	Housing REMA DIN 320 Female – incl. Cable Clamp
8	75660-01 75665-01 75670-01	Main Contact REMA DIN 320 Female – 50 mm² Main Contact REMA DIN 320 Female – 70 mm² Main Contact REMA DIN 320 Female – 95 mm²
10	75057-01 75233-01 75057-95	REMA DIN 160/320 Coding Pin – Grey REMA DIN 160/320 Coding Pin – Green REMA DIN 160/320 Coding Pin – Blue (Li)
14	75070-32	Air Adapter REMA DIN 320/640 Female
15	75591-00	Pilot Contacts (2 pcs.+ adapter) REMA DIN 320/640 Female
16	75590-02	Auxiliary Contact REMA DIN 320/640 Female

77

DIN 320 Male connector		
Item	**Ordering code**	**Description**
1/2/3/4/ 5(2x)/6*	95500-01 95505-01 95510-01	REMA DIN 320 Male – 50 mm² REMA DIN 320 Male – 70 mm² REMA DIN 320 Male – 95 mm²
1/3/5(2x)/6	95600-01	Housing REMA DIN 320 Male – incl. Cable Clamp
2	75560-01 75565-01 75570-01	Main Contact REMA DIN 320 Male – 50 mm² Main Contact REMA DIN 320 Male – 70 mm² Main Contact REMA DIN 320 Male – 95 mm²
4	75057-01 75233-01 75057-90 75231-01	REMA DIN 160/320 Coding Pin – Grey REMA DIN 160/320 Coding Pin – Green REMA DIN 160/320 Coding Pin – Blue (Li) REMA DIN 160/320 Coding Pin – Yellow
11	75070-33	Air Adapter REMA DIN 320/640 Male
12	75596-00	Pilot Contacts (2 pcs.+ adapter) REMA DIN 320/640 Male
13	75595-01	Auxiliary Contact REMA DIN 320/640 Male
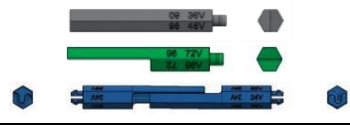
Accessories		
Picture	**Ordering code**	**Description**
	79817-00 79816-00 77605-00	Reducing Bushing REMA 50 mm² - 35 mm² Reducing Bushing REMA 50 mm² - 25 mm² Reducing Bushing REMA 50 mm² - 16 mm²
	95066-67 95066-68 75066-68	Screwed Handle REMA DIN 320 – Standard with 4 screws Handle REMA DIN 160/320 (8 screws) Handle REMA DIN 320 – Red (4 screws)
	95239-05	Screwed Flat Handle REMA DIN 320 - 2 bolts 50 mm, security nuts
	EHDL-EN	Handle DIN 160-320 A – Long Steel – PVC
	EHDL-TOY	Handle DIN 160-320 – Steel with PVC-coating
	LV160/320 H1/S	Handle Schaltbau LV/LB-L 160/320 A with screws – Black
	80283-12	Locking Plate – REMA DIN 320

79
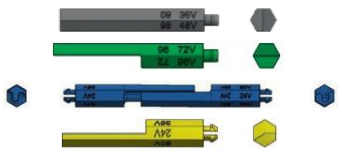
DIN 640 Female connector		
Item	**Ordering code**	**Description**
5(2x)/6/7/ 8/9/10*	95950-30 95950-20 95950-10 95950-00	REMA DIN 640 Female – 70 mm² REMA DIN 640 Female – 95 mm² REMA DIN 640 Female – 120 mm² REMA DIN 640 Female – 240 mm²
10	75057-01 75233-01 75057-95	REMA DIN 160/320 Coding Pin – Grey REMA DIN 160/320 Coding Pin – Green REMA DIN 160/320 Coding Pin – Blue (Li)
14	75070-32	Air Adapter REMA DIN 320/640 Female
15	75591-00	Pilot Contacts (2 pcs. + adapter) REMA DIN 320/640 Female
16	75590-02	Auxiliary Contact REMA DIN 320/640 Female
17	M93320-74	Auxiliary Contact REMA MRC 320 Female – 2 pieces

DIN 640 Male connector		
Item	**Ordering code**	**Description**
1/2/3/4/ 5(2x)/6*	95850-30 95850-20 95850-10 95850-00	REMA DIN 640 Male – 70 mm² REMA DIN 640 Male – 95 mm² REMA DIN 640 Male – 120 mm² REMA DIN 640 Male – 240 mm²
4	75057-01 75233-01 75057-90 75231-01	REMA DIN 160/320 Coding Pin – Grey REMA DIN 160/320 Coding Pin – Green REMA DIN 160/320 Coding Pin – Blue (Li) REMA DIN 160/320 Coding Pin – Yellow
11	75070-33	Air Adapter REMA DIN 320/640 Male
12	75596-00	Pilot Contacts (2 pcs.+ adapter) REMA DIN 320/640 Male
13	75595-01	Auxiliary Contact REMA DIN 320/640 Male

Accessories		
Picture	**Ordering code**	**Description**
	95800-11	Handle REMA DIN 640 (4 screws)
	EHDL-MET-TOY-640-SCR	Screwed Metal Handle DIN 640 with PVC-coating - L: 135 mm + 4 screws

82

1.2.2 FT Connector

To ensure optimal electrical motor performance it is imperative to use a reliable, high-quality connection. The REMA Motor Connectors guarantee a long-lasting connection with low power losses.

The design of the motor connectors is extremely compact. That means high amperage – small dimensions. Each connection fulfils the highest quality standards and shows functionality, easy handling, robust reliability, and economy. The type FT 80 is in correspondence with French industrial standard and the European EN 1175-1 standard.

REMA motor connectors are suitable for use in the following applications:

- Personnel / Burden Carriers

- Golf Carts

- Sweeper / Scrubber Floor Cleaning Equipment

- Boating

- Light On-Highway Caravans, Trailer, and Mobile Homes

Contacts are made from E-Cu copper optimized for crimp connection.

FT 80
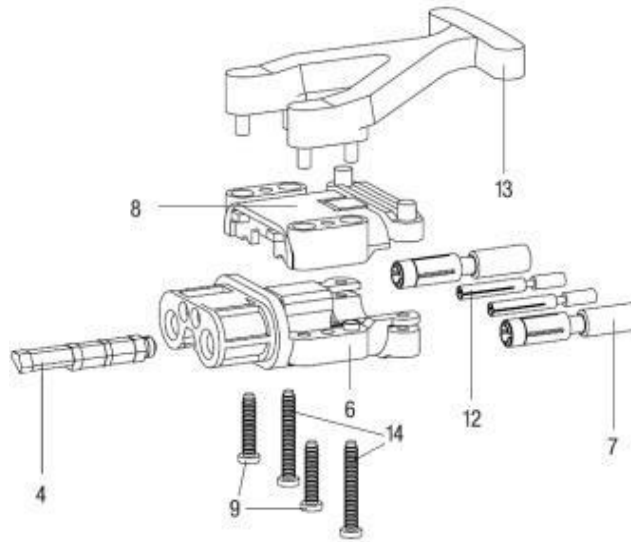
FT80 Female connector		
Item	**Ordering code**	**Description**
4/6/7/8/9/14	81200-00 81201-00	FT 80 Female – 16 mm² FT 80 Female – 25 mm²
4/6/7/8/9/13/14	81205-00 81206-00	FT 80 Female – 16 mm² – incl. Handle FT 80 Female – 25 mm² – incl. Handle
4	81236-00	Charger Key FT 80 Male/Female
7	81232-00 81234-00	Main Contact FT 80 – 16 mm² – Female Main Contact FT 80 – 25 mm² – Female
12	81243-00	Pilot Contact FT 80 – Female
13	81235-00	Handle REMA FT 80 – Red
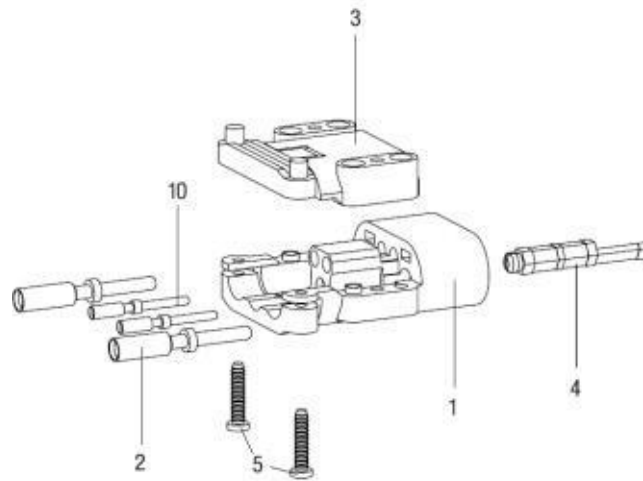
FT80 Male connector		
Item	**Ordering code**	**Description**
1/2/3/4/5	81220-00 81221-00	FT 80 Male – 16 mm² FT 80 Male – 25 mm²
2	81242-00 81244-00	Main Contact FT 80 – 16 mm² – Male Main Contact FT 80 – 25 mm² – Male
4	81236-00	Charger Key FT 80 Male/Female
10	81245-00	Pilot Contact FT 80 Male

1.2.3 JH Connector

Prior to standardization REMA has developed a two-pole electrical connection. These robust connectors have proved there reliability already for decades within the REMA product portfolio. The focus of applications of these connectors are electrical connections between trailer and towing machine on road trucks.

The contact design has large connection surfaces with a spring-loaded connector pin sliding into the sleeves inside the female connector. The result is an extremely low resistance in the electrical connection. The contacts show a differentiation between solder and crimp connections.

On top the twin plug and sockets have:
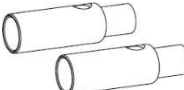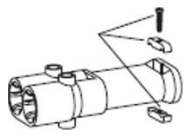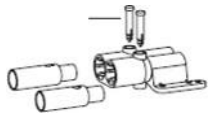
- mechanical robustness
- constant extraction forces
- protection against humidity, acids, and UV radiation
- reliable design for long lifetimes and vibration protection

Connectors			
Type	**Dimensions**	**Ordering code**	**Description**
	Length: 150 mm Width: 100 mm Height: 40 mm	76250-00 76251-00	JH Twin 160 Plug – 35 mm² – type A – Battery JH Twin 200 Plug – 50 mm² – type A – Battery
	Length: 117 mm Width: 100 mm Height: 44 mm	76350-00 76351-00	JH Twin 160 Socket – 35 mm² – type B – Truck JH Twin 200 Socket – 50 mm² – type B – Truck
	Length: 161 mm Width: 65 mm Height: 44 mm	76460-00 76470-00	JH Twin 160 Socket – 35 mm² – type C – Charger JH Twin 200 Socket – 50 mm² – type C – Charger
	Length: 117 mm Width: 100 mm Height: 40 mm	77350-00 77351-00	JH Twin 160 Plug – 35 mm² – type D – Truck JH Twin 200 Plug – 50 mm² – type D – Truck
	Length: 107 mm Width: 100 mm Height: 40 mm	77360-00 77361-00	JH Twin 160 Plug – 35mm² – type E – Truck JH Twin 200 Plug – 50 mm² – type E – Truck
	Length: 161 mm Width: 65 mm Height: 44 mm	77460-00 77461-00	JH Twin 160 Plug – 35 mm² – type F – Charger JH Twin 200 Plug – 50 mm² – type F – Charger
	Length: 150 mm Width: 100 mm Height: 44 mm	77250-00 77251-00	JH Twin 160 Socket – 35 mm² – type G – Battery JH Twin 200 Socket – 50 mm² – type G – Battery

Accessories			
Picture	**Ordering code**	**Description**	**For Type**
	76935-00 76925-00	Reducing bushing 35 mm² – 16 mm² Reducing bushing 35 mm² – 25 mm²	A – B – C – D – E – F – G
	76765-00 76766-00	Main Contact JH – 35 mm² – Male Main Contact JH – 50 mm² – Male	A – D – E – F
	76915-00 76916-00	Main Contact JH – 35 mm² – Female Main Contact JH – 50 mm² – Female	B – C – G
	76850-00	Cable Clamp JH Connector	A – C – F – G
	76947-00	Locking Pin JH – 33,5 mm	B – C – D – E
	76946-00	Locking Pin JH – 30,5 mm	A – F – G

1.2.4 MRC Connector

Patented high power connector which has been specifically designed for the quick and opportunity charging of large battery capacities.

Compliant with DIN EN 0623-589 and EN 1175-

Various cable sizes from 16 mm² to 95 mm²

The gas-tight connection between cable and connector housing allows a higher current carrying capacity (Patented MRC technology)

Used in combination with the REMA Flex cable, which has a special jacket, results in significantly higher performance and durability.

Preassembled cables in the different sizes guarantee short installation times and therefore save money.

High current rated according to DIN VDE 0623-589 (Current Rating II) depending on the cable size.

Special characteristics of the material (chemically coupled, heat and alkali-stabilized copolymer), ensure high resistance against battery acid and UV.

High-grade contacts made from pure high conductive Cu-ETP copper with silver plated surface and an anti- friction and tarnish coating ensure.

> a power transition with minimal losses

> long life

Design matches the DIN 80, DIN 160, and DIN 320
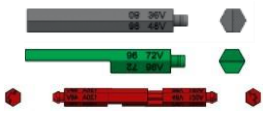
All accessories of the REMA DIN series like coding pins, auxiliary contacts and pilot contacts can be interchangeable.

89
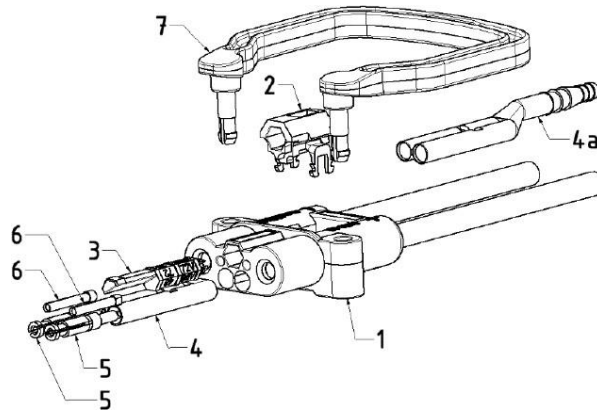
MRC 80/120

MRC 80/120 Female connector		
Item	**Ordering code**	**Description**
1*	Assembly code*	MRC80F Housing, only available in assembly
2	M93080-48	Coding Pin Support for REMA MRC 80 Female
	M93080-53	Coding Pin Support for REMA MRC 120 Female
3	75435-00	REMA DIN 80 Coding Pin – Gray
	75438-00	REMA DIN 80 Coding Pin – Green
	M75057-65	MRC 120 Coding Pin Female – Red
4/5	75289-00	Pilot Contacts (2 pcs.+ adapter) REMA DIN 80 Female
4a	75070-42	Air Adapter REMA DIN 80 Female
6	M93080-74	Auxiliary Contact REMA MRC 80 Female – 2 pieces
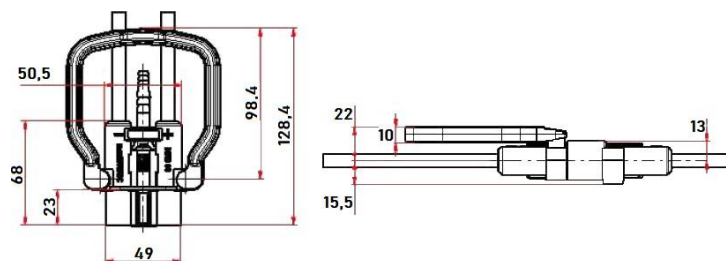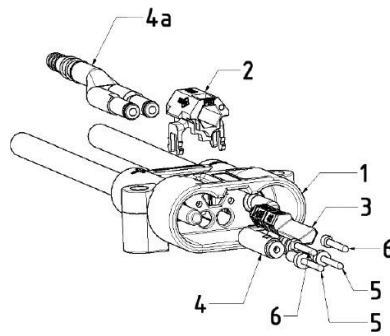
MRC 80/120 Male connector		
Item	**Ordering code**	**Description**
1	Assembly code*	MRC80M Housing, only available in composition
2	M93080-04 M93080-05	Coding Pin Support for REMA MRC 80 Male Coding Pin Support for REMA MRC 120 Male
3	75435-00 75438-00 75436-00 M75057-60	REMA DIN 80 Coding Pin – Gray REMA DIN 80 Coding Pin – Green REMA DIN 80 Coding Pin – Yellow MRC 120 Coding Pin – Male – Red
4/5	75243-00	Pilot Contacts (2 pcs.+ adapter) REMA DIN 80 Male
4a	75070-43	Air Adapter REMA DIN 80 Male
6	M93080-44	Auxiliary Contact REMA MRC 80 Male – 2 pieces
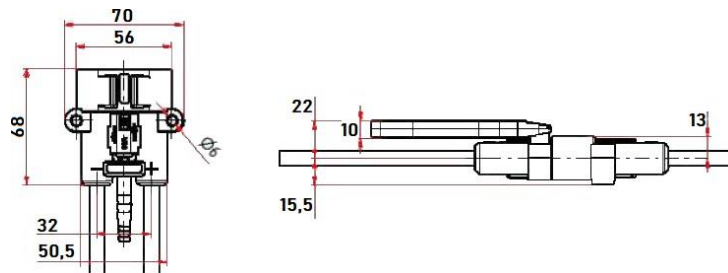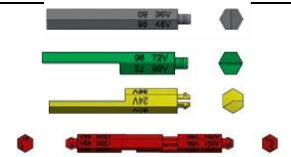
Accessories		
Picture	**Ordering code**	**Description**
	95244-00	Snap-on Handle REMA DIN 80 – Standard
	95244-01	Handle REMA DIN 80 – with screws M6x30
	0702629	Handle Toyota/BT – REMA DIN 80

91

Assembly code

Example: MRC80*-F-1-1-24V-2-1-16-1000-650

Gender:
F – Female
M – Male

Handle:
0 – No Handle
1 – Standard Handle Screwed
2 – Click-on Handle

Coding Pin:
1 – Gray   4 – Red - High Amp (MRC120)
2 – Green   5 – Blue - High Amp (MRC120)
3 – Yellow (only male)

Harness Voltage:
*xxV – code pin not mounted, delivered loose

Options :
0 – None   4 – Aux. And Pilot Contacts
1 – Aux. Contacts   5 – Air Adapter
2 – Pilot Contacts   6 – Air Adapter + Aux. Contacts

Terminal Connection:
1 – Flex   5 – Cable Lug M12
2 – Perfect   6 – Cable Lug M14
3 – Cable Lug M8   9 – Cable Lug M16
4 – Cable Lug M10   0 – Open

Cable Section:
16 mm²
25 mm²

+ Terminal Length in mm:
– Terminal Length in mm:

*MRC80 with red or blue coding pin becomes a MRC120

Remark: For special assemblies, please contact us

92
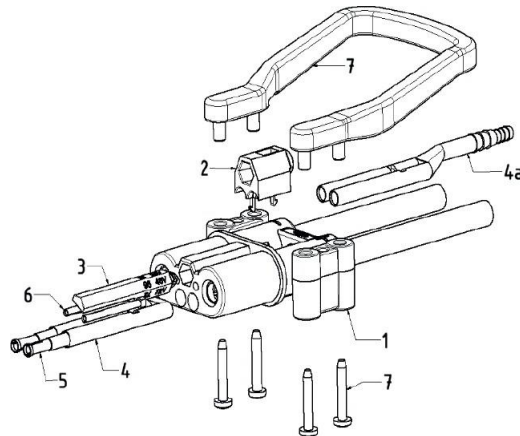
MRC 160/250

MRC 160/250 Female connector		
Item	**Ordering code**	**Description**
1*	Assembly code*	MRC160/250F Housing, only available in composition
2	M93160-48 M93160-53	Coding Pin Support for REMA MRC 160 Female Coding Pin Support for REMA MRC 250 Female
3	75057-01 75233-01 M75057-75 104594	REMA DIN 160/320 Coding Pin – Gray REMA DIN 160/320 Coding Pin – Green MRC250 Coding Pin – Female – Red MRC250 Coding Pin – Female – Blue
4/5	75068-03	Pilot Contacts (2 pcs.+ adapter) REMA DIN 160 Female
4a	75070-12	Air Adapter REMA DIN 160 Female
6	M93160-74	Auxiliary Contact REMA MRC 160 Female – 2 pieces
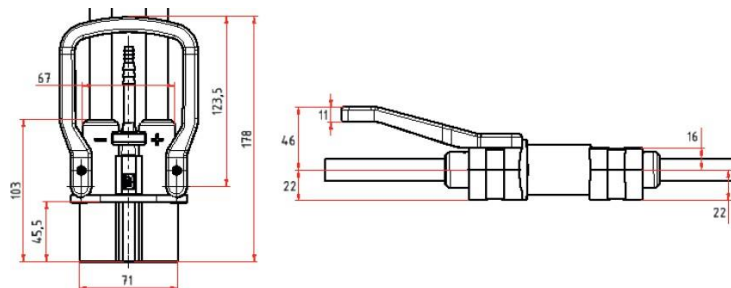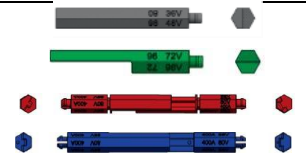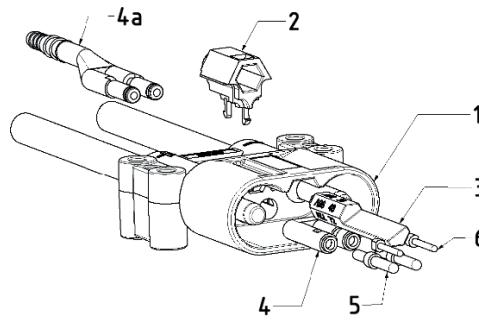
MRC 160/250 Male connector		
Item	**Ordering code**	**Description**
1	Assembly code*	MRC160/250M Housing, only available in composition
2	M93160-04 M93160-05	Coding Pin Support for REMA MRC 160 Male Coding Pin Support for REMA MRC 250 Male
3	75057-01 75233-01 75231-01 M75057-70 104593	REMA DIN 160/320 Coding Pin – Gray REMA DIN 160/320 Coding Pin – Green REMA DIN 160/320 Coding Pin – Yellow MRC250 Coding Pin – Male – Red MRC250 Coding pin – Male – Blue
4	M93160-44	Auxiliary Contact REMA MRC 160 Male – 2 pieces
4a	75070-13	Air Adapter REMA DIN 160 Male
5	75070-03	Pilot Contacts (2 pcs.+ adapter) REMA DIN 160 Male
6	M93160-44	Auxiliary Contact REMA MRC 160 Male – 2 pieces
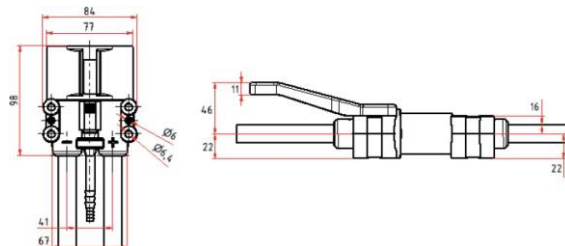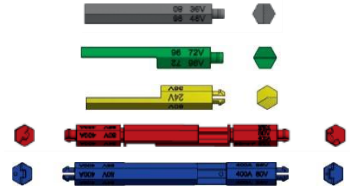
Accessories		
Picture	**Ordering code**	**Description**
	95066-65	Screwed Handle DIN 160 – Standard with 4 screws
	EHDL160/320-TOY	Handle MRC 160-320 A Toyota

Assembly code

Example: MRC160*-F-1-1-24V-2-1-25-1000-650

Gender:
F – Female
M – Male

Handle:
0 – No Handle
1 – Standard Handle Screwed

Coding Pin:
1 – Gray   4 – Red - High Amp (MRC250)
2 – Green   5 – Blue - High Amp (MRC250)
3 – Yellow (only male)

Harness Voltage:
*xxV – code pin not mounted, delivered loose

Options :
0 – None   4 – Aux. And Pilot Contacts
1 – Aux. Contacts 5 – Air adapter
2 – Pilot Contacts 6 – Air Adapter + Aux. Contacts

Terminal Connection:
1 – Flex   5 – Cable Lug M12
2 – Perfect   6 – Cable Lug M14
3 – Cable Lug M8 9 – Cable Lug M16
4 – Cable Lug M10 0 – Open

Cable Section :
16 mm²
25 mm²
50 mm²

+ Terminal Length in mm:
– Terminal Length in mm:

*MRC160 with red or blue coding pin becomes a MRC250

Remark: For special assemblies, please contact us

95

MRC 320/400

MRC 320/400 Female connector			
Item	Ordering code	Description	
1*	Assembly code*	MRC320/400F Housing, only available in composition	
2	M93320-48	Coding Pin Support for REMA MRC 320 Female	
	M93320-53	Coding Pin Support for REMA MRC 400 Female	
3	75057-01	REMA DIN 160/320 Coding Pin – Gray	
	75233-01	REMA DIN 160/320 Coding Pin – Green	
	M75057-85	MRC400 Coding Pin Female – Red	
	111376	MRC400 Coding Pin Female – Blue	
4/5	75591-00	Pilot Contacts (2 pcs.+ adapter) REMA DIN 320/640 Female	
4a	75070-32	Air Adapter REMA DIN 320/640 Female	
6	M93320-74	Auxiliary Contact REMA MRC 320 Female – 2 pieces	

MRC 320/400 Male connector		
Item	Ordering code	Description
1	Assembly code*	MRC320/400M Housing, only available in composition
2	M93320-04 M93320-05	Coding Pin Support for REMA MRC 320 Male Coding Pin Support for REMA MRC 400 Male
3	75057-01 75233-01 75231-01 M75057-80 111375	REMA DIN 160/320 Coding Pin – Gray REMA DIN 160/320 Coding Pin – Green REMA DIN 160/320 Coding Pin – Yellow MRC400 Coding Pin Male – Red MRC400 Coding Pin Male – Blue
4/5	75596-00	Pilot contacts (2 pcs.+ adapter) REMA DIN 320/640 male
4a	75070-33	Air adapter REMA DIN 320 /640 male
6	M93320-44	Auxiliary contact REMA MRC 320 plug – 2 pieces
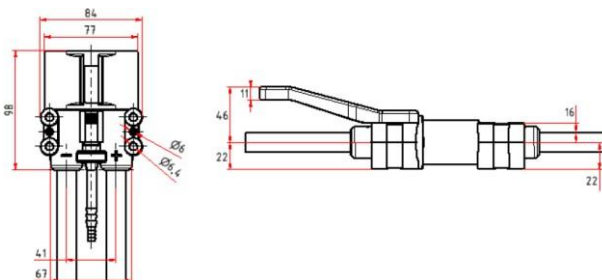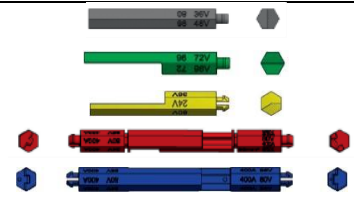
Accessories		
Picture	Ordering code	Description
	95066-67	Screwed handle REMA DIN 320 - standard with 4 screws
	EHDL160/320-TOY	Handle MRC 160-320 A Toyota

97

Assembly code

Example: **MRC320*-F-1-1-24V-2-1-70-1000-650**

Gender:
F – Female
M – Male

Handle:
0 – No Handle
1 – Standard Handle Screwed

Coding pin:
1 – Gray   4 – Red - High Amp (MRC400)
2 – Green   5 – Blue - High Amp (MRC400)
3 – Yellow (only male)

Harness Voltage:
*xxV – code pin not mounted, delivered loose

Options :
0 – None   4 – Aux. And Pilot Contacts
1 – Aux. Contacts   5 – Air adapter
2 – Pilot Contacts   6 – Air Adapter + Aux. Contacts

Terminal Connection:
1 – Flex   5 – Cable Lug M12
2 – Perfect   6 – Cable Lug M14
3 – Cable Lug M8   9 – Cable Lug M16
4 – Cable Lug M10   0 – Open

Cable Section :
50 mm²
70 mm²
95 mm²

+ Terminal Length in mm:
– Terminal Length in mm:

*MRC320 with red or blue coding pin becomes a MRC400

Remark: For special assemblies, please contact us

98

Conversion table	
10 mm²	8 AWG
16 mm²	6 AWG
25 mm²	4 AWG
35 mm²	2 AWG
50 mm²	1/0 AWG
70 mm²	2/0 AWG
95 mm²	3/0 AWG
120 mm²	4/0 AWG
150 mm²	300 MCM
240 mm²	500 MCM

1.2.5 SR Connector

Reliable power connection solution for

- Electric vehicle batteries
- Battery chargers
- Forklift trucks
- Other DC voltage applications

Operating voltage determined by housing colour

- Simplifies mating of same voltages

Plug and socket with identical housing design.

- Reduces quantity of components
- Reduces purchasing and storage cost
- Acid resistant housing material Handles, strain relieves available.

CE Marking & UL recognized.

Contacts sized for AWG (American Wire Gauge)

REMA developed high-grade contacts made from pure high conductive Cu-ETP copper with silver plated surface and an anti-friction and tarnish coating ensure.

- Power transition with minimal losses
- Long life
- Suitable for crimping

SR 50

Connectors = Standard housing + wire contacts (set)			
Color	12-10 AWG	8 AWG	6 AWG
Gray	78180-01	78180-02	78180-00
Red	78176-00	78176-01	78184-00
Black	78181-04	78181-05	78181-00
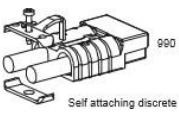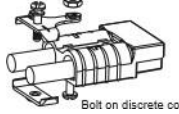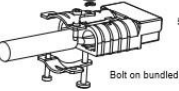
Standard housings		
Color	Ordering code	Description
Gray	78001-00	Housing SR 50 – Gray
Red	78002-00	Housing SR 50 – Red
Black	78003-00	Housing SR 50 – Black
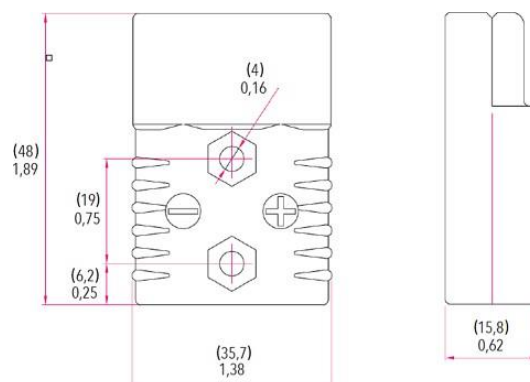
✎ Silver plated wire contacts		
Section	**Ordering code**	**Description**
12-10 AWG	78265-05	Main Contact SR 50 – 12-10 AWG
8 AWG	78265-10	Main Contact SR 50 – 8 AWG
6 AWG	78265-00	Main Contact SR 50 – 6 AWG

Accessories		
Picture	**Ordering code**	**Description**
	78295-00	Handle SR 50 – Red
	78295-05	Handle SR 50 – Red – T-shaped
	990 990G2	Cable Clamp, self-attaching for discrete conductor – 8-6 AWG Cable Clamp, self-attaching for discrete conductor – 12-10 AWG
	990G1 5905	Cable Clamp for discrete conductor – 12-6 AWG Cable Clamp for bundled conductor – 0.32"-0.45"

SR 175

Connectors = Standard housing + wire contacts (set)			
Color	4 AWG	2 AWG	1/0 AWG
Gray	78220-01	78220-02	78220-00
Red	78234-00	78235-00	78236-00
Blue	78224-01	78224-02	78224-00
Yellow*	78230-00	78231-00	78232-00
Orange*	78229-00	78229-01	78228-00

Standard housings		
Color	Ordering code	Description
Gray	78004-00	Housing SR 175 – Gray
Red	78008-00	Housing SR 175 – Red
Blue	78005-00	Housing SR 175 – Blue
Yellow*	78007-00	Housing SR 175 – Yellow
Orange*	78006-00	Housing SR 175 – Orange

103
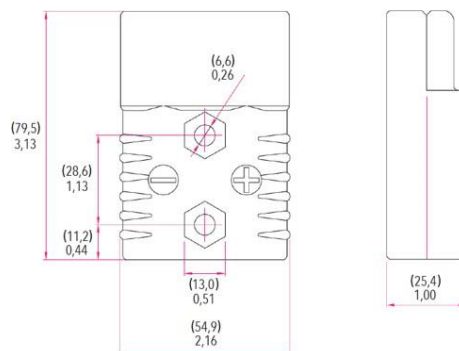
Silver plated wire contacts		
Section	**Ordering code**	**Description**
AWG 4	78268-00	Main Contact SR 175 – 4 AWG
AWG 2	78270-01	Main Contact SR 175 – 2 AWG
AWG 1/0	78270-00	Main Contact SR 175 – 1/0 AWG

Accessories		
Picture	**Ordering code**	**Description**
	78290-04 78291-04	Handle SR / SRX 175 & SRE160 – Gray – incl. screws Handle SR / SRX 175 & SRE160 – Red – incl. screws
	78010-00	Metallic Strain Relief Cable Clamp REMA SR 175

SR 350

Connectors = Standard housing + wire contacts (set)				
Color	**1/0 AWG**	**2/0 AWG**	**3/0 AWG**	**4/0 AWG**
Gray	78299-00	78300-00	78301-00	on request
Red	78307-00	78308-00	78309-00	on request
Blue	78303-00	78304-00	78304-01	on request
Green	78316-01	78316-00	78317-00	on request

Standard housings		
Color	**Ordering code**	**Description**
Gray	78135-00	Housing SR 350 – Gray
Red	78138-00	Housing SR 350 – Red
Blue	78136-00	Housing SR 350 – Blue
Green	78139-00	Housing SR 350 – Green

105
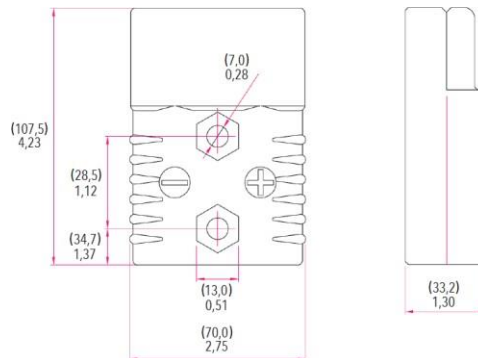
Silver plated wire contacts		
Section	**Ordering code**	**Description**
AWG 1/0	78273-00	Main Contact SR 350 – 1/0 AWG
AWG 2/0	78275-00	Main Contact SR 350 – 2/0 AWG
AWG 3/0	78275-05	Main Contact SR 350 – 3/0 AWG
AWG 4/0	78275-10	Main Contact SR 350 – 4/0 AWG

Accessories		
Picture	**Ordering code**	**Description**
	78297-04 78298-04	Handle SR350/SRE320/SRX350 – Gray Handle SR350/SRE320/SRX350 – Red
	78297-02	Handle SR350/SRE320/SRX350 – Gray – with 2 screws 1/4" x 43
	78011-00	Metallic Strain Relief Cable Clamp REMA SR 350

1.2.6 SRE Connector

Reliable power connection solution for

- Electric vehicle batteries
- Battery chargers
- Forklift trucks
- Other DC voltage applications

Operating voltage determined by housing colour

- Simplifies mating of same voltages

Plug and socket with identical housing design.

- Reduces quantity of components
- Reduces purchasing and storage cost
- Acid resistant housing material Handles, strain relieves available.

CE Marking & UL recognized.

Contacts sized for AWG (American Wire Gauge)

REMA developed high-grade contacts made from pure high conductive Cu-ETP copper with silver plated surface and an anti-friction and tarnish coating ensure.

- Power transition with minimal losses
- Long life

Suitable for crimping

SRE 160

Connectors = Standard housing + wire contacts (set)					
Color	16 mm²	25 mm²	35 mm²	50 mm²	1/0 AWG
Red	78039-03	78035-00	78071-00	78036-00	78070-00
Gray	on request	78027-00	78051-00	78028-00	78050-00
Blue	on request	78029-00	78056-00	78030-00	78055-00
Black	78039-02	78039-00	78082-00	78040-00	78082-05
Yellow*	on request	78033-00	78066-00	78034-00	78065-00
Green	on request	78037-00	78081-00	78038-00	78080-00
Orange*	on request	78031-00	78061-00	78032-00	78060-00

Standard housings		
Color	Ordering code	Description
Red	78024-00	Housing SRE 160 – Red
Gray	78020-00	Housing SRE 160 – Gray
Blue	78021-00	Housing SRE 160 – Blue
Black	78026-00	Housing SRE 160 – Black
Yellow*	78023-00	Housing SRE 160 – Yellow
Green	78025-00	Housing SRE 160 – Green
Orange*	78022-00	Housing SRE 160 – Orange
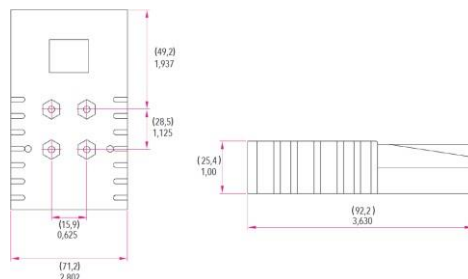
Silver plated wire contacts		
Section	**Ordering code**	**Description**
16 mm²	78284-00	Main Contact SRE 160 – 16 mm²
25 mm²	78282-00	Main Contact SRE 160 – 25 mm²
35 mm²	78283-00	Main Contact SRE 160 – 35 mm²
50 mm²	78281-00	Main Contact SRE 160 – 50 mm²
1/0 AWG	78280-00	Main Contact SRE160/SRX175 – 1/0 AWG

Accessories		
Picture	**Ordering code**	**Description**
	78290-04 78291-04	Handle SR / SRX 175 & SRE 160 – Gray – incl. screws Handle SR / SRX 175 & SRE 160 – Red – incl. screws
	78000-00	Strain Relief Cable Clamp in plastic REMA
	75071-10	Air Adapter SRE 160 – Blue
	78072-00	Coding pin SRE 160/320 – Yellow
	78079-00	Auxiliary Contact kit SRX / SRE

109

SRE 320
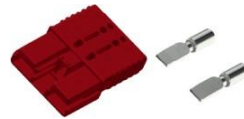
Connectors = Standard housing + wire contacts (set)					
Color	35 mm²	50 mm²	70 mm²	95 mm²	2/0 AWG
Red	on request	78340-00	78341-00	78342-00	78341-05
Gray	on request	78330-00	78331-00	78332-00	78331-05
Blue	78336-35	78335-00	78336-00	78337-00	78336-05
Black	78349-35	78349-00	78350-00	78351-00	78350-05
Yellow*	on request	78352-00	78353-00	78355-00	78353-05
Green	on request	78344-00	78345-00	78347-00	78345-05
Orange*	on request	78357-00	78358-00	78360-00	78358-05
Brown*	on request	78357-02	78358-02	78338-00	on request
Purple*	on request	on request	on request	on request	on request
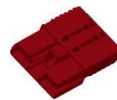
Standard housings		
Color	Ordering code	Description
Red	78151-00	Housing SRE 320 – Red
Gray	78149-00	Housing SRE 320 – Gray
Blue	78150-00	Housing SRE 320 – Blue
Black	78153-00	Housing SRE 320 – Black
Yellow*	78154-00	Housing SRE 320 – Yellow
Green	78152-00	Housing SRE 320 – Green
Orange*	78155-00	Housing SRE 320 – Orange
Brown*	78156-00	Housing SRE 320 – Brown
Purple*	78157-00	Housing SRE 320 – Purple

110
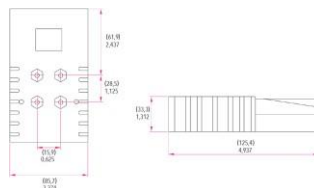
✏️ Silver plated wire contacts		
Section	**Ordering code**	**Description**
35 mm²	78286-00	Main Contact SRE 320 – 35 mm²
50 mm²	77951-00	Main Contact SRE 320 – 50 mm²
70 mm²	78285-00	Main Contact SRE 320 – 70 mm²
95 mm²	78287-00	Main Contact SRE 320 – 95 mm²
2/0 AWG	78285-05	Main Contact SRE 320/SRX 350 – 2/0 AWG

Accessories		
Picture	**Ordering code**	**Description**
	78297-02 78297-04 78298-04	Handle SR 350/SRE 320/SRX 350 – gray – with 2 screws 1/4" x 43 Handle SR 350/SRE 320/SRX 350 – gray Handle SR 350/SRE 320/SRX 350 – red
	78000-00	Strain Relief Cable Clamp in plastic REMA
	75071-11	Air Adapter SRE 320 – Blue
	78072-00	Coding pin SRE 160/320 – yellow
	78079-00	Auxiliary Contact kit SRX / SRE

Conversion table	
10 mm²	8 AWG
16 mm²	6 AWG
25 mm²	4 AWG
35 mm²	2 AWG
50 mm²	1/0 AWG
70 mm²	2/0 AWG
95 mm²	3/0 AWG
120 mm²	4/0 AWG
150 mm²	300 MCM
240 mm²	500 MCM

1.2.7 SRX Connector

Reliable power connection solution for

- Electric vehicle batteries
- Battery chargers
- Forklift trucks
- Other DC voltage applications

Operating voltage determined by housing colour

- Simplifies mating of same voltages

Plug and socket with identical housing design.

- Reduces quantity of components
- Reduces purchasing and storage cost
- Acid resistant housing material Handles, strain relieves available.

CE Marking & UL recognized.

Contacts sized for AWG (American Wire Gauge)

REMA developed high-grade contacts made from pure high conductive Cu-ETP copper with silver plated surface and an anti-friction and tarnish coating ensure.

- Power transition with minimal losses
- Long life

Suitable for crimping

113

SRX 175

Connectors = Standard housing + wire contacts (set)	
Color	1/0 AWG
Red	78070-00
Gray	78050-00
Blue	78055-00
Black	78082-05
Yellow*	78065-00
Green	78080-00
Orange*	78060-00

Standard housings		
Color	Ordering code	Description
Red	78024-00	Housing SRE 160 – Red
Gray	78020-00	Housing SRE 160 – Gray
Blue	78021-00	Housing SRE 160 – Blue
Black	78026-00	Housing SRE 160 – Black
Yellow*	78023-00	Housing SRE 160 – Yellow
Green	78025-00	Housing SRE 160 – Green
Orange*	78022-00	Housing SRE 160 – Orange

114
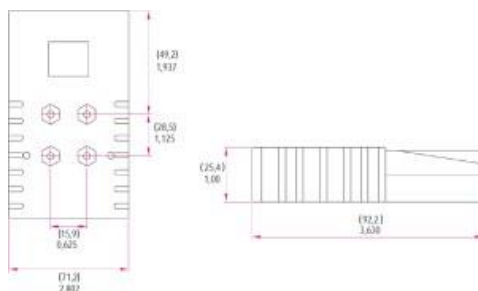
Silver plated wire contacts		
Section	**Ordering code**	**Description**
1/0 AWG	78280-00	Main Contact SRE 160/SRX 175 – 1/0 AWG

Accessories		
Picture	**Ordering code**	**Description**
	78290-04 78291-04	Handle SR / SRX 175 & SRE 160 – Gray – incl. screws Handle SR / SRX 175 & SRE 160 – Red – incl. screws
	78000-00	Strain Relief Cable Clamp in plastic REMA
	78072-00	Coding Pin SRE 160/320 – Yellow
	78079-00	Auxiliary Contact kit SRX / SRE

115

SRX 350

Connectors = Standard housing + wire contacts (set)			
Color	2/0 AWG	3/0 AWG	4/0 AWG
Red	78110-00	on request	on request
Gray	78100-00	on request	on request
Blue	78105-00	on request	on request
Black	78120-00	on request	on request
Yellow*	78125-00	on request	on request
Green	78115-00	on request	on request
Orange*	78130-00	on request	on request
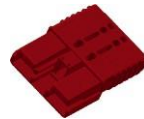
Standard housings		
Color	Ordering code	Description
Red	78143-00	Housing SRX 350 – Red
Gray	78141-00	Housing SRX 350 – Gray
Blue	78142-00	Housing SRX 350 – Blue
Black	78145-00	Housing SRX 350 – Black
Yellow*	78146-00	Housing SRX 350 – Yellow
Green	78144-00	Housing SRX 350 – Green
Orange*	78147-00	Housing SRX 350 – Orange

116
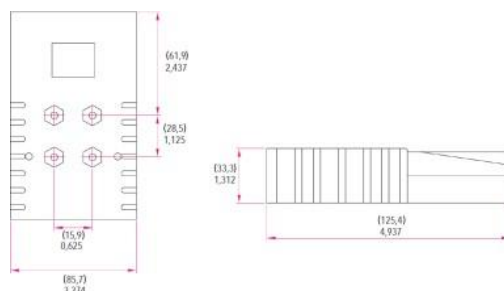
Silver plated wire contacts		
Section	**Ordering code**	**Description**
2/0 AWG	78285-05	Main Contact SRE 320/SRX 350 – 2/0 AWG
3/0 AWG	78287-05	Main Contact SRX 350/SRE 320 – 3/0 AWG
4/0 AWG	78285-10	Main Contact SRX 350 – 4/0 AWG

Accessories		
Picture	**Ordering code**	**Description**
	78297-02 78297-04 78298-04	Handle SR 350/SRE 320/SRX 350 – gray – with 2 screws 1/4" x 43 Handle SR 350/SRE 320/SRX 350 – gray Handle SR 350/SRE 320/SRX 350 – red
	78000-00	Strain Relief Cable Clamp in plastic REMA
	78072-00	Coding Pin SRE 160/320 – Yellow
	78079-00	Auxiliary Contact kit SRX / SRE

117

1.2.8 Explosion Proof Connector

Electrical connector especially designed for the use in

hazardous areas. <u>Product features and advantages:</u>
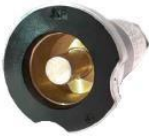
- Approved for Zone 1 (gas) and Zone 21 (dust).

- „Ex" marking

- Compliant with the European directive 2014/34/EU „Equipment and protective systems intended for use
in potentially explosive atmospheres" and following standards:

- EN60079-0: General requirements
- EN60079-1: Equipment protection by flameproof enclosures „d"
- EN60079-7: Equipment protection by increased safety „e"
- EN60079-31: Explosive atmospheres. Equipment dust ignition protection by enclosure „t"

- REMA developed contacts made out of pure high conductive Cu-ETP copper with silver
plated surface and an anti-friction and tarnish coating which ensure:

- a power transition with minimal losses
- long lifetime

- Polarity and combination protection through contact coding.

- Solder joint for gas tight connection between contact and cable.

- Screw for connecting socket and cable.

- DR E250 ex with a cable ≥ 50 mm² can conduct up to 250A continuously.

- DR E250 ex may be used for lower operating current with smaller cross-section cables.

DR E250 EX – Male connector – Positive

Male connector - positive		
Picture	**Ordering code**	**Description**
	79250-00	DR E250 ex Plug - positive - 25-50 mm² - male
	79270-00	DR E250 ex Plug - positive - 70 mm² - male

Male connector - positive - with coding contact		
Picture	**Ordering code**	**Description**
	79250-05	DR E250 ex Plug - positive - 25-50 mm² - male - with coding system
	79270-05	DR E250 ex Plug - positive - 70 mm² - male - with coding system
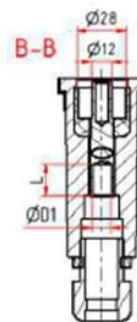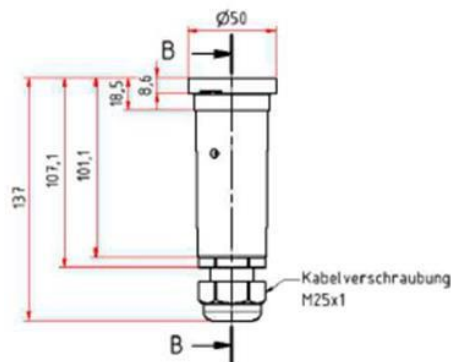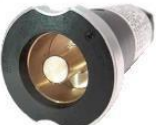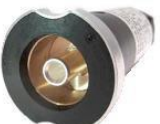
DR E250 EX – Male connector – Negative

Male connector - negative		
Picture	**Ordering code**	**Description**
	79250-01	DR E250 ex Plug - negative - 25-50 mm² - male
	79270-01	DR E250 ex Plug - negative - 70 mm² - male

Male connector - negative - with coding contact		
Picture	**Ordering code**	**Description**
	79250-06	DR E250 ex Plug - negative - 25-50 mm² - male - with coding system
	79270-06	DR E250 ex Plug - negative - 70 mm² - male - with coding system

120
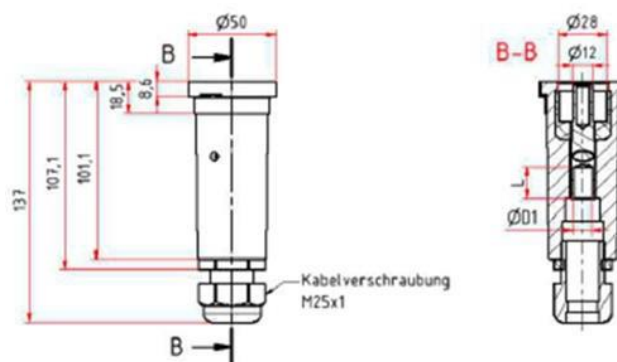
DR E250 EX – Female connector

Female connector		
Picture	**Ordering code**	**Description**
	79350-00	DR E250 ex M12 - female - with screw connection

Female connector - with coding contact		
Picture	**Ordering code**	**Description**
	79350-05	DR E250 ex M12 - female - with screw connection and coding system
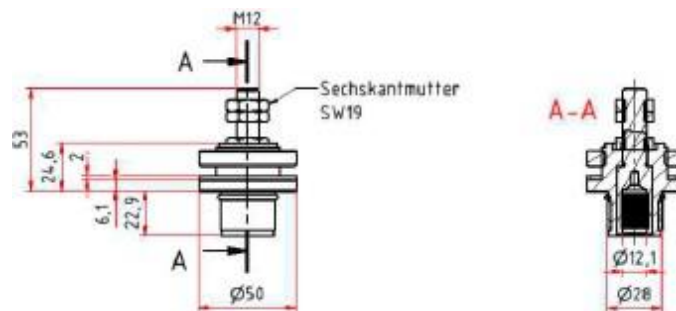
Extra info	
Picture	**Description**
	Male connector (plug) - positive
	Male connector (plug) - negative
	Male and female connector with coding contact

1.3 Schaltbau

1.3.1 Euro Din Connectors

LV Series

The Schaltbau LV Series connectors are especially designed to meet the demands of modern materials handling vehicles. They exceed the requirements of standard EN 1175-1 in many of their features. There is an option for chargers with electrolyte circulation system.

Like all LV Series connectors, also this option is intermateable with all standard commercial charging connectors. Available as 80-, 160-, 320- and 500-amp connectors.

LV80/120

LV160/250

LV320

LV500

LV80/120
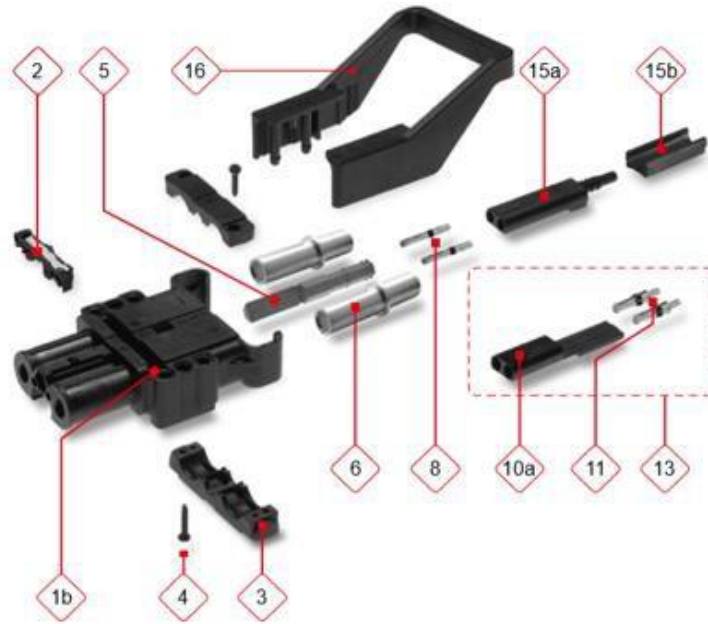
LV80/120 Female connector		
Item	Ordering code	Description
1b	LV80/120 G-SP	Housing Shell LV80/120 - Female, incl. pilot contact adapter (10a)
2	LV80/120 S	Locking Part "Schaltbau" for SCHALTBAU DIN 80
3	LV80 D	Cable Clamp LV80
4	LV SC 3.5X16	Tapping Screw SC 3.5x16 for cable clamp LV 80
5	LV80-N-GR LV80-T-GN LV120-N-R-S LV120-LI-U-S	Coding Pin-SCHALTBAU DIN 80 – grey Coding Pin-SCHALTBAU DIN 80 – green Coding Pin SCHALTBAU DIN 120 – red Coding Pin-SCHALTBAU DIN 120 – blue
6	LV80/120 S6/25 LV80 S6/35	Main Contact SCHALTBAU DIN 80 Female - 25 mm² Main Contact SCHALTBAU DIN 80 Female - 35 mm²
8/11	LV80 BBC-2.5-AG	Auxiliary/pilot contact SCHALTBAU DIN 80 Female
13	LV80 P-S/S	Pilot Contact SCHALTBAU DIN 80 Female - 2 pieces, incl adapter (10a)
15a	LV80 LV-S	Air Adapter SCHALTBAU DIN 80 Female
15b	LV80 DS-L	Spacer LV80

126
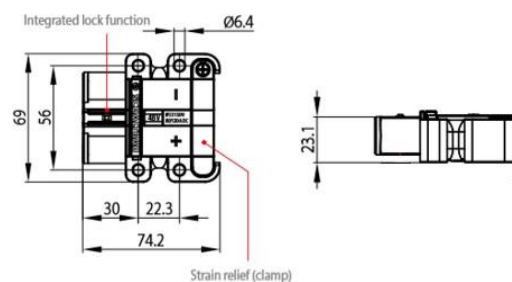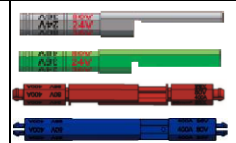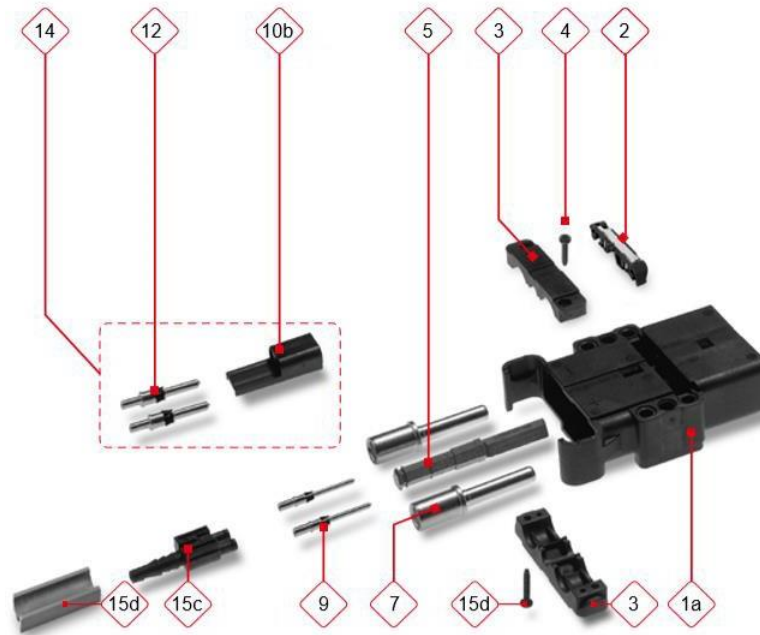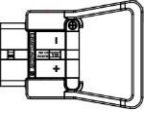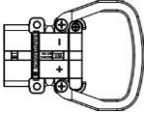
LV80/120 Male connector		
Item	**Ordering code**	**Description**
1a	LV80/120 G-P	Housing Shell LV80/120 - Male
2	LV80 S	Locking Part "Schaltbau" for SCHALTBAU DIN 80
3	LV80 D	Cable Clamp LV80
4	LV SC 3.5X16	Tapping Screw SC 3.5x16 for cable clamp LV 80
5	LV80-N-GR LV80-T-GN LV80-U-GE LV120-N-R-P LV120-LI-U-P	Coding Pin-SCHALTBAU DIN 80 – grey Coding Pin-SCHALTBAU DIN 80 – green Coding Pin SCHALTBAU DIN 80 – yellow (universal) Coding Pin SCHALTBAU DIN 120 – red Coding Pin SCHALTBAU DIN 120 – blue
7	LV80 P6/25 LV80 P6/35	le - 25 mm² Main Contact SCHALTBAU DIN 80 Male - 35 mm²
9/12	LV80 SBC-2.5-AG	Auxiliary/pilot Contact SCHALTBAU DIN 80 Male
14	LV80 P-P/S	Pilot Contact SCHALTBAU DIN 80 Male - 2 pieces, incl adapter (10b)
15c	LV80 LV-P	Air Adapter SCHALTBAU DIN 80 Male
15d	N.A.	Not applicable on LV80/120

H1/S – Black, screw on
H2/S – Red, screw on

127

Ordering code

Example:
LV80/120-R-S25-0-2-L0-H3

Series:
LV80/120

Keying plug:
R – Red
N – Grey
T – Green
U – Yellow (universal)
LI – Blue

Main contacts:
P25 – Pin 25mm² (AWG 4)
P16 – Pin 16 mm² (AWG 5)*
P10 – Pin 10 mm² (AWG 6)*
S25 – Socket 25 mm² (AWG 4)
S16 – Socket 16 mm² (AWG 5)*
S10 – Socket 10 mm² (AWG 6)*
*Contact supplied with reducer

Pilot contacts:
0 – None
2 – 2 pilots contacts

Aux. Contacts :
0 – None
2 – 2 aux. Contacts

Air tube adapter :
L0 – None
L1 – Air tube adapter

Handle:
H0 – None
H1 – Black, snap on
H2 – Red, snap on
H1/S – Black, screw on
H2/S – Red, screw on

Accessories		
Picture	**Ordering code**	**Description**
	LV RH-25/10 LV RH-25/16	Reducing Bushing SCHALTBAU 25 mm² - 10 mm² Reducing Bushing SCHALTBAU 25 mm² - 16 mm²
	LV80 H1 LV80 H2	Snap-on Handle SCHALTBAU LV 80 - **black** Snap-on Handle SCHALTBAU LV 80 - **red**
	LV80 H1/S LV80 H2/S	Handle SCHALTBAU DIN 80 with 2 Screws– **black** Handle SCHALTBAU DIN 80 with 2 Screws– **red**

129
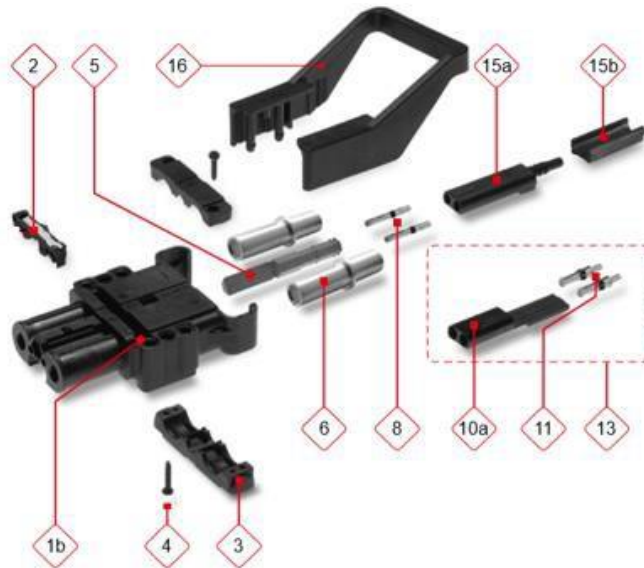
LV160/250

LV160/250 Female connector		
Item	Ordering code	Description
1b	LV160/250 G-SP	Housing Shell LV160/250 - Female, incl. pilot contact adapter (10a)
2	LV160/250 S	Locking Part "Schaltbau" for SCHALTBAU DIN 160
3	LV160/250 D	Cable Clamp LV160/250
4	LV SC 3.5X19	Tapping Screw SC 3.5x19 for cable clamp LV 160/320
5	LV160/320-N-GR LV160/320-T-GN LV250/400-N-R-S LV250/400-LI-U-S	Coding Pin-SCHALTBAU DIN 160/320 – grey Coding Pin-SCHALTBAU DIN 160/320 – green Coding Pin-SCHALTBAU DIN 250/400 – red Coding Pin-SCHALTBAU DIN 250/400 – blue
6	LV160/250 S8.5/50	Main Contact SCHALTBAU DIN 160 Female - 50 mm2
9	LV160 BBC-2.5-AG	Auxiliary Contact SCHALTBAU DIN 160 Female
11	BCC-2.5-AG	Pilot Contact SCHALTBAU LV160/320 Female
13	LV160/320 P-S/S	Pilot Contact SCHALTBAU DIN 160/320 Female - 2 pieces, incl adapter (10a)
15a	LV160/320 LV-S	Air Adapter SCHALTBAU DIN 160/320 Female
15b	LV160/320 DS-LS	Spacer LV160/320
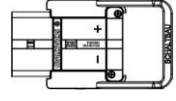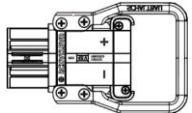
LV160/250 Male connector		
Item	**Ordering code**	**Description**
1a	LV160/250 G-P	Housing Shell LV160/250 - Male
2	LV160/250 S	Locking Part "Schaltbau" for SCHALTBAU DIN 160
3	LV160/250 D	Cable Clamp LV160/250
4	LV SC 3.5X19	Tapping Screw SC 3.5x19 for cable clamp LV 160/320
5	LV160/320-N-GR LV160/320-T-GN LV160/320-U-GE LV250/400-N-R-P LV250/400-LI-U-P	Coding Pin-SCHALTBAU DIN 160/320 – grey Coding Pin-SCHALTBAU DIN 160/320 – green Coding Pin SCHALTBAU DIN 160/320 – yellow (universal) Coding Pin SCHALTBAU DIN 250/400 – red Coding Pin SCHALTBAU DIN 250/400 – blue
7	LV160 P8.5/50	Main Contact SCHALTBAU DIN 160 Male - 50 mm²
9	LV160 SBC-2.5-AG	Auxiliary Contact SCHALTBAU DIN 160 Male
12	SCC-2.5-AG	Pilot Contact SCHALTBAU LV160/320 Male
14	LV160/320 P-P/S	Pilot Contact SCHALTBAU DIN 160/320 Male - 2 pieces, incl adapter (10b)
15c	LV160/320 LV-P	Air Adapter SCHALTBAU DIN 160/320 Male
15d	LV160/320 DS-LP	Spacer LV160/320

131

Ordering code

Example:
LV160/250-R-S25-0-2-L0-H3

Series:
LV160/250

Keying plug:
R – Red
N – Grey
T – Green
U – Yellow (universal)
LI – Blue

Main contacts:
P50 – Pin 50mm² (AWG 1/0)
P35 – Pin 35 mm² (AWG 1)
* P25 – Pin 25 mm² (AWG 4) *
S50 – Socket 50 mm² (AWG 1/0)
S35 – Socket 35 mm² (AWG 1) *
S25 – Socket 25 mm² (AWG 4) *
*Contact supplied with reducer

Pilot contacts:
0 – None
2 – 2 pilots contacts

Aux. Contacts :
0 – None
2 – 2 aux. Contacts

Air tube adapter :
L0 – None
L1 – Air tube adapter

Handle:
H0 – None
H1/S – Black, screw on
H2/S – Red, screw on
H3 – Black, snap on
H4 – Red, snap on

Accessories		
Picture	**Ordering code**	**Description**
	LV RH-50/25 LV RH-50/35	Reducing Bushing SCHALTBAU 50 mm² - 25 mm² Reducing Bushing SCHALTBAU 50 mm² - 35 mm²
	LV160/320 H3 LV160/320 H4	Snap-on Handle SCHALTBAU LV 160/320 – **black** Snap-on Handle SCHALTBAU LV 160/320 – **red**
	LV160/320 H1/S LV160/320 H2/S	Handle SCHALTBAU LV 160/320 with screws – **black** Handle SCHALTBAU LV 160/320 with screws – **red**
	Multifunctional adapters for LV160/320/500	See drawing and table below

133

Accessories		
Picture	**Ordering code**	**Description**
	LV160/320 HW1 LV160/320 HW2	Handle for SCHALTBAU DIN 160/320 when central water module support is used, **black.** Handle for SCHALTBAU DIN 160/320 when central water. module support is used, **red**
	LV160/320 MA-L LV160/320 MA-R	Distance Piece Left Distance Piece Right
	LV160/320 MT-M	Auxiliary Module Support SCHALTBAU DIN 160/320 for central mounting
	LV SC 5.5X25	Tapping Screw SC 5,5x25 - black, galvanized
	LV160/320 DS-WP	Distance Piece for water module – Male
	LV160/320 DS-WS	Distance Piece for water module – Female
	LV160/320 WK-P	Water Module with tube SCHALTBAU DIN 160/320 and plug (incl pos 7 and 8)
	LV160/320 WK-S	LV Multifunctional Adapter Female with tube and plug (incl pos 7 and 8)
	LV160/320 LV-P	Air Adapter SCHALTBAU DIN 160/320 Male
	LV160/320 LV-S	Air Adapter SCHALTBAU DIN 160/320 Female
	LV160/320 PA-P	Pilot Contact Adapter LV 160/320 Male
	LV160/320 PA-SW	Pilot Contact Adapter SCHALTBAU DIN 160/320 Female
	SCC-2.5-AG	Pilot Contact LV 160/320 Male
	BCC-2.5-AG	Pilot Contact LV 160/320 Female

134

LV320/400

LV320/400 Female connector		
Item	Ordering code	Description
1b	LV320/400 G-SP	Housing Shell LV320/400 - Female, incl. pilot contact adapter (10a)
2	LV320/400 S	Locking Part "Schaltbau" for SCHALTBAU DIN 320/400
3	LV320 D	Cable Clamp LV320/400
4	LV SC 3.5X19 LV SC 3.5X25	Tapping Screw SC 3.5x19 for cable clamp LV 160/320 Tapping Screw SC 3.5x25 for cable clamp LV 320 95mm²
5	LV160/320-N-GR LV160/320-T-GN LV250/400-N-R-S LV250/400-LI-U-S	Coding Pin-SCHALTBAU DIN 160/320 – grey Coding Pin-SCHALTBAU DIN 160/320 – green Coding Pin-SCHALTBAU DIN 250/400 – red Coding Pin-SCHALTBAU DIN 250/400 – blue
6	LV500 S10/AWG4/0 LV320 S10/95 LV320 S10/70 LV320 S10/50	Main Contact SCHALTBAU DIN 500 Female – 120mm² (AWG 4/0) Main Contact SCHALTBAU DIN 320 Female – 95 mm² Main Contact SCHALTBAU DIN 320 Female – 70 mm² (AWG 3/0) Main Contact SCHALTBAU DIN 320 Female – 50 mm² (AWG 1/0)
9	LV320 BCC-2.5-AG	Auxiliary Contact SCHALTBAU DIN 320 Female
11	BCC-2.5-AG	Pilot Contact SCHALTBAU LV160/320 Female
13	LV160/320 P-S/S	Pilot Contact SCHALTBAU DIN 160/320 Female - 2 pieces, incl adapter (10a)
15a	LV160/320 LV-S	Air Adapter SCHALTBAU DIN 160/320 Female
15b	LV160/320 DS-LS	Spacer LV160/320
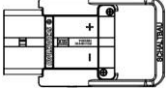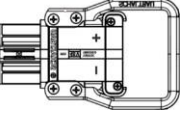
LV320/400 Male connector		
Item	**Ordering code**	**Description**
1a	LV320/400 G-P	Housing Shell LV320/400 - Male
2	LV320/400 S	Locking Part "Schaltbau" for SCHALTBAU DIN 320/400
3	LV320 D	Cable Clamp LV320/400
4	LV SC 3.5X19	Tapping Screw SC 3.5x19 for cable clamp LV 160/320
	LV SC 3.5X25	Tapping Screw SC 3.5x25 for cable clamp LV 320 95mm²
5	LV160/320-N-GR	Coding Pin-SCHALTBAU DIN 160/320 – grey
	LV160/320-T-GN	Coding Pin-SCHALTBAU DIN 160/320 – green
	LV160/320-U-GE	Coding Pin SCHALTBAU DIN 160/320 – yellow (universal)
	LV250/400-N-R-P	Coding Pin-SCHALTBAU DIN 250/400 – red
	LV250/400-LI-U-P	Coding Pin-SCHALTBAU DIN 250/400 – blue
7	LV500 P10/AWG4/0	Main Contact SCHALTBAU DIN 500 Male – 120mm² (AWG 4/0)
	LV320 P10/95	Main Contact SCHALTBAU DIN 320 Male – 95 mm²
	LV320 P10/70	Main Contact SCHALTBAU DIN 320 Male – 70 mm² (AWG 3/0)
	LV320 P10/50	Main Contact SCHALTBAU DIN 320 Male – 50 mm² (AWG 1/0)
9	LV320 SCC-2.5-AG	Auxiliary Contact SCHALTBAU DIN 320 Male
12	SCC-2.5-AG	Pilot Contact SCHALTBAU LV160/320 Male
14	LV160/320 P-P/S	Pilot Contact SCHALTBAU DIN 160/320 Male - 2 pieces, incl adapter (10b)
15c	LV160/320 LV-P	Air Adapter SCHALTBAU DIN 160/320 Male
15d	LV160/320 DS-LP	Spacer LV160/320

Ordering code

Example:
LV320/400-R-S50-0-2-L0-H3

Series:
LV320/400

Keying plug:
R – Red
N – Grey
T – Green
U – Yellow (universal)
LI – Blue

Main contacts:
P4/0 – Pin 120 mm² (AWG 4/0)
P95 – Pin 95mm²
P70 – Pin 70 mm² (AWG 3/0)
P50 – Pin 50 mm² (AWG 1/0)
S4/0 – Socket 120 mm² (AWG 4/0)
S95 – Socket 95 mm²
S70 – Socket 70 mm² (AWG 3/0)
S50 – Socket 50 mm² (AWG 1/0)

Pilot contacts :
0 – None
2 – 2 pilots contacts

Aux. Contacts :
0 – None
2 – 2 aux. Contacts

Air tube adapter :
L0 – None
L1 – Air tube adapter

Handle:
H0 – None
H1/S – Black, screw on
H2/S – Red, screw on
H3 – Black, snap on
H4 – Red, snap on

137

Accessories		
Picture	**Ordering code**	**Description**
	LV RH-70/50 LV RH-50/35	Reducing bushing SCHALTBAU 70 mm² - 50 mm² Reducing bushing SCHALTBAU 50 mm² - 35 mm²
	LV160/320 H3 LV160/320 H4	Snap-on handle SCHALTBAU LV 160/320 – **black** Snap-on handle SCHALTBAU LV 160/320 – **red**
	LV160/320 H1/S LV160/320 H2/S	Handle SCHALTBAU LV 160/320 with screws – **black** Handle SCHALTBAU LV 160/320 with screws – **red**
	Multifunctional adapters for LV160/320/500	See drawing and table below

138

Accessories		
Picture	**Ordering code**	**Description**
	LV160/320 HW1 LV160/320 HW2	Handle for SCHALTBAU DIN 160/320 when central water module support is used, **black** Handle for SCHALTBAU DIN 160/320 when central water module support is used, **red**
	LV160/320 MA-L LV160/320 MA-R	Distance Piece Left Distance Piece Right
	LV160/320 MT-M	Auxiliary Module Support SCHALTBAU DIN 160/320 for central mounting
	LV SC 5.5X25	Tapping Screw SC 5,5x25 - black, galvanized
	LV160/320 DS-WP	Distance Piece for water module – Male
	LV160/320 DS-WS	Distance Piece for water module – Female
	LV160/320 WK-P	Water Module with tube SCHALTBAU DIN 160/320 and plug (incl pos 7 and 8)
	LV160/320 WK-S	LV Multifunctional Adapter Female with tube and plug (incl pos 7 and 8)
	LV160/320 LV-P	Air Adapter SCHALTBAU DIN 160/320 Male
	LV160/320 LV-S	Air Adapter SCHALTBAU DIN 160/320 Female
	LV160/320 PA-P	Pilot Contact Adapter LV 160/320 Male
	LV160/320 PA-SW	Pilot Contact Adapter SCHALTBAU DIN 160/320 Female
	SCC-2.5-AG	Pilot Contact LV 160/320 Male
	BCC-2.5-AG	Pilot Contact LV 160/320 Female

139

LV500

LV500 Female connector		
Item	Ordering code	Description
1b	LV500 G-S	Housing Shell LV500 - Female, incl. pilot contact adapter (10a)
2	LV320/400 S	Locking Part "Schaltbau" for SCHALTBAU DIN 320/400
3	LV500 D	Cable Clamp LV500
4	LV SC 3.5X25	Tapping Screw SC 3.5x25 for cable clamp LV 320 95mm²
5	LV160/320-N-GR LV160/320-T-GN LV250/400-N-R-S LV250/400-LI-U-S	Coding Pin-SCHALTBAU DIN 160/320 – grey Coding Pin-SCHALTBAU DIN 160/320 – green Coding Pin-SCHALTBAU DIN 250/400 – red Coding Pin-SCHALTBAU DIN 250/400 – blue
6	LV500 S10/AWG4/0	Main Contact SCHALTBAU DIN 500 Female – 120mm² (AWG 4/0)
8	LV320 BCC-2.5-AG	Auxiliary Contact SCHALTBAU DIN 320 Female
11	BCC-2.5-AG	Pilot Contact SCHALTBAU LV160/320 Female
13	LV160/320 P-S/S	Pilot Contact SCHALTBAU DIN 160/320 Female - 2 pieces, incl adapter (10a)
15a	LV160/320 LV-S	Air Adapter SCHALTBAU DIN 160/320 Female
15b	LV160/320 DS-LS	Spacer LV160/320

140
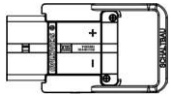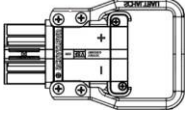
Ordering code

Example:
LV500-0-S4/0-0-2-L0-H3

Series:
LV500

Keying plug:
0 – None
R – Red
N – Grey
T – Green
U – Yellow (universal)
LI – Blue

Main contacts:
P4/0 – Pin 120 mm² (AWG 4/0)
S4/0 – Socket 120 mm² (AWG 4/0)

Pilot contacts :
0 – None
2 – 2 pilots contacts

Aux. Contacts :
0 – None
2 – 2 aux. Contacts

Air tube adapter :
L0 – None
L1 – Air tube adapter

Handle:
H0 – None
H1/S – Black, screw on
H2/S – Red, screw on
H3 – Black, snap on
H4 – Red, snap on

Accessories		
Picture	**Ordering code**	**Description**
	LV160/320 H3 LV160/320 H4	Snap-on handle SCHALTBAU LV 160/320 – **black** Snap-on handle SCHALTBAU LV 160/320 – **red**
	LV160/320 H1/S LV160/320 H2/S	Handle SCHALTBAU LV 160/320 with screws – **black** Handle SCHALTBAU LV 160/320 with screws – **red**
	Multifunctional adapters for LV160/320/500	See drawing and table below

Accessories		
Picture	**Ordering code**	**Description**
	LV160/320 HW1 LV160/320 HW2	Handle for SCHALTBAU DIN 160/320 when central water module support is used, **black** Handle for SCHALTBAU DIN 160/320 when central water module support is used, **red**
	LV160/320 MA-L LV160/320 MA-R	Distance Piece Left Distance Piece Right
	LV160/320 MT-M	Auxiliary Module Support SCHALTBAU DIN 160/320 for central mounting
	LV SC 5.5X25	Tapping Screw SC 5,5x25 - black, galvanized
	LV160/320 DS-WP	Distance Piece for water module – Male
	LV160/320 DS-WS	Distance Piece for water module – Female
	LV160/320 WK-P	Water Module with tube SCHALTBAU DIN 160/320 and plug (incl pos 7 and 8)
	LV160/320 WK-S	LV Multifunctional Adapter Female with tube and plug (incl pos 7 and 8)
	LV160/320 LV-P	Air Adapter SCHALTBAU DIN 160/320 Male
	LV160/320 LV-S	Air Adapter SCHALTBAU DIN 160/320 Female
	LV160/320 PA-P	Pilot Contact Adapter LV 160/320 Male
	LV160/320 PA-SW	Pilot Contact Adapter SCHALTBAU DIN 160/320 Female
	SCC-2.5-AG	Pilot Contact LV 160/320 Male
	BCC-2.5-AG	Pilot Contact LV 160/320 Female

143

1.4 Rebling

1.4.1 Double Pole Connectors

Rebling is a manufacturer of connectors located near Philadelphia (US) specialized in high current (100 to 1.000 A) connectors for the past 50 years.

As applications trend toward higher voltages and currents as well as faster charging times, improved features are needed to enable OEMs in those sectors to maintain their competitive edge and reduce their end users' total cost of ownership.

144

1.4.2 Double Pole Quick Disconnect Connectors and Accessories

The bulkhead mounted receptacles and plugs are used in various industries.

At the moment, there is a trend toward higher voltages and currents and faster charging for work trucks, electrified vehicles, auxiliary power, and stationary power applications. It leads to a need for improved features, which enables OEMs in those markets to maintain a competitive edge and reduce their end users' total cost of ownership.

We can offer commercial grade receptacles and sockets with six colour-coded mechanical keying combinations. These keying combinations can be used to differentiate various voltage or current levels to prevent errors by your system assembly, operations, or maintenance personnel.

The Battery Swap Connector is suitable for battery swap and stackable modular power applications. Both high current DC connector halves are bulkhead-mounted and the rugged, high current pin contacts of the male connector act as the guide pins which mate with the socket contacts of the female connector.

145
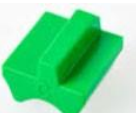
1.4.3 Commercial Cable Mounted Plugs

Type	7020-T	7020-O	7020-E
EMI-shielded	✖		✔
Keyable	✔		✖
HVIL Switch & Magnet Kit	Optional		
Continuous Rated current (CRC) *(per UL1977)*	500 A		400 A
Current Profile #2 50% CRC for 60min + 1 sec peak + 50% CRC for 60 min	3000 A		2200 A
Current Profile #3 50% CRC for 60min + 10 sec peak + 50% CRC for 60 min	2000 A		1500 A
Current Profile #4 50% CRC for 60min + 30 sec peak + 50% CRC for 60 min	1500 A		1000 A
Current Profile #5 50% CRC for 60min + 60 sec peak + 50% CRC for 60 min	1000 A		800 A
Rated Voltage	1500 VDC		1000 VDC
Dielectric Withstanding Voltage	5000 VDC		4000 VDC
Max Contact Resistance	70 MicroOhm		
Maximum Wire Size	4/0 AWG (110 mm²)		
Maximum Terminal Lug Tongue Width (inches)	1.08 (27,4 mm)		
Maximum Terminal Lug Web Width (inches)	0.45 (11,4 mm)		
Enviromental Sealing	IP55 IP56 (with optional shrink tube)		
Operating Temperature	-40°C to 125°C		-40°C to 90°C
Connection Bolts (inch)	5/16-18		

146

Ordering codes and spare parts

	Ordering code	Description
	RBL-7020-T	Rebling Double pole, keyable Plug, with non-conductive black backshell
	RBL-7020-O	Rebling Double pole, keyable Plug, with non-conductive orange backshell
	RBL-7020-E	Rebling Double pole, Plug, with EMI grey backshell
	RBL-643A1757	Rebling HVIL Kit for 7010 and 7020
	RBL-684A1765-A	Rebling Key Set for 7020, Orange (not for 7020-E)
	RBL-684A1765-B	Rebling Key Set for 7020, Blue (not for 7020-E)
	RBL-684A1765-C	Rebling Key Set for 7020, Green (not for 7020-E)
	RBL-684A1765-D	Rebling Key Set for 7020, Pink (not for 7020-E)
	RBL-684A1765-E	Rebling Key Set for 7020, White (not for 7020-E)
	RBL-684A1765-F	Rebling Key Set for 7020, Yellow (not for 7020-E)
	AVIONICS MILITARY SPECIALS	*Plugs also available with certificate for avionics applications per military standards → for these versions, please contact us*

Measurements

117,6 mm / 4.63"   73,4 mm / 2.89"
19 mm / 0.75"   85,3 mm / 3.36"
7020
27,7 mm / 1.09" inside   21,1 mm / 0.83" inside
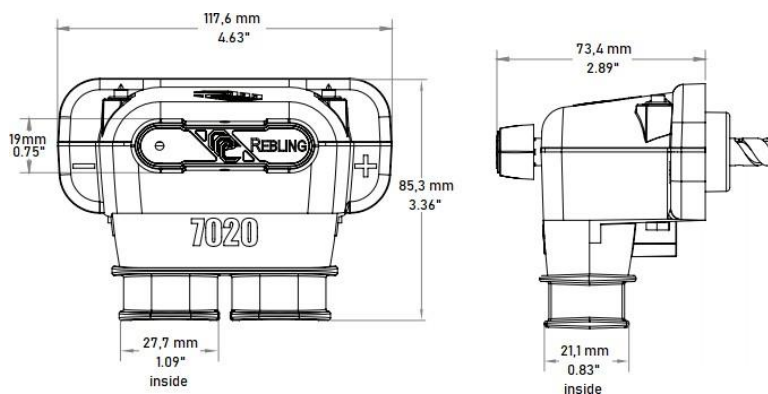
1.4.4 Commercial Bulkhead Mounted Receptacles

Type		7010-3	7009-51
EMI-shielded		❌	✔️
Keyable		✔️	❌
HVIL Switch & Magnet Kit	Optional		
Continuous Rated current (CRC) *(per UL1977)*		500 A	400 A
Current Profile #2 50% CRC for 60min + 1 sec peak + 50% CRC for 60 min		3000 A	2200 A
Current Profile #3 50% CRC for 60min + 10 sec peak + 50% CRC for 60 min		2000 A	1500 A
Current Profile #4 50% CRC for 60min + 30 sec peak + 50% CRC for 60 min		1500 A	1000 A
Current Profile #5 50% CRC for 60min + 60 sec peak + 50% CRC for 60 min		1000 A	800 A
Rated Voltage		1500 VDC	1000 VDC
Dielectric Withstanding Voltage		5000 VDC	4000 VDC
Max Contact Resistance	70 MicroOhm		
Maximum Wire Size	4/0 AWG (110 m²)		
Maximum Terminal Lug Tongue Width (inches)		0.82 (20,8 mm)	0.8 (20,3 mm)
Maximum Terminal Lug Web Width (inches)		0.26 (6,6 mm)	0.24 (6,1 mm)
Enviromental Sealing	IP56 IP68 (with optional gasket)		
Operating Temperature		-40°C to 140°C	-40°C to 90°C
Connection Bolts (inch)	5/16-18		

148

Ordering codes and spare parts		
	Ordering code	Description
	RBL-7010-3	Rebling Double pole, Keyable Receptacle
	RBL-7009-51	Rebling Double pole Receptacle, EMI Shielded
	RBL-643A1757	Rebling HVIL Kit for 7010 and 7020
	RBL-685A1766	Rebling Gasket with attached Dust Cover for 7010
	RBL-100A1784	Rebling Gasket for 7010
	RBL-643A1625	Rebling EMI gasket for 7009-51
	RBL-684A1763-A	Rebling Key Set for 7010, Orange (not for 7009)
	RBL-684A1763-B	Rebling Key Set for 7010, Blue (not for 7009)
	RBL-684A1763-C	Rebling Key Set for 7010, Green (not for 7009)
	RBL-684A1763-D	Rebling Key Set for 7010, Pink (not for 7009)
	RBL-684A1763-E	Rebling Key Set for 7010, White (not for 7009)
	RBL-684A1763-F	Rebling Key Set for 7010, Yellow (not for 7009)
	AVIONICS MILITARY SPECIALS	*Receptacles also available with certificate for avionics applications per military standards → for these versions, please contact us*

149

Measurements

RBL-7010-3

6,9 mm
0.27"

5/16-18
THREADED
POSTS

40,6 mm
1.60"

6,4 mm
0.25"

109,2 mm
4.30"

73,4 mm
2.89"

38,9 mm
1.53"

41,4 mm
1.63"

34,5 mm
1.36"

FRONT

BACK

RBL-7009-51

6,35 mm
0.25"

5/16-18
THREADED
POSTS

40,9 mm
1.61"

6,4 mm
0.25"

109,2 mm
4.30"

73,4 mm
2.89"

38,9 mm
1.53"

41,4 mm
1.63"

34,5 mm
1.36"

FRONT

BACK

150
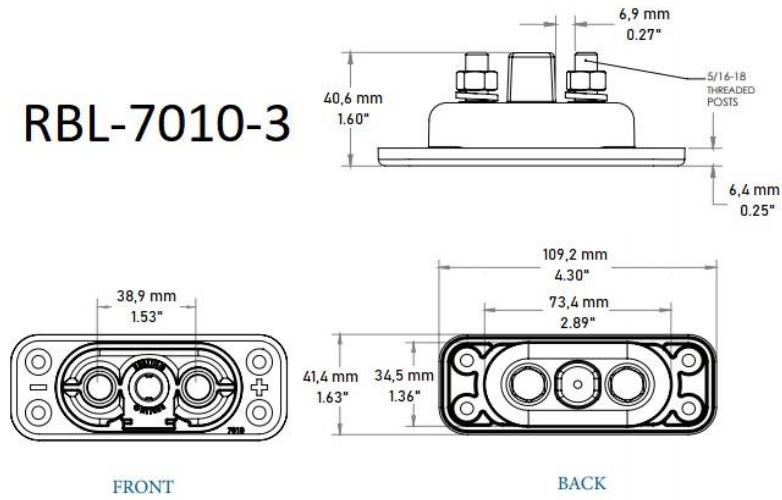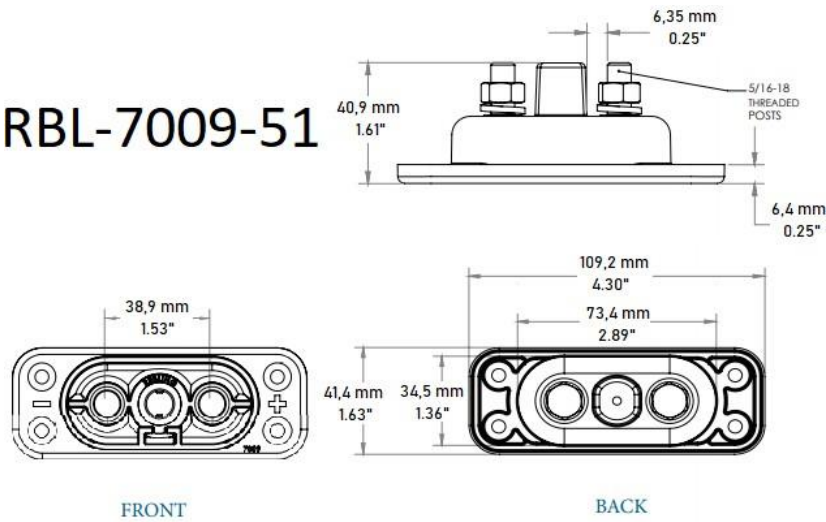
1.4.5 Battery Swap Bulkhead Mounted Connectors

Application	Suitable for battery swap and stackable modular power applications
Continuous Rated current (CRC) – Amp (per UL1977)	500 A
Current Profile #2 50% CRC for 60min + 1 sec peak + 50% CRC for 60 min	3000 A
Current Profile #3 50% CRC for 60min + 10 sec peak + 50% CRC for 60 min	2000 A
Current Profile #4 50% CRC for 60min + 30 sec peak + 50% CRC for 60 min	1500 A
Current Profile #5 50% CRC for 60min + 60 sec peak + 50% CRC for 60 min	1000 A
Rated Voltage	1000 VDC
Dielectric Withstanding Voltage	4000 VDC
Max Contact Resistance	70 MicroOhm
Maximum Buss Bar Cross Section (sq inches)	0.80 (516 mm²)
Maximum Buss Bar Width (inches)	1.3 (33 mm)
Maximum Cable Lug Tongue Width (inches)	1.3 (33 mm)
Enviromental Sealing	IP68 for pin connector IP66 for socket connector
Operating Temperature	-40°C to 140°C
Connection Bolts (inch)	5/16-18

151

Ordering codes and spare parts		
	Ordering code	Description
	RBL-654A1679	Rebling Battery Swap Male Connector, Black
	RBL-654A1680	Rebling Battery Swap Female Connector, Black
	RBL-100A1112	Gasket for Battery Swap Pin or Socket

Measurements

Socket Connector

Pin Connector
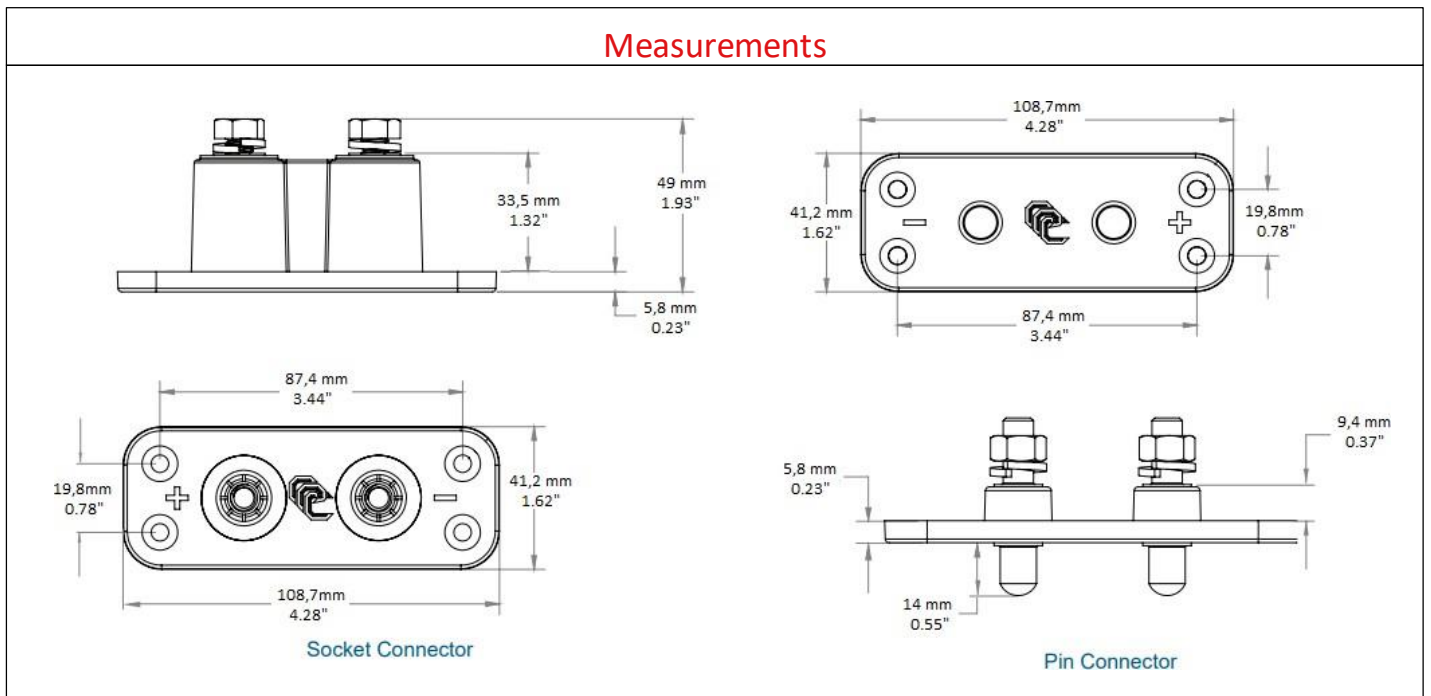
1.4.6 Rebling Terminals

Single pole feed-through terminals

The feed-through terminals are rated from 250 A to 1.000 A and 2.000 V, can take a peak current from
1.500 A to 5.000 A. They are designed for mounting to the steel, aluminum, or plastic panels found in switchgear, panel boards, power cabinets, generator sets, transformers, electrical panel boards, power management modules, battery racks, and control panels.

The terminals are also ideal to use in lithium battery applications: they can be used as external connections in a low voltage battery module or as internal connections in a high voltage battery pack. The brass core of this through panel connector is available with nickel plating for the harsh environments found in outdoor enclosures and remains cool at extreme DC charge or discharge cycles or AC switching rates.

Equipping your design with these single pole, pass-through terminals will enable integrators to incorporate your products into their power conditioning or distribution panel systems.

The double-ended female threaded electrical termination scheme eliminates the shorting hazard of male threaded posts and delivers more than twice the torque strength of a threaded post. This prevents potential damage inflicted by over-zealous end users. Flexible or rigid covers provide touch safety, both before and after cables have been attached to our power pass-through connector.

153

Single pole feed-through terminals

Type	LFT	SFT	MFT	BFT	BFT	XFT	XFT
Core Material	Brass				Copper	Brass	Copper
Nickel plated	Optional			✔			
Continuous Rated current (CRC) *(each of these current profiles causes a maximum 30ºC temperature rise)*	250 A	250 A	500 A	750 A	1000 A	750 A	1000 A
Current Profile #2 50% CRC for 60min + 1 sec peak + 50% CRC for 60 min	1500 A	1500 A	3000 A	4000 A	5000 A	4000 A	5000 A
Current Profile #3 50% CRC for 60min + 10 sec peak + 50% CRC for 60 min	1000 A	1000 A	2000 A	3000 A	4000 A	3000 A	4000 A
Current Profile #4 50% CRC for 60min + 30 sec peak + 50% CRC for 60 min	750 A	750 A	1250 A	1800 A	2500 A	1800 A	2500 A
Current Profile #5 50% CRC for 60min + 60 sec peak + 50% CRC for 60 min	500 A	500 A	1000 A	1500 A	2000 A	1500 A	2000 A
Rated Voltage (continuous)	2000 V						
Minimum Dielectric Withstanding Voltage	5000 V (AC or DC)						
Max Contact Resistance	70 MicroOhm						
Maximum Wire Size - Terminal only	4/0 AWG (110 mm²)		450 MCM (230 mm²)	750 MCM (380mm²)			
Maximum Wire Size - With Flexible Cover	4/0 AWG (110 mm²)						
Maximum Wire Size - With Rigid Short Cover	3/0 AWG (80 mm²)			Only long rigid cover available		Rigid cover not available	
Maximum Wire Size - With Rigid Long Cover	2 AWG (35 mm²)			250 MCM (126 mm²)		Rigid cover not available	
Maximum Terminal Lug Tongue Width (inches) - With Flexible Cover	1.10 (28 mm)			1.50 (38 mm)			
Maximum Terminal Lug Tongue Width (inches) - With Rigid Short Cover	0.91 (23,11 mm)			Only long rigid cover available		Rigid cover not available	
Maximum Terminal Lug Tongue Width (inches) - With Rigid Long Cover	0.70 (17,8 mm)			1.70 (38 mm)		Rigid cover not available	
Minimum Panel Thickness (inches)	0.110 (2,8 mm)	0.025 (0,65 mm)		0.080 (2 mm)		0.025 (0,65 mm)	
Enviromental Sealing	IP65 IP68 (with optional O-ring or gasket)						
Operating Temperature	Terminal and rigid cover: -40°C to 125°C With flexible cover: -40°C to 90°C						
Bolt size (SS Bolt)	M8 - 1.25 x 14mm			5/16-18 x 5/8 inch		M10 - 1.5 x 16mm	

154

Ordering codes		
	Ordering code	Description
	RBL-LFT-B-B	Rebling LFT 250 amp, unplated brass, black
	RBL-LFT-B-R	Rebling LFT 250 amp, unplated brass, red
	RBL-LFT-B-E	Rebling LFT 250 amp, unplated brass, blue
	RBL-LFT-P-B	Rebling LFT 250 amp, nickel plated brass, black
	RBL-LFT-P-R	Rebling LFT 250 amp, nickel plated brass, red
	RBL-LFT-P-E	Rebling LFT 250 amp, nickel plated brass, blue
	RBL-SFT-B-B	Rebling SFT 250 amp, unplated brass, black
	RBL-SFT-B-R	Rebling SFT 250 amp, unplated brass, red
	RBL-SFT-B-E	Rebling SFT 250 amp, unplated brass, blue
	RBL-SFT-P-B	Rebling SFT 250 amp, nickel plated brass, black
	RBL-SFT-P-R	Rebling SFT 250 amp, nickel plated brass, red
	RBL-SFT-P-E	Rebling SFT 250 amp, nickel plated brass, blue
	RBL-MFT-B-B	Rebling MFT 500 amp, unplated brass, black
	RBL-MFT-B-R	Rebling MFT 500 amp, unplated brass, red
	RBL-MFT-B-E	Rebling MFT 500 amp, unplated brass, blue
	RBL-MFT-P-B	Rebling MFT 500 amp, nickel plated brass, black
	RBL-MFT-P-R	Rebling MFT 500 amp, nickel plated brass, red
	RBL-MFT-P-E	Rebling MFT 500 amp, nickel plated brass, blue
	RBL-BFT-P-B	Rebling BFT 750 amp, nickel plated brass, black
	RBL-BFT-P-R	Rebling BFT 750 amp, nickel plated brass, red
	RBL-BFT-N-B	Rebling BFT 1000 amp, nickel plated copper, black
	RBL-BFT-N-R	Rebling BFT 1000 amp, nickel plated copper, red
	RBL-XFT-P-B	Rebling XFT 750 amp, nickel plated brass, black
	RBL-XFT-P-R	Rebling XFT 750 amp, nickel plated brass, red
	RBL-XFT-N-B	Rebling XFT 1000 amp, nickel plated copper, black
	RBL-XFT-N-R	Rebling XFT 1000 amp, nickel plated copper, red

155

Spare Parts – Accessories – Tools

	Ordering code	Description	**For**
	RBL-716A1814	Rebling Gasket for SFT	
	RBL-716A1815	Rebling Gasket for MFT	
	RBL-700A1799	Rebling O-ring for LFT	
	RBL-720A1817	Rebling Gasket for XFT	
	RBL-651A1811	Rebling Gasket for BFT	
	RBL-648A1758	Rebling Rigid Cover for BFT, black	
	RBL-648A1779	Rebling Rigid Cover for BFT, red	

156

	RBL-639A1830-B	Rebling Flexible Cover for BFT, XFT, black	
	RBL-639A1830-R	Rebling Flexible Cover for BFT, XFT, red	
	RBL-713A1806-B	Rebling Flexible Cover for LFT, SFT, MFT, black	
	RBL-713A1806-R	Rebling Flexible Cover for LFT, SFT, MFT, red	
	RBL-713A1806-E	Rebling Flexible Cover for LFT, SFT, MFT, blue	
	RBL-698A1789-L-B	Rebling Long Rigid Snap-on Cover for LFT, SFT, MFT, black	
	RBL-698A1789-L-R	Rebling Long Rigid Snap-on Cover for LFT, SFT, MFT, red	
	RBL-698A1789-L-E	Rebling Long Rigid Snap-on Cover for LFT, SFT, MFT, blue	
	RBL-698A1789-S-B	Rebling Short Rigid Snap-on Cover for LFT, SFT, MFT, black	
	RBL-698A1789-S-R	Rebling Short Rigid Snap-on Cover for LFT, SFT, MFT, red	
	RBL-698A1789-S-E	Rebling Short Rigid Snap-on Cover for LFT, SFT, MFT, blue	

Measurements	
LFT	34 mm / 1.34" · 5 mm / 0.20" · 32,3 mm / 1.27" · 20,8 mm / .82"
SFT	5 mm / 1.34" · 7,1 mm / 0.28" · 13,5 mm / 0.53" · 32,3 mm / 1.27" · 20,8 mm / 0.82" · REBUMG
MFT	5 mm / 1.34" · 7,1 mm / 0.28" · 13,5 mm / 0.53" · 32,3 mm / 1.27" · 25,7 mm / 1.01" · REBUMG

158

BFT	
XFT	

159
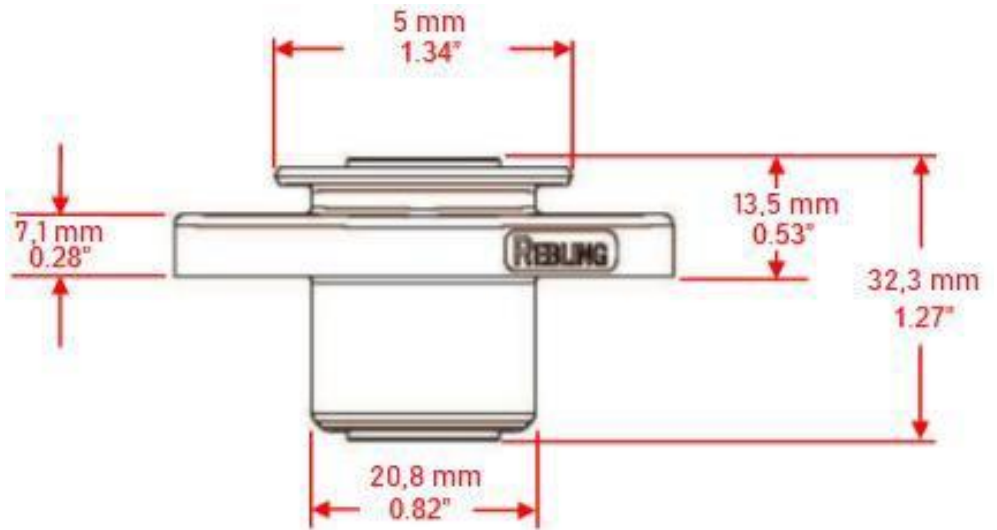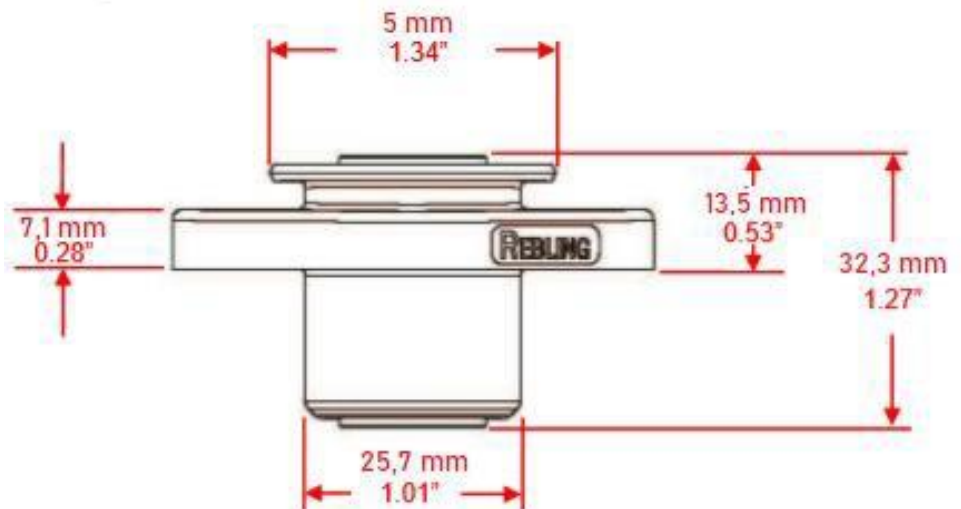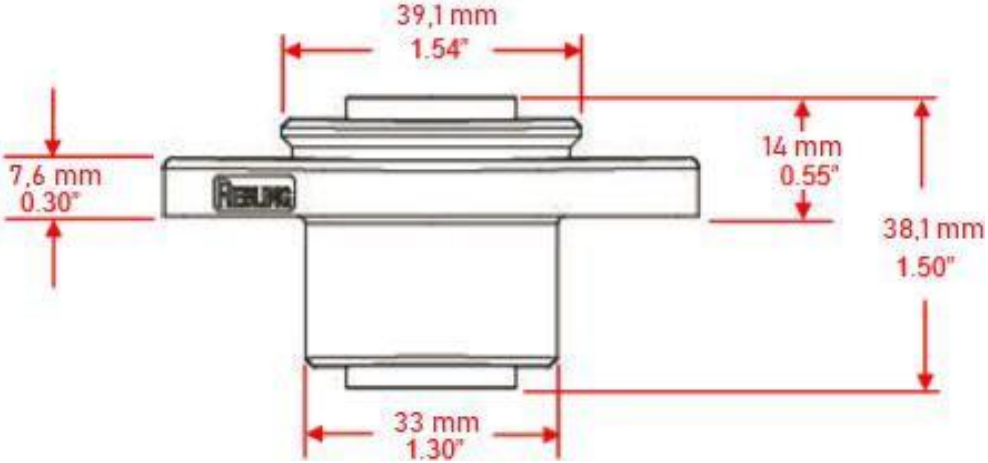
1.5 Ravioli

1.5.1 Europa Series

Including the versions 80 A, 160 A, 320 A, this range is in accordance with the current Norms DIN VDE 0623-589, defining unified distances between centers and representing the evolution of the previous DIN Norms.

The series includes 2 versions:

- Shock resistant housing – suitable for all applications requiring high resistance against shocks.

- Acid- proof polymer housing – suitable for applications needing elevated resistance against acid.

The improved version 320A is also available for the cabling of a 95mmq dimeter cable, a feature that allows to further enlarge the range of use of the products on different applications.

Europe Series 80-160-320 A

DIN 80

DIN 80 Female connector		
Item	**Ordering code**	**Description**
5/6/7/8/9/10	EPBC80AR1 EPBC80ST1	RAVIOLI DIN 80 Female – 16/25 mm² – Acid Proof – Grey Coding Pin RAVIOLI DIN 80 Female – 16/25 mm² – Shock Resistant – Grey Coding Pin
2	EXP80PRAR EXP80PRST	Pilot Contact RAVIOLI DIN 80 Female – 2 pieces – Acid Resistant Pilot Contact RAVIOLI DIN 80 Female – 2 pieces – Not Acid Resistant
3	EXP80SEC	Auxiliary Contact RAVIOLI 80 Female – 2 pieces
4	EAIRTUBE80P	Air Adapter RAVIOLI DIN 80 Female
7	E34404 E34434 E34435	Coding Pin RAVIOLI DIN 80 – Grey Coding Pin RAVIOLI DIN 80 – Green Coding Pin RAVIOLI DIN 80 – Yellow

Joined: ~180
76   76
56   104
127
Height with mounted handle 44 mm
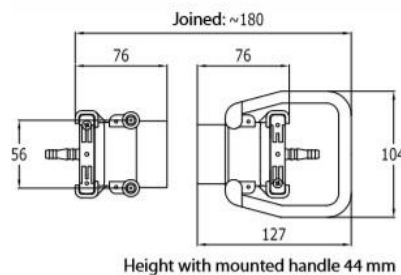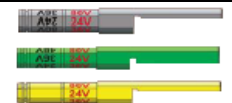
DIN 80 Male connector		
Item	Ordering code	Description
5/6/7/8/9/10	ESBC80AR1 ESBC80ST1	RAVIOLI DIN 80 Male – 16/25 mm² – Acid Proof – Grey Coding Pin RAVIOLI DIN 80 Male – 16/25 mm² – Shock Resistant – Grey Coding Pin
2	EXS80PRAR EXS80PRST	Pilot Contact RAVIOLI DIN 80 Male – 2 pieces – Acid Resistant Pilot Contact RAVIOLI DIN 80 Male – 2 pieces – Not Acid Resistant
3	EXS80SEC	Auxiliary Contact RAVIOLI 80 Male – 2 pieces
4	EAIRTUBE80S	Air Adapter RAVIOLI DIN 80 Male
7	E34404 E34434 E34435	Coding Pin RAVIOLI DIN 80 – Grey Coding Pin RAVIOLI DIN 80 – Green Coding Pin RAVIOLI DIN 80 – Yellow
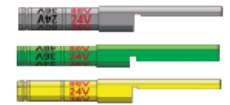
Accessories		
Picture	Ordering code	Description
	EMAN80AR EMAN80ARRED EMAN80ST	Handle RAVIOLI DIN 80 – Acid Proof Handle RAVIOLI DIN 80 – Acid Proof – Red Handle RAVIOLI DIN 80 – Not Acid Proof

162

Ordering code
XXXX 80 XX X

Gender:
ESBC = Plug EPBC
= Socket
EKPM = Socket + handle

Range:
80

Version:
AR = Acid-Proof
ST = Shock Resistant

Color Coding Pin:
1 = Grey
2 = Yellow
3 = Green

DIN 160

DIN160 Female connector		
Item	**Ordering code**	**Description**
5/6/7/8/ 9/10	EPBC160AR1 EPBC160AR1-25 EPBC160ST1 EPBC160ST1-25	RAVIOLI DIN 160 Female – 35/50 mm² – Acid Proof – Grey Coding Pin RAVIOLI DIN 160 Female – 25/50 mm² – Acid Proof – Grey Coding Pin RAVIOLI DIN 160 Female – 35/50 mm² – Shock Resistant – Grey Coding Pin RAVIOLI DIN 160 Female – 25/50 mm² – Shock Resistant – Grey Coding Pin
2	EXP160320PRAR EXP160320PRST	Pilot Contact RAVIOLI DIN 160/320 Female – 2 pieces – Acid Resistant Pilot Contact RAVIOLI DIN 160/320 Female – 2 pieces – Not Acid Resistant
3	EXP160SEC	Auxiliary Contact RAVIOLI 160 Female – 2 pieces
4	EAIRTUBE160P	Air Adapter RAVIOLI DIN 160 Female
7	E29304 E29366 E29367	Coding Pin RAVIOLI DIN 160/320 – Grey Coding Pin RAVIOLI DIN 160/320 – Green Coding Pin RAVIOLI DIN 160/320 – Yellow
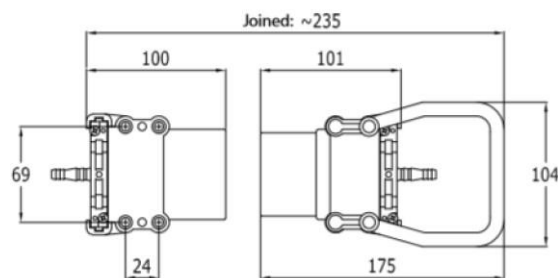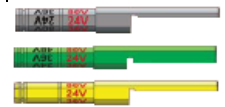
Height with mounted standard handle: 57 mm.
Height with mounted flat handle: 40,5 mm.

164

165
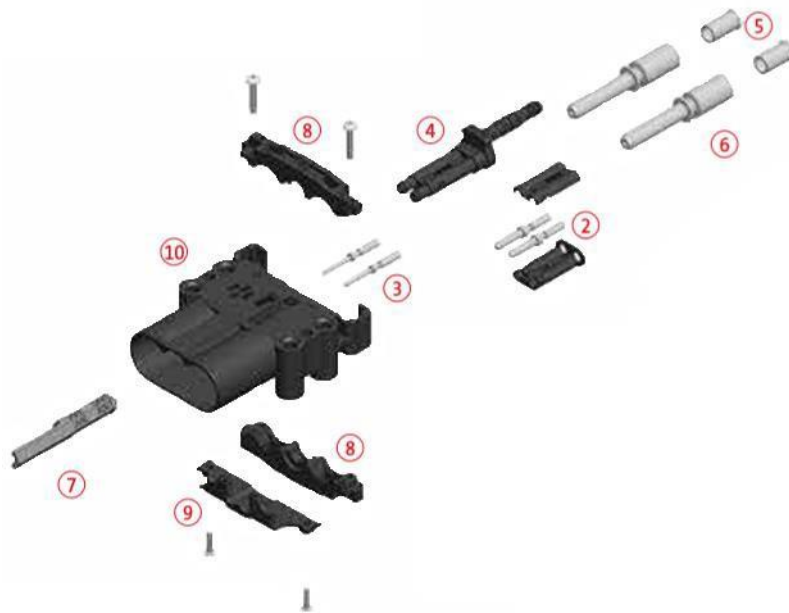
DIN160 Male connector		
Item	**Ordering code**	**Description**
5/6/7/8/9/10	ESBC160AR1 ESBC160AR1-25 ESBC160ST1 ESBC160ST1-25	RAVIOLI DIN 160 Male – 35/50 mm² – Acid Proof – Grey Coding Pin RAVIOLI DIN 160 Male – 25/50 mm² – Acid Proof – Grey Coding Pin RAVIOLI DIN 160 Male – 35/50 mm² – Shock Resistant – Grey Coding Pin RAVIOLI DIN 160 Male – 25/50 mm² – Shock Resistant – Grey Coding Pin
2	EXS160320PRAR EXS160320PRST	Pilot Contact RAVIOLI DIN 160/320 Male – 2 pieces – Acid Resistant Pilot Contact RAVIOLI DIN 160/320 Male – 2 pieces – Not Acid Resistant
3	EXS160SEC	Auxiliary Contact Ravioli 160 Male – 2 pieces
4	EAIRTUBE160S	Air Adapter RAVIOLI DIN 160 Male
7	E29304 E29366 E29367	Coding Pin RAVIOLI DIN 160/320 – Grey Coding Pin RAVIOLI DIN 160/320 – Green Coding Pin RAVIOLI DIN 160/320 – Yellow

Accessories		
Picture	**Ordering code**	**Description**
	ERID50-25	Reducing Bushing RAVIOLI 50 mm² - 25 mm²
	EM160320ST EM160320AR EM160320ARRED	Handle RAVIOLI DIN 160/320 – Euro Handle RAVIOLI DIN 160/320 – Acid Proof Handle RAVIOLI DIN 160/320 – Acid Proof – Red
	EM160320STP	Flat Handle RAVIOLI DIN 160/320

166

Ordering code
XXXX 160 XX X

Gender:
ESBC = Plug EPBC
= Socket
EKPM = Socket + handle

Range:
160

Version:
AR = Acid-Proof
ST = Shock Resistant

Color Coding Pin:
1 = Grey
2 = Yellow
3 = Green

167

DIN320 Female connector		
Item	Ordering code	Description
5/6/7/8/ 9/10	EPBC320AR1	RAVIOLI DIN 320 Female – 50/70 mm² – Acid Proof – Grey Coding Pin
	EPBC320ST1	RAVIOLI DIN 320 Female – 50/70 mm² – Shock Resistant – Grey Coding Pin
	EPBC320AR1-95	RAVIOLI DIN 320 Female – 95 mm² – Acid Proof – Grey Coding Pin
	EPBC320ST1-95	RAVIOLI DIN 320 Female – 95 mm² – Shock Resistant – Grey Coding Pin
2	EXP160320PRAR	Pilot Contact RAVIOLI DIN 160/320 Female – 2 pieces – Acid Resistant
	EXP160320PRST	Pilot Contact RAVIOLI DIN 160/320 Female – 2 pieces – Not Acid Resistant
3	EXP320SEC	Auxiliary Contact RAVIOLI 320 Female – 2 pieces
4	EAIRTUBE320P	Air Adapter RAVIOLI DIN 320 Female
7	E29304	Coding Pin RAVIOLI DIN 160/320 – Grey
	E29366	Coding Pin RAVIOLI DIN 160/320 – Green
	E29367	Coding Pin RAVIOLI DIN 160/320 – Yellow
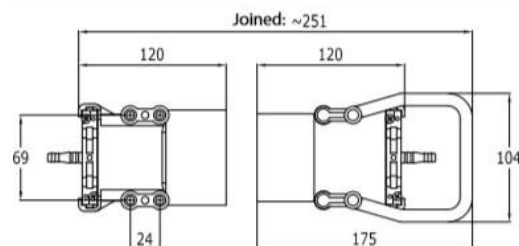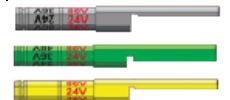
Height with mounted standard handle: 64 mm.
Height with mounted flat handle: 48 mm.

168

DIN320 Male connector		
Item	**Ordering code**	**Description**
5/6/7/8/ 9/10	ESBC320AR1 ESBC320ST1 ESBC320AR1-95 ESBC320ST1-95	RAVIOLI DIN 320 Male – 50/70 mm² – Acid Proof – Grey Coding Pin RAVIOLI DIN 320 Male – 50/70 mm² – Shock Resistant – Grey Coding Pin RAVIOLI DIN 320 Male – 95 mm² – Acid Proof – Grey Coding Pin RAVIOLI DIN 320 Male – 95 mm² – Shock Resistant – Grey Coding Pin
2	EXS160320PRAR EXS160320PRST	Pilot Contact RAVIOLI DIN 160/320 Male – 2 pieces – Acid Resistant Pilot Contact RAVIOLI DIN 160/320 Male – 2 pieces – Not Acid Resistant
3	EXS320SEC	Auxiliary Contact RAVIOLI 320 Male – 2 pieces
4	EAIRTUBE320S	Air Adapter RAVIOLI DIN 320 Male
7	E29304 E29366 E29367	Coding Pin RAVIOLI DIN 160/320 – Grey Coding Pin RAVIOLI DIN 160/320 – Green Coding Pin RAVIOLI DIN 160/320 – Yellow

Accessories		
Picture	**Ordering code**	**Description**
	ERID50-25 ERID70-35	Reducing Bushing RAVIOLI 50 mm² - 25 mm² Reducing Bushing RAVIOLI 70 mm² - 35 mm²
	EM160320ST EM160320AR EM160320ARRED	Handle RAVIOLI DIN 160/320 – Euro Handle RAVIOLI DIN 160/320 – Acid Proof Handle RAVIOLI DIN 160/320 – Acid Proof – Red

169

	EM160320STP	Flat Handle RAVIOLI DIN 160/320

Ordering code
XXXX 320 XX X

Gender:
ESBC = Plug EPBC
= Socket
EKPM = Socket + handle

Range:
320

Version:
AR = Acid-Proof
ST = Shock Resistant

Color Coding Pin:
1 = Grey
2 = Yellow
3 = Green

1.6 Amphenol Surlok Plus

Vandapower has been THE one-stop shop and expert in battery components for 20 years. We provide convenience to our customers worldwide and want to deliver the best possible service.

Take a look at our website for more products and don't hesitate to contact us if you have any questions.

We at Vandapower are ready to serve you, are you ready to be served?

Amphenol

Article numbers

SurLok Plus™ Plugs

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPIPB35BSO0	C10-731951-000	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 90°K EYWAY - ORANGE
SLPIPB35BSB0	C10-731951-100	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 90°K EYWAY - BLACK
SLPIPB35BSR0	C10-731951-200	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 90°KEYWAY - RED
SLPIPB35BSO1	C10-731951-001	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 180°K EYWAY - ORANGE
SLPIPB35BSB1	C10-731951-101	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 180°K EYWAY - BLACK
SLPIPB35BSR1	C10-731951-201	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 180°K EYWAY - RED
SLPIPB35BSO2	C10-731951-002	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 60°K EYWAY - ORANGE
SLPIPB35BSB2	C10-731951-102	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 60°K EYWAY - BLACK
SLPIPB35BSR2	C10-731951-202	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 60°K EYWAY - RED
SLPIPB35BSO3	C10-731951-003	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 120°K EYWAY - ORANGE
SLPIPB35BSB3	C10-731951-103	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 120°K EYWAY - BLACK
SLPIPB35BSR3	C10-731951-203	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 120°K EYWAY - RED
SLPIPB35BSO4	C10-731951-004	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 150°K EYWAY - ORANGE
SLPIPB35BSB4	C10-731951-104	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 150°K EYWAY - BLACK
SLPIPB35BSR4	C10-731951-204	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 35 MM 2 SEALED WITH 150°K EYWAY - RED
SLPIPB50BSO0	C10-731951-010	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 90°KEYWAY - ORANGE
SLPIPB50BSB0	C10-731951-110	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 90°KEYWAY - BLACK
SLPIPB50BSR0	C10-731951-210	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 90°KEYWAY - RED
SLPIPB50BSO1	C10-731951-011	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 180°K EYWAY - ORANGE
SLPIPB50BSB1	C10-731951-111	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 180°K EYWAY - BLACK
SLPIPB50BSR1	C10-731951-211	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 180°KEYWAY - RED
SLPIPB50BSO2	C10-731951-012	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 60°KEYWAY - ORANGE
SLPIPB50BSB2	C10-731951-112	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 60°KEYWAY - BLACK
SLPIPB50BSR2	C10-731951-212	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 60°KEYWAY - RED
SLPIPB50BSO3	C10-731951-013	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 120°K EYWAY - ORANGE

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPIPB50BSB3	C10-731951-113	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 120°K EYWAY - BLACK
SLPIPB50BSR3	C10-731951-213	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 120°KEYWAY - RED
SLPIPB50BSO4	C10-731951-014	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 150°K EYWAY - ORANGE
SLPIPB50BSB4	C10-731951-114	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 150°K EYWAY - BLACK
SLPIPB50BSR4	C10-731951-214	8 .0 MM SURLOK PLUS STRAIGHT PLUG FOR 50 MM 2 SEALED WITH 150°K EYWAY - RED
SLPPB35BSO	C10-730188-030	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED ORANGE
SLPPB35BSB	C10-730188-130	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED BLACK
SLPPB35BSR	C10-730188-230	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED RED
SLPPB50BSO	C10-730188-000	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED ORANGE
SLPPB50BSB	C10-730188-100	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED BLACK
SLPPB50BSR	C10-730188-200	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED RED
SLPPB35BSO0	C10-730188-0300	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 90° Keyway - ORANGE
SLPPB35BSB0	C10-730188-1300	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 90° Keyway - BLACK
SLPPB35BSR0	C10-730188-2300	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 90° Keyway - RED
SLPPB50BSO0	C10-730188-0000	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 90° Keyway - ORANGE
SLPPB50BSB0	C10-730188-1000	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 90° Keyway - BLACK
SLPPB50BSR0	C10-730188-2000	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 90° Keyway - RED
SLPPB35BSO1	C10-730188-0301	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 180° Keyway - ORANGE
SLPPB35BSB1	C10-730188-1301	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 180° Keyway - BLACK
SLPPB35BSR1	C10-730188-2301	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 180° Keyway - RED
SLPPB50BSO1	C10-730188-0001	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 180° Keyway - ORANGE
SLPPB50BSB1	C10-730188-1001	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 180° Keyway - BLACK
SLPPB50BSR1	C10-730188-2001	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 180° Keyway - RED
SLPPB35BSO2	C10-730188-0302	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 60° Keyway - ORANGE
SLPPB35BSB2	C10-730188-1302	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 60° Keyway - BLACK
SLPPB35BSR2	C10-730188-2302	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 60° Keyway - RED
SLPPB50BSO2	C10-730188-0002	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 60° Keyway - ORANGE

174

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPPB50BSB2	C10-730188-1002	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 60° Keyway - BLACK
SLPPB50BSR2	C10-730188-2002	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 60° Keyway - RED
SLPPB35BSO3	C10-730188-0303	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 120° Keyway - ORANGE
SLPPB35BSB3	C10-730188-1303	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 120° Keyway - BLACK
SLPPB35BSR3	C10-730188-2303	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 120° Keyway - RED
SLPPB50BSO3	C10-730188-0003	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 120° Keyway - ORANGE
SLPPB50BSB3	C10-730188-1003	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 120° Keyway - BLACK
SLPPB50BSR3	C10-730188-2003	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 120° Keyway - RED
SLPPB35BSO4	C10-730188-0304	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 150° Keyway - ORANGE
SLPPB35BSB4	C10-730188-1304	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 150° Keyway - BLACK
SLPPB35BSR4	C10-730188-2304	8 .0 MM SURLOK PLUS R/A PLUG FOR 35 MM 2 SEALED , 150° Keyway - RED
SLPPB50BSO4	C10-730188-0004	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 150° Keyway - ORANGE
SLPPB50BSB4	C10-730188-1004	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 150° Keyway - BLACK
SLPPB50BSR4	C10-730188-2004	8 .0 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED , 150° Keyway - RED
SLPPA16BSO	C10-730186-030	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED ORANGE
SLPPA16BSB	C10-730186-130	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED BLACK
SLPPA25BSO	C10-730186-000	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED ORANGE
SLPPA25BSB	C10-730186-100	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED BLACK
SLPPA25BSR	C10-730186-200	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED RED
SLPPA16BSO0	C10-730186-0300	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 90° Keyway - ORANGE
SLPPA16BSB0	C10-730186-1300	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 90° Keyway - BLACK
SLPPA16BSR0	C10-730186-2300	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 90° Keyway - RED
SLPPA25BSO0	C10-730186-0000	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 90° Keyway - ORANGE
SLPPA25BSB0	C10-730186-1000	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 90° Keyway - BLACK
SLPPA25BSR0	C10-730186-2000	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 90° Keyway - RED
SLPPA16BSO1	C10-730186-0301	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 180° Keyway - ORANGE
SLPPA16BSB1	C10-730186-1301	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 180° Keyway - BLACK

175

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPPA16BSR1	C10-730186-2301	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 180° Keyway - RED
SLPPA25BSO1	C10-730186-0001	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 180° Keyway - ORANGE
SLPPA25BSB1	C10-730186-1001	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 180° Keyway - BLACK
SLPPA25BSR1	C10-730186-2001	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 180° Keyway - RED
SLPPA16BSO2	C10-730186-0302	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 60° Keyway - ORANGE
SLPPA16BSB2	C10-730186-1302	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 60° Keyway - BLACK
SLPPA16BSR2	C10-730186-2302	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 60° Keyway - RED
SLPPA25BSO2	C10-730186-0002	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 60° Keyway - ORANGE
SLPPA25BSB2	C10-730186-1002	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 60° Keyway - BLACK
SLPPA25BSR2	C10-730186-2002	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 60° Keyway - RED
SLPPA16BSO3	C10-730186-0303	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 120° Keyway - ORANGE
SLPPA16BSB3	C10-730186-1303	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 120° Keyway - BLACK
SLPPA16BSR3	C10-730186-2303	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 120° Keyway - RED
SLPPA25BSO3	C10-730186-0003	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 120° Keyway - ORANGE
SLPPA25BSB3	C10-730186-1003	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 120° Keyway - BLACK
SLPPA25BSR3	C10-730186-2003	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 120° Keyway - RED
SLPPA16BSO4	C10-730186-0304	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 150° Keyway - ORANGE
SLPPA16BSB4	C10-730186-1304	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 150° Keyway - BLACK
SLPPA16BSR4	C10-730186-2304	5 .7 MM SURLOK PLUS R/A PLUG FOR 16 MM 2 SEALED , 150° Keyway - RED
SLPPA25BSO4	C10-730186-0004	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 150° Keyway - ORANGE
SLPPA25BSB4	C10-730186-1004	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 150° Keyway - BLACK
SLPPA25BSR4	C10-730186-2004	5 .7 MM SURLOK PLUS R/A PLUG FOR 25 MM 2 SEALED , 150° Keyway - RED
SLPPC85BSO0	C10-730190-0800	10 .3 MM SURLOK PLUS R/A PLUG FOR 85 MM 2 SEALED 90° KEYWAY - ORANGE
SLPPC85BSB0	C10-730190-1800	10 .3 MM SURLOK PLUS R/A PLUG FOR 85 MM 2 SEALED 90° KEYWAY - BLACK
SLPPC85BSR0	C10-730190-2800	10 .3 MM SURLOK PLUS R/A PLUG FOR 85 MM 2 SEALED 90° KEYWAY - RED
SLPPC70BSO0	C10-730190-0700	10 .3 MM SURLOK PLUS R/A PLUG FOR 70 MM 2 SEALED 90° KEYWAY - ORANGE
SLPPC70BSB0	C10-730190-1700	10 .3 MM SURLOK PLUS R/A PLUG FOR 70 MM 2 SEALED 90° KEYWAY - BLACK

176

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPPC70BSR0	C10-730190-2700	10 .3 MM SURLOK PLUS R/A PLUG FOR 70 MM 2 SEALED 90° KEYWAY - RED
SLPPC50BSO0	C10-730190-0500	10 .3 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED 90° KEYWAY - ORANGE
SLPPC50BSB0	C10-730190-1500	10 .3 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED 90° KEYWAY - BLACK
SLPPC50BSR0	C10-730190-2500	10 .3 MM SURLOK PLUS R/A PLUG FOR 50 MM 2 SEALED 90° KEYWAY - RED

SurLok Plus™ Receptacles

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPRBTPSO	C10-730189-020	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH SCREW THREAD - ORANGE
SLPRBTPSB	C10-730189-120	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH SCREW THREAD - BLACK
SLPRBTPSR	C10-730189-220	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH SCREW THREAD - RED
SLPRBBPSO	C10-730189-010	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH FLAT BUSBAR - ORANGE
SLPRBBPSB	C10-730189-110	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUN WITH FLAT BUSBAR - BLACK
SLPRBBPSR	C10-730189-210	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH FLAT BUSBAR - RED
SLPRB35CPSO	C10-730189-030	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 35 MM 2 - ORANGE
SLPRB35CPSB	C10-730189-130	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 35 MM 2 - BLACK
SLPRB35CPSR	C10-730189-230	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 35 MM 2 - RED
SLPRB50CPSO	C10-730189-000	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 50 MM 2 - ORANGE
SLPRB50CPSB	C10-730189-100	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 50 MM 2 - BLACK
SLPRB50CPSR	C10-730189-200	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 50 MM 2 - RED
SLPIRBBPSO0	C10-731950-010	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 90°K EYWAY WITH FLAT BUSBAR - ORANGE
SLPIRBTPSO0	C10-731950-020	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 90°K EYWAY WITH SCREW THREAD - ORANGE
SLPIRB35CPSO0	C10-731950-030	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 90°K EYWAY CRIMP FOR 35 MM 2 - ORANGE
SLPIRB50CPSO0	C10-731950-000	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 90°K EYWAY CRIMP FOR 50 MM 2 - ORANGE
SLPIRBBPSO1	C10-731950-011	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY WITH FLAT BUSBAR - ORANGE
SLPIRBTPSO1	C10-731950-021	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY WITH SCREW THREAD - ORANGE
SLPIRB35CPSO1	C10-731950-031	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY CRIMP FOR 35 MM 2 - ORANGE

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPIRB50CPSO1	C10-731950-001	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY CRIMP FOR 50 MM 2 - ORANGE
SLPIRBBPSO2	C10-731950-012	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 60°K EYWAY WITH FLAT BUSBAR - ORANGE
SLPIRBTPSO2	C10-731950-022	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 60°K EYWAY WITH SCREW THREAD - ORANGE
SLPIRB35CPSO2	C10-731950-032	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 60°K EYWAY CRIMP FOR 35 MM 2 - ORANGE
SLPIRB50CPSO2	C10-731950-002	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 60°K EYWAY CRIMP FOR 50 MM 2 - ORANGE
SLPIRBBPSO3	C10-731950-013	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY WITH FLAT BUSBAR - ORANGE
SLPIRBTPSO3	C10-731950-023	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY WITH SCREW THREAD - ORANGE
SLPIRB35CPSO3	C10-731950-033	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY CRIMP FOR 35 MM 2 - ORANGE
SLPIRB50CPSO3	C10-731950-003	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY CRIMP FOR 50 MM 2 - ORANGE
SLPIRBTPSO4	C10-731950-024	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 150°K EYWAY WITH SCREW THREAD - ORANGE
SLPIRB35CPSO4	C10-731950-034	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 150°K EYWAY CRIMP FOR 35 MM 2 - ORANGE
SLPIRB50CPSO4	C10-731950-004	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 150°K EYWAY CRIMP FOR 50 MM 2 - ORANGE
SLPIRBBPSO1	C10-731950-011	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY WITH FLAT BUSBAR - ORANGE
SLPIRBTPSO1	C10-731950-021	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY WITH SCREW THREAD - ORANGE
SLPIRB35CPSO1	C10-731950-031	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY CRIMP FOR 35 MM 2 - ORANGE
SLPIRB50CPSO1	C10-731950-001	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY CRIMP FOR 50 MM 2 - ORANGE
SLPIRBBPSB0	C10-731950-110	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 90°K EYWAY WITH FLAT BUSBAR - BLACK
SLPIRBTPSB0	C10-731950-120	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 90°K EYWAY WITH SCREW THREAD - BLACK
SLPIRB35CPSB0	C10-731950-130	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 90°K EYWAY CRIMP FOR 35 MM 2 - BLACK
SLPIRB50CPSB0	C10-731950-100	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 90°K EYWAY CRIMP FOR 50 MM 2 - BLACK
SLPIRBBPSB1	C10-731950-111	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY WITH FLAT BUSBAR - BLACK
SLPIRBTPSB1	C10-731950-121	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY WITH SCREW THREAD - BLACK
SLPIRB35CPSB1	C10-731950-131	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY CRIMP FOR 35 MM 2 - BLACK
SLPIRB50CPSB1	C10-731950-101	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY CRIMP FOR 50 MM 2 - BLACK
SLPIRBBPSB2	C10-731950-112	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 60°K EYWAY WITH FLAT BUSBAR - BLACK
SLPIRB35CPSB2	C10-731950-132	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 60°K EYWAY CRIMP FOR 35 MM 2 - BLACK
SLPIRB50CPSB2	C10-731950-102	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 60°K EYWAY CRIMP FOR 50 MM 2 - BLACK

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPIRBBPSB3	C10-731950-113	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY WITH FLAT BUSBAR - BLACK
SLPIRBTPSB3	C10-731950-123	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY WITH SCREW THREAD - BLACK
SLPIRB35CPSB3	C10-731950-133	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY CRIMP FOR 35 MM 2 - BLACK
SLPIRB50CPSB3	C10-731950-103	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY CRIMP FOR 50 MM 2 - BLACK
SLPIRBBPSB4	C10-731950-114	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY WITH FLAT BUSBAR - BLACK
SLPIRBTPSB4	C10-731950-124	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY WITH SCREW THREAD - BLACK
SLPIRB35CPSB4	C10-731950-134	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY CRIMP FOR 35 MM 2 - BLACK
SLPIRB50CPSB4	C10-731950-104	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY CRIMP FOR 50 MM 2 - BLACK
SLPIRBBPSR1	C10-731950-211	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY WITH FLAT BUSBAR - RED
SLPIRBTPSR1	C10-731950-221	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY WITH SCREW THREAD - RED
SLPIRB35CPSR1	C10-731950-231	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY CRIMP FOR 35 MM 2 - RED
SLPIRB50CPSR1	C10-731950-201	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 180°K EYWAY CRIMP FOR 50 MM 2 - RED
SLPIRBBPSR2	C10-731950-212	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 60°K EYWAY WITH FLAT BUSBAR - RED
SLPIRBTPSR2	C10-731950-222	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 60°K EYWAY WITH SCREW THREAD - RED
SLPIRB35CPSR2	C10-731950-232	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 60°K EYWAY CRIMP FOR 35 MM 2 - RED
SLPIRB50CPSR2	C10-731950-202	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 60°K EYWAY CRIMP FOR 50 MM 2 - RED
SLPIRBBPSR3	C10-731950-213	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY WITH FLAT BUSBAR - RED
SLPIRBTPSR3	C10-731950-223	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY WITH SCREW THREAD - RED
SLPIRB35CPSR3	C10-731950-233	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY CRIMP FOR 35 MM 2 - RED
SLPIRB50CPSR3	C10-731950-203	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 120°K EYWAY CRIMP FOR 50 MM 2 - RED
SLPIRBBPSR4	C10-731950-214	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 150°K EYWAY WITH FLAT BUSBAR - RED
SLPIRBTPSR4	C10-731950-224	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 150°K EYWAY WITH SCREW THREAD - RED
SLPIRB35CPSR4	C10-731950-234	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 150°K EYWAY CRIMP FOR 35 MM 2 - RED
SLPIRB50CPSR4	C10-731950-204	8 .0 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH 150°K EYWAY CRIMP FOR 50 MM 2 - RED
SLPRABPSO	C10-730187-010	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH FLAT BUSBAR - ORANGE
SLPRABPSB	C10-730187-110	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH FLAT BUSBAR - BLACK
SLPRABPSR	C10-730187-210	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH FLAT BUSBAR - RED

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPRATPSO	C10-730187-020	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH SCREW THREAD - ORANGE
SLPRATPSB	C10-730187-120	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH SCREW THREAD - BLACK
SLPRATPSR	C10-730187-220	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED WITH SCREW THREAD - RED
SLPRA16CPSO	C10-730187-030	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 16 MM 2 - ORANGE
SLPRA16CPSB	C10-730187-130	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 16 MM 2 - BLACK
SLPRA16CPSR	C10-730187-230	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 16 MM 2 - RED
SLPRA25CPSO	C10-730187-000	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 25 MM 2 - ORANGE
SLPRA25CPSB	C10-730187-100	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 25 MM 2 - BLACK
SLPRA25CPSR	C10-730187-200	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED CRIMP FOR 25 MM 2 - RED
SLPRABPSO0	C10-730187-0100	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway WITH FLAT BUSBAR - ORANGE
SLPRABPSB0	C10-730187-1100	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway WITH FLAT BUSBAR - BLACK
SLPRABPSR0	C10-730187-2100	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway WITH FLAT BUSBAR - RED
SLPRATPSO0	C10-730187-0200	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway WITH SCREW THREAD - ORANGE
SLPRATPSB0	C10-730187-1200	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway WITH SCREW THREAD - BLACK
SLPRATPSR0	C10-730187-2200	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway WITH SCREW THREAD - RED
SLPRA16CPSO0	C10-730187-0300	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway CRIMP FOR 16 MM 2 - ORANGE
SLPRA16CPSB0	C10-730187-1300	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway CRIMP FOR 16 MM 2 - BLACK
SLPRA16CPSR0	C10-730187-2300	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway CRIMP FOR 16 MM 2 - RED
SLPRA25CPSO0	C10-730187-0000	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway CRIMP FOR 25 MM 2 - ORANGE
SLPRA25CPSB0	C10-730187-1000	5 . 7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway CRIMP FOR 25 MM 2 - BLACK
SLPRA25CPSR0	C10-730187-2000	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 90° Keyway CRIMP FOR 25 MM 2 - RED
SLPRABPSO1	C10-730187-0101	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway WITH FLAT BUSBAR - ORANGE
SLPRABPSB1	C10-730187-1101	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway WITH FLAT BUSBAR - BLACK
SLPRABPSR1	C10-730187-2101	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway WITH FLAT BUSBAR - RED
SLPRATPSO1	C10-730187-0201	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway WITH SCREW THREAD - ORANGE
SLPRATPSB1	C10-730187-1201	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway WITH SCREW THREAD - BLACK
SLPRATPSR1	C10-730187-2201	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway WITH SCREW THREAD - RED

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPRA16CPSO1	C10-730187-0301	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway CRIMP FOR 16 MM 2 - ORANGE
SLPRA16CPSB1	C10-730187-1301	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway CRIMP FOR 16 MM 2 - BLACK
SLPRA16CPSR1	C10-730187-2301	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway CRIMP FOR 16 MM 2 - RED
SLPRA25CPSO1	C10-730187-0001	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway CRIMP FOR 25 MM 2 - ORANGE
SLPRA25CPSB1	C10-730187-1001	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway CRIMP FOR 25 MM 2 - BLACK
SLPRA25CPSR1	C10-730187-2001	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 180° Keyway CRIMP FOR 25 MM 2 - RED
SLPRABPSO3	C10-730187-0103	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway WITH FLAT BUSBAR - ORANGE
SLPRABPSB3	C10-730187-1103	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway WITH FLAT BUSBAR - BLACK
SLPRABPSR3	C10-730187-2103	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway WITH FLAT BUSBAR - RED
SLPRATPSO3	C10-730187-0203	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway WITH SCREW THREAD - ORANGE
SLPRATPSB3	C10-730187-1203	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway WITH SCREW THREAD - BLACK
SLPRATPSR3	C10-730187-2203	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway WITH SCREW THREAD - RED
SLPRA16CPSO3	C10-730187-0303	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway CRIMP FOR 16 MM 2 - ORANGE
SLPRA16CPSB3	C10-730187-1303	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway CRIMP FOR 16 MM 2 - BLACK
SLPRA16CPSR3	C10-730187-2303	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway CRIMP FOR 16 MM 2 - RED
SLPRA25CPSO3	C10-730187-0003	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway CRIMP FOR 25 MM 2 - ORANGE
SLPRA25CPSB3	C10-730187-1003	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway CRIMP FOR 25 MM 2 - BLACK
SLPRA25CPSR3	C10-730187-2003	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 120° Keyway CRIMP FOR 25 MM 2 - RED
SLPRABPSO4	C10-730187-01043	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway WITH FLAT BUSBAR - ORANGE
SLPRABPSB4	C10-730187-1104	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway WITH FLAT BUSBAR - BLACK
SLPRABPSR4	C10-730187-2104	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway WITH FLAT BUSBAR - RED
SLPRATPSO4	C10-730187-0204	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway WITH SCREW THREAD - ORANGE
SLPRATPSB4	C10-730187-1204	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway WITH SCREW THREAD - BLACK
SLPRATPSR4	C10-730187-2204	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway WITH SCREW THREAD - RED
SLPRA16CPSO4	C10-730187-0304	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway CRIMP FOR 16 MM 2 - ORANGE
SLPRA16CPSB4	C10-730187-1304	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway CRIMP FOR 16 MM 2 - BLACK
SLPRA16CPSR4	C10-730187-2304	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway CRIMP FOR 16 MM 2 - RED

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPRA25CPSO4	C10-730187-0004	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway CRIMP FOR 25 MM 2 - ORANGE
SLPRA25CPSB4	C10-730187-1004	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway CRIMP FOR 25 MM 2 - BLACK
SLPRA25CPSR4	C10-730187-2004	5 .7 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED , 150° Keyway CRIMP FOR 25 MM 2 - RED
SLPRCTPSO0	C10-730191-0200	10 .3 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY WITH SCREW THREAD - ORANGE
SLPRCTPSB0	C10-730191-1200	10 .3 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY WITH SCREW THREAD - BLACK
SLPRCTPSR0	C10-730191-2200	10 .3 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY WITH SCREW THREAD - RED
SLPRCBPSO0	C10-730191-0100	10 .3 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY WITH FLAT BUSBAR - ORANGE
SLPRCBPSB0	C10-730191-1100	10 .3 MMSURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY WITH FLAT BUSBAR - BLACK
SLPRCBPSR0	C10-730191-2100	10 .3 MMSURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY WITH FLAT BUSBAR - RED
SLPRC85CPSO0	C10-730191-0800	10 .3 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY 85 MM 2 CRIMP- ORANGE
SLPRC85CPSB0	C10-730191-1800	10 .3 MMSURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY 85 MM 2 CRIMP - BLACK
SLPRC85CPSR0	C10-730191-2800	10 .3 MMSURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY 85 MM 2 CRIMP - RED
SLPRC70CPSO0	C10-730191-0700	10 .3 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY 70 MM 2 CRIMP- ORANGE
SLPRC70CPSB0	C10-730191-1700	10 .3 MMSURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY 70 MM 2 CRIMP - BLACK
SLPRC70CPSR0	C10-730191-2700	10 .3 MMSURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY 70 MM 2 CRIMP - RED
SLPRC50CPSO0	C10-730191-0500	10 .3 MM SURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY 50 MM 2 CRIMP- ORANGE
SLPRC50CPSB0	C10-730191-1500	10 .3 MMSURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY 50 MM 2 CRIMP - BLACK
SLPRC50CPSR0	C10-730191-2500	10 .3 MMSURLOK PLUS RECEPTACLE PANEL MOUNT SEALED 90° KEYWAY 50 MM 2 CRIMP - RED
SLPRATNSO	C10-731457-020	5 .7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH SCREW THREAD - ORANGE
SLPRATNSB	C10-731457-120	5 .7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH SCREW THREAD - BLACK
SLPRATNSR	C10-731457-220	5 .7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH SCREW THREAD - RED
SLPRATNSO0	C10-731457-0200	5 .7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 90°K EYWAY WITH SCREW THREAD - ORANGE
SLPRATNSB0	C10-731457-1200	5 .7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 90°K EYWAY WITH SCREW THREAD - BLACK
SLPRATNSR0	C10-731457-2200	5 .7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 90°K EYWAY WITH SCREW THREAD - RED
SLPRATNSO1	C10-731457-0201	5 .7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 180°K EYWAY WITH SCREW THREAD - ORANGE
SLPRATNSB1	C10-731457-1201	5 .7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 180°K EYWAY WITH SCREW THREAD - BLACK
SLPRATNSR1	C10-731457-2201	5 .7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 180°K EYWAY WITH SCREW THREAD - RED

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPRATNSO2	C10-731457-0202	5.7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 60°K EYWAY WITH SCREW THREAD - ORANGE
SLPRATNSB2	C10-731457-1202	5.7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 60°K EYWAY WITH SCREW THREAD - BLACK
SLPRATNSR2	C10-731457-2202	5.7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 60°K EYWAY WITH SCREW THREAD - RED
SLPRATNSO3	C10-731457-0203	5.7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 120°K EYWAY WITH SCREW THREAD - ORANGE
SLPRATNSB3	C10-731457-1203	5.7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 120°K EYWAY WITH SCREW THREAD - BLACK
SLPRATNSR3	C10-731457-2203	5.7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 120°K EYWAY WITH SCREW THREAD - RED
SLPRATNSO4	C10-731457-0204	5.7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 150°K EYWAY WITH SCREW THREAD - ORANGE
SLPRATNSB4	C10-731457-1204	5.7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 150°K EYWAY WITH SCREW THREAD - BLACK
SLPRATNSR4	C10-731457-2204	5.7 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH 150°K EYWAY WITH SCREW THREAD - RED
SLPRBTNNO	C10-731842-000	8.0 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH SCREW THREAD - ORANGE
SLPRBTNNB	C10-731842-100	8.0 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH SCREW THREAD - BLACK
SLPRBTNNR	C10-731842-200	8.0 MM SURLOK PLUS RECEPTACLE W/O FLANGE SEALED WITH SCREW THREAD - RED

183

SurLok Plus™ EMI Version

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPPB70BSO0EH	C10-738728-1700	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 90°Keyway - Orange
SLPPB70BSO1EH	C10-738728-1701	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 270°Keyway - Orange
SLPPB70BSO2EH	C10-738728-1702	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 60°Keyway - Orange
SLPPB70BSO3EH	C10-738728-1703	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 120°Keyway - Orange
SLPPB70BSO4EH	C10-738728-1704	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 150°Keyway - Orange
SLPPB70BSB0EH	C10-738728-2700	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 90°Keyway - Black
SLPPB70BSB1EH	C10-738728-2701	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 270°Keyway -Black
SLPPB70BSB2EH	C10-738728-2702	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 60°Keyway - Black
SLPPB70BSB3EH	C10-738728-2703	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 1 2 0°K e y w a y - B la c k
SLPPB70BSB4EH	C10-738728-2704	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 150°Keyway - Black
SLPPB70BSR0EH	C10-738728-3700	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 90°Keyway - Red
SLPPB70BSR1EH	C10-738728-3701	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 270°Keyway - Red
SLPPB70BSR2EH	C10-738728-3702	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 60°Keyway - Red
SLPPB70BSR3EH	C10-738728-3703	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 120°Keyway -Red
SLPPB70BSR4EH	C10-738728-3704	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,70 mm2 , 150°Keyway - Red

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPPB50BSO0EH	C10-738728-1500	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2 , 90°Keyway - Orange
SLPPB50BSO1EH	C10-738728-1501	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2 , 270°Keyway - Orange
SLPPB50BSO2EH	C10-738728-1502	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2 , 60°Keyway - Orange
SLPPB50BSO3EH	C10-738728-1503	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2 , 120°Keyway - Orange
SLPPB50BSO4EH	C10-738728-1504	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2 , 150°Keyway - Orange
SLPPB50BSB0EH	C10-738728-2500	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2 , 90°Keyway - Black
SLPPB50BSB1EH	C10-738728-2501	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2 , 270°Keyway -Black
SLPPB50BSB2EH	C10-738728-2502	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2 , 60°Keyway - Black
SLPPB50BSB3EH	C10-738728-2503	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2, 120°Keyway - Black
SLPPB50BSB4EH	C10-738728-2504	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2, 150°Keyway - Black
SLPPB50BSR0EH	C10-738728-3500	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2, 90°Keyway - Red
SLPPB50BSR1EH	C10-738728-3501	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2, 270°Keyway - Red
SLPPB50BSR2EH	C10-738728-3502	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2 , 60°Keyway -Red
SLPPB50BSR3EH	C10-738728-3503	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2 , 120°Keyway - Red
SLPPB50BSR4EH	C10-738728-3504	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,50 mm 2 , 150°Keyway - Red
SLPPB35BSO0EH	C10-738728-1300	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 90°Keyway - Orange
SLPPB35BSO1EH	C10-738728-1301	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 270°Keyway - Orange
SLPPB35BSO2EH	C10-738728-1302	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 60°Keyway - Orange
SLPPB35BSO3EH	C10-738728-1303	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 120°Keyway - Orange
SLPPB35BSO4EH	C10-738728-1304	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 150°Keyway - Orange
SLPPB35BSB0EH	C10-738728-2300	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 90°Keyway - Black
SLPPB35BSB1EH	C10-738728-2301	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 270°Keyway - Black
SLPPB35BSB2EH	C10-738728-2302	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 60°Keyway - Black
SLPPB35BSB3EH	C10-738728-2303	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 120°Keyway - Black
SLPPB35BSB4EH	C10-738728-2304	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 150°Keyway - Black
SLPPB35BSR0EH	C10-738728-3300	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 90°Keyway - Red
SLPPB35BSR1EH	C10-738728-3301	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 270°Keyway - Red

185

186

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPPB35BSR2EH	C10-738728-3302	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2, 60°Keyway - Red
SLPPB35BSR3EH	C10-738728-3303	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 120°Keyway - Red
SLPPB35BSR4EH	C10-738728-3304	Surlok plus 8 .0 mm right angle Plug with EMI and HVIL,35 mm 2 , 150°Keyway - Red
SLPIPB70BSO0EH	C10-738727-1700	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 90°Keyway - Orange
SLPIPB70BSO1EH	C10-738727-1701	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 270°Keyway - Orange
SLPIPB70BSO2EH	C10-738727-1702	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 60°Keyway - Orange
SLPIPB70BSO3EH	C10-738727-1703	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 120°Keyway - Orange
SLPIPB70BSO4EH	C10-738727-1704	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 150°Keyway - Orange
SLPIPB70BSB0EH	C10-738727-2700	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 90°Keyway - Black
SLPIPB70BSB1EH	C10-738727-2701	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 270°Keyway - Black
SLPIPB70BSB2EH	C10-738727-2702	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 60°Keyway - Black
SLPIPB70BSB3EH	C10-738727-2703	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 120°Keyway - Black
SLPIPB70BSB4EH	C10-738727-2704	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 150°Keyway - Black
SLPIPB70BSR0EH	C10-738727-3700	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 90°Keyway - Red
SLPIPB70BSR1EH	C10-738727-3701	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 270°Keyway - Red
SLPIPB70BSR2EH	C10-738727-3702	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 60°Keyway - Red
SLPIPB70BSR3EH	C10-738727-3703	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 120°Keyway - Red
SLPIPB70BSR4EH	C10-738727-3704	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,70 mm 2 , 150°Keyway - Red
SLPIPB50BSO0EH	C10-738727-1500	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 90°Keyway - Orange
SLPIPB50BSO1EH	C10-738727-1501	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 270°Keyway - Orange
SLPIPB50BSO2EH	C10-738727-1502	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 60°Keyway - Orange
SLPIPB50BSO3EH	C10-738727-1503	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 120°Keyway - Orange
SLPIPB50BSO4EH	C10-738727-1504	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 150°Keyway - Orange
SLPIPB50BSB0EH	C10-738727-2500	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 90°Keyway - Black
SLPIPB50BSB2EH	C10-738727-2502	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 60°Keyway - Black
SLPIPB50BSB3EH	C10-738727-2503	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 120°Keyway - Black
SLPIPB50BSB4EH	C10-738727-2504	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 150°Keyway - Black

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPIPB50BSR0EH	C10-738727-3500	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 90°Keyway - Red
SLPIPB50BSR1EH	C10-738727-3501	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 270°Keyway - Red
SLPIPB50BSR2EH	C10-738727-3502	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 60°Keyway - Red
SLPIPB50BSR3EH	C10-738727-3503	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 120°Keyway - Red
SLPIPB50BSR4EH	C10-738727-3504	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,50 mm 2 , 150°Keyway - Red
SLPIPB35BSO0EH	C10-738727-1300	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 90°Keyway - Orange
SLPIPB35BSO1EH	C10-738727-1301	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 270°Keyway - Orange
SLPIPB35BSO2EH	C10-738727-1302	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 60°Keyway - Orannge
SLPIPB35BSO3EH	C10-738727-1303	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 120°Keyway - Orange
SLPIPB35BSO4EH	C10-738727-1304	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 150°Keyway - Orange
SLPIPB35BSB0EH	C10-738727-2300	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 90°Keyway - Black
SLPIPB35BSB1EH	C10-738727-2301	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 270°Keyway - Black
SLPIPB35BSB2EH	C10-738727-2302	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 60°Keyway - Black
SLPIPB35BSB3EH	C10-738727-2303	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 120°Keyway - Black
SLPIPB35BSB4EH	C10-738727-2304	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 150°Keyway - Black
SLPIPB35BSR0EH	C10-738727-3300	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 90°Keyway - Red
SLPIPB35BSR1EH	C10-738727-3301	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 270°Keyway - Red
SLPIPB35BSR2EH	C10-738727-3302	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 60°Keyway - Red
SLPIPB35BSR3EH	C10-738727-3303	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 120°Keyway - Red
SLPIPB35BSR4EH	C10-738727-3304	Surlok plus 8 .0 mm Straight Plug with EMI and HVIL,35 mm 2 , 150°Keyway - Red
SLPIRBBBSO0EH	C10-738726-1100	Surlok plus 8 .0 mm EMI& HVIL receptacle Busbar Terminal, 90°Keyway - Orange
SLPIRBBBSO1EH	C10-738726-1101	Surlok plus 8 .0 mm EMI& HVIL receptacle Busbar Terminal, 270°Keyway - Orange
SLPIRBBBSO2EH	C10-738726-1102	Surlok plus 8 .0 mm EMI& HVIL receptacle Busbar Terminal, 60°Keyway - Orange
SLPIRBBBSO3EH	C10-738726-1103	Surlok plus 8 .0 mm EMI& HVIL receptacle Busbar Terminal, 120°Keyway - Orange
SLPIRBBBSO4EH	C10-738726-1104	Surlok plus 8 .0 mm EMI& HVIL receptacle Busbar Terminal, 150°Keyway - Orange
SLPIRBBBSB0EH	C10-738726-2100	Surlok plus 8 .0 mm EMI& HVIL receptacle Busbar Terminal, 90°Keyway - Black
SLPIRBBBSB1EH	C10-738726-2101	Surlok plus 8 .0 mm EMI& HVIL receptacle Busbar Terminal, 270°Keyway - Black

AMPHENOL ARTICLE NUMBER	AMPHENOL MANUFACTURING PN	DESCRIPTION
SLPIRBBBSB2EH	C10-738726-2102	Surlok plus 8.0 mm EMI& HVIL receptacle Busbar Terminal, 60°Keyway - Black
SLPIRBBBSB3EH	C10-738726-2103	Surlok plus 8.0 mm EMI& HVIL receptacle Busbar Terminal, 120°Keyway - Black
SLPIRBBBSB4EH	C10-738726-2104	Surlok plus 8.0 mm EMI& HVIL receptacle Busbar Terminal, 150°Keyway - Black
SLPIRBBBSR0EH	C10-738726-3100	Surlok plus 8.0 mm EMI& HVIL receptacle Busbar Terminal, 90°Keyway - Red
SLPIRBBBSR1EH	C10-738726-3101	Surlok plus 8.0 mm EMI& HVIL receptacle Busbar Terminal, 270°Keyway - Red
SLPIRBBBSR2EH	C10-738726-3102	Surlok plus 8.0 mm EMI& HVIL receptacle Busbar Terminal, 60°Keyway - Red
SLPIRBBBSR3EH	C10-738726-3103	Surlok plus 8.0 mm EMI& HVIL receptacle Busbar Terminal, 120°Keyway - Red
SLPIRBBBSR4EH	C10-738726-3104	Surlok plus 8.0 mm EMI& HVIL receptacle Busbar Terminal, 150°Keyway - Red

189

1.7 Mennekes

1.7.1 Pro Top CEE Connectors

MENNEKES industrial CEE Connectors according to IEC 60309 standard, are used where high currents have to be transferred safely and economically.

Mennekes Industrial Connectors can reliably be used for:

- Industrial plants
- Chemical and petrochemical industries
- Railway and transport companies
- Shipyards
- Food industry
- Trade fairs and exhibitions
- Data centres
- Trade
- Production industry

Other types of Mennekes range on request.

We can also provide customized cable assemblies with these connectors.

MENNEKES®

190

1.7.2 Pro Top Plugs

Pro Top Plug

Characteristics	
Voltage rating/color housing	110V (Yellow) – 230V (Blue) – 400V (Red) – 500V (Black)
Number of poles	3- / 4- / 5-pole
Current rating	16A / 32A
Hertz	50-60 Hz
Connection	Screw terminals
Contacts	Standard contacts
Protection degree	IP44
Declaration of conformity	VDE – EAC – CQC
Extra features	Gland with sealing – Strain relief – Protection against kinking – Enclosure with thread lock and safety slide

Clock position

Ordering Codes					
Ordering Code	Current	Poles	Voltage Rating	Clock Position	Picture
MEN147A	16A	3	110V	4 h	
MEN654		4		4 h	
MEN159	32A	3		4 h	
MEN148A	16A	3	230V	6 h	
MEN151A		4		9 h	
MEN157A		5		9 h	
MEN160	32A	3		6 h	
MEN163		4		9 h	
MEN169A		5		9 h	
MEN149A	16A	3	400V	9 h	
MEN152A		4		6 h	
MEN13A*		5		6 h	
MEN164	32A	4		6 h	
MEN14A*		5		6 h	
MEN153A	16A	4	500V	7 h	
MEN659		5		7 h	
MEN165	32A	4		7 h	
MEN777		5		7 h	

192

1.7.3 Pro Top Socket

Pro Top Socket	
Characteristics	
Voltage rating/color housing	110V (Yellow) – 230V (Blue) – 400V (Red) – 500V (Black)
Number of poles	3- / 4- / 5-pole
Current rating	16A / 32A
Hertz	50-60 Hz
Connection	Screw terminals
Contacts	Standard contacts
Protection degree	IP44
Declaration of conformity	VDE – EAC – CQC
Extra features	Gland with sealing – Strain relief – Protection against kinking - Enclosure with thread lock and safety slide

Ordering Codes					
Ordering Code	Current	Poles	Voltage Rating	Clock Position	Picture
MEN179A	16A	3	110V	4 h	
MEN202		4		4 h	
MEN121	32A	3		4 h	
MEN180A	16A	3	230V	6 h	
MEN193A		4		9 h	
MEN199A		5		9 h	
MEN122	32A	3		6 h	
MEN125		4		9 h	
MEN645		5		9 h	
MEN181A	16A	3	400V	9 h	
MEN194A		4		6 h	
MEN15A		5		6 h	
MEN126	32A	4		6 h	
MEN16A		5		6 h	
MEN195A	16A	4	500V	7 h	
MEN310		5		7 h	
MEN127	32A	4		7 h	
MEN646		5		7 h	

194

2. Intercell Connectors + End Terminals

2.1 Intercell Connectors and Take-Off Leads

2.1.1 Terminal Cable "Flex"

TERMINAL CABLE "FLEX" – STANDARD VERSIONS

Ordering code	Section (mm²)	Length (mm)	Packing unit (pieces)
FES25-300	25	300	100
FES25-500	25	500	70
FES25-1000	25	1000	40
FES25-1200	25	1200	40
FES25-1500	25	1500	30
FES25-2000	25	2000	20
…	…	…	…
FES35-300	35	300	100
FES35-500	35	500	70
FES35-1000	35	1000	40
FES35-1200	35	1200	40
FES35-1500	35	1500	30
FES35-1600	35	1600	20
FES35-2000	35	2000	20
FES35-2500	35	2500	16
FES35-3000	35	3000	16
FES35-3500	35	3500	10
…	…	…	…
FES50-300	50	300	100
FES50-500	50	500	50
FES50-1000	50	1000	30
FES50-1200	50	1200	26
FES50-1500	50	1500	26
FES50-1600	50	1600	26
FES50-2000	50	2000	16
FES50-2500	50	2500	10
FES50-3000	50	3000	6
FES50-3200	50	3200	6
FES50-4000	50	4000	6
FES50-5000	50	5000	6

195

...	...	...	...
FES70-300	70	300	80
FES70-500	70	500	50
FES70-1000	70	1000	20
FES70-1200	70	1200	16
FES70-1500	70	1500	16
FES70-2000	70	2000	10
FES70-2500	70	2500	8
FES70-3000	70	3000	6
FES70-4000	70	4000	6
FES70-5000	70	5000	6
FES70-7000	70	7000	2
...	...	...	...
FES95-1000	95	1000	15
FES95-1200	95	1200	15
FES95-1500	95	1500	10
FES95-1600	95	1600	10
FES95-2000	95	2000	6
FES95-2500	95	2500	6
FES95-3000	95	3000	6
...	...	...	...

TERMINAL CABLE "FLEX" – 120 mm²

For section 120 mm² the connection is executed with ferrule technique

Ordering code	Section (mm²)	Length (mm)	Packing unit (pieces)
FEH120-1000	120	1000	15
FEH120-1500	120	1500	10
FEH120-2000	120	2000	10
FEH120-3000	120	3000	8
FEH120-5000	120	5000	5
...	...	...	...

TERMINAL CABLE FLEX – OTHER VERSIONS*
Also available with M6 and M8 connections *For example: FES50-1500M8 = Terminal Cable Flex 50/1500 FES - M8*
Also available in other lengths *For example: FES50-800 = Terminal Cable Flex 50 mm² - 800 mm*
Also available in other sections: 10 / 16 / 107 mm² *For example: FES16-1000 = Terminal Cable Flex 16 mm² - 1000 mm*
Can be provided with integrated fuse from 200 A up to 500A   *For example: FES50-1000-FUS3 = Cable 50/1000 FES- fuse 300A* *Maximum cable section with fuse is 70 mm²*
Also available in UL94 V0 flamability rating (V0: burning stops within 10 seconds on a vertical specimen; drips of particles allowed as long as they are not inflamed.)

TERMINAL CABLE FLEX – "SUNLIGHT"

- Connector for Sunlight batteries, with slightly bigger inner diameter of the insulation (16,5 mm) to fit the terminal.
- Visual recognition: notch in the outside of the insulation.

Ordering code	Section (mm²)	Length (mm)	Packing unit (pieces)
FESU25-300	25	300	100
FESU25-500	25	500	70
FESU25-1000	25	1000	40
FESU25-1200	25	1200	40
FESU25-1500	25	1500	30
FESU25-2000	25	2000	20
...	...	...	...
FESU35-300	35	300	100
FESU35-500	35	500	70
FESU35-1000	35	1000	40
FESU35-1200	35	1200	40

197

FESU35-1500	35	1500	30
FESU35-1600	35	1600	20
FESU35-2000	35	2000	20
FESU35-2500	35	2500	16
FESU35-3000	35	3000	16
FESU35-3500	35	3500	10
...	...	...	...
FESU50-300	50	300	100
FESU50-500	50	500	50
FESU50-1000	50	1000	30
FESU50-1200	50	1200	26
FESU50-1500	50	1500	26
FESU50-1600	50	1600	26
FESU50-2000	50	2000	16
FESU50-2500	50	2500	10
FESU50-3000	50	3000	6
FESU50-3200	50	3200	6
FESU50-4000	50	4000	6
FESU50-5000	50	5000	6
...	...	...	...
FESU70-300	70	300	80
FESU70-500	70	500	50
FESU70-1000	70	1000	20
FESU70-1200	70	1200	16
FESU70-1500	70	1500	16
FESU70-2000	70	2000	10
FESU70-2500	70	2500	8
FESU70-3000	70	3000	6
FESU70-4000	70	4000	6
FESU70-5000	70	5000	6
FESU70-7000	70	7000	2
...	...	...	...
FESU95-1000	95	1000	15
FESU95-1200	95	1200	15
FESU95-1500	95	1500	10
FESU95-1600	95	1600	10
FESU95-2000	95	2000	6
FESU95-2500	95	2500	6
FESU95-3000	95	3000	6
...	...	...	...

2.1.2 Intercell Connectors "Flex"

INTER-CELL CONNECTORS "FLEX" – STANDARD VERSIONS

Ordering code	Section (mm²)	Length (mm)	Packing unit (pieces)
FVS25-075	25	75	300
FVS25-085	25	85	300
FVS25-095	25	95	300
FVS25-110	25	110	300
FVS25-130	25	130	250
FVS25-150	25	150	250
FVS25-170	25	170	200
FVS25-190	25	190	200
FVS25-210	25	210	150
FVS25-300	25	300	100
...	...	...	...
FVS35-075	35	75	300
FVS35-085	35	85	300
FVS35-095	35	95	300
FVS35-110	35	110	300
FVS35-130	35	130	250
FVS35-150	35	150	250
FVS35-170	35	170	200
FVS35-190	35	190	100
FVS35-210	35	210	100
FVS35-230	35	230	100
FVS35-250	35	250	100
FVS35-300	35	300	100
...	...	...	...
FVS50-075	50	75	250
FVS50-085	50	85	250
FVS50-095	50	95	250
FVS50-110	50	110	250
FVS50-130	50	130	200
FVS50-150	50	150	200

FVS50-170	50	170	150
FVS50-190	50	190	120
FVS50-210	50	210	120
FVS50-230	50	230	100
FVS50-250	50	250	100
FVS50-300	50	300	100
...	...	...	...
FVS70-095	70	95	200
FVS70-110	70	110	200
FVS70-130	70	130	150
FVS70-150	70	150	150
FVS70-170	70	170	120
FVS70-190	70	190	120
FVS70-210	70	210	120
FVS70-250	70	250	100
FVS70-300	70	300	80
...	...	...	...
FVS95-110	95	110	100
FVS95-130	95	130	76
FVS95-150	95	150	76
FVS95-170	95	170	60
FVS95-190	95	190	50
FVS95-210	95	210	50
FVS95-300	95	300	50
...	...	...	...

INTER-CELL CONNECTORS "FLEX" – 120 mm²

For section 120 mm² the connection is executed with ferrule technique

Ordering code	Section (mm²)	Length (mm)	Packing unit (pieces)
FVH120-110	120	110	100
FVH120-150	120	150	75
FVH120-170	120	170	75
FVH120-210	120	210	50
FVH120-250	120	250	50
FVH120-300	120	300	50
FVH120-450	120	450	40
…	…	…	…

FLEXIBLE CONNECTORS – OTHER VERSIONS*

Also available with M6 and M8 connections
For example: FVS70-300M8 = Connector FVS 70-300 - M8 (with M8 connection)

Also available in other lengths
For example: FVS25-1000 = Connector Flex 25 mm² - 1000 mm

Also available in other sections: 10 / 16 / 107 mm²
For example: FVS16-250 = Connector Flex 16 mm² - 250 mm

Can be provided with integrated fuse from 200 A up to 500A

For example: FVS35-350F3A = Connector 35/350 - Fuse 300 A Maximum
cable section with fuse is 70 mm²

Also available in UL94 V0 flamability rating
(V0: burning stops within 10 seconds on a vertical specimen; drips of particles allowed as long as they are not inflamed.)

TERMINAL CABLE "PERFECT" – STANDARD VERSIONS

Ordering code	Section (mm²)	Length (mm)	Packing unit (pieces)
FESPH25-700	25	700	45
FESPH25-800	25	800	50
FESPH25-900	25	900	45
FESPH25-1000	25	1000	40
FESPH25-1200	25	1200	40
FESPH25-1400	25	1400	30
FESPH25-1500	25	1500	30
FESPH25-1800	25	1800	30
FESPH25-2200	25	2200	15
FESPH25-3000	25	3000	10
…	…	…	…
FESPH35-650	35	650	45
FESPH35-800	35	800	50
FESPH35-850	35	850	45
FESPH35-1000	35	1000	40
FESPH35-1250	35	1250	40
FESPH35-1400	35	1400	30
FESPH35-1500	35	1500	30
FESPH35-1800	35	1800	30
FESPH35-2200	35	2200	15
FESPH35-3000	35	3000	10
…	…	…	…
FESPH50-600	50	600	25
FESPH50-800	50	800	25
FESPH50-1000	50	1000	25
FESPH50-1400	50	1400	20
FESPH50-1500	50	1500	20
FESPH50-1800	50	1800	15
FESPH50-2000	50	2000	15
FESPH50-2200	50	2200	10

2.1.3 Terminal Cable "Perfect"

FESPH50-2600	50	2600	10
FESPH50-3000	50	3000	5
…	…	…	…
FESPH70-600	70	600	25
FESPH70-800	70	800	25
FESPH70-1000	70	1000	25
FESPH70-1400	70	1400	20
FESPH70-1500	70	1500	20
FESPH70-1800	70	1800	15
FESPH70-2200	70	2200	10
FESPH70-3000	70	3000	5
…	…	…	…
FESPH95-1000	95	1000	20
FESPH95-1200	95	1200	20
FESPH95-1500	95	1500	15
FESPH95-2000	95	2000	10
FESPH95-2500	95	2500	5
FESPH95-3000	95	3000	5
…	…	…	…

TERMINAL CABLE "PERFECT" – 120 mm²			
For section 120 mm² the connection is executed with ferrule technique			
Ordering code	Section (mm²)	Length (mm)	Packing unit (pieces)
FEHPH120-2000	120	2000	5
FEHPH120-2200	120	2200	5
FEHPH120-3000	120	3000	4
…	…	…	…

-Standard connection = M10

203

TERMINAL CABLE "PERFECT" – OTHER VERSIONS*
Also available in other lengths *For example: FESPH35-2750= Terminal Cable Perfect FESPH 35-2750*
Also available in other sections: 10 / 16 mm² *For example: FESPH16-1000 = Terminal Cable Perfect FESPH 16-1000*
Can be provided with integrated fuse from 200 A up to 500A *For example: FESPH50-1500-FUS5= Terminal Cable Perfect FESPH 50-1500 - fuse 500 A* *Maximum cable section with fuse is 70 mm²*
Also available in UL94 V0 flamability rating (V0: burning stops within 10 seconds on a vertical specimen; drips of particles allowed as long as they are not inflamed.)

2.1.4 "Perfect" Connectors

"PERFECT" CONNECTORS – STANDARD VERSIONS

Ordering code	Section (mm²)	Length (mm)	Packing unit (pieces)
FVSPH25-080	25	80	216
FVSPH25-095	25	95	192
FVSPH25-110	25	110	168
FVSPH25-130	25	130	156
FVSPH25-150	25	150	144
FVSPH25-200	25	200	120
FVSPH25-250	25	250	84
FVSPH25-300	25	300	48
...	...	...	...
FVSPH35-080	35	80	216
FVSPH35-095	35	95	192
FVSPH35-110	35	110	168
FVSPH35-130	35	130	156
FVSPH35-150	35	150	144
FVSPH35-170	35	170	120
FVSPH35-200	35	200	120
FVSPH35-250	35	250	48
FVSPH35-300	35	300	48
...	...	...	...
FVSPH50-095	50	95	180
FVSPH50-110	50	110	144
FVSPH50-130	50	130	144
FVSPH50-150	50	150	144
FVSPH50-170	50	170	120
FVSPH50-200	50	200	120
FVSPH50-300	50	300	60
...	...	...	...
FVSPH70-095	70	95	180
FVSPH70-110	70	110	144
FVSPH70-130	70	130	144

FVSPH70-150	70	150	144
FVSPH70-170	70	170	120
FVSPH70-200	70	200	108
FVSPH70-250	70	250	84
FVSPH70-300	70	300	60
...	...	...	...
FVSPH95-095	95	95	180
FVSPH95-110	95	110	144
FVSPH95-130	95	130	120
FVSPH95-150	95	150	120
FVSPH95-170	95	170	120
FVSPH95-190	95	190	100
FVSPH95-210	95	210	90
FVSPH95-300	95	300	60
...	...	...	...

"PERFECT" CONNECTORS – 120 mm²

For section 120 mm² the connection is executed with ferrule technique

Ordering code	Section (mm²)	Length (mm)	Packing unit (pieces)
FVHPH120-095	120	95	100
FVHPH120-110	120	110	100
FVHPH120-165	120	165	50
FVHPH120-340	120	340	30
...	...	...	...

-Standard connection = M10

"PERFECT" CONNECTORS – OTHER VERSIONS*

Also available in other lengths
For example: FVSPH25-1000 = Connector Perfect 25 mm² - 1000 mm

Also available in other sections: 10 / 16 mm²
For example: FVSPH16-250 = Connector Perfect 16 mm² - 250 mm

Can be provided with integrated fuse from 200 A up to 500A

For example: FVSPH35-350F3A = Connector Perfect 35/350 - Fuse 300 A Maximum cable section with fuse is 70 mm²

Also available in UL94 V0 flamability rating
(V0: burning stops within 10 seconds on a vertical specimen; drips of particles allowed as long as they are not inflamed.)

207

2.1.5 Rigid Connectors

RIGID OVERMOLDED CONNECTORS – STANDARD VERSIONS

Ordering code	Width (mm)	Thickness (mm)	Length	Cross-Sect. (mm²)
SV30x3-60-M10	30	3	60	90
SV30x3-80-M10	30	3	80	90
SV30x3-82-M10	30	3	82	90
SV30x3-85-M10	30	3	85	90
SV30x3-92-M10	30	3	92	90
SV30x3-115-M10	30	3	115	90
SV30x3-123-M10	30	3	123	90
SV30x3-125-M10	30	3	125	90
SV30x3-135-M10	30	3	135	90
SV30x3-143-M10	30	3	143	90
SV30x3-155-M10	30	3	155	90
SV30x3-163-M10	30	3	163	90
SV30x3-175-M10	30	3	175	90
SV30x3-178-M10	30	3	178	90
SV30x5-115-M10	30	5	115	150
SV30x5-125-M10	30	5	125	150
SV30x5-132-M10	30	5	132	150
SV30x5-135-M10	30	5	135	150
SV30x5-155-M10	30	5	155	150
SV30x5-163-M10	30	5	163	150
SV30x5-175-M10	30	5	175	150
SV30x5-195-M10	30	5	195	150
SV30x10-115-M10	30	10	115	300
SV30x10-125-M10	30	10	125	300
SV30x10-132-M10	30	10	132	300
SV30x10-135-M10	30	10	135	300
SV30x10-155-M10	30	10	155	300

RIGID OVERMOLDED CONNECTORS – OTHER VERSIONS*

Also available with M6 and M8 connections
For example: **SV30x3-85-M8** *= Rigid Connector 30x3 - L=85mm - M8 - w/o insulation cap*

Also available in other lengths
Only on special request

Also available in 20 mm width and 2mm thick
For example: SV20x2-61-M10 = Rigid connector 20x2mm - L=61mm - M10 - w/o insulation cap

Also available with Perfect connector and 20 mm width
For example: SVPH20x2-61-M10 = Rigid connector 20x2mm - L61mm - M10 - w/o insulation cap

209

2.1.6 Screws and Accessories

SCREWS / CU-RINGS / GASKETS / CAPS		
	Ordering code	**Description**
	SCR1016-MM	Screw steel M10x16 - with testing point *also available without coating, add -NP to the ordering code
	SCR1018-MM	Screw steel M10x18 - with testing point *also available without coating, add -NP to the ordering code
	SCR1022-MM	Screw steel M10x22 - with testing point *also available without coating, add -NP to the ordering code
	SCR1025-MM	Screw steel M10x25 - with testing point *also available without coating, add -NP to the ordering code
	SCR1034-MM	Screw steel M10x34 - with testing point *also available without coating, add -NP to the ordering code
	SCREWAC	Screw M10x22 with aux. contact M6 *for other executions (measurements), please contact us *also available without coating, add -NP to the ordering code
	DBM08M10 DBM10M10	Double sided bolt M8/M10 with "Fixcoat" Double sided bolt M10/M10 with "Fixcoat" *also available without coating, add -NP to the ordering code
	SCR121	Screw Hawker Perfect M10x20 Din 933 - V2A *also available without coating, add -NP to the ordering code
	FVPH-CAP-NEG	Cap Perfect - black - with testing point Also available in red, blue, orange, yellow without warning symbol or gray with warning symbol

210

	FVPH-CAP-POS	Cap Perfect - black - without testing point Also available in red, blue, orange, yellow without warning symbol or gray with warning symbol
	ROND10-15-2.3	Copper ring M10 – height 2,3 mm
	ROND10-F	Copper ring M10 – 10.4 x 15 x 5 mm
	RONDP375	Ring gasket 37 x 10,5 x 2
	RONDP3753	Ring gasket 37,5 x 15 x 3
	ROND10-PP-18-2	Adapter ring between "Flex" connector and EnerSys terminal
	ZGEL25 ZGEL35 ZGEL50 ZGEL70 ZGEL95 ZGEL120	Cable Clamps for Battery Tray 25 mm² Cable Clamps for Battery Tray 35 mm² Cable Clamps for Battery Tray 50 mm² Cable Clamps for Battery Tray 70 mm² Cable Clamps for Battery Tray 95 mm² Cable Clamps for Battery Tray 120 mm²

CHARGING CABLES	
	Charging Cable for Female Thread - Cable cross sections: 16 mm² and 25 mm² - Thread size: M6, M8 and M10 - Several lengths possible *For example: VC16-0500M08 = Charging connector 16mm² - Conn. M8 - L=500mm*
	Charging Cable for DIN Pole "S Type" - Cable cross sections: 10 mm² and 16 mm² - Fully insulated - Several lengths possible *For example: VSI16-0500 = Charging connector S-type - insulated - 16mm² - L=500mm*
	Charging Cable for DIN Pole "T Type" - Cable cross sections: 10 mm² and 16 mm² - Fully insulated - Several lengths possible *For example: VTI16-0500 = Charging connector T-type - insulated 16mm² – L=500 mm*

212

2.2 Insulators

2.2.1 Surlok Insulators

2.2.2 200 Series Lug & Ring Terminal Caps

200 Series Lug & Ring Terminal Caps

The 200 Series terminal insulators are designed to protect ring and lug terminals. They are available in sizes from 12 mm up to 34 mm. They are manufactured from PVC, wich has a 105°C temperature rating.

TOD= Terminal Outside Diameter

212 Series
12 mm TOD
18 – 2 ga cable

214 Series
14 mm TOD
18 – 2 ga cable

216 Series
16 mm TOD
18 – 2 ga cable

218 Series
18 mm TOD
18 – 2 ga cable

220 Series
20 mm TOD
18 – 2/0 ga cable

222 Series
22 mm TOD
18 – 2/0 ga cable

224 Series
24 mm TOD
18 – 2/0 ga cable

226 Series
26 mm TOD
18 – 2/0 ga cable

The 200 Series terminal insulators work with stud and eyelet terminals.

This series can have an extended length for longer terminals, and can be manufactured in 14 colors.

The 200 Series is commonly used on inverters, starters, windlasses, chargers, and other high energy connections.

228 Series
28 mm TOD
18 – 2/0 ga cable

230 Series
30 mm TOD
18 – 2/0 ga cable

232 Series
32 mm TOD
18 – 2/0 ga cable

234 Series
34 mm TOD
18 – 2/0 ga cable

213

200 Series Lug & Ring Terminal Caps

Part Dimensions / Ordering Information

Dimensions

Base Part Number	A Terminal O.D. (in/mm)	B Post Height (in/mm)	C Ins. Grip Diameter (in/mm)	D Cable Entry Options (See Chart)	E Terminal Length (in/mm)	Nominal Material Thickness (in/mm)
TI 212N*	.48/12	.70/17.8	.5/12.7	1,2	1.0/25.4	.06/1.5
TI 212E*	.48/12	.70/17.8	.5/12.7	1,2	1.25/31.8	.06/1.5
TI 214N*	.55/14	.75/19.1	.5/12.7	1,2	1.0/25.4	.06/1.5
TI 214E*	.55/14	.75/19.1	.5/12.7	1,2	1.25/31.8	.06/1.5
TI 216N*	.65/16	.80/20.3	.5/12.7	1,2	1.0/25.4	.06/1.5
TI 216E*	.65/16	.80/20.3	.5/12.7	1,2	1.25/31.8	.06/1.5
TI 218N*	.73/18	.87/22.1	.5/12.7	1,2	1.0/25.4	.06/1.5
TI 218E*	.73/18	.87/22.1	.5/12.7	1,2	1.25/31.8	.06/1.5
TI 220N*	.81/20	.95/24.1	.7/17.8	1,2,3	1.32/33.5	.07/1.8
TI 220E*	.81/20	.95/24.1	.7/17.8	1,2,3	1.75/44.5	.07/1.8
TI 222N*	.87/22	1.05/26.7	.7/17.8	1,2,3	1.32/33.5	.07/1.8
TI 222E*	.87/22	1.05/26.7	.7/17.8	1,2,3	1.75/44.5	.07/1.8
TI 224N*	.95/24	1.13/28.7	.7/17.8	1,2,3	1.62/41.2	.08/2.0
TI 224E*	.95/24	1.13/28.7	.7/17.8	1,2,3	2.06/52.3	.08/2.0
TI 226N*	1.03/26	1.25/31.8	.7/17.8	1,2,3	1.62/41.2	.08/2.0
TI 226E*	1.03/26	1.25/31.8	.7/17.8	1,2,3	2.06/52.3	.08/2.0
TI 228N*	1.11/28	1.32/33.5	.75/19.1	1,2,3	1.75/44.5	.09/2.3
TI 228E*	1.11/28	1.32/33.5	.75/19.1	1,2,3	2.25/57.2	.09/2.3
TI 230N*	1.20/30	1.40/35.6	.75/19.1	1,2,3	1.75/44.5	.09/2.3
TI 230E*	1.20/30	1.40/35.6	.75/19.1	1,2,3	2.25/57.2	.09/2.3
TI 232N*	1.28/32	1.50/38.1	.9/22.9	1,2,3,4	1.75/44.5	.10/2.5
TI 232E*	1.28/32	1.50/38.1	.9/22.9	1,2,3,4	2.38/60.5	.10/2.5
TI 234N*	1.37/34	1.60/40.6	.9/22.9	1,2,3,4	1.75/44.5	.10/2.5
TI 234E*	1.37/34	1.60/40.6	.9/22.9	1,2,3,4	2.38/60.5	.10/2.5
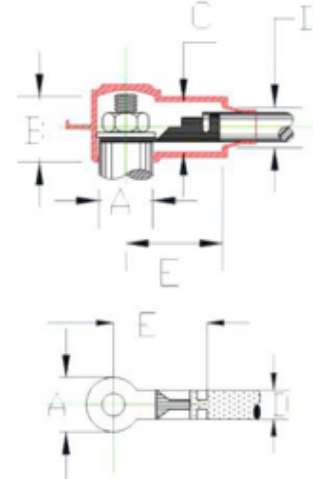
For use with stud-type terminal posts
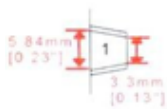
Cable Gauges 18-10
0.8mm²
(3.24mm/0.13") to
5mm²
(5.42mm/0.215")
[1] 5.84mm [0.23"] / 3.3mm [0.13"]
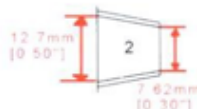
Cable Gauges 8-2
8mm²
(6.98mm/0.28") to
32mm²
(11.93mm/0.51")
[2] 12.7mm [0.50"] / 7.62mm [0.30"]
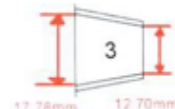
Cable Gauges 2-2/0
32mm²
(11.93mm/0.51") to
62mm²
(16.0mm/0.66")
[3] 17.78mm [0.70"] / 12.70mm [0.50"]
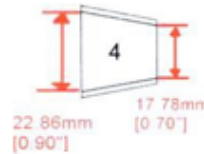
Cable Gauges 3/0-4/0
81mm²
(18.3mm/0.75") to
103mm²
(19.8mm/0.81")
[4] 22.86mm [0.90"] / 17.78mm [0.70"]

Sample 8 Digit Part Number

TI232   N   4   V   02

Mold Number: 212-234

Length:
N – Normal
E - Extended

Cable Entry (see Above)

Material:
V - Vinyl

Color:
02 – Red (*)
14 – Black (*)
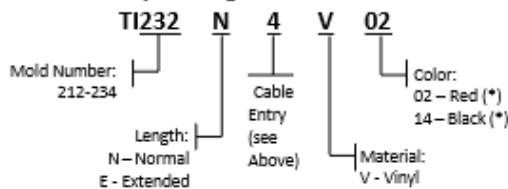
Finding the correct insulation

1. Determine your terminal's outside diameter (A above).
2. Determine your terminal's post height (B above).
3. Determine your terminal's cable entry (D above)

Match your terminal's measurements against the table above to find the correct insulator for your application.

214

2.2.3 Lug & Ring Terminal Insulators

Lug & Ring Terminal Insulators

A more comprehensive line of insulators, offering a wider variety of lug and ring protection. Our lug and ring insulators can be used with starters, generators, alternators, solenoids, and other devices.

258 Series

- Protect large terminal connections from shorts
- Terminal Outside Dia: 2.3"/58.7mm
- Post height: 2.0"/50.8mm
- Inside grip Dia: .65"/16.6mm
- Can accept multiple cables, up to 1/0 ga each

Part#	Cable Entry Size
TI258N9*	Oval, up to 4/0

216T Series

- Snap-on insulator, can be removed without cable
- Terminal outside dia: .64"/16.3mm
- Post height: .74"/18.8mm

Part#	Cable Entry Size
TI216T8*	.27"/6.9mm

400 Series

- Terminal outside dia: .6"/15.2mm
- Post height: .88"/22.4mm
- Inside grip dia: .44"/11.2mm
- Terminal length: 1.19"/30.3mm

Part#	Cable Entry Size
TI400N7*	.31"/7.9mm
TI400N9*	.44"/11.2mm
TI400E4*	.18"/4.6mm

405 Series

- Terminal outside Dia: 1.0"/25.4mm
- Post height: .98"/24.8mm
- Inside grip dia: .50"/12.7mm

NEW: 406 Series

Part#	Cable Entry Size
TI405N1*	.13"/3.3mm
TI405N2*	.30"/7.6mm
TI405N9*	.50"/12.7mm
TI406N3*	.16"/4.1mm
TI406N9*	.75"/19mm

470 Series

- Terminal outside dia: .85"/21.6mm
- Post height: 1.06"/26.9mm
- Inside grip dia: .63"/15.9mm
- Terminal length: 1.81"/46.0mm

Part#	Cable Entry Size
TI470N9*	.63"/15.9mm

485 Series

- Terminal outside dia: .52"/12.9mm
- Post height: .45"/11.4mm
- Inside grip dia: .25"/6.4mm
- Cable entry: .25"/6.4mm

Part#	Cable Entry Size
TI485N9*	.25"/6.4mm

215

Lug & Ring Terminal Insulators

487 Series

- Terminal Outside Dia: 1.26"/32mm
- Post height: .98"/24.9mm
- Inside grip Dia: .1.0"/25.4mm
- Available in 5 cable entries

NEW: 488 Series

Part#	Cable Entry Size
TI487N6*	.5"/12.7mm
TI487N7*	.6"/15.2mm
TI487N8*	.65"/16.5mm
TI487N9*	.75"/19mm
TI488N9*	.87"/22.1mm

490 Series

- Used for angled connections
- Terminal outside dia: .75"/19.1mm
- Post height: 1.07"/27.2mm
- Inside grip dia: .50"/12.7mm

Part#	Cable Entry Size
TI490N9*	.5"/12.7mm

510 Series

- Terminal outside dia: .5"/12.7mm
- Post height: .8"/20.3mm
- Inside grip dia: .6.4-11.6mm
- Additional lead times may apply

Part#	Cable Entry Size
TI510N9*	.25"/6.4mm

600 Series

- Terminal outside Dia: 1.57"/40mm
- Post height: .1.62"/41.1mm
- Inside grip dia: .65"/16.6mm
- Available in 7 cable entries

Part#	Cable Entry Size	
TI600N1*	(1)	.31"/7.9mm
TI600N2*	(2)	.31"/7.9mm
TI600N3*	(1)	.5"/12.7mm
TI600N4*	(2)	.5"/12.7mm
TI600N5*	(1)	.62"/15.8mm
TI600N6*	(2)	.62"/15.8mm
TI600N7*	Oval up to 4/0	

800 Series

- Terminal outside dia: .85"/21.6mm
- Post height: 1.06"/26.9mm
- Inside grip dia: .63"/15.9mm
- Terminal length: 1.81"/46.0mm

Part#	Cable Entry Size
TI800N4*	.17"/4.3mm
TI800N5*	.21"/5.3mm
TI800N8*	.31"/7.9mm
TI800N9*	.50"12.7mm

801 Series

- Terminal outside dia: .75"/19.1mm
- Post height: 1.03"/26.2mm
- Inside grip dia: .37"/9.4mm
- Cable entry: .31"/7.9mm

Part#	Cable Entry Size
TI801N8*	.31"/7.9mm

* V02= Red
  V14= Black

2.2.4 Battery Terminal Insulators

Battery Terminal Insulators

The battery insulators are designed for use in marine, commercial, industrial and automotive fields. Our battery terminal insulators are available in various materials and colors.

409 Series

- Protect stamped or wrapped battery terminals
- Available in 2 cable entries
- Post height: .83"/21.0mm
- Cable entry: 8 ga -1/0 ga

Part#	Cable Entry Size
TI409N2*	.29"/7.2mm
TI409N3*	.50"/12.7mm

415 Series

- Protect tapered style battery posts
- Post height: .74"/18.8mm
- Cable entry:1/0 ga -2/0 ga
- Available in 4 entry sizes

Part#	Cable Entry Size
TI415N6*	.37"/9.4mm
TI415N7*	.44"/11.2mm
TI415N8*	.50"/12.7mm
TI415N9*	.625"/15.9mm

416 Series

- Protect tapered style battery posts
- Post height: .76"/19.3mm
- Inside grip: .63"/16.0mm

Part#	Cable Entry Size
TI416N9*	.63"/16.0mm

417 Series

- Snap-on insulator, can be removed without cable
- Post height: .91"/23.1mm
- Inside grip dia: .50"/12.7mm
- Cable entry: 1-1/0 ga

Part#	Cable Entry Size
TI417N9*	.50"/12.7mm

430 Series

- Protect tapered style battery posts
- Post height: .83"/21.1mm
- Inside grip dia: .56"/14.2mm
- Cable entry: 2/0-3/0 ga

Part#	Cable Entry Size
TI430N7*	.56"/14.2mm
TI430N8*	.68"/17.3mm

455 Series

- Insulator for dual post battery
- Insulator snaps onto cable, and can be fastened with zip-tie
- Can accept multiple cables, of different sizes

Part#	Cable Entry Size
TI455N4*	.4"/10mm
TI455N6*	.5"/12.7mm
TI455N8*	.75"/19.1mm

* V02= Red
V14= Black

217

Battery Terminal Insulators

458 Series

- Insulator for dual post battery
- Attached cover can insulate post when not in use
- Often used with 226 Series Cap

Part#	Cable Entry Size
TI458N0*	n/a

500 Series

- Protect angle battery terminals
- Left, right, and dual cable entry
- Available in 2 sizes

Part#	Cable Entry Size
TI500L7*	.5"/12.7mm
TI500L9*	.69"/17.5mm
TI500R7*	.5"/12.7mm
TI500R9*	.69"/17.5mm
TI500D7*	.5"/12.7mm
TI500D9*	.69"/17.5mm

553 Series

- Protect side post battery connection
- Available in two sizes

Part#	Cable Entry Size
TI553X6*	.59"/15.0mm
TI553X9*	.90"/22.9mm

460 Series

- Protect marine battery, Exide 32
- Tabbed finger grip, for easy removal
- Available for positive and negative
- Allows for secondary battery connection

Part#	Cable Entry Size
TI460N9*	n/a

462 Series

- Protect dual-post battery terminals
- Often used in marine industry
- Attached cap covers post when not in use

Part#	Cable Entry Size
TI462N0*	n/a

466 Series

- Protect heavy duty battery terminal
- Inside grip dia: .42"/10.7mm
- Cable entry:

Part#	Cable Entry Size
TI466L1,R1*	.13"/3.3mm
TI466L2,R2*	.30"/7.6mm
TI466L3,R3*	.50"/12.7mm
TI466N9*	Oval up to 4/0 ga

Left Entry   Right Entry   Oval Entry

468 Series

- Protect heavy duty battery terminal
- Accepts right, left, and dual cable
- Snaps onto terminal & cable
- Accepts up to 4/0 ga cables

Part#	Cable Entry Size
TI468L9*	.82"/20.8mm
TI468R9*	.82"/20.8mm
TI468D9*	.82"/20.8mm

* V02= Red
  V14= Black

218

Battery Terminal Insulators

740 Series

- Protect marine wing-nut terminals
- Top insulator swivels to accommodate different cable direction
- Several cable entries
- Top insulator offers single, dual,

Red	Black	Cable Entry Size
TI3014	TI4013	(1).31"/7.9mm
TI3024	TI4023	(2).31"/7.9mm
TI3034	TI4033	(1).5"/12.7mm
TI3044	TI4043	(2).5"/12.7mm
TI3054	TI4053	(1).62"/15.8mm
TI3064	TI4063	(2).62"/15.8mm
TI3074	TI4073	Oval up to 4/0 ga

843 Series

- Protect tapered battery post
- Left, right and duals cable entry
- Post height: .79"/20.1mm

Part#	Cable Entry Size
TI843L8*	.44"/11.2mm
TI843L9*	.50"/12.7mm
TI843R8*	.44"/11.2mm
TI843R9*	.50"/12.7mm
TI843D8*	.44"/11.2mm
TI843D9*	.50"/12.7mm

900 Series

- Protect tapered battery post
- Left, right and dual cable entry
- Cable entry ring can utilize zip-tie, securing insulator
- Cable entry: up to 3/0 ga (4/0 ga when cut and ziptied)

Part#	Cable Entry Size
TI900L9*	.63"/16.0mm
TI900R9*	.63"/16.0mm
TI900D9*	.63"/16.0mm

975 Series

- Heavy duty cable series
- Cable entry accepts double cable
- Wide cable entry for large cable
- Cable entry: up to 4/0 ga

Part#	Cable Entry Size
TI975D8	.80"/20.3mm

976 Series

- Heavy duty cable series
- Triple cable entry permits 3 cables
- Wide cable entry for large cables
- Cable entries can be blocked
- Cable entry: up to 4/0 ga

Part#	Cable Entry Size
TI976N8	.80"/20.3mm

* V02= Red
  V14= Black

2.2.5 L-Post Terminal Insulators

L-Post Terminal Insulators

This series of insulators is designed to protect L- Post terminals, or Flag terminals.

433 Series

- Protect L-Post battery terminals
- Available with left & right entry
- Cable entry: .44"/11.2mm
- Post height: 1.04"/26.4mm

Part#	Cable Entry Size
TI433L5*	.44"/11.2mm
TI433R5*	.44"/11.2mm

436 Series

- Protect flat threaded battery posts
- Also protect low-profile L-Post
- Insulator snaps onto cable
- Can be secured to cable with ziptie
- Available without shroud
- Post height: .75"/19.1mm

Part#	Cable Entry Size
TI436N4*	.36"/9.2mm
TI436N5*	.48"/12.2mm
TI436N7*	.64"/16.2mm
TI43654*	.35"/9.0mm
TI43655*	.48"/12.2mm

437 Series

- Protect L-post battery terminals
- Insulator snaps onto cable
- Can be secured to cable with a ziptie
- Availble without shroud
- Post height: 1.28"/32.5mm

Part#	Cable Entry Size
TI437N4*	.36"/9.3mm
TI437N5*	.46"/11.4mm
TI437N7*	.48"/12.3mm
TI437S5*	.40"/10.0mm

439 Series

- Protect L-Post battery terminals
- Isolator snaps onto cable
- Can be secured to cable with ziptie
- Available without shroud
- Post height: 1.28"/32.5mm

Part#	Cable Entry Size
TI439N5*	.38"/9.6mm

444 Series

- Protect smaller L-Post terminals
- Available with left of right entry
- Post height: 1.2"/30.5mm

Part#	Cable Entry Size
TI444L6*	.30"/7.6mm
TI444R6*	.30"/7.6mm
TI444L8*	.37"/9.4mm
TI444R8*	.37"/9.4mm
TI444L9*	.44"/11.2mm
TI444R9*	.44"/11.2mm

799 Series

- Protect smaller L-Post battery terminals
- Left, Right and duals cable entry
- Post height: 1.51"/38.3mm
- Cable entry: .25"/6.4mm

Part#	Cable Entry Size
TI799L9*	.25"/6.4mm
TI799R9*	.25"/6.4mm
TI799D9*	.25"/6.4mm

481 Series

- Protect heavy duty L-Post terminals
- Covers exposed terminal base
- Typically used with 433 Series

Part#	Cable Entry Size
TI481N9*	n/a

* V02= Red
  V14= Black

220

2.2.6 Adapter Terminal Insulators

Adapter Terminal Insulators

Adapter Terminal Insulators are designed to protect combination connections, where cables may be detached from the battery terminal.

419 Series

- Protect multiple cable terminals
- Insulator can slide back, to access cable connections
- Cable Entry: .53"/13.8mm

Part#	Cable Entry Size
TI419N9*	Open up to 1/0 ga

421 Series

- Protect offset battery terminals
- Use with negative terminal, usually left cable entry
- Insulator slides over terminal
- Cable entry: .60"/15.2mm

Part#	Cable Entry Size
TI421N9	.60"/15.2mm

422 Series

- Protect offset battery terminals
- Use with positive terminal, usually right cable entry
- Insulator slides over terminal
- Cable Entry: .60"/15.2mm

Part#	Cable Entry Size
TI422N9	.60"/15.2mm

456 Series

- Protect marine battery terminals
- Works with bolt-on / wing-nut type battery terminals
- Accepts single or multiple cables

Part#	Cable Entry Size
TI456N9*	Oval up to 4/0 ga

457 Series

- Protect marine battery terminals
- Works with bolt-on / wing-nut type battery terminals
- Single cable entry, in 3 sizes

Part#	Cable Entry Size
TI457N1*	.11"/2.8mm
TI457N2*	.32"/8.1mm
TI457N3*	.55"/14.0mm

* V02= Red
V14= Black

221

Adapter Terminal Insulators

451 Series

- Protect multiple cable terminals
- Insulator snaps onto cables and ca be removed easily
- Cable entry: 53"/13.8mm

Part#	Cable Entry Size
TI451N9*	Open up to 1/0 ga

453 Series

- Protect offset battery terminal, usually left cable entry
- Insulator snaps onto cable
- Cable entry: .50"/12.7mm

Part#	Cable Entry Size
TI453L9 V14	Open up to 1/0 ga
TI453R9 V14	Open up to 1/0 ga
TI453D9 V14	Open up to 1/0 ga

454 Series

- Protect offset battery terminals
- Use with positive terminal, usually right cable entry
- Insulator slides on to cable
- Cable Entry: .50"/12.7mm

Part#	Cable Entry Size
TI45 L9 V02	Open up to 1/0 ga
TI45 R9 V02	Open up to 1/0 ga
TI45 D9 V02	Open up to 1/0 ga

776 Series

- Protect heavy duty battery terminals
- Waterproof inulator/cover kit
- Prevents electrical current flow when submerged in salt water
- Includes 479 Series disc

Part#	Cable Entry Size
TI776N7*	.42"/10.7mm
TI776N8*	.62"/15.8mm
TI776N9*	.82"/20.8mm

70480 Series

- Corrosion prevention kit for 8DA & 4DA batteries
- Cable locations can be changed
- Includes all necessary components: bases, covers, terminals, sleeves, plugs, gel
- For use with 1/0 ga – 4/0 ga cables

Part#	Cable Entry Size
70480*	Min: .5"/12.7mm Max: .87"/22.1mm

* V02= Red
  V14= Black

2.2.7 Specialty Terminal Insulators

Specialty Terminal Insulators

550 Series

- Covers engine sensors
- Generous height and downward wire exit
- Retainer lip keeps cover in place
- Wall thickness: ~1mm
- Available in 2 cable entries

Part#	Cable Entry Size
TI550N6*	.25"/6.4mm
TI550N9*	.38"/9.5mm

560 Series

- Covers engine sensors
- Generous height and downward wire exit
- Retainer lip keeps cover in place
- Wall thickness: ~2.8mm

Part#	Cable Entry Size
TI560N4*	.25"/6.4mm

621 Series

- Small straight sensor cover
- Molded in ring allows for greater strength
- Typically used with oil and water temperature sensors

Part#	Cable Entry Size
TI621N9*	.25"/6.4mm

725 Series

- Accepts terminals up to 24mm
- Tunnel cap allows for various cable entry sizes and shapes
- Insulator can be zip-tied to cable
- Maximum terminal OD: .94"/24mm
- Maximum terminal height: .99"/25.3mm
- Available in halogen-free material

Part#	Cable Entry Size
TI224T9*	Various inserts
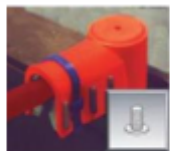
Style A   Style B   Style C
.3" / 7.6mm

729 Series

- Accepts terminals up to 24mm
- Tunnel cap allows for various cable entry sizes and shapes
- Insulator can be zip-tied to cable
- Maximum terminal OD: .1.1"/28mm
- Maximum terminal height: 1.2"/30.7mm
- Available in halogen-free material

Part#	Cable Entry Size
TI228T9	Various inserts
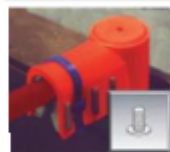
Style A   Style B   Style C
.5" / 12.7mm

735 Series

- Accepts terminals up to 24mm
- Tunnel cap allows for various cable entry sizes and shapes
- Insulator can be zip-tied to cable
- Maximum terminal OD: .1.52"/34mm
- Maximum terminal height: 1.3"/38.6mm
- Available in halogen-free material

Part#	Cable Entry Size
TI234T9*	Various inserts

Style A   Style B   Style C
.7" / 17.8mm

* V02= Red
V14= Black

3. Battery Management Systems

3.1 Philadelphia Scientific

3.1.1 Blinky water level sensors

Expensive assets are almost always monitored to record how they are being used. While a forklift truck has an hour meter and a service record to help estimate the usage level, the monitoring of the battery is often overlooked. This leads to batteries becoming over-discharged, not watered, and ultimately dead long before they're supposed to be. The range of battery monitors gives you both visual and audio cues to make sure essential maintenance is carried out, and you can even record and transmit a wide range of data points giving you key information on how individual batteries are performing.

The Blinky™ range of battery water level monitors (BWM) feature patented UL Classified® technology that dramatically improves battery maintenance by intelligently alerting personnel when a battery needs water. The new super bright LED light indicator and audible alarm (Pro unit) eliminate operator error by clearly indicating when a battery has sufficient electrolyte. Philadelphia Scientific has three tiers of battery water level monitors to suit all applications and budgets:

⏶ Basic Blinky is the entry level battery water level monitor. It has provided decades of protection against battery dry out and remains the industry leading low-cost battery monitor.

⏶ Smart Blinky is the mid-range battery water level monitor and offers comprehensive functionality for great value. The unique SmartDelay feature provides 100% confidence of a true indication.

⏶ Smart Blinky Pro adds an audible alarm and fool proof installation to SmartDelay, making SmartBlinky Pro the gold standard for battery monitors.

BasicBlinky   SmartBlinky   SmartBlinky Pro

224
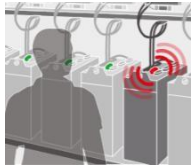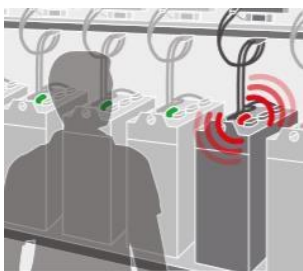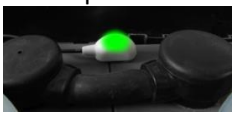
		BasicBlinky		SmartBlinky		SmartBlinky Pro	
LED Indications	OK	Green		Green with pulse		Green with pulse	
	Fill soon			Green with red flash		Green with red flash	
	Fill now	No light		Red asymmetric warning flash		Red asymmetric warning flash + audible alarm	
	Refilled			Green flash		Green flash	
LED		Super bright LED		Super bright LED		Matrix of four super bright LEDs	
Operating voltage		4,0 V (Max. 18 V)		4,0 V to 12,0 V (Max. 18 V)		24 V to 80V (Max. 80V)	
Forgiveness zone ❓		7.0 V to 18.0 V hibernates		14 V to 16.0 V hibernates		N/A	
Nominal current		28.0mA		2.67mA		@ 24V 20mA, @ 48V 10mA, @ 80V 5mA	
Fuses		Version B & S : 1 Version Q : 2		Version B & S: 2 Version Q: 3		Version B & S: 2 Version Q: 3	
Standard probe length		122 mm		122 mm		122 mm	
Certification		UL, C-Tick, CE Mark		UL, C-Tick, CE Mark		UL, C-Tick, CE Mark	
Return On Invest in weeks		9		18		20	
Reverse polarity protection ❓		✔		✔		✔	
SmartDelay ❓		✖		✔		✔	
Audible alarm		✖		✖		✔	
Days without water indicator (SmartBEEP) ❓		✖		✖		✔	

225

Anycell installation ❓	✖	✖	✔

	Basic*Blinky*	Smart*Blinky*	Smart*Blinky* Pro
Housing dimensions	L = 27 mm W = 12 mm H = 15 mm	L = 33 mm W = 12 mm H = 14 mm	L = 62 mm W = 32 mm H = 25 mm
Weight	90,7 grams	90,7 grams	120 grams
Connections	(S) M4 steel ring & screw (B) M10 steel ring (Q) FlexiTap piercing	(S) M4 steel ring & screw (B) M10 steel ring (Q) FlexiTap piercing	(S) M4 steel ring & screw (Q) FlexiTap piercing
Versions	Standard: LED on the probe	Standard: LED on the probe	Standard: LED on the battery
		Remote: LED located anywhere on battery	Remote: LED mounted between the cables
		Cyclops: LED mounts between the cables	
		Detachable: Allows the LED to be mounted anywhere.	
		Interface: A 'clean contact' output for connection to 3rd party devices – no LED	

227

Version	Ordering code	Description	Connection
	BL-BWM3-S	Basic*Blinky* – M4	
	BL-BWM3-B	Basic*Blinky* – M10	
	BL-BWM3-Q	Basic*Blinky* – Flexi Tap	
	BL-SWM3-S	Smart*Blinky* – M4	
	BL-SWM3-B	Smart*Blinky* – M10	
	BL-SWM3-Q	Smart*Blinky* – Flexi Tap	
	BL-SWM3-BR	Smart*Blinky* – Remote Detachable – M10	
	BL-SWM3-SRC	Smart*Blinky* – Remote Cable Mount – M4	
	BL-SWM3-BRC	Smart*Blinky* – Remote Cable Mount – M10	
	BL-SWM3-QRC	Smart*Blinky* – Remote Cable Mount – Flexi Tap	
	BL-SREM3-S	Smart*Blinky* – Remote – M4	
	BL-SREM3-B	Smart*Blinky* – Remote – M10	
	BL-SWM3-B-IF	Smart*Blinky* – Interface – M10 – No LED	
	BL-SWM3-Q-IF	Smart*Blinky* – Interface – Flexi Tap – No LED	
	BL-SWP-C	Smart*Blinky* Pro – Remote Cable Mount – Self-Piercing	
	BL-SWP-S	Smart*Blinky* Pro – Battery Mount – M4	
	BL-SWP-Q	Smart*Blinky* Pro – Battery Mount – Flexi Tap	

228

Advantages
Patented Smart Sensing Technology: The Blinky eliminates false indication. This maximizes watering intervals to prevent unnecessary watering or dry out and minimizes costly boil overs.
Battery-friendly probe: The probe is lead so there is never a fear of poisoning the cell into which it is placed.
Engineered to be tough: The Blinky's are built to withstand the harsh environment of industrial battery applications. All materials are resistant to corrosion and the low profile design protects against damage.
Inexpensive and cost effective: Over a battery lifetime, the Blinky battery watering monitor saves a surprising amount of time - or labour cost - and delivers a rapid return on investment.
Fits almost all batteries: Blinky monitors are available with many standard probe lengths, and can also be easily trimmed to any custom length.

❓ Extra info ❓	
Reverse polarity protection	Connecting SmartBlinky 'the wrong way round' will not damage it.
SmartDelay	The SmartDELAY optimises battery filling whilst preventing boil-over. The electrolyte level in a battery can rise and fall several times a day, with SmartDELAY the Smart Blinky's LED only turns red once the electrolyte level has been low for over 24 hours, reducing the risk of incorrect topping and reducing the topping frequency.
Days without water indicator	SmartBEEP - The Smart Blinky Pro has a unique beeper that will help you identify a battery that needs water even if you can't see it. The frequency of the beep indicates for how many days the electrolyte has been low.
Anycell installation	Patented universal voltage and polarity means the installation is simple and cannot damage the device. ANYCELL technology means it is almost impossible to put the probe in the wrong location.
Forgiveness Zone	This feature provides for more tolerance of installation errors, reducing the risk of damaging the monitors during installation. If the unit is installed incorrectly within the forgiveness zone the LED will not come on but the unit is not permanently damaged and can be corrected.

229

3.1.2 eGO! Battery Life Monitor

BATTERY MONITORING

Expensive assets are almost always monitored to record how they are being used. While a forklift truck has an hour meter and a service record to help estimate the usage level, the monitoring of the battery is often overlooked. This leads to batteries becoming over-discharged, not watered and ultimately dead long before they're supposed to be. A battery life monitor gives you visual cues to make sure essential maintenance is carried out, and you can even record and transmit a wide range of data points giving you key information on how individual batteries are performing.

The eGO!c battery life monitor is an advanced battery life monitor, turning any lead-acid battery into a smart battery. Recording over 256,000 data samples, across 28 fields, covering 23 separate performance indicators, the eGO!c is an all-encompassing intelligence system that delivers the data that is locked away within your batteries.

The wide range of metrics recorded by the eGO!c can be used to improve the overall performance of a battery fleet:

- Improve maintenance procedures.
- Increase run-time and reduce costs.
- Assign accountability for battery abuse.
- Quickly review the data for your entire fleet.
- Identify improvements to maintenance procedures across multiple sites.
- Pro-actively monitor to track improvements

230

eGO!c
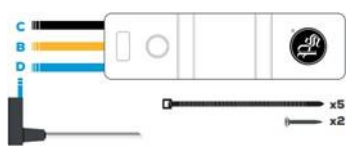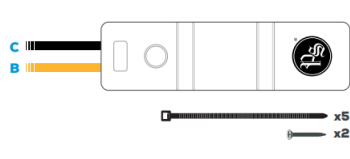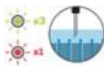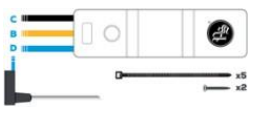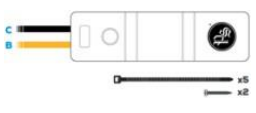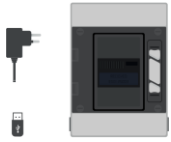
Operating voltage	12 V		
Nominal current	30-100mA		
Over-discharge threshold	80%		
LED	Super bright LED		
Housing	Translucent Overmold		
Protection	IP68		
Connections/Fuses	(S) M4 Steel Ring and Screw (Q) FlexiTap		1x board, 2 x In-line 1 x board, 2 x FlexiTap
Flame retardant	✔		
Reverse polarity protection ❓	✔		
SmartSense ❓	✔		
SmartDelay ❓	24 Hours (Standard) 5 Day (Optional)		
Cable color(s)	Black (-), Yellow (+), Blue (Probe)		
Account	An account needs to be created for the website setup and administration. After setup you can see the Data Dashboard of each individual eGOc. Website: https://www.batterymanagement.net		
Manual upload	An upload can be triggered using the eGO!Tools App		
Automatic upload	When the battery is fully charged, the eGOc will trigger an upload and sent data to the iHUB (optional)		

eGO!c
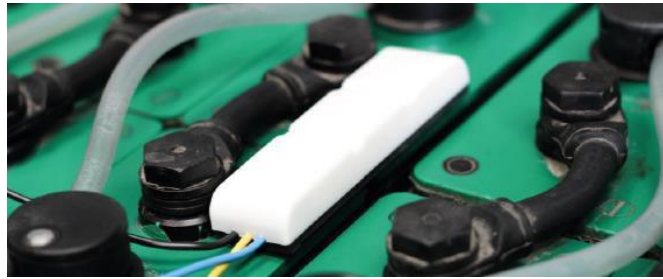
Housing dimensions	L = 100 mm W = 30 mm H = 18 mm	
Versions	Flooded	Gel
Weight	100 grams (including EL Probe)	80 grams

LED Indications	OK		
	Fill soon		
	Fill now		
	Over Temperature	>40°C ✖	>37°C ✖
	Comms Operating		

Version	Ordering code	Description	Connection
	EGOC-12SE	eGO Compact Battery Life Monitor M4 Flooded	
	EGOC-12QE	eGO Compact Battery Life Monitor FlexiTap Flooded	
	EGOC-12SG	eGO Compact Battery Life Monitor M4 Gel	
	EGOC-12QG	eGO Compact Battery Life Monitor FlexiTap Gel	

232

Picture	Ordering code	Description
	EGO3-IHUB-CL1	Cloud Link eGO Data Hub WLAN
	EGO3-IHUB-CL2	Cloud Link eGO Data Hub Wi-Fi

DATA YOU CAN USE	
Electrolyte Levels	The eGOc alerts you when the battery needs water (Flooded version).
Temperature Levels	Hot running or charging temperatures are a telltale sign that something is wrong.
Normal Cycles	When a battery is charged, used and discharged, this is classed as a normal usage cycle.
Opportunity Cycles	If a battery is charged multiple times during a work cycle this reduces overall life expectancy.
Abuse Cycles	Abuse cycles are another big killer of batteries. The eGOc tracks it so you can amend working practices and maintenance.
Work Time	You can see exactly how long each battery has worked for.
Rest Time	Reporting in conjunction with Work Time, this shows how long a battery has stood unused with charge.
Charge Time	The amount of time a battery has been on charge can indicate a whole range of issues with capacity.
Cool Down Time	Using a battery that hasn't cooled down enough drastically impacts performance, the eGOc tracks it so you can change practices.
Life Used	Calculating the average lifespan of a battery using the data captured through the eGOc we can show current life used.
Life Remaining	Working in with Life Used, the life remaining report allows you to effectively plan in replacing batteries and assets.
Data Received	There can be tracked when exactly the last upload was received online.

233

DATA POINTS AND RECORDED METRICS	
Download date	Date of download
eGOc Serial number	Serial number issued by PS identifying the eGOc. This is located on top of the eGOc.
Cell voltage at download	This is the average 'volts per cell' of the battery.
Temperature download	Specific temperature at download.
Electrolyte status at download	OK = electrolyte level is correct Fill soon = electrolyte level is getting low Fill now = electrolyte level is low, battery needs filling
Number of normal charge cycles	The number of times the battery is discharged and then charged with a normal termination.
Hours of opportunity charge	Quantity of hours of charge when the charge is ended before having reached the end of normal charging.
Estimated total cycles	An estimation of the total quantity of cycles including any opportunity charging that may have occurred.
Lifetime average cycles per day	This is the average number of cycles per day since the eGOc was installed.
Last 30 days average cycles per day	The average number of cycles per day for the last 30 days.
Total connected days	How many days the eGOc has been connected to the battery.
Number of connections	The number of times the eGOc has been disconnected and reconnected.
Days since last connection	Number of days since the last time the eGOc was connected.
Lifetime work hours	The number of hours of discharge, recorded from the first time the eGOc was installed.
Lifetime rest hours	The number of hours the battery is not on charge or being discharged, recorded from the first time the eGOc was installed.
Last cycle complete hours between charges	The number of hours between the end of the last charge and the beginning of the next charge.
Last cycle work time	The number of hours the battery is being discharged during the last cycle.
Last cycle rest time	The number of hours the battery is not being discharged during the last cycle.
Last cycle charge time	The number of hours during which the battery is on charge during the last cycle.
Maximum temperature during last cycle	Highest recorded temperature during last cycle.
Maximum voltage during last cycle	Highest recorded voltage during last cycle.
Minimum voltage during last cycle	Lowest recorded voltage during last cycle.
Lifetime average temperature	The average temperature recorded since the first installation of the eGOc.
Lifetime max temperature	Highest recorded temperature since the eGOc was installed.
Days since connection when maximum temp occurred	The number of days between the initial installation up until the highest temperature was recorded.

234

Last 30 days average temperature	The average temperature recorded for the preceding 30 days.
Last 24 hours average temperature	The average temperature recorded for the preceding 24 hours.
Cumulative hours of high temperature	The number of hours where the temperature exceeds 40 degrees Celsius (flooded) and 37 degrees Celsius (VRLA).
Lifetime max voltage	The highest voltage recorded since the eGOc was first installed.
Days since connection when maximum voltage occurred	The number of days between the initial installation up until the day the maximum voltage occurred.
Lifetime minimum voltage	The lowest voltage recorded since the eGOc was first installed.
Days since connection when minimum voltage occurred	The number of days between the initial installation up until the day the minimum voltage occurred.
Hours of over discharge	The number of hours that the average cell voltage is below the pre-defined voltage.
Total number of days without water	The number of days the electrolyte level is below the level of the probe.
Longest period without water	The longest period in days that the electrolyte level has been below the level of the probe.
Days without water at download	The number of days the electrolyte level is below the level of the probe at the time of download.

235
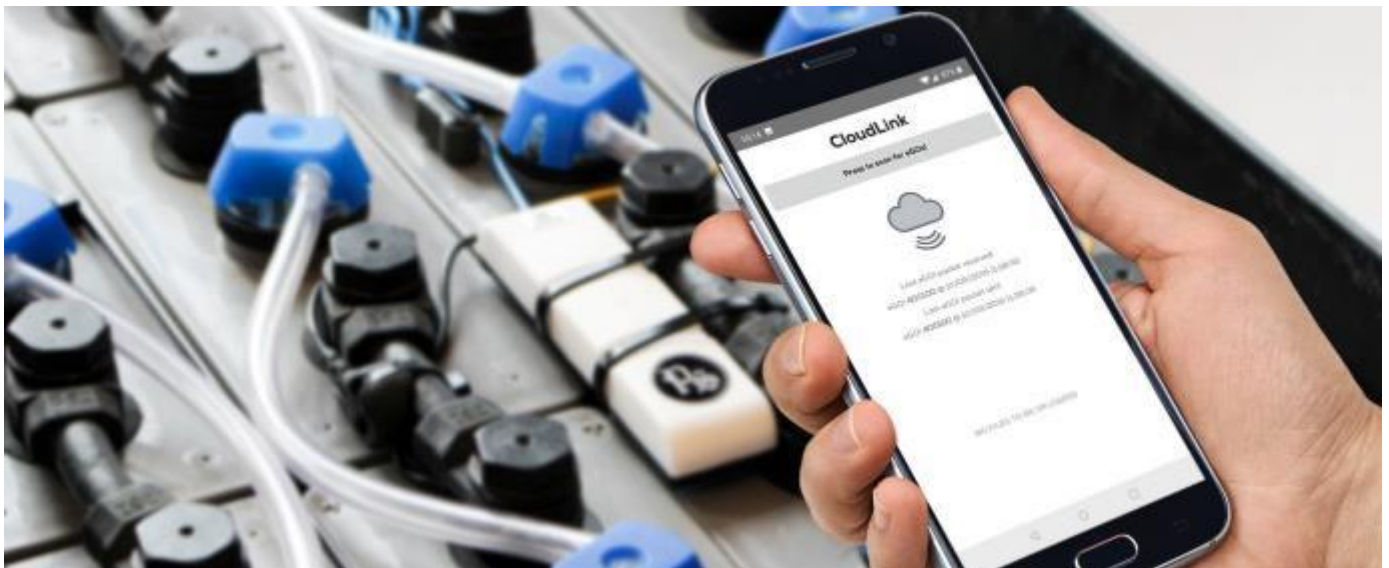
Advantages
+ Quick and easy to install: Only three leads: two to connect power and one for the electrolyte probe. Complete the fields in the eGOcTools app with the battery information and press send.
+ Easy to use: Simply log onto www.batterymanagement.net to view your battery information.
+ Real-time email alerts can be configured to each site's requirements across multiple parameters (with CloudLink and an Internet connection).
+ Offers battery replacement date predictions.
+ Multiple user profiles can be provided depending on needs and access permissions. From the administrator who has full access, through management tiers, to a user who can only view reports.
+ The batterymanagment.net API can be integrated into many third party online reports such as forklift management systems.
+ Multi-language reports are available in English, Korean, Japanese, Spanish, French, German, Dutch, Italian, Portuguese, Serbian, Slovak, Czech, Hungarian.
+ When using the iTAG system and reports, batterymanagement.net provides in-depth battery asset records, including condition histories and service records which complement the eGOc reports.

❓ Extra info ❓	
Reverse Polarity Protection	Connecting 'the wrong way round' will not damage it.
SmartDelay	The SmartDELAY optimises battery filling whilst preventing boil-over. The electrolyte level in a battery can rise and fall several times a day, with SmartDELAY the LED only turns red once the electrolyte level has been low for over 24 hours (5 day optional), reducing the risk of incorrect topping and reducing the topping frequency.
SmartSense	Programme that confirms electrolyte level is below the probe.

3.1.3 iBOS Management System
Battery room management that extends battery life and effectiveness.

Site tests have shown that if battery selection is left to an operator, 30% of the batteries will be underutilized and 20% will be overused. The result: uneven battery usage, premature battery failure and lost productivity.

The iBOS® (Intelligent Battery Organizing System) with Real-Time Monitor enables the most cost-effective utilization of your pool of batteries. It ensures proper battery rotation, which is critical to long battery life and maximum run time. iBOS monitors all batteries in a pool and eliminates operator judgment in battery selection by determining which battery has had the longest cooling time since charging. Once charged, each battery is placed in queue. The simple-to-use iBOS "read and react" Display then tells the operator which battery to take. An audible alarm called the "Shouter" alerts the operator when the wrong battery is taken. And the Real-Time Monitor provides all the information needed to efficiently manage the battery pool.

How it works:

237
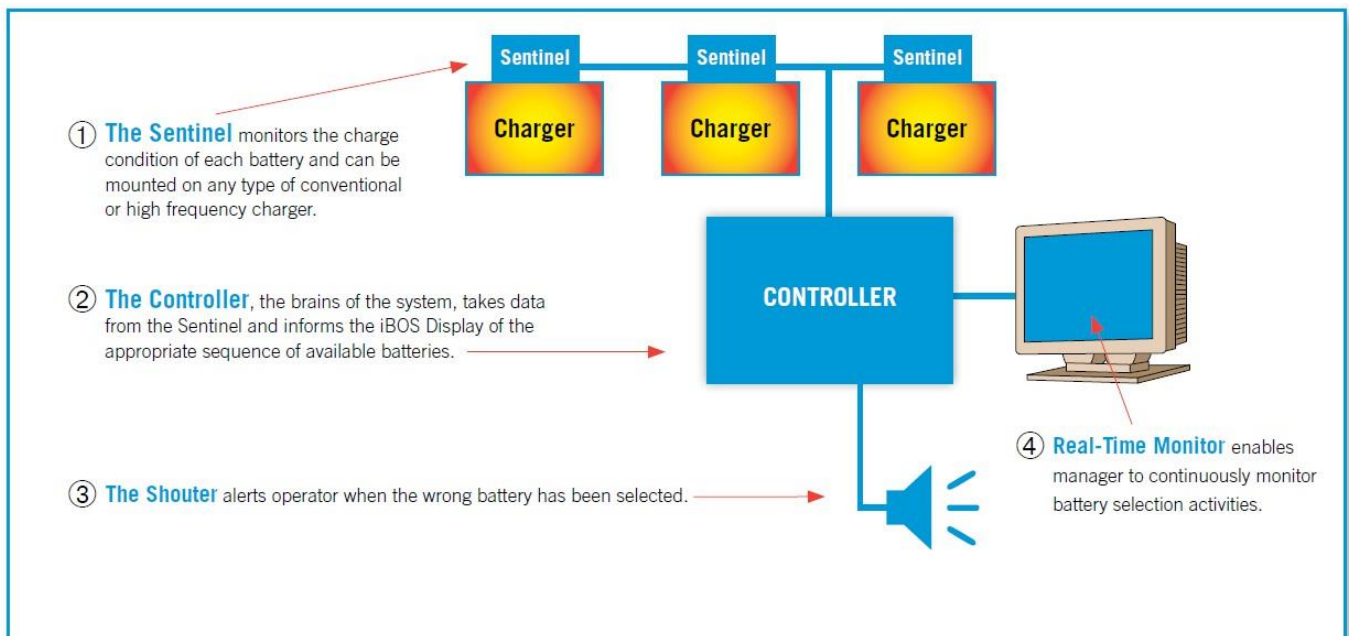
With the iBOS Real-Time Monitor, a battery room manager can use an on-site computer to continuously monitor battery selection activities. It provides information in an easy-to-understand manner, signalling the manager when one of our five alert conditions is triggered:

1. Battery availability low – when no charged batteries (or any number a manager chooses) are available.

2. Mis pick – when an operator chooses the wrong battery or if the battery picked is still charging.

3. Short charge duration – when a battery takes less than three hours (or any duration the manager chooses) to charge. This may indicate a low capacity battery or that an operator is returning a battery for recharging too soon.

4. Charger no start – when a charger does not turn on when a battery is connected — sometimes due to an over-discharged battery.

5. Cool down time – when a battery is picked before a pre-selected length of cool-down time, potentially reducing the life of the battery

iBOS Features

• Easy-to-use "read and react" system.

• Large scrolling display tells forklift operators the "correct" battery to pick next. Displays are available in multiple languages.
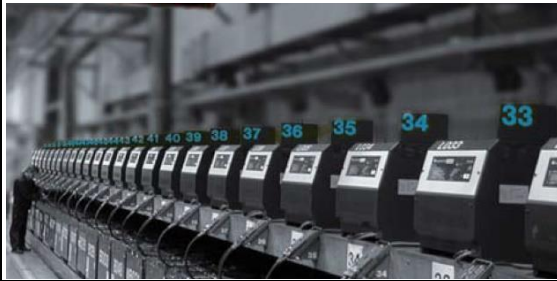
• Shouter sounds an alarm when operator takes a battery that is not fully charged, reducing mis picks.

• Real-Time Monitor provides all the information needed to efficiently manage the battery pool.

• Works with virtually any charger.

iBOS Benefits

• Promotes longer battery run time and life through uniform usage.

• Improves operator productivity.

• Identifies faulty equipment.

• Helps managers decide if there are too many or too few batteries in the pool.

iBOS Basic, Plus and Pro

	iBOS Basic	iBOS Plus	iBOS Pro
Number of Chargers	50	100	200
Number of Battery Pools*	1	9	9
Compatible with All Chargers	✔	✔	✔
Blue"Pick Light" to Indicate Correct Battery	✔	✔	✔
Universal Voltage Sentinel	✔	✔	✔
Daisy Chain Wiring with Cable Included	✔	✔	✔
Built-in Shouter	✔	✔	✔
Built-in Touch Screen	�’✘	✔	✔
7 Days On-Site Data	✘	✔	✔
Built-in Configuration Wizard	✘	✔	✔
Optional Web-Based Reporting	✘	✔	✔
Optional 3G Modem for Web Connectivity	✘	✔	✔
Built-in UPS	✘	✘	✔
Optional Wireless Display	✘	✘	✔
Optional Remote Shouter	✘	✘	✔

* a pool is a group of the same battery type.

239

Parts included in the standard iBOS kits

Picture	Ordering code	Description
	BOS-CB6400EU	iBOS Controller, iBOS 6 Basic, 50-Chargers 1-Pool EU
	BOS-B-PCEU	IEC Power cable
	BOS-143	iBOS Extension Cable Lead & Coupler RJ12 L=8,0m/25ft • *2 pieces included in set*
	BOS-SU6000R	iBOS Sentinel 6 c/w QT & Report • *RJ12 Cable L=2,0m included* • *Quantity depends on the number of chargers (maximum 50)*

iBOS Basic Kit

240

iBOS Plus Kit

Picture	Ordering code	Description
	BOS-CB6500EU	iBOS Controller, iBOS 6 Plus, 100-Chargers, 9-Pools EU
	BOS-B-PCEU	IEC Power cable • *2 pieces (for UPS and iBOS)*
	Not available separately	iBOS Extension Cable Lead & Coupler RJ12 L=15m/50ft • *4 pieces included in set*
	BOS-200	iBOS Extension CAT6 Cable & Coupler RJ45 L=15m/50ft
	BOS-SU6000R	iBOS Sentinel 6 c/w QT & Report • *RJ12 Cable L=2,0m included* • *Quantity depends on the number of chargers (maximum 100)*
	BOS-511	Certa UPS C60/800

iBOS Pro Kit

Picture	Ordering code	Description
	BOS-CB6700EU	iBOS Controller, iBOS 6 Pro, 200-Charger, 9-Pools EU
	Not available separately	Mounting bracket for IBOS Pro controller
	BOS-B-PCEU	IEC Power cable • *2 pieces (for UPS and iBOS)*
	Not available separately	iBOS Extension Cable Lead & Coupler RJ12 L=15m/50ft • *8 pieces included in set*
	BOS-200	iBOS Extension CAT6 Cable & Coupler RJ45 L=15m/50ft
	BOS-231	5-way adapter for TV driver connection
	BOS-SU6000R	iBOS Sentinel 6 c/w QT & Report • *RJ12 Cable L=2,0m included* • *Quantity depends on the number of chargers (maximum 200)*
	BOS-511	Certa UPS C60/800

242

iBOS Options

Picture	Ordering code	Description
	BOS-143	**iBOS Extension Cable Lead & Coupler RJ12 L=8m/25ft** • *Included in iBOS Basic*
	Not available separately	**iBOS Extension Cable Lead & Coupler RJ12 L=15m/50ft** • *Included in iBOS Plus and Pro*
	BOS-161	**iBOS Extension Cable Lead & Coupler RJ12 L=30m/100ft**
	BOS-224	**iBOS Sentinel Mounting Bracket, Galv. Steel**
	BOS-226	**iBOS Sentinel Cable Lead RJ12 L=1.0m/3ft Type 'B'**
	BOS-227	**iBOS Sentinel Cable Lead RJ12 L=1.5m/5ft Type 'B'**
	BOS-228	**iBOS Sentinel Cable Lead RJ12 L=2.0m/7ft Type 'B'** • *Standard length – included in Sentinel*
	BOS-229	**iBOS Sentinel Cable Lead RJ12 L=3.0m/10ft Type 'B'**
	HDMI-2PS	**HDMI splitter cable - 2 ports (Full HD, Passive)**
For other options or extra features, please contact us		

243

iBOS TV Driver – optional for iBOS Plus and Pro

Picture	Ordering code	Description
	BOS-HDS6N2	iBOS HD Next Module Sentinel 6 PLUS Panel (w/o TV Screen)*
	BOS-HDS6N	iBOS HD Next Module Sentinel 6 PRO Panel (w/o TV Screen)*

*This set includes: the HD Next Module Sentinel, Power adapter, Mouse, HDMI Cable, RJ45 Cable and RJ45 to HDMI Converter.

*RJ45 to HDMI Converter only applicable for iBOS Plus.

*Monitor not included. Any TV-screen or monitor with HDMI-port can be used.

Set-up TV-driver for iBOS PLus

244

Set-up TV-driver for iBOS Pro

Monitor
(NOT INCLUDED)

HDMI
Cable

PPT   102

REACH   109

iBOS Next Module
Sentinel

Mouse

RJ45 Cable

Power Adapter
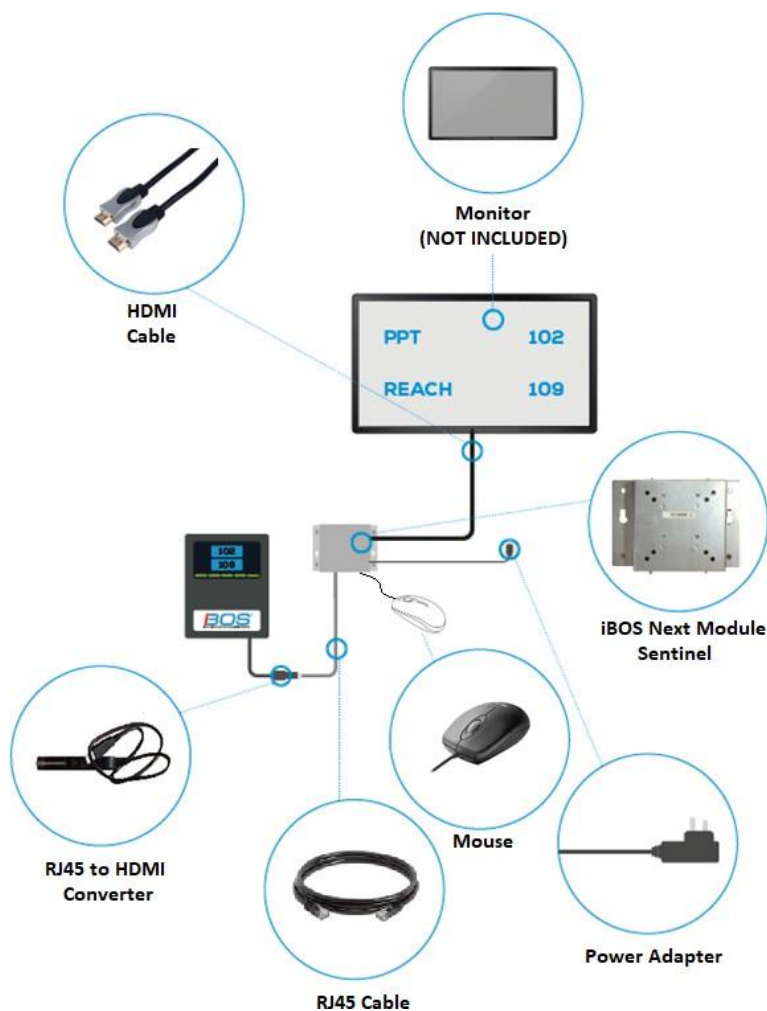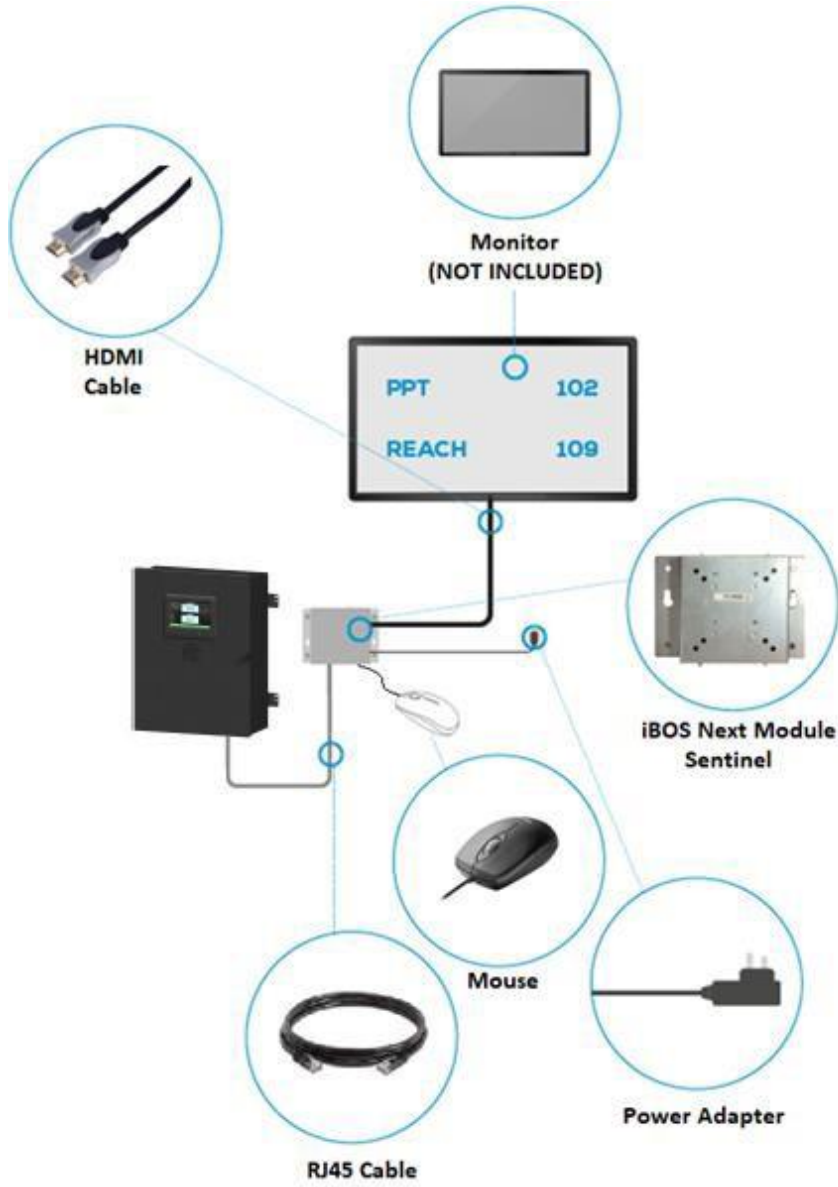
Sentinel LED status

Picture	Description
	Green LED = Communication Status: A solid green light indicates a good connection to the Controller. All Sentinels™ should have a solid green light. Upon initial connection, the green light will flash fast, then slower, before settling at solid green. If the green light remains flashing fast, check the wire connection to the Sentinel™.
	Amber LED = Charging Status: When the amber light is on, the battery is connected. If the amber light does not turn on, check the Flexi-Tap connections to ensure that the pins have fully penetrated the cables.
	Blue LED = Next Battery to Pick: A slow, blue flashing light indicated the next battery to pick in that pool. If you do not want to use the blue light as a pick light indicator, it can be turned off in the settings panel.

246

iBOS World Web Service

• Enables the remote review and analysis of battery room performance — at a single facility or at multiple sites.

• Identifies faulty chargers and other equipment problems that might otherwise go unnoticed.

• Avoids disruptions to operations caused by too few batteries.

• Verifies optimum battery to truck ratio.

• Management reports give information on asset utilization and availability and proper battery rotation.

• Data is displayed in time increments specified by the user.

• Enables the analysis of long-term trends and seasonal battery usage.

• Supports energy management by facilitating off-peak charging.

• Allows management to benchmark a facility and compare its performance to other facilities.

• Access to the data is limited and controlled.

• 5 years of available data.

• Any Web browser can be used to access data.

• Saves money by helping avoid the purchase of unneeded batteries.

• Helps establish correct number of batteries needed and provides independent justification for battery and charger purchases.

• With the iBOS World™ Web Service (www.iBOSWorld.com), management can optimize assets by analysing battery performance and creating reports remotely on the Internet.

• iBOS World Web Service subscriptions are available in one-, three- and five-year plans.
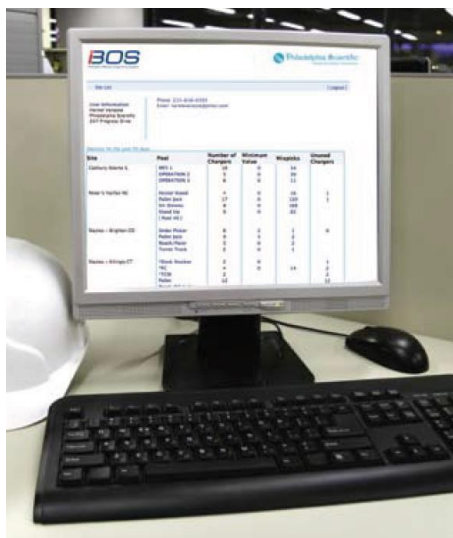
3.2 Abertax Technologies

3.2.1 Capacitive Level Sensor

CLS Capacitive Battery

Electrolyte Level Sensor for all flooded lead acid batteries

Description

The New ABERTAX® CLS Capacitive Battery Electrolyte Level Sensor uses Patented Technology which
allows numerous advantages over all other sensors on the market. Green light indicates that the electrolyte
is at or above the specified minimum level. Flashing red indicates that the electrolyte is below minimum.

Product and Safety Features

- Patented Technology that eliminates electrolytic corrosion between the probe and cell plates
- Easiest installation in the shortest time by qualified service personnel
- Allows installation in any of the 6 cells supplying the sensor
- Supply wires are fed from opposite ends of the sensor to eliminate wire loops and allow maximum isolation
- Protected against transient voltages
- Protected against over-current in all three possible paths
- Sensor not damaged by wrong polarity connection
- Protected against electro-magnetic interference
- Patented connector that ensures a perfect battery seal
- Connector designed for Bolted type of Batteries (WLW*); other connectors for Welded type also available
- Acid-resistant body with grommets to ensure a perfect seal between the wire and housing
- Sensor probe with Gauge Guard to protect probe from touching the seperators

248

WLW - Washer with leading Wire

Installation on battery

SENSOR OR PROBE WITH GAUGE GUARD — GAUGE GUARD, DRILLED HOLE — **A**

SENSOR OR PROBE WITHOUT GAUGE GUARD (WITH O-RING) — PROBE, AIR-AGITATION HOLE — **B**
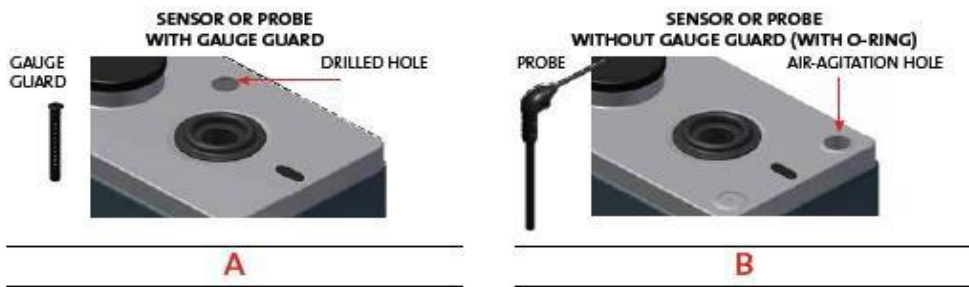
For correct Sensor type refer to selection table on left.
For Installation Instructions see overleaf

2mm

Battery cross-section showing installed Sensor with Gauge Guard
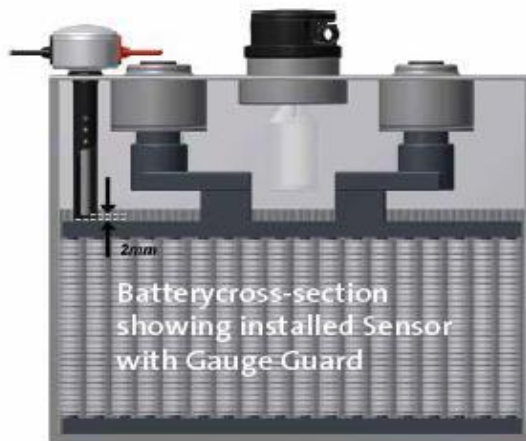
Mechanical construction

The New Patented Abertax® CLS(Capacitive Level Sensor) has an acid-resistant housing with grommets for a perfect seal between the wire and housing. To ensure an accurate installation of the Sensor, only the special Abertax drill should be used.

The Gauge Guard has three functions:
- Protection of the Probe from touching the plate seperators in the Battery.
- Provision of a good seal between the Probe and the Battery lid.
- Ensuring the correct length of the Sensor probe.

The Probe can be installed in any cell between the supply Voltage Cells.

Technical specifications

Supply voltage	12V (6 x 2V cells)
Current consumption	<20mA
Operational temperature range	-25…+80°C

249

Available Sensor Types

Example: CS-GG-127-SS-4

Capacitive Level Sensor:

Probe:
GG   Sensor or probe with Gauge Guard
ST   Sensor or probe without Gauge Guard (with o-ring)

Probe Length:
127   Long probe 127 mm
077   Standard probe 77 mm

Sensor:
SS   Standard sensor
BC   Sensor for mounting between cells
CT   Sensor for mounting on cable (with strapping bracket)
MLBC   Multilayer sensor with external housing between cells
MLCT   Multilayer sensor with external housing on cable (with strapping bracket)
DB   Sensor with remote led and lens mounted in dashboard
CM   Sensor with remote led mounting between cables

Connection:
4   Terminal connector
S   Standard connection
1   WLW connector

250

3.2.2 BMS
BMS Battery Monitoring SYSTEM

Description

The BMS is another quality product from Abertax Technologies. It gives essential battery information i.e. full voltage, half voltage, temperature and electrolyte level. It stores the number of charge/discharge cycles, temperature, electrolyte low level duration and deep discharge duration.

The sensor has 3 LEDs, which indicate the following:

- Flashing green: when powered and no warnings
- Flashing red: electrolyte level below specified minimum for flooded batteries and low voltage for maintenance free batteries
- Flashing yellow: battery temperature above 50°C

251

Product and Safety Features

- Easiest sensor to install in shortest time by personnel familiar with servicing and/or use of batteries

- Patented connector that ensures a perfect battery seal

- Not affected by current due to parasitic resistance

- Not affected by wrong polarity connection

- Acid resistant

- Level probe with Gauge Guard (for flooded batteries)

- Protected against electro-magnetic interference

- Not affected by inductive currents

Installation
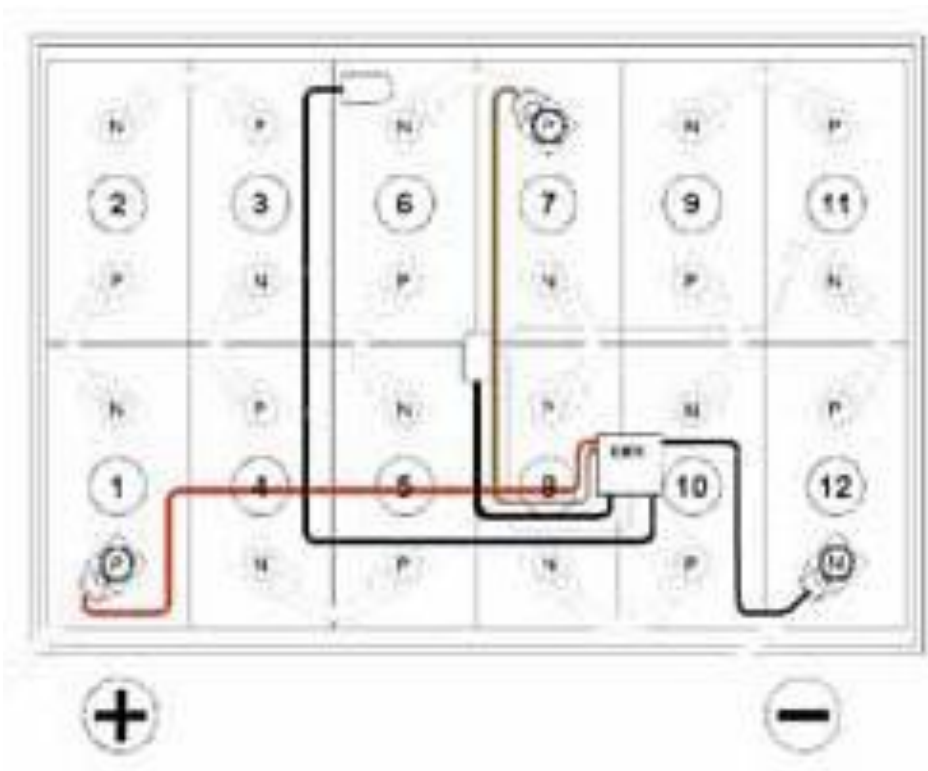
Software

Stored data can be downloaded for evaluation. The available software will display: on time, discharge time, number of charge and discharge events, low acid level time, over temperature time, battery/ambient temperature and full/half battery voltage. Data can be downloaded via cable or wireless (Bluetooth).
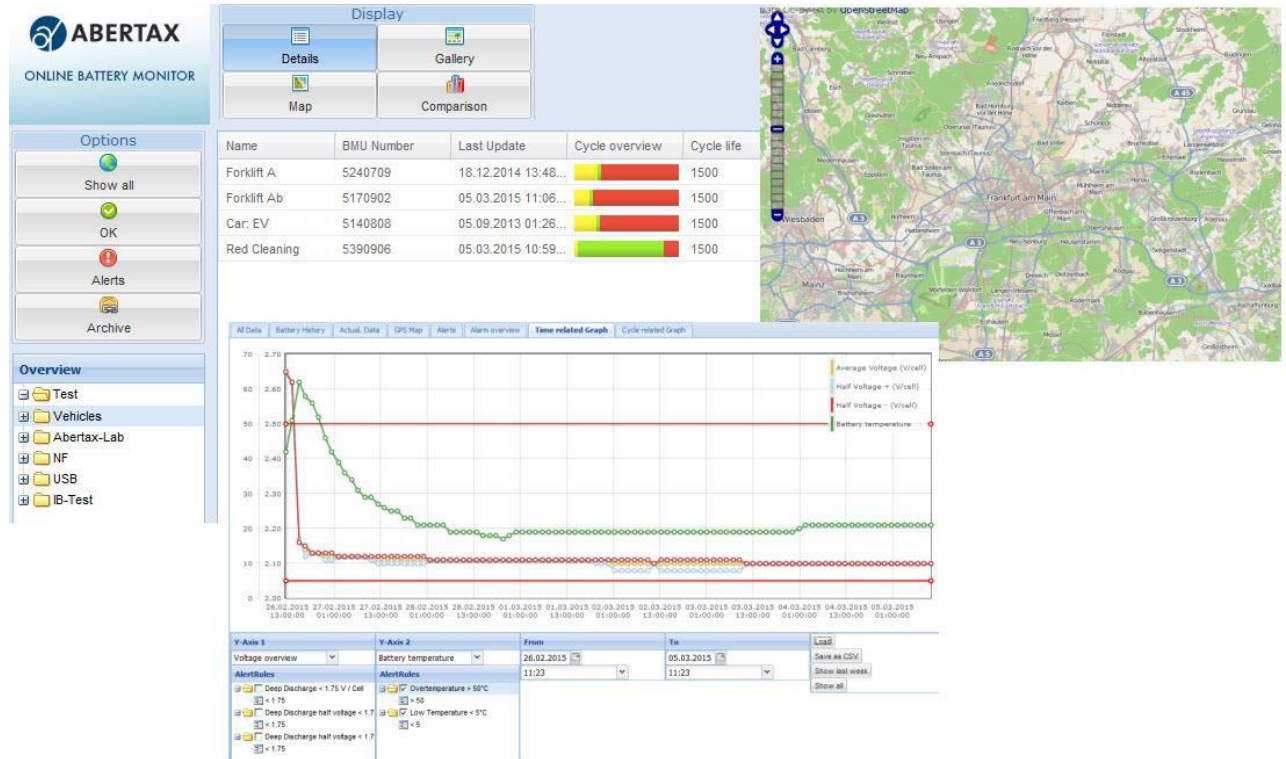
Mechanical Construction

Abertax sensors have an acid resistant housing. It features an additional cable for communication with the computer. For flooded batteries probe and Gauge Guard have to be ordered to length. The Abertax drill should be used for drilling the Gauge Guard hole.

Technical Specifications

Supply voltage	8V – 130V
Current consumption	<33mA
Operational temperature range	-25…+80°C
Serial Interface	9.6k Band, 3.3V level
Temperature set point	50)C
Weight	185gr

253

Available Models

Example: BMS-G127-M04-24

Battery Management Unit/ Battery Monitoring Sensor:
BMS   Battery Monitoring Sensor

Probe:
G   Probe with Gauge Guard

Probe Length:
77   Short probe 77 mm
127   Long probe 127 mm

Connection:
M04   Terminal connector
WLW   WLW connector
S   Standard connector

Voltage:
24   24V
36   36V
48   48V
72   72V
80   80V
96   96V

254

3.2.3 e²BMS

e²BMS Battery Monitoring SYSTEM

Description

e²BMS is a state-of-the-art wireless technology for operation cost-cutting and providing a quality service. Opens new opportunities in material handling applications, saving up to 20% in costs.

Product and Safety Features

Easy to install in shortest time by personnel familiar with servicing and/or use of batteries

- Does not require personnel in the field to retrieve data (Online version)

- Wide operational voltage range

- Current measurement (Option)

- Two voltage inputs, string and half voltage

- Two temperature measurements

- Electrolyte level sensing

- Uploading of logged data to server via GPRS/3G (Online version)

- RF communication on site with other nearby modules & sensors
- Accessed using Internet Browser (Internet Explorer, Safari, Chrome, Firefox) on any internet

  enable device (PC, Laptop, Smartphone, Tablet) (Online version)

- No software installation required

- Different access levels (RF-USB, RF-WIFI, RF-LAN, RF-CAN)

- Display location of e² (Online version)

255

Installation
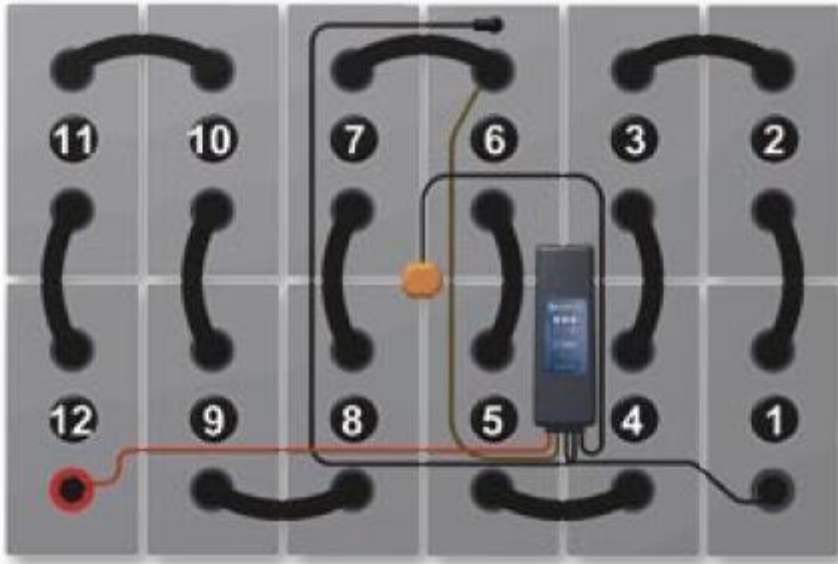
OBM Web Portal – Online Monitoring of Data

- Gallery display shows immediate indication of the status of each battery in the fleet. Systems that are marked red show that an alarm has occurred.

- Data samples such as voltage, low acid level, temperature,

etc., are displayed in the form of a table. Data can be exported and opened by a spreadsheet program.

- Variable sampling rate as defined by user.

- Graphs of any two of the logged data, e.g. temperature and voltage (including + and – half voltage)

256

- Display live Alarms of any battery parameter/condition e.g. low electrolyte level, high temperature, depth of discharge, etc.- Rectification of any problems before damage is done to the battery.

- Alarm notification via email.
- Online report generation.
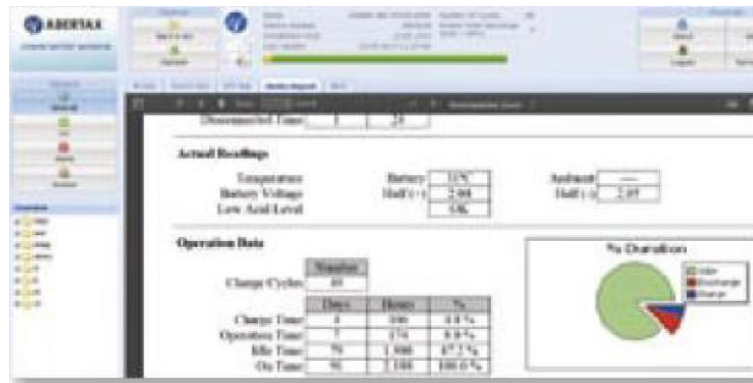
3.3 Curtis
3.3.1 Battery Discharge Indicators

BATTERY DISCHARGE CONTROLLER – TYPE 900
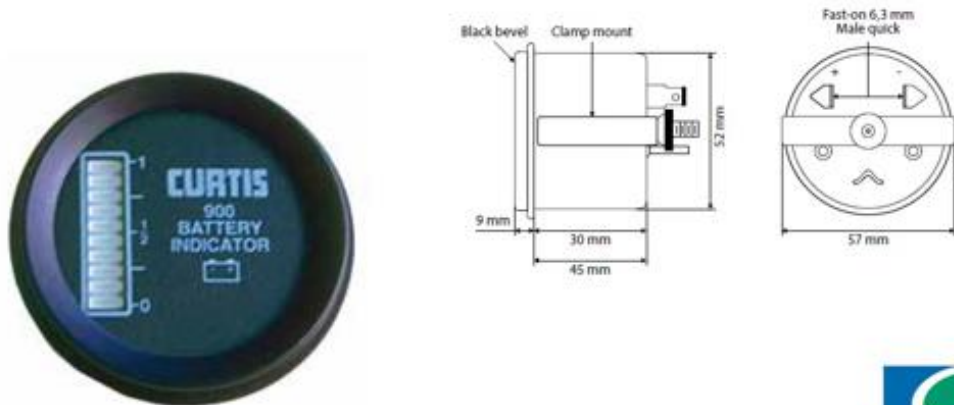
- Diameter: 52 mm
- Without lock-out*
- Product Code: BDC24 (24V) and BDC48 (48V) and BDC80 (80V)

BATTERY DISCHARGE CONTROLLER – TYPE 901
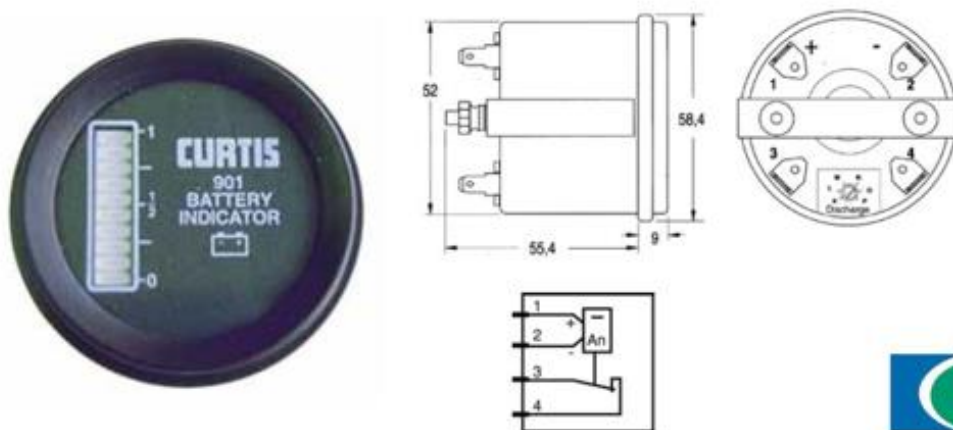
- Diameter: 52 mm
- With lock-out*
- Product Code: BDC24-L (24V) and BDC48-L (48V) and BDC80-L (80V)

(*) Lock-Out function: Shuts down the lift-function at low battery level, so the truck can still drive to the charging station.

3.4 Frötek

3.4.1 Level Indicators

The FRÖTEK Level Indicator is a product intended to indicate the battery electrolyte level of lead-acid batteries during operation. Basically, it consists of a housing with an optical alarm system onto which a long bar with external insulation is mounted in such a way that this bar, if inserted through a battery lid, touches the electrolyte. Furthermore, at least one or, depending on the model concerned, several cables for voltage supply or signal transmission are connected to the housing.

<u>Functions and Features:</u>

Basic Functions: When the FLI has contact with the electrolyte, it flashes green.

When it has no contact, the signal will go out in case of the basic-model, or, in case of the Advanced Ad-model, a red flashing signal will appear.

Level verification: Prior to each flashing of the LED, the FLI will perform a level check. In order to achieve this, the unit tries to run a test current of I ≈ 25mA for a period of approx. t = 380 µs.

If this is possible, the contact to the electrolyte is deemed secured and the green LED will flash.

If not, the LED will go out or emit red flashes. This program's step is to prevent creepage current causing false indications. If contact is made only through creepage, then the signal indicating a low electrolyte level will be emitted. This applies also to the FLI, which will normally not emit red flashes.
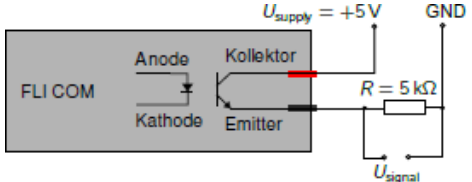
Spilling hysteresis function (Ad-models only): In order to avoid too frequent switching of the Ad-FLI, the switching behaviour are dampened by an asymmetric switching delay:

• Green LED flashes. Contact to the electrolyte interrupted. Switching to the red signal after 25-40 seconds

• Red LED flashes. Contact to the electrolyte is made. Switching to the green signal after 8-12 seconds Permanent shortage of water indicator (Ad-models only): The longer contact to the electrolyte is interrupted, the faster the red LED of the Ad-FLI will start to flash. The following rule of thumb applies: "One Hz of flashing frequency for every day´´. After a period of approx. 5 days, the Ad-FLI will permanently emit red flashing signals.

259

Technical data			
	Basic Level Indicator	**Advanced Level Indicator**	**Advanced Level Indicator with Remote display**
LED Indications — Level OK	Green	Green	Green
LED Indications — Fill now	No light	Red symmetrical pulse, depending on time	
Voltage Tap Cable Length (l_{neg})	600 mm		
Second Voltage Tap Cable Length (l_{pos})	✖	200 mm	
Signal Cable Length (l_{remote})	✖	✖	2000 mm
Assessment Voltage	12V		
Operating voltage	6 – 14V		
Assessment current	30 mA		
Average operating current	15 mA		
Fuse Current	125 mA		
Electrolyte Probe Current	25 mA		
Inverse Polarity Protection Limit	-50 V (-160 V for electronic version)		
Limit Resistance Level Detection	400 Ω		
Cable Assessment Voltage	250 V		
Cable Test Voltage	1,5 kV		

260

Max. Collector-Emitter Voltage	80 V (only applicable for electronic version)	
Max. Emitter-Collector Voltage	6 V (only applicable for electronic version)	
Maximum Collector Current	50 mA (only applicable for electronic version)	
Typical Collector Current	5 mA (only applicable for electronic version)	Example of a circuit for the version(s) with electronic output
EMC-test passed according to	EN61326-1	
Operation Temperature Range	-20/85°C	
Standard probe length	140 mm	
Minimum remaining Electrode Length after Cut-Off	30 mm	
Assembly Hole Diameter	8 mm	
Lead Electrode Diameter	3 mm	
Non-Halogen	✔	
IP-class (EN60529)	- if using a terminal bolt without inspection hole : IP66 - if using a terminal bolt with inspection hole : IP36B - if using the pin-tap : IP65 - if using the ring lug (screw) tap: IP00 (the housing accords to IP66)	
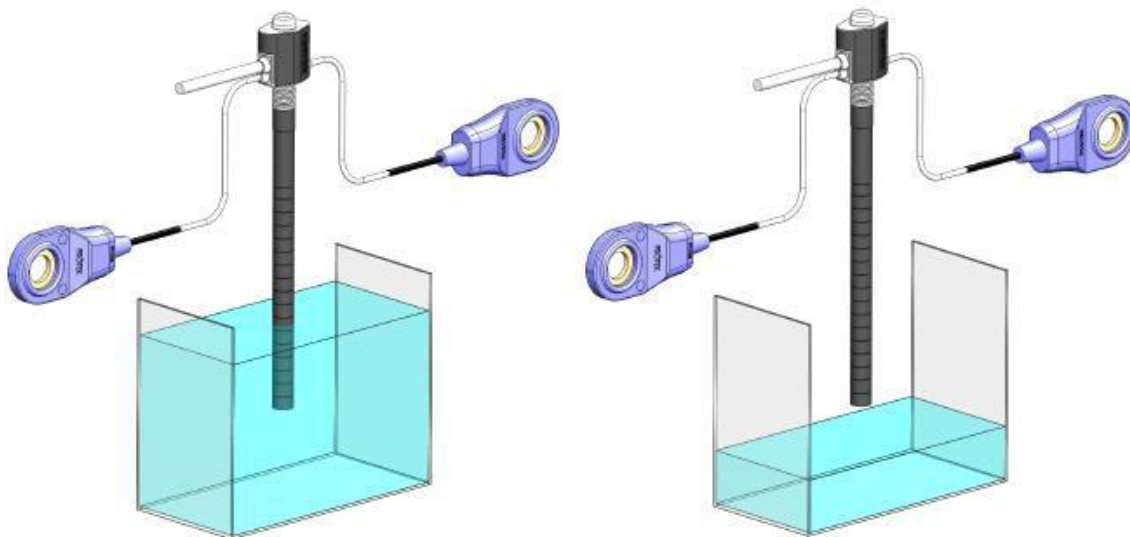
Version	Ordering code	Description	Connection
	FS-SB-B	Basic Frötek Level Indicator	
	FS-AB-B	Advanced Frötek Level Indicator	
	FS-AR-B	Advanced Frötek Level Indicator with Remote Display	*Standard*

Other Version
Also available with electronic signal output • *for these versions, please contact us*
Also available with other connections • *for these versions, please contact us*

With voltage tap	
With cable lug M4	
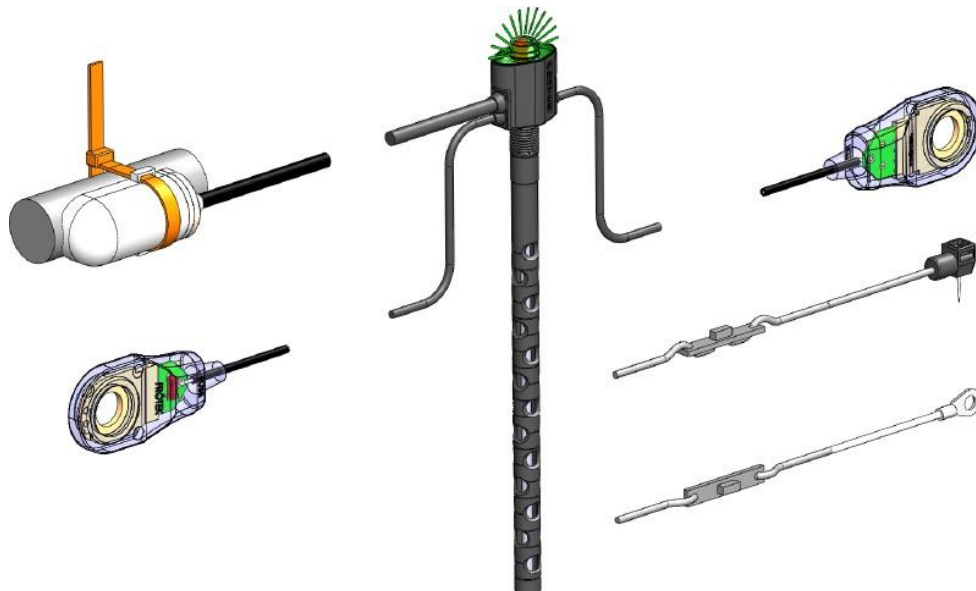
4. Aqua Accessories

4.1 BFS

4.1.1 Water Filling Systems

The BFS System:

A Synthesis of Technology and Design.

Battery service and care can be a complicated and time-consuming process that is not without its dangers. An automatic battery watering system is the best alternative – for several reasons:

Efficient – You don't need to remove caps by hand and water cells manually.

Precise – Electrolyte is reliably filled to exactly the same level. Safe – No risk of injuring yourself with battery acid.

Time-saving – The time required to water a battery is reduced significantly. Cost-saving – Saving time means saving money.

Push-in Plugs

	Push-in Plug III A51000	Push-in Plug IV A4N000	Push-in Plug IV with float housing A4N 540/580/620/660/700/780/860
Vent Size Battery	35 mm (S35)		
Construction Height	21 mm	20 mm	20 mm
Min Casing Depth	46 mm	44 mm	60 mm
Float Stroke	4 mm		
Valve Stroke	1,6 mm		
Leverage	2,4:1		
Min. Filling Pressure	0,2 bar		
Max. Filling Pressure	3,8 bar		
Flow Rate at 0,3 Bar	1650 ml/min	2050 ml/min	2050 ml/min
Flow Rate at 0,4 Bar	2030 ml/min	2540 ml/min	2540 ml/min
Flow Rate at 0,5 Bar	2420 ml/min	3150 ml/min	3150 ml/min
Flow Rate at 1,0 Bar	3600 ml/min	5100 ml/min	5100 ml/min
Flow Rate at 3,0 bar	6750 ml/min	8700 ml/min	8700 ml/min

264

Bayonet Plugs

	Bayonet Plug III B51000	Bayonet Plug IV B4N100	4-Bayonet Plug III H51000	4-Bayonet Plug IV H4N000	Tall Bayonet Plug III G51000
Vent Size Battery (bayonet)	24 mm (European std)		29 mm (Asian std)		24 mm (European std)
Construction Height	34 mm	21 mm	32 mm	21 mm	45 mm
Min Casing Depth	32 mm	43mm	34 mm	43 mm	21 mm
Float Stroke	4 mm				
Valve Stroke	1,6 mm				
Leverage	2,4:1				
Min. Filling Pressure	0,2 bar				
Max. Filling Pressure	3,8 bar				
Flow Rate at 0,3 Bar	1650 ml/min	2050 ml/min	1650 ml/min	2050 ml/min	1650 ml/min
Flow Rate at 0,4 Bar	2030 ml/min	2540 ml/min	2030 ml/min	2540 ml/min	2030 ml/min
Flow Rate at 0,5 Bar	2420 ml/min	3150 ml/min	2420 ml/min	3150 ml/min	2420 ml/min
Flow Rate at 1,0 Bar	3600 ml/min	5100 ml/min	3600 ml/min	5100 ml/min	3600 ml/min
Flow Rate at 3,0 bar	6750 ml/min	8700 ml/min	6750 ml/min	8700 ml/min	6750 ml/min

Threaded Plugs

	Threaded Plug III M27 C51000	Threaded Plug IV M27 C4N000	Threaded Plug III M30 D51000	Threaded Plug III C35 E51000	Threaded Plug III M36 F51000
Vent Size Battery (thread)	M27		M30 x 2	C35	M36
Construction height	31 mm	20 mm	31 mm	31 mm	31 mm
Min Casing Depth	35 mm	44 mm	35 mm	35 mm	35 mm
Float Stroke	4 mm				
Valve Stroke	1,6 mm				
Leverage	2,4:1				
Min. Filling Pressure	0,2 bar				
Max. Filling Pressure	3,8 bar				
Flow Rate at 0,3 Bar	1650 ml/min	2050 ml/min	1650 ml/min	1650 ml/min	1650 ml/min
Flow Rate at 0,4 Bar	2030 ml/min	2540 ml/min	2030 ml/min	2030 ml/min	2030 ml/min
Flow Rate at 0,5 Bar	2420 ml/min	3150 ml/min	2420 ml/min	2420 ml/min	2420 ml/min
Flow Rate at 1,0 Bar	3600 ml/min	5100 ml/min	3600 ml/min	3600 ml/min	3600 ml/min
Flow Rate at 3,0 bar	6750 ml/min	8700 ml/min	6750 ml/min	6750 ml/min	6750 ml/min

Clip-in Plugs

		Clip-in Plug III I51000	Clip-in Plug IV I4N000	Clip-in Plug IV for 4-Bayonet I4NV00	Clip-in Plug IV I4N260	Clip-in Plug IV I4N330	Clip-in Plug IV I4N420
Vent Size Battery (bayonet)		24 mm (European std)		29 mm (Asian std)	24 mm (European std)		
Construction Height		34 mm	21 mm	21 mm	21 mm	21 mm	21 mm
Min Casing Depth		32 mm	43mm	43mm	55 mm	62 mm	71 mm
Float Stroke		4 mm					
Valve Stroke		1,6 mm					
Leverage		2,4:1					
Min. Filling Pressure		0,2 bar					
Max. Filling Pressure		3,8 bar					
Flow Rate at 0,3 Bar		1650 ml/min	2050 ml/min	2050 ml/min	2050 ml/min	2050 ml/min	2050 ml/min
Flow Rate at 0,4 Bar		2030 ml/min	2540 ml/min	2540 ml/min	2540 ml/min	2540 ml/min	2540 ml/min
Flow Rate at 0,5 Bar		2420 ml/min	3150 ml/min	3150 ml/min	3150 ml/min	3150 ml/min	3150 ml/min
Flow Rate at 1,0 Bar		3600 ml/min	5100 ml/min	5100 ml/min	5100 ml/min	5100 ml/min	5100 ml/min
Flow Rate at 3,0 bar		6750 ml/min	8700 ml/min	8700 ml/min	8700 ml/min	8700 ml/min	8700 ml/min

Plugs with Central Degassing

	Push-in Plug III with Central Degassing A51220	Bayonet Plug III with Central Degassing B51220	Threaded Plug III with Central Degassing C/D/E/F51220
Vent Size Battery	35 mm (S35)	24 mm (bayonet, European std)	Thread C: M27, D: M30x2, E: C35, F: M36
Construction Height	21 mm	34 mm	31 mm
Min Casing Depth	46 mm	32 mm	35 mm
Float Stroke	4 mm		
Valve Stroke	1,6 mm		
Leverage	2,4:1		
Min. Filling Pressure	0,2 bar		
Max. Filling Pressure	3,8 bar		
Flow Rate at 0,3 Bar	1650 ml/min	1650 ml/min	1650 ml/min
Flow Rate at 0,4 Bar	2030 ml/min	2030 ml/min	2030 ml/min
Flow Rate at 0,5 Bar	2420 ml/min	2420 ml/min	2420 ml/min
Flow Rate at 1,0 Bar	3600 ml/min	3600 ml/min	3600 ml/min
Flow Rate at 3,0 bar	6750 ml/min	6750 ml/min	6750 ml/min

268
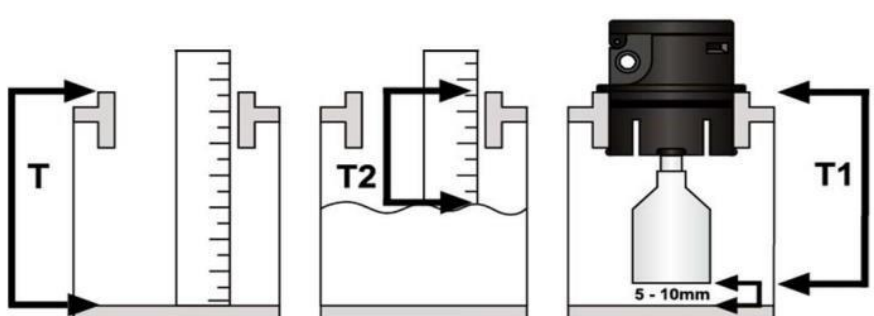
Special Plugs				
	Plug with Security Valve A31000*	Plug with Flame Arrestor I51FOV**	Special Plug IV V4N000***	Triple Unit X4N320
Vent Size Battery	35 mm (S35)	24 mm (bayonet, European std)	Bayonet R16	19mm size and a hole separation of 41.25 mm
Construction height	21 mm	34 mm	48 mm	29,5 mm
Min Casing Depth	46mm	32 mm	45 mm	50 mm
Float stroke	4 mm			
Valve stroke	1,6 mm			
Leverage	2,4:1			
Min. Filling Pressure	0,25 bar	0,2 bar		
Max. Filling Pressure	3,8 bar	3,8 bar	0,6 bar	1,5 bar
Flow Rate at 0,3 Bar	1650 ml/min	1650 ml/min	2050 ml/min	2050 ml/min
Flow Rate at 0,4 Bar	2030 ml/min	2030 ml/min	2540 ml/min	2540 ml/min
Flow Rate at 0,5 Bar	2420 ml/min	2420 ml/min	3150 ml/min	3150 ml/min
Flow Rate at 1,0 Bar	3600 ml/min	3600 ml/min	-	5100 ml/min
Flow Rate at 3,0 bar	6750 ml/min	6750 ml/min	-	-

Calculation of float size for traction batteries (T1) and stationary batteries (T2)

Type plug	Push-in				Bayonet/Clip-in				Threaded			
Plug code	A51000		A4N000		B51000 I51000		B4N000 I4N000		C/D/E/F 51000		C4N000	
Batterie	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
↓ Ordering code float ↓	mm		mm		mm		mm		mm		mm	
BFS-072214	41	29	-	-	28	14	40	26	31	17	41	27
BFS-072220	48	34	45	32	35	19	44	31	37	23	45	32
BFS-072224	52	38	49	36	39	22	48	36	41	26	59	35
BFS-072229	57	42	54	40	44	26	53	39	46	31	54	40
BFS-072234	62	46	59	44	49	31	58	43	51	35	59	44
BFS-072239	67	50	64	48	54	35	63	48	56	39	64	48
BFS-072244	72	55	69	53	59	39	68	52	61	44	69	53
BFS-072249	77	59	74	57	64	43	73	56	66	48	74	57
BFS-072259	87	67	84	65	74	52	83	65	76	57	84	65
BFS-071923	50	35	48	32	37	21	47	31	39	23	48	32
BFS-071926	53	37	51	34	40	23	50	34	42	26	51	35
BFS-071930	56	40	55	38	43	26	54	37	46	29	55	38
BFS-071934	60	44	58	41	46	30	57	40	49	32	58	41
BFS-071938	64	47	63	44	51	33	62	44	54	35	63	45
BFS-071942	68	50	67	48	55	36	66	47	58	39	67	48
BFS-071950	76	56	75	54	63	42	74	53	66	45	75	54
BFS-071958	84	63	83	61	71	49	82	60	74	52	83	61
BFS-071726	52	36	51	33	40	22	50	32	42	25	51	33
BFS-071733	59	41	58	39	46	27	57	38	49	30	58	39
BFS-071742	68	47	67	45	55	33	66	44	58	36	67	45
BFS-071432	58	35	-	-	46	23	56	34	49	26	57	33
BFS-071441	67	39	-	-	54	25	65	38	56	28	66	39

T = top of cell to top of separator

T1 = top of cell to base of float

T2 = top of cell to top of electrolyte level

5 - 10mm

The filling level T2 on the list is an average with a tolerance of +/- 2,0mm (0.075").
For stationary batteries mainly T2 is deciding!

Floats			
	Ordering code	**Diameter**	**Height**
	BFS-071432	14 mm	32 mm
	BFS-071441	14 mm	41 mm
	BFS-071726	17 mm	26 mm
	BFS-071733	17 mm	33 mm
	BFS-071742	17 mm	42 mm
	BFS-071923	19 mm	23 mm
	BFS-071926	19 mm	26 mm
	BFS-071930	19 mm	30 mm
	BFS-071934	19 mm	34 mm
	BFS-071938	19 mm	38 mm

271

	BFS-071942	19 mm	42 mm
	BFS-071950	19 mm	50 mm
	BFS-071958	19 mm	58 mm
	BFS-072214	22 mm	14 mm
	BFS-072220	22 mm	20 mm
	BFS-072224	22 mm	24 mm
	BFS-072229	22 mm	29 mm
	BFS-072234	22 mm	34 mm
	BFS-072239	22 mm	39 mm
	BFS-072244	22 mm	44 mm
	BFS-072249	22 mm	49 mm
	BFS-072259	22 mm	59 mm

272

Manual Plugs*					
	Manual Push-in Plug MAA000**	Manual Bayonet Plug MB0000	Manual Threaded Plug M27/M30/C35/M36 MC/D/E/F000	Manual Tall Bayonet Plug MG0000	Manual 4-Bayonet Plug MH0000
Vent size battery	35 mm (S35)	24 mm (bayonet, European std)	Thread C: M27, D: M30x2, E: C35, F: M36	24 mm (bayonet, European std)	29 mm (bayonet, Asian std)
Construction height	21 mm	34 mm	31 mm	45 mm	21 mm
Min Casing Depth	43 mm	-	-	-	-

Spare Parts – Accessories – Tools
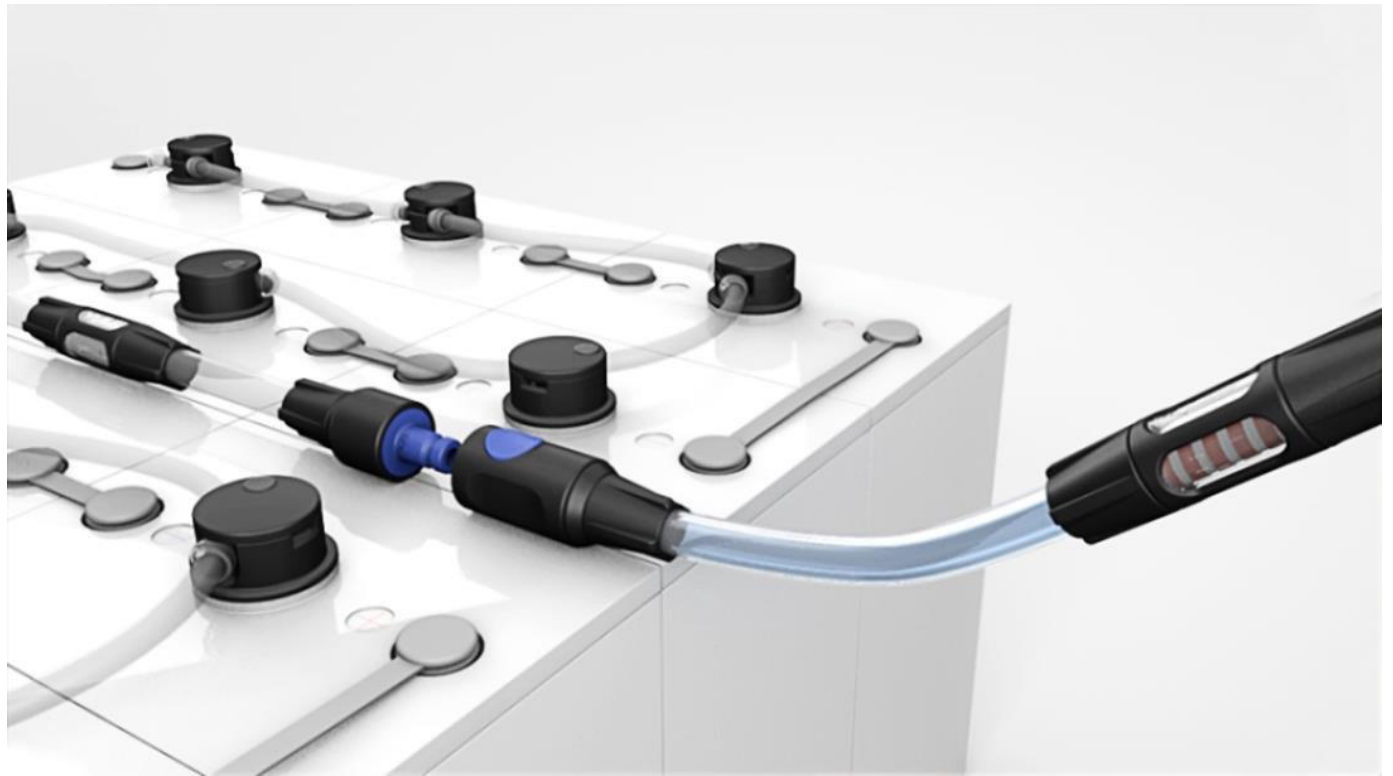
	Ordering code	Description	For
	09DI10	Gasket for plug – 1,0 mm	B4N100 / I4Nxxx
	09DI30	Gasket for plug – 3,0 mm	B51000 / G51000 I51000
	09RI45	Gasket for plug – 4,5 mm	H4N000 / H51000 I4NV00
	FRSCH06	PVC hose 6 x 1,5 mm	
	FRSCH10	PVC hose 10 x 14 mm	
	08KLE1	Hose Clamp NW10	
	08KLE6	Hose clamp NW6	
	08END6	End Piece NW6	

274

	09KUV1B	Quick coupling male NW10 (08KLE1B included)	
	09KUM1B	Quick coupling female NW10 (08KLE1B included)	
	09KUV6B	Quick coupling male NW6 (08KLE6B included)	
	09KUM6B	Quick coupling female NW6 (08KLE6B included)	
	09BKM6B	Quick coupling female NW6 (Air)	
	09BKV6B	Quick coupling male NW6 (Air)	
	09BKM1B	Quick coupling female NW10 (Air)	
	09BKV1B	Quick coupling male NW10 (Air)	
	08KLE6B	Hose clamp NW6 (for 09KUM6B and 09KUV6B)	
	08KLE1B	Hose clamp NW10 (for 09KUM1B and 09KUV1B, 09FIL1B and 09FLI1B)	
	K6	Coupling Female K6 - Blue, without valve - 6 mm - Water inlet	FRÖTEK
	K10	Coupling Female K10 - Blue, without valve - 10 mm - Water inlet	FRÖTEK
	KV6	Coupling Female KV6 - Grey, with valve - 6 mm - Water inlet	FRÖTEK
	KV10	Coupling Female KV10 - Grey, with valve - 10 mm - Water inlet	FRÖTEK
	S6	Coupling Male S6 - Blue, without valve - 6 mm - Battery	FRÖTEK
	S10	Coupling Male S10 - Blue, without valve - 10 mm - Battery	FRÖTEK
	SV6	Coupling Male SV6 - Grey, with valve - 6 mm - Battery	FRÖTEK
	SV10	Coupling Male SV10 - Grey, with valve - 10 mm - Battery	FRÖTEK

	09FIL1B	Filter cartridge NW10 (2x 08KLE1B included)	
	09FLl1B	Flow indicator NW10 (2x 08KLE1B included)	
	FLFI06	Flow indicator with Filter NW6	FRÜTEK
	FLFI10	Flow indicator with Filter NW10	FRÜTEK
Integrated filter and flow indicator	AIO-C-F-1NW10	Coupling All-In-One Female 1xNW10 (shown in picture)	aqua pro factory
	AIO-C-F-1NW06	Coupling All-In-One Female 1xNW6	aqua pro factory
	AIO-C-F-2NW06	Coupling All-In-One Female 2xNW6	aqua pro factory
Integrated filter and flow indicator	AIO-C-M-1NW10	Coupling All-In-One Male 1xNW10	aqua pro factory
	AIO-C-M-1NW06	Coupling All-In-One Male 1xNW06	aqua pro factory
	AIO-C-M-2NW06	Coupling All-In-One Male 2xNW06 (shown in picture)	aqua pro factory
	09STAC	Dust cap C	
	09MOD6	Tool for hose clamp 08KLE6B To ease and quicken the assembly of the bfs twist clamps NW6	
	09MOD1	Tool for hose clamp 08KLE1B To ease and quicken the assembly of the bfs twist clamps NW10	
	09WE16	Slide tool The mounting tool can be used to make the mounting of hose clamps 08KLE1 and 08KLE6 easier.	
	09KSCH	Sliding tool for clamps NW6	
	09LEHR	Slide ruler for T1 Caliper to determine the length of the float T1: see table "Calculation of float size for traction batteries (T1) and stationary batteries (T2)"	
	09STHE	Removal tool for push-in plug (plastic) The removal tool for plugs was specifically developed for maintenance and service use. Placed under the flange of the bfs push-in plug, the plug can easily be levered out of the cell opening	
	AQF-R-TOOL	Removal tool for push-in plug (metal) The removal tool for plugs was specifically developed for maintenance and service use. Placed under the flange of the bfs push-in plug, the plug can easily be levered out of the cell opening.	FRÜTEK

276

	09MOWE	**Assembly tool** To ease and quicken the assembly of a bfs plug in adapter versions such as bayonet adapters or threaded adapters.
	09FEX1	Filter EX for central degassing
	08T616	T-piece 6/10/6
	08T111	T-piece 10/10/10
	08T161	T-piece 10/6/10
	08T666	T-piece 6/6/6
	08WI11	Elbow fitting 10/10
	08WI16	Elbow fitting 10/6
	08WI66	Elbow fitting 6/6
	08KR11	Cross fitting 10/10/10/10
	08KR61	Cross fitting 6/10/6/10
	08KR66	Cross fitting 6/6/6/6
	08RED6	Reducer 10/6
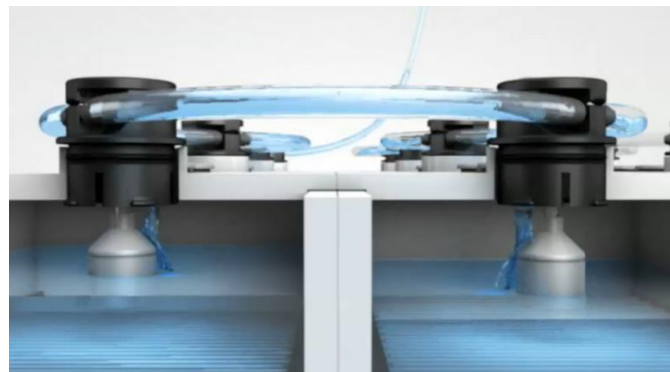
Ordering code for Aqua-fill sets

Example:
AQBCA-48V-BC-NF34

AQ – Aqua-fill set

Type of kit:
F – Fully Assembled (layout battery needed)
P – Partially Assembled (layout battery needed) B
– Basic Kit (not assembled)

Type of tube:
B – Black tube
P – PVC hose without clamps
C – PVC hose with clamps (standard)

Plug type:
Push-in: A – A51000   B – A4N000   BB – A4N with housing
Bayonet: C – H4N000   D – H51000   E – B4N100   F – B51000   K – G51000
Clip-in: G – I4N000   H – I4NV00   I – I4N260   J – I4N420   N – I51000   Q – I4N330
Treaded: O – C51000   P – C4N000   R – D51000   S – E51000   T – F51000
Central degassing: U – F51220   V – E51220   W – D51220   X – C51220   Y – A51220   Z – B51220

Battery Voltage:
For example 48V

Coupling inlet:
B – BFS
C – CPC
F – Frötek

Dust cap (09STAC):
N – No Cap C
– With Cap

Flow Indicator (09FLI1B):
N – No Flow Indicator I
– With Flow indicator

Filter (09FIL1B):
N – No Filter F
– With Filter

Float - to be determined via table "calculation of float size":
Example: 34 = BFS-072234

4.1.2 Quick Couplings

BFS

Article nr.	Description
09KUM6B	Connection Female with Valve 6 mm - water supply
09KUM1B	Connection Female with Valve 10 mm - water supply
09KUV6B	Connection Male with Valve 6 mm - Battery
09KUV1B	Connection Male with Valve 10 mm - Battery

Article nr.	Description
08KLE1B	Twist clamp NW10

Article nr.	Description
08KLE6B	Twist clamp NW6

279

FRÖTEK

Article nr.	Description
K6	Coupling Female K6 - Blue, without valve - 6 mm - Water inlet
K10	Coupling Female K10 - Blue, without valve - 10 mm - Water inlet
KV6	Coupling Female KV6 - Grey, with valve - 6 mm - Water inlet
KV10	Coupling Female KV10 - Grey, with valve - 10 mm - Water inlet
S6	Coupling Male S6 - Blue, without valve - 6 mm - Battery
S10	Coupling Male S10 - Blue, without valve - 10 mm - Battery
SV6	Coupling Male SV6 - Grey, with valve - 6 mm - Battery
SV10	Coupling Male SV10 - Grey, with valve - 10 mm - Battery

All-In-One-Couplers

Article nr.	Description
AIO-C-F-1NW10	Coupling All-In-One Female 1xNW10
AIO-C-F-1NW06	Coupling All-In-One Female 1xNW6
AIO-C-F-2NW06	Coupling All-In-One Female 2xNW6
AIO-C-M-1NW10	Coupling All-In-One Male 1xNW10
AIO-C-M-1NW06	Coupling All-In-One Male 1xNW06
AIO-C-M-2NW06	Coupling All-In-One Male 2xNW06

SPECIAL COUPLINGS

Article nr.	Description
WM-NS4D17006	Non-spill coupling PP 9.5 mm - female/socket
WM-NS4D22006	Non-spill coupling PP 9.5 mm - male/plug

4.2 Philadelphia Scientific

4.2.1 Water Injectors

The Water Injector System™ is the world's fastest and most reliable way to add water to industrial batteries. Filling a battery takes just 15 seconds, which means that you can fill 8 batteries in the time that it takes to fill 1 battery with other systems! There are two versions of the system available to meet your needs: the Water Injector Classic System™ and the Water Injector Spider System™. Both systems feature legendary reliability and speed of fill but differ in the way that the water is delivered to each Injector valve and the way they fit on top of the battery.

The system saves money in two ways. First, it cuts labor costs, often paying for itself within its first year of operation. Second, it extends the life of each expensive battery onto which it is installed due to improved quality of watering.
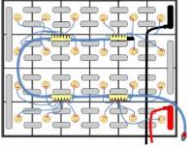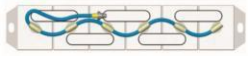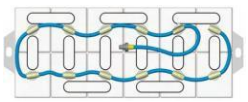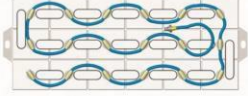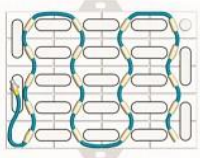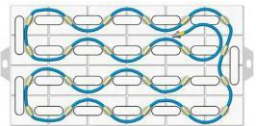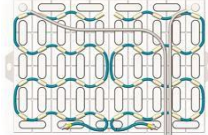
The system also improves safety and environmental cleanliness. There is no need to peer into cells to inspect levels as with manual filling. And water Injectors automatically fill each cell to the correct level, so there is no overfilling and no electrolyte spillage during charging. Did you know that each time a battery boils over it loses 3% of its capacity? That equates to 15 minutes of run time for each and every boil over! And the only way to recover the capacity is to perform an expensive acid equalization process, which typically costs more than the Water Injector System.

Because of its robustness and reliability, the Water Injector System is the preferred system for all Opportunity and Fast/Rapid charge applications.
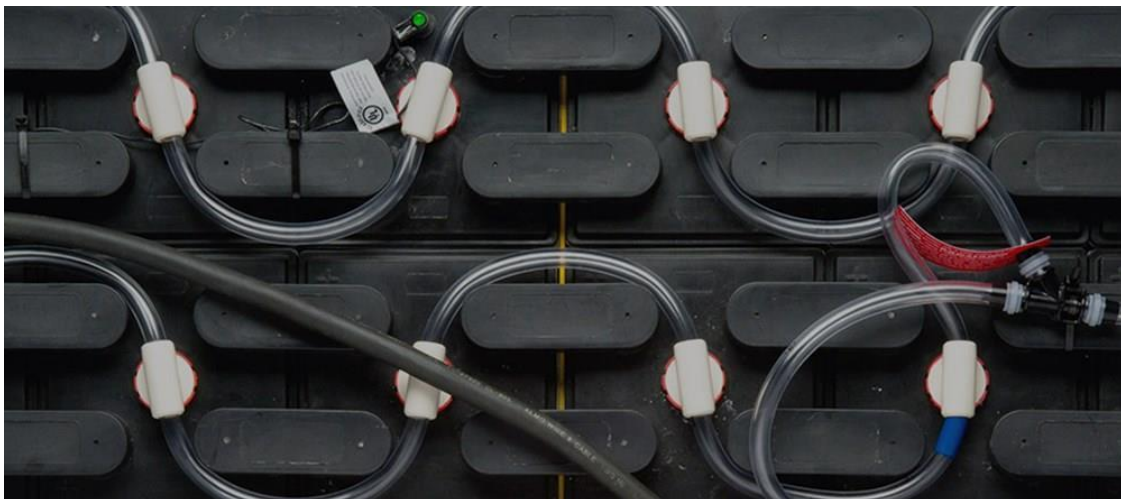
	Water Injector Spider System	Water Injector Classic System
Layout	Parallel	Serial
Input/Operating Pressure	25 to 35 psi	
Acceptable Filling Temperature	35° to 160°F	
Valve Body Material	Polypropylene	
Flow Rate	8 to 10 gpm per string	
System Exposure Temperature	-20° to 160°F	
Tubing Material	Proprietary flexible PVC	
Fitting Type (Compatible with Vent Opening Types)	US 1/4 Turn & DIN	
Maximum number of valves per input coupling	24	
Input Hose Size	1/2 in	
Max Valve Height above Vent	0.85 in	1.10 in
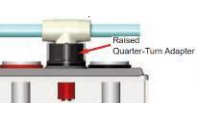
Example Layout	Ordering code	Description
	INJ-LP20ED	SPIDER Injector – 20 cell – DIN Adapter
	INJ-LP24ED	SPIDER Injector – 24 cell – DIN Adapter
	INJ-S6ED	Water Injector Classic – 6 cell string – Self-Assembly
	INJ-S6EDX	Water Injector Classic – 6 cell string – Self-Assembly – Extended
	INJ-P6ED	Water Injector Classic – 6 cell string – Prepunched
	INJ-P6EDX	Water Injector Classic – 6 cell string – Prepunched – Extended
	INJ-S12ED	Water Injector Classic – 12 cell string – Self-assembly
	INJ-S12EDX	Water Injector Classic – 12 cell string – Self-assembly – Extended
	INJ-P12ED	Water Injector Classic – 12 cell string – Prepunched
	INJ-P12EDX	Water Injector Classic – 12 cell string – Prepunched – Extended
	INJ-S18ED	Water Injector Classic – 18 cell string – Self-assembly
	INJ-S18EDX	Water Injector Classic – 18 cell string – Self-assembly – Extended
	INJ-P18ED	Water Injector Classic – 18 cell string – Prepunched
	INJ-P18EDX	Water Injector Classic – 18 cell string – Prepunched – Extended
	INJ-S20ED	Water Injector Classic – 20 cell string – Self-assembly
	INJ-S20EDX	Water Injector Classic – 20 cell string – Self-assembly – Extended
	INJ-P20ED	Water Injector Classic – 20 cell string – Prepunched
	INJ-P20EDX	Water Injector Classic – 20 cell string – Prepunched – Extended
	INJ-S24ED	Water Injector Classic – 24 cell string – Self-assembly
	INJ-S24EDX	Water Injector Classic – 24cell string – Self-assembly – Extended
	INJ-P24ED	Water Injector Classic – 24 cell string – Prepunched
	INJ-P24EDX	Water Injector Classic – 24 cell string – Prepunched – Extended
	INJ-AJS40PS	Water Injector Classic – 2x20 cell string – Self-assembly
	INJ-AJS40PL	Water Injector Classic – 2x20 cell string – Self-Assembly – Extended

Spare parts and accessories		
Ordering code	Description	For
INJ-495	Injector Tubing ½", intermediate, clear wall, per m	Classic Spider
FLT-072	Injector Tubing ¼" for Spider Systems	Spider
INJ-311	Injector Tooling: Hole Punch for Tubing	Classic
INJ-585	Connection Injector String Male 3/4" - 10 mm – with Cap	Classic Spider
INJ-CP	Connection Injector String Male 3/4" - 10 mm	Classic Spider
INJ-FC	Flow checker	Classic Spider
INJ-214	Injector Repair coupling for injector system	Classic Spider
INJ-608	Injector/Stealth Float Collar (25 pieces)	Classic Spider
INJ-615	Wye Fitting, with Collars	Classic Spider
INJ-TK-TP	Tape for Water Injector installation To prevent the tubing from moving during use, wrap six turns of installation tape (INJ-202) around the tubing, directly behind the first Water Injector	Classic
INJ-212	Ratchet Clamp	Classic Spider
INJ-664	Injector Manifold 6-Port for Injector Spider System	Spider
INJ-670	Injector Manifold 6-Port Inline for Injector Spider System	Spider
INJ-LP1	Injector Spider	Spider

285

	INJ-LP1D	Water Injector Spider, for DIN Vent Openings	Spider
	INJ-253	Injector DIN Vent Adapter Push-in	Classic
	INJ-L1	Individual Injector with Moulded Dust Cap Bayonet (Quarter turn)	Classic
	INJ-L1A	Water Injector, Extended Length, for Standard Bayonet Vent Openings	Classic
	INJ-L1AD	Water Injector, Extended Length, for DIN Vent Openings	Classic
	INJ-L1D	Water Injector, for DIN Vent Openings	Classic
	INJ-CL1	Clamp Lock Water Injector, for Standard Bayonet Vent Openings	Classic
	INJ-CL1A	Clamp Lock Water Injector, Extended Length, for Standard Bayonet Vent Openings	Classic
	INJ-CL1AD	Clamp Lock Water Injector, Extended Length, for DIN Vent Openings	Classic
	INJ-CL1D	Clamp Lock Water injector, standard length for DIN Vent Openings	Classic
	INJ-TL1	Clamp Lock Terminating Water Injector, for Standard Bayonet Vent Openings	Classic
	INJ-TL1A	Clamp Lock Terminating Water Injector, Extended Length, for Standard Bayonet Vent Openings	Classic

286

	INJ-TL1AD	Clamp Lock Terminating Water Injector, Extended Length, for DIN Vent Openings	Classic
	INJ-TL1D	Clamp Lock Terminating Water Injector, for DIN Vent Openings	Classic
	INJ-536	Raised Quarter Turn Adapter (6 pcs)	Classic
	INJ-447	Terminating Injector – Push-in	Classic
	INJ-530	Terminating Injector Extended Diffuser – Push-in	Classic
	INJ-NC-006	Clamp Lock Water Injector, Nicad With Flame arrestor adaptor	Classic
	INJ-NC-007	Terminating Water Injector, Nicad With Flame arrestor adaptor	Classic

4.2.2 Water Deionizer

Hard water in your water supply may be causing poor battery performance. Metallic impurities in water can affect cell voltages and increase self-discharge, resulting in shortened battery run time and reduced battery life. The traditional method to avoid water impurities is to use distilled water, an expensive and inconvenient proposition. Using deionized water is a simple and effective way to maximize battery life.

Easy to use

- Comes with everything you need to make pure water from the tap
- Operates at full-line pressure to dispense pure water directly from the deionizer
- Quick cartridge replacement requires no tools
- 6 m output hose allows maximum watering flexibility and convenience
- Optional Watering Gun lets you fill a battery directly from the deionizer

High capacity

- Cartridge is rated for 2300 litres or 600 gallons of pure water*
- ➜ Capacity varies with purity of incoming water. See Purity Chart

Exclusive battery-operated purity light

- Dual color light indication signals when it's time to change the cartridge
  - Green light means water quality is OK
  - Red light means it is time to change cartridge
  - No light means batteries need to be changed
- Includes 2 D-cell batteries that will last for 2 years
- No need to mount near AC power source

Easy installation

A mounting plate with hose hanger is provided for easy installation. The cartridge has standard hose fittings and connects in seconds to the input and output hoses with quick-connect couplings. No plumber or maintenance department is required. Cartridge replacement takes just seconds – and disposal is easy because cartridge contents are non-toxic.

Pressurized system

Unlike some lab-type systems, the WD2000 cartridge takes full-line pressure up to 5,5 bar (80 psi). So the water flow is fast enough to use directly with the Watering Gun.

Low cost

Cartridges are available for a fraction of the cost of distilled water, enabling battery

288

users to produce their own pure water for less money than it would cost to buy it.
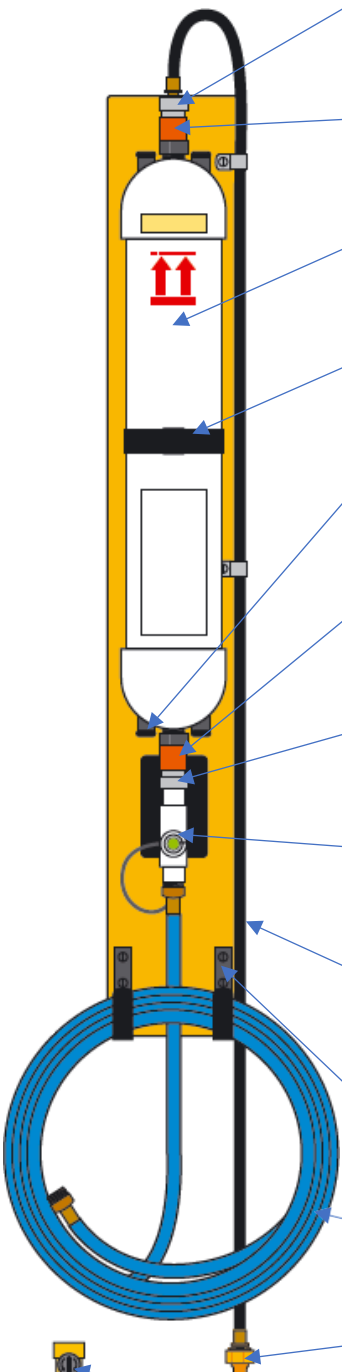
Specifications	
Order reference	WD2000
Flow Rate – with provided restrictor	2 lpm (0.5 gpm)
Purity Light Power Source (included)	2 D-cell Batteries
Life Estimation	2 years
Purity Light Setting	50 ppm
Dimensions	Mounting Plate	1115 mm x 155 mm (44" x 6")
	Disposable Cartridge	690 mm x 123 mm (27" x 4.5")
	Input Hose	9,5 mm x 3m (3/8" x 10')
	Output Hose	9,5 mm x 6m (3/8" x 20')
Maximum pressure tap water	5,5 bar (80 psi)

Purity Chart (= capacity in function of purity of incoming water)					
	Total Dissolved Solids*		Conductivity*	Cartridge Capacity	
↓Purity of tap water↓	PPM	Grains	µS/cm	Litres	U.S. Gallons
Good	20	1.17	30	13.627	3600
	50	3	75	5.451	1440
	75	4	112,5	3.634	960
Average	100	6	150	2.725	720
	125	7.3	187,5	2.180	576
	150	9	225	1.817	480
Poor	200	12	300	1.363	360
	250	15	375	1.090	288
	300	17.5	450	908	240

Spare parts			
	WD-PS-120	Male coupling threaded inside 3/4	
	WD-PS-125	Quick disconnect female - female thread	
	WDFIL2000	Cartridge for WD2000 * to be disposed as ordinary trash * cartridges have a five year shell life from date of manufacture	
	WD-PS-170	Mounting Strap	
	WD-PS-181	Bracket, straight, 2 pack	
	WD-PS-125	Quick disconnect female - female thread	
	WD-PS-120	Male coupling threaded inside 3/4	
	WD-PS-160DC	Purity Light, Complete Tee Assembly, DC battery incl.	
	WD-PS-140	Input Hose, 3m (10')	
	WD-PS-ACC-035	Bracket Hose Hanger, 2 Pack	
	WD-PS-150	Output Hose, 6m (20')	
	WD-GUN-GF	Quick Connect Male	
	WD-PS-190	Flow Restrictor	

Accessories		
WD-PS-121	Female coupling with male thread	
WCA-FA-ACC003C	**Adjustable filling adapter, set 0.65 Bar - coupling incl.** * to couple the deionizer directly onto an automatic filling system * also order WD-PS-121 to couple to de deioniser	
WGU-XPS	**Universal watering gun** * also order WD-PS-121 to couple to de deioniser	

4.2.3 Water Caddy

One of the major and time-consuming issues with filling your batteries up quickly and easily is an adequate water supply.

More often than not, the water supply is not the easiest place to get to and can be on the other side of the warehouse, which is expensive to reposition. What's more of an issue is that operators often use this water to fill their batteries, which can cause a lot of issues such as increased self-discharge, shortened run time, and reduced battery life. Battery water should be free from impurities because they can directly affect cell voltages and cannot be removed by using conventional filters. The range of battery watering carts can help to make that laborious task a breeze to do. The range of tanks are designed to be easily moved from your source of deionized water to your battery room. This allows you to efficiently fill up your entire fleet when you need to.

Vandapower offers three types of water caddies.

- The electrical water caddy from Philadelphia Scientific is available with a 10 Gallon and a 16 Gallon tank. The caddies can be optionally equipped with a filling gun with a filling adapter for use with an automatic battery watering system.
- The manual Vandapower 4 Gallon pressure tank with trolley is lightweight and easy to use.

292

	PT15	HydroFill	HydroFill Pro
Ordering Code	PT15-BFS	WCA2-LD-2	WCA60
Capacity	4 Gallons	10 Gallons	16 Gallons
Water Pressure	43.5 psi	Min 15 psi Max 25 psi	14.5 psi
Height	25 in	37 in	39.3 in
Width	10.4 in	17 in	13.7 in
Net Weight	7.5 lb	27 lb	17.6 lb
Wheel Size	6 in	6 in	6 in
Wheel Type	Plastic	Plastic/Rubber	Plastic/Rubber
Output Hose Length	6 ft	9.8 ft	9.8 ft
Manual Pressurized	✔	✘	✘
Battery Filling System with Integrated Pump	✘	✔	✔
Integrated Deionizer	✘	✘	Optional
LCD Display	✘	✘	✔
Purity Sensor	✘	✘	✔
Discharge Indicator	✘	✘	✔
Low Water Alert	✘	✘	✔
Diagnostic Information	✘	✘	✔
Output Connection			

Spare parts and accessories			
For		**Ordering code**	**Description**
		CRT-E208	**Input Hose with Timer and Flow Restrictor** Because the HydroFill™ Pro with deioniser takes 30 minutes to fill up (due to the fact that the flow rate cannot be more than 2 liters per minute through the deioniser cartridge), the timer is intended to automatically cut off after 30 minutes (or a time setting the customer specifies)
		WCA-CRT-E209	Input Hose with Flow Restrictor
		WCA-CRT-E215	Fuse
		WCA-CRT-E214	Lid with clip for hose
		09KUM1B	Quick Coupling Female NW 10
		09FLI1B	Flow Indicator NW 10
		PS600	Cartridge
		WCA-CRT-E216	HydroFill Pro - Purity Sensor
		WCA-CRT-E217	HydroFill Pro - Pump Assembly
		WCA-CRT-E218	HydroFill Pro - Display Unit
		WCA-CRT-E219	HydroFill Pro - Power Cable
		CRT-E210	BFS Connector (male) - Adaptor

294

		WCA-FA-ACC003C	Adjustable filling adapter, set 0.65 Bar - coupling incl.
			For the Hydrofill Pro only possible in combination with CRT-E210
		WCA-CRT-070	Output Hose with Fitting – 3,5 m (12 ft)
			For the Hydrofill Pro only possible in combination with CRT-E210
+		WCA-CRT-E201	Battery Charger 12 V Watercaddy - Universal
		WCA-CRT-E205	6" wheel + tire for 35 l Watercaddy / 30 l AquaJet
		WCA-CRT-E206	3/8" axle cap for wheel 35 l Watercaddy / 30 l AquaJet
		WCA-CRT-E207	3/8" axle rod for wheel 35 l Watercaddy / 30 l AquaJet
		WCA-CRT-095	Battery Sealed 12VDC - 7.5 Ah (151 x 65 x 99 mm)
		INJ-E068	Moulded cap for 30l AquaJet/35l Watercaddy, Black
		INJ-E066	Rocker Switch, On/Off, D/P, 12 VDC, (2A2)
		WCA-CRT-040	Pump 12V-DC Watercaddy
		WCA-CRT-E200	Adaptor for Batt. Charger 12V Watercaddy

295

	PT15-BFS-B	Handle for pressure tank PT15-BFS
	PT15-BFS-C	Plunger for pressure tank PT15-BFS
	PT15-BFS-D	Outlet for manual pressure tank PT15-BFS
	PT15-BFS-F	Suction tube for pressure tank PT15-BFS
	PT15-BFS-G	Pressure release valve for pressure tank PT15-BFS
	PT15-BFS-E	Screw cap for pressure tank PT15-BFS
	PT15-BFS-H	Output hose for pressure tank PT15-BFS
	09KUM6B	Quick coupling female NW 6
ACCESORIES	WD-PS-125	Quick disconnect female - female thread
	WCA-CRT-075	Quick disconnect - female - Watercaddy
	INJ-472	Coupling male with Return Valve
	INJ-122	Sediment Filter
	INJ-FC	Flow checker

296

4.2.4 Water Tanks

AQUA ACCESSOIRIES
WATERTANKS

WTA16/30

Water tank: 30 L, white, with tap, flow-indicator, female connection, 3 or 5m PVC tube, lid opening 80 mm.

Special features (see image below):
- Reinforced bottom side.
- Reinforced threaded tap connection (20mm depth)

WTA60-2

Water tank: 60 L, white, with tap, flow-indicator, female connection, 3 or 5m PVC tube.

Special features (see image below):
- 2 lid openings DIN 61
- Reinforced bottom side.
- Reinforced threaded tap connection (20mm depth)

Reinforced bottom side.
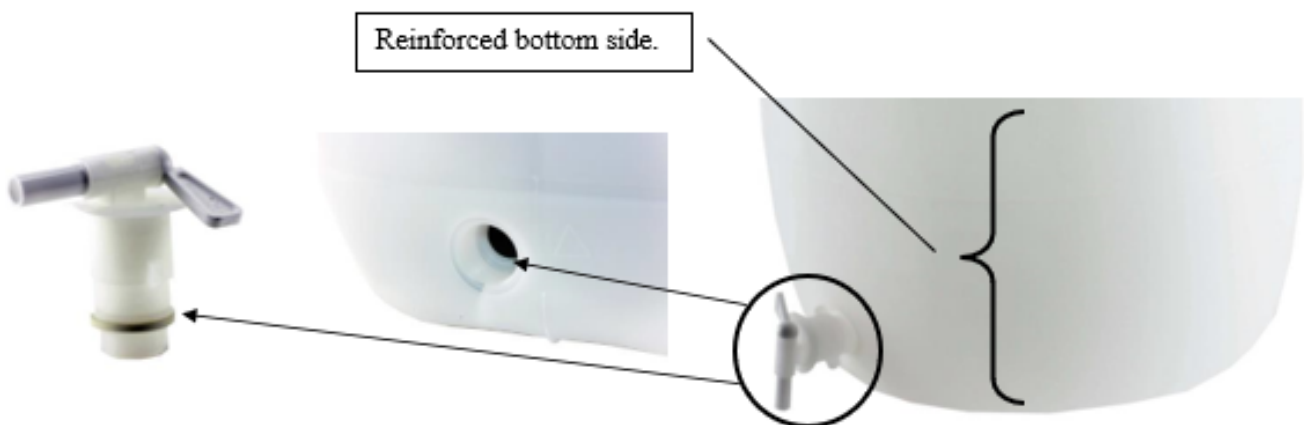
More assembled water tanks available on request. Please contact our office.

297

WTA30SUPP: support for water tank 30 L

WTA30-60SUPP: support for water tank 30 L and 60 L

WTA15GV3, WTA...GV3, WTA500GV3

Strong water tank.

Available in 15, 30, 50, 80, 100, 125, 150, 200, 300, 500 L.

All tanks available with female connection, 3m PVC tube, flow-indicator, and valve.

298

WTA60FLOAT

4.2.5 Watering Guns

No battery room should be without this essential maintenance tool. Simply connect the Battery Watering Gun to a standard water hose or a Deionizer, put the tip of the gun into the cell, and squeeze the ergonomic handle. It also saves money: compared to hand watering, the battery watering gun reduces labour costs up to 150 Euro's a year for each 18-cell battery.

BENEFITS

⏶ Wide range: We offer a wide range of watering guns from Philadelphia Scientific and other suppliers ⏶ Safe: It keeps eyes and face away from battery hazards and reduces backache from bending over.

batteries. It is insulated to prevent sparking on connectors.

⏶ Easy Installation: Attach the Battery Watering Gun to any standard garden hose, a Hydro*Fill* Watering Cart, or a Deionizer System and you have a fully operating battery filling system.

⏶ Fast but gentle: A flow rate up to 6,4 litres/minute (1.7 gallons/minute), which is fast enough for the largest cells. Yet the flow is gentle enough to fill a coffee mug.

POSSIBLE FEATURES

⏶ Automatic shutoff: The Watering Gun fills cells to precisely the correct level. The shutoff is so positive you can actually feel it.

⏶ LED + Buzzer indicator: Flashing red LED and buzzer via contact electrodes when the level is reached ⏶ Integrated flow indicator: Shows when the filling/flow has stopped.

Ordering code	WGU-L	WGU-XPS	WGU-S	WGU-RR	WGU-J	WGU-A
Input/Operating pressure	< 10 bar (145 psi)	< 5,5 bar (80 psi)	< 5,5 bar (80 psi)	< 5,5 bar (80 psi)	< 5,5 bar (80 psi)	< 2,5 bar (36 psi)
Flow rate	-	6,4 l/m (1.7 gpm)	2 l/m (0.52 gpm)	6,4 l/m (1.7 gpm)	2 l/m (0.52 gpm)	-
Working temperature	-20° to 60°C (-4° to 140°F)	2° to 71°C (35° to 160°F)	2° to 71°C (35° to 160°F)	2° to 71°C (35° to 160°F)	2° to 71°C (35° to 160°F)	-
Weight	0,225 kg (0.5 lb)	0,68 kg (1.5 lb)	0,68 kg (1.5 lb)	0,68 kg (1.5 lb)	0,7 kg (1.54 lb)	0,4 kg (0.88 lb)
Product Length	34 cm (13.4 in)	43,2 cm (17 in)	43,2 cm (17 in)	50,8 cm (20 in)	64,8 cm (25.5 in)	19 cm (7.48 in)
Product Height	17,8 cm (7 in)	17,8 cm (7 in)	17,8 cm (7 in)	17,8 cm (7 in)	17,8 cm (7 in)	18 cm (7.08 in)
Product Width	3,8 cm (1.5 in)	5,1 cm (2 in)	5,1 cm (2 in)	3,8 cm (1.5 in)	6,3 vm (2.5 inch)	4 cm (1.57 in)
Nozzle Angle	45°	45°	90°	45°	90°	0°
Nozzle diameter	8 mm (0.31 in)	17mm (0.67 in)	9 mm (0.35 in)	16 mm (0.63 in)	8 mm (0.31 in)	9 mm (0.35 in)
Integrated Flow Indicator	✖	✔	✖	✔	✖	✖
Special Nozzle	✖	Flow diffuser	Cone shaped nozzle	✖	Nozzle combined with spacer	✖
Automatic Shut-off	✖	✔	✖	✔	✔	✖
Manual adjustable flow throttle	✖	✖	✔	✖	✖	✖
Secure level control	✖	✔	✖	✖	Different dimensions in spacers	Optional
LED + buzzer indication	✖	✖	✖	✖	✖	✔
Battery	✖	✖	✖	✖	✖	9V

EXTRA INFO

Integrated Flow Indicator – Secure Level Control – Flow Diffuser

Integrated Flow Indicator
- Shows you when filling has stopped

Secure Level Control
- Will not move over time
- Pre-set for optimum level for most motive power batteries
- Adjustable or removable
- Beveled to conform to vent well at many angles

Flow Diffuser
- Converts the rapid flow to a gentle spray
- Protects nozzle from damage

Measurement table Spacers WGU-J

Spacer Lengths

Fill Levels
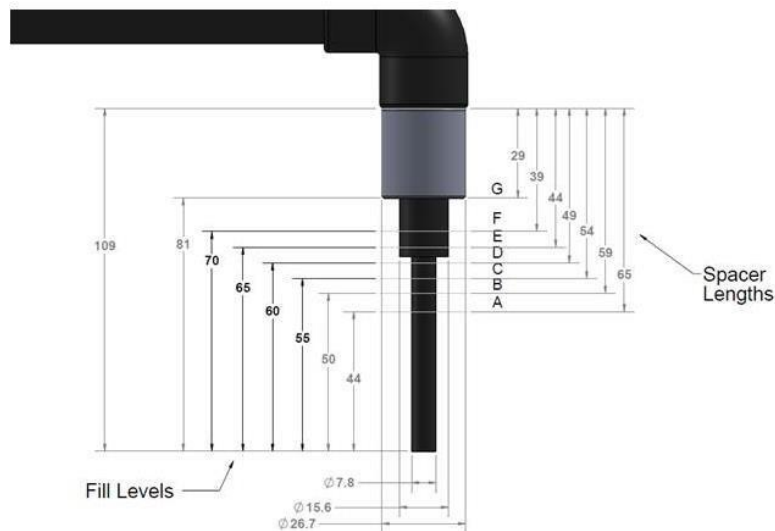
5. Miscellaneous Battery Accessories

5.1 Drainage pumps

- Article nr. DRAINP-MAN-6L.
- 6 litre capacity.
- Acid-proof material.

BIO15 SUCTION PEAR
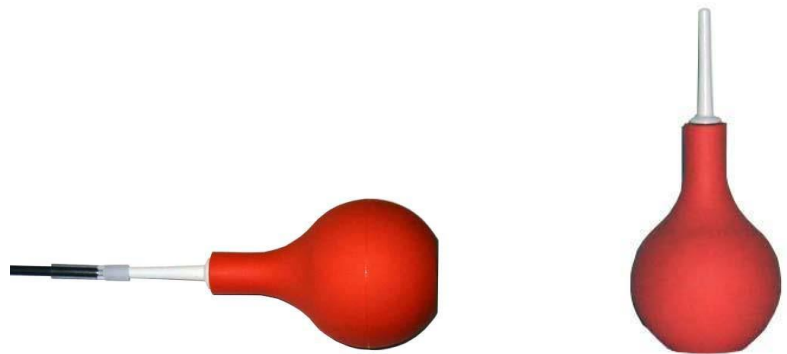
ARTICLE NR.	DESCRIPTION
BIO15	BIO 15 - PEAR 340ml with pipe 70mm
BIO15-ABR	BIO 15 - PEAR 340ml with pipe 70mm + suction tube 6x760 P555

303

ELECTRICAL DRAINAGE PUMP

- Electrical-operated acid-extraction-station incl. drainage pump.
- 3 m suction tube 6 x 1,5 mm,
- 2 m discharge tube 10 x 2 mm
- 12 V 12 Ah battery + charger
- Drip tray
- ON / OFF switch
- Diode in PVC box with shoulder strap

ARTICLE NR.	DESCRIPTION
DRAINP-BAMOB	Drainage Pump with battery - mobile

304

MANUAL FILLING PUMP

ARTICLE NR.	DESCRIPTION
PUMP-BA	Pump for filling Acid/Water
PUMP-BA-F7	Pump for filling acid/water – foot operation

5.2 Acid Circulation Systems

Electrolyte Circulation

A membrane pump ensures permanent electrolyte movement inside the cell. Pumping air into the base of the cell maintains electrolyte circulation preventing varying temperatures and electrolyte densities throughout the cell.

- The sealing grommet is directly injected moulded onto the tube before it is installed in the cell lid.
- Tail ends, corners and T-pieces are put on.
- This system offers you the advantage of reduced storage.
- There are different lengths of tubes. The immersion depth must be at least ¾ of the cell height.

Standard Electrolyte Circulation Tubes		
Picture	**Ordering code**	**Description**
	EUW-TUBE	Electrolyte circulation tube with moulded T-piece - 600 mm • *Standard length*
	Also available in lengths: 550, 470, 420, 385, 330, 265 mm • *To be ordered per 50 pieces* Or the standard length of 600mm can be shortened to the desirable length	
	END6EUW	End piece NW 6 for electrolyte circulation
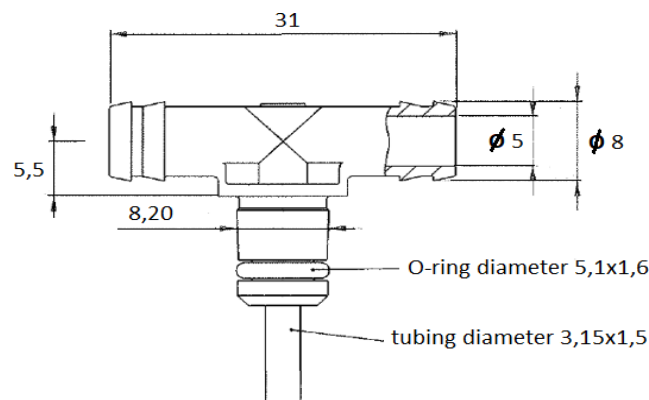
Electrolyte Circulation Tubes Version R

Picture	Ordering code	Description
	EUW-R-640	Electrolyte circulation tube with moulded opening - 640 mm • *Standard length*
		Also available in lengths: 615, 535, 495, 470, 440, 415, 390, 340, 270, 210 mm • *To be ordered per 50 pieces* Or the standard length of 640mm can be shortened to the desirable length
	EUW-E	E-piece for electrolyte circulation – corner • *Reinforced version (standard)*
	END6EUW	End piece NW 6 for electrolyte circulation
	EUW-L	L-piece for electrolyte circulation - end
	EUW-T	T-piece for electrolyte circulation • *Reinforced version (standard)*
	EUW-ADAP	Adapter for electrolyte circulation tube • *To extend the tube connection by 25 mm*

tubing diameter 4mm

21,5 mm

307
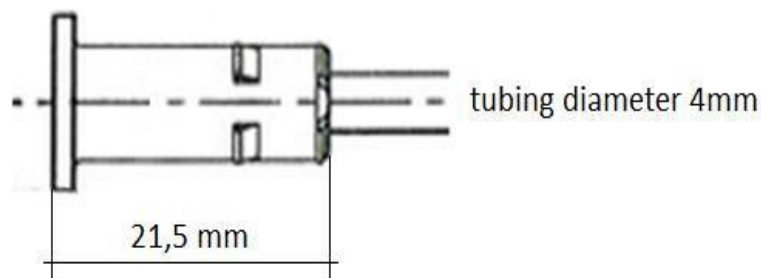
Electrolyte Circulation Tubes Version R-H2

Picture	Ordering code	Description
	EUW-R-H2-680	Electrolyte circulation tube with moulded opening - 680 mm • *Standard length*
		Also available in lengths: 311, 371, 441, 511, 534, 572, 644 mm • *To be ordered per 50 pieces* Or the standard length of 680mm can be shortened to the desirable length
	END6EUW	End piece NW 6 for electrolyte circulation
	EUW-L-H2	E-piece for electrolyte circulation – corner
	EUW-T-H2	T-piece for electrolyte circulation

tubing diameter 6mm

19,7 mm
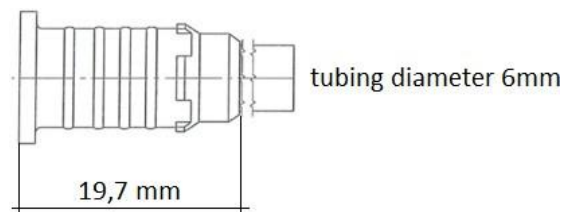
Electrolyte Accessories		
Picture	Ordering code	Description
	FRSCH06	PVC hose 6 x 1,5 mm
	09BKM6B	Quick coupling female NW6 (Air)
	09BKV6B	Quick coupling male NW6 (Air)
	08KLE6B	Hose clamp NW6 (for 09KUM6B and 09KUV6B)

309
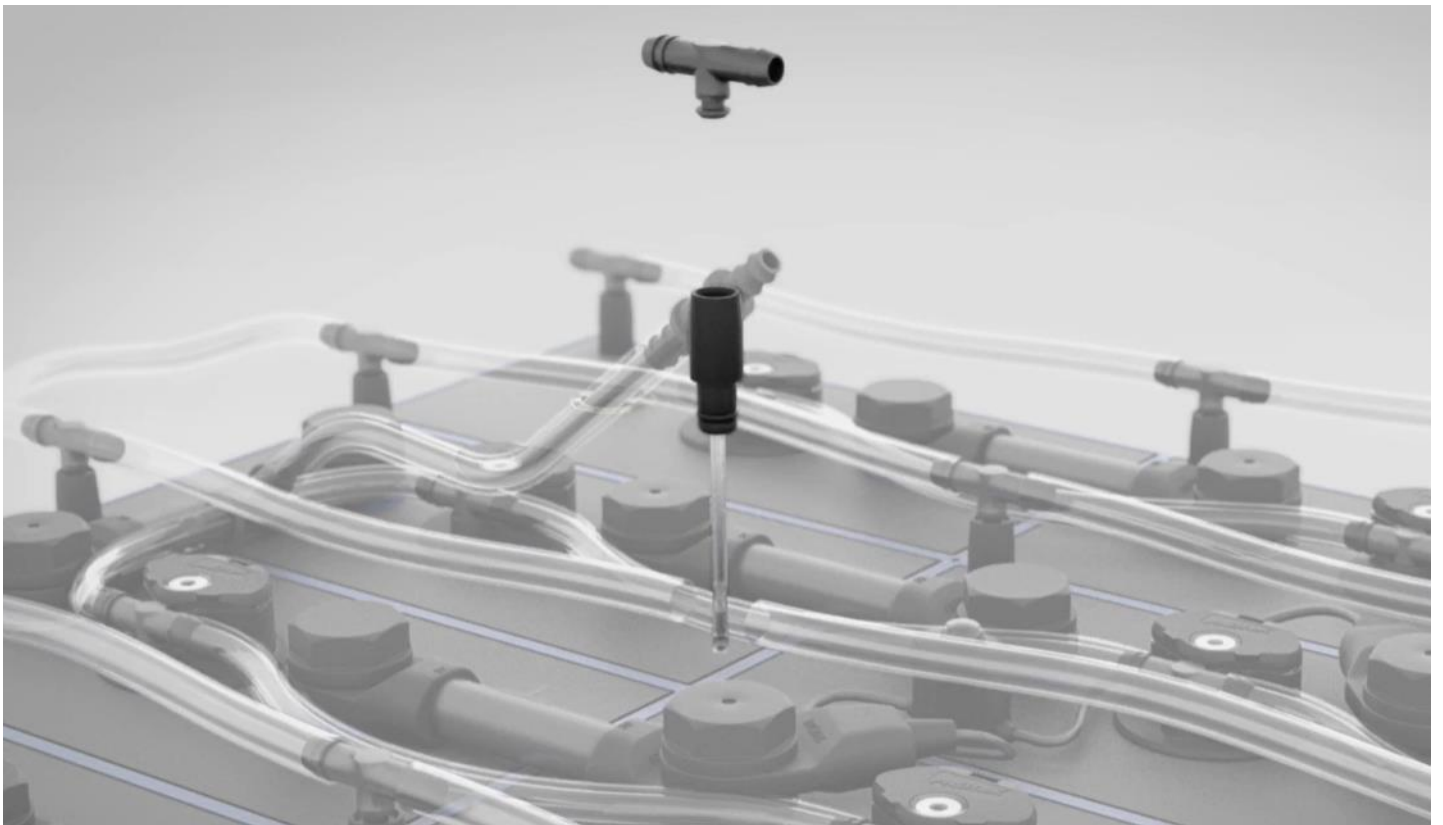
5.3 Battery Acid Testers and Thermometers

A battery hydrometer or acid tester is used to test the state of charge of a battery cell. This is performed by measuring the density of the electrolyte, which is accomplished by measuring the specific gravity of the electrolyte. The greater the concentration of sulfuric acid, the denser the electrolyte becomes.

Vandapower can supply different acid testers:

- different sizes

- with plastic cylinder or glass bulb

- measuring ranges from 1,08 to 1,30 g/ml

- different graduations: 0,005 g/ml or 0,01 g/ml

- different sizes of suction hoses

Serie 6300

Specifications

Material	Straight plastic cylinder
Measuring range	1,10 to 1,30 g/ml
Graduations	0,01 g/ml
Suction volume	18 ml
Overall length	255 mm
Weight	100 gr
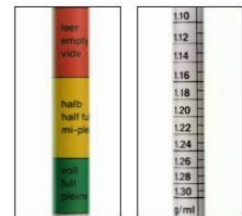
Ordering codes

AK-SP-6300	With suction hose length 52 mm, diameter 5,2 mm
AK-SP-6320	With suction hose length 140 mm, diameter 5,2 mm
AK-SP-6322	With suction hose length 130 mm, diameter 3,1 mm

Extra info

- Universal workshop device
- Sturdy design with straight plastic cylinder
- Small suction volume, but large areometer
- Centered areometer, no swinging, no lateral contact, correct and fast reading
- Broad colored scale and numerical scale

Serie 6500

Specifications

Material	Bulged glass cylinder	
Measuring range	1,08 to 1,30 g/ml	
Graduations	0,005 g/ml	
Suction volume	38 ml	
Overall length	328 mm	
Weight	150 gr	
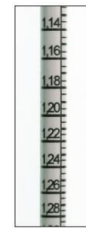
Ordering codes

AK-SP-6500	With suction hose length 52 mm, diameter 5,2 mm	
AK-SP-6520	With suction hose length 140 mm, diameter 5,2 mm	
AK-SP-6522	With suction hose length 130 mm, diameter 3,1 mm	

Extra info

- Large model with bulged glass cylinder
- For large vehicle batteries and stationary accumulators
- Accurate reading through large scale with small graduations
- Suitable for calibration, supplied with calibration certificate on request

Serie 1260

Specifications

Material	Straight glass cylinder	
Measuring range	1,10 to 1,30 g/ml	
Graduations	0,010 g/ml	
Calibration temperature	20°C	
Overall length	± 320 mm	
Weight	140 gr	

Ordering codes

AK-SP12620	With suction hose length 140 mm, diameter 4 mm	

Extra info
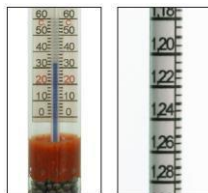
- Large model with straight glass cylinder
- For frequent workshop use
- Precision model, accurate reading

Acid tester with glass bulb and build-in thermometer

Serie 6600

Specifications

Material	Bulged glass cylinder	
Measuring range	1,08 to 1,30 g/ml	
Graduations	0,005 g/ml	
Suction volume	38 ml	
Temperature display	0 to 60°C	
Overall length	328 mm	
Weight	155 gr	

Ordering codes

AK-SP-6600	With suction hose length 52 mm, diameter 5,2 mm	
AK-SP-6620	With suction hose length 140 mm, diameter 5,2 mm	
AK-SP-6622	With suction hose length 130 mm, diameter 3,1 mm	

Extra info

- Large model with bulged glass cylinder
- For large vehicle batteries and stationary accumulators
- With build-in thermometer for temperature reading
- Accurate reading through large scale with small graduations
- Suitable for calibration, supplied with calibration certificate on request

314

Thermometer Alcohol Liquid

Specifications

Material	Sodocalcique glass
Measuring range	-10°C to +60°C
Graduations	0,5°C
Accuracy	1°C
Overall length	305 mm
Diameter	6 - 7 mm

Ordering codes

AK-TH-10/60	Thermometer, length 305mm, -10/+60°C : 0,5°C

Extra info

- Solid stem thermometer for daily use
- Non-roll design
- Very readable printed graduation
- Resistant to aggressive agents (except fluoridric acid and hot soda)
- Yellow enamel backing, red liquid
  - Total immersion: the thermometer most be immersed at the same level of the temperature read

315

5.4 Maintenance and cleaning

BatteryShine

BatteryShine is a professional battery cleaner that removes battery corrosion fast and efficiently. It can be applied undiluted, using the atomiser. It is not advised to use it with a steam cleaner. Please keep in mind the safety precautions delivered with the product.

Make sure all battery cell plugs are closed well before using the product. Spray a film over the battery, especially onto the terminals and wait a few minutes. Then rinse off the product from the battery.

After drying the product leaves a film which protects against corrosion.

Also available with neutraliser/leak detector:

This product neutralises any acid spilled and allows it to be rinsed off in a clean and environmentally friendly way.

Make sure all battery cell plugs are closed well before using the product. Spray a film over the battery, especially onto the terminals and wait for a few minutes.

When acid is detected, the yellow foam will turn pink. Hence the product contains a coloured indicator which permits easy spotting of acid leaks.

Keep on spraying the product onto the battery until the foam turns yellow again. The acid is then neutralised, making it environmentally safe to rinse off the product.

316

Product		
Picture	Ordering code	Description
	VDBATCL1	BatteryShine battery cleaner, in bottle with spray nozzle - 1 L
	VDBATCL5	BatteryShine battery cleaner, tank 5 L
	VDBATNE1	BatteryShine neutralising battery cleaner with leak detector, in bottle with spray nozzle - 1 L
	VDBATNE5	BatteryShine neutralising battery cleaner with leak detector, tank 5 L

317

5.5 Digital Multimeter

- **Article code DIG-MM1**
- 3 ½ digit LC and bar graph display with polarity and battery low voltage indication.
- For voltage, DC current and resistance measurements, continuity and diode testing.
- DC voltage :   320 mV / 600 V (5 ranges)
- Accuracy :   ± 0.5 % + 2 digit
- AC voltage :   3.2 V / 600 V (4 ranges)
- Accuracy :   ± 1.5 % + 5 digit
- DC current :   320 µA / 3200 µA (2 ranges)
- Accuracy :   ± 1.0 % + 2 digit
- Resistance :   320 Ω / 32MΩ (6 ranges)
- Accuracy :   320 Ω : ± 1.0 % + 4 digit
                        3.2 kΩ – 3.2 MΩ : ± 0.8 % + 2 digit
                        32 MΩ : ± 2.0 % + 5 digit
- Continuity test :   20 Ω
- Diode test :   1.5 mA
- All measures with overload protection

318

5.6 Spring Balancers

Application: when heavy battery connectors/cables have to be easily portable.

In order to support the weight of pneumatic, hydraulic and electric equipment, the use of a spring balancer should be considered. The performance of the equipment will be speeded up due to good balance and reduced operator fatigue, when using a spring balancer.

Main features:

• Rugged construction, cast aluminium body.

• Stainless steel rope.

• Adjustable capacity.

• Auxiliary safety suspension.

• Adjustable stroke limiting device.

• Cable guide in antifriction material.

• Inert spring drum assembly.

• Polyamides thimble.

Spring balancers			
Picture	Ordering code	Description	Specifications
	BAL9311	Balancer 0,4 – 1,0 kg – 1,6m	Cable length: 1,6 m Capacity: 0,4 - 1,0 kg Weight: 0,6 kg
	BAL9312	Balancer 1,0 – 2,0 kg – 1,6m	Cable length: 1,6 m Capacity: 1,0 - 2,0 kg Weight: 0,6 kg
	BAL9313	Balancer 2,0 – 3,0 kg – 1,6m	Cable length: 1,6 m Capacity: 2,0 - 3,0 kg Weight: 0,7 kg

319

Dimensions for BAL9311, BAL9312 and BAL9313
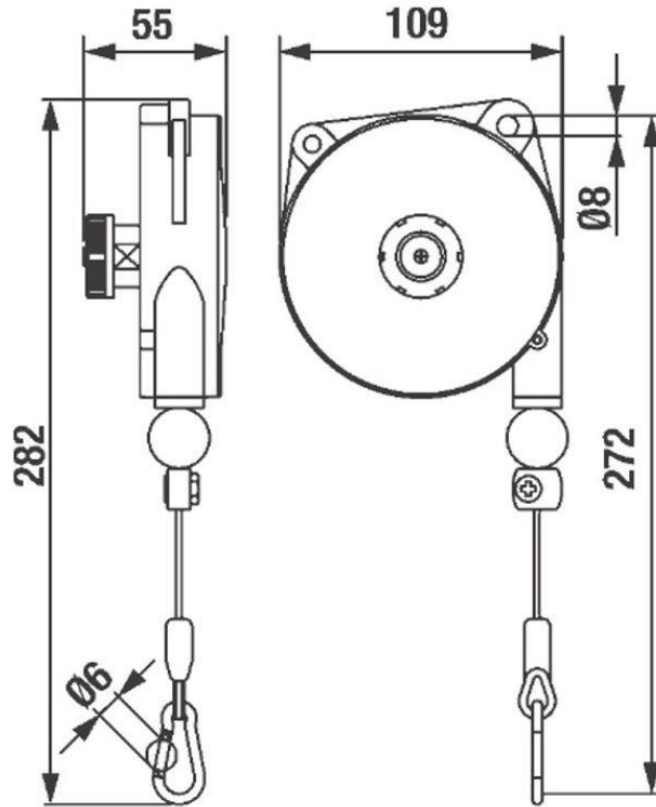
5.7 Safety Kit

The Safety Kit and Safety Box provides you with all the necessary equipment to protect yourself when maintaining/topping up batteries: safety glasses, apron, gloves, soda. The Safety Kit also includes first aid accessories such as an eye-shower and first aid kit.

SAF-KIT V3

SAF-BOX 31

321

SAF-KIT V3

Products included in the Safety Kit

Picture	Ordering code	Description
	SK-AID	**First aid kit – 40 pieces** Included: 10 waterproof plasters, 2 Steropore non-woven plasters 7,5x5cm, 6 alcohol free swabs, triangle bandage, elastic gauze bandage 5 cm, elastic gauze bandage 7 cm, adhesive plaster 1.25 cm, 2 sterile non-adhesive compresses, 5 sterile compresses 10 x 10 cm, instant Cold Pack, pair of gloves, scissors, 12 safety pins
	SK-SODA	Fine soda 1kg
	SK-SG-SAF	Safety glasses
	SK-ESCH-PL001	Eyewash bottle – 200 ml – NaCl
	SK-ESCH-PL005	Eyewash bottle – 200 ml – PH neutral
	SK-GL-35	Pair of acid-resistant PVC-coated gloves - 350 mm
	SK-APR90130	Apron 90 x 120 cm, white
	SAF-KIT V3-ST	Sticker for Safety Kit
	SAF-KIT-BUTT	Mini cam lock with wing knob for SAF-KIT V3, black (standard on SAF-KIT V3-BUTT)

322

SAF-BOX 31

Products included in the Safety Box

Picture	Ordering code	Description
	SK-SODA	Fine soda 1kg
	SK-SG-SAF	Safety glasses
	SK-ESCH-PL001	Eyewash bottle - 200 ml - NaCl
	SK-GL-35	Pair of acid-resistant PVC-coated gloves - 350 mm
	SK-APR90130	Apron 90 x 120 cm, white
	SAF-KIT V3-ST	Sticker for Safety Kit

5.8 Packing Plates

Material: Polypropylene with 30% Talc Filler

Part Number	Thickness (mm)	Length (mm)	Width (mm)
RP02-323	2	323	198
RP02-400	2	400	198
RP02-475	2	475	198
RP02-535	2	535	198
RP02-565	2	565	198
RP02-680	2	680	198
RP02-720	2	720	198
RP05-314	5	314	198
RP05-400	5	400	198
RP05-460	5	460	198
RP05-535	5	535	198
RP05-545	5	545	198
RP05-565	5	565	198
RP05-680	5	680	198
RP05-720	5	720	198
RP10-314	10	314	198
RP10-400	10	400	198
RP10-460	10	460	198
RP10-535	10	535	198
RP10-545	10	545	198
RP10-565	10	565	198
RP10-680	10	680	198
RP10-720	10	720	198
RP15-314	15	314	198
RP15-400	15	400	198
RP15-455	15	455	198
RP15-535	15	535	198
RP15-545	15	545	198
RP15-565	15	565	198
RP15-680	15	680	198
RP15-720	15	720	198

6. Battery Cable + Accessories

6.1 Battery Cable

6.1.1 Highly Flexible Twin Cable

HIGHLY FLEXIBLE TWIN CABLE

TECHNICAL SPECIFICATIONS	
Cable standards	Figure of 8 configuration based on VDE0250 BS EN 60332-1-2, BS EN 62230
Voltage rating	450/750 V
Temperature rating	Flexed: -20°C to +70°C
Cable construction	Class 6 extra flexible copper conductor to BS EN 60228 Insulation: PVC-NBR Transparent PVC (Polyvinyl Chloride) sheath type TM2 according to BS EN 50363
Minimum bending radius	Fixed: 6 x overall diameter

CABLE DESIGN PARAMETERS					
Nominal Cross-Section (mm2)	Nominal thickness of insulation (mm)	Nominal thickness of sheath (mm)	Max. Diameter of wires in Conductor (mm)	Nominal overall diameter (mm)	Max. DC Conductor Resistance at 20°C (Ω/km)
2 x 2,5	0,8	0,8	0,21	4,4 x 10,8	7,98
2 x 4	0,8	0,8	0,21	4,7 x 11,4	4,95
2 x 6	1	1	0,21	5,3 x 12,6	3,30
2 x 10	1	1,2	0,21	6,0 x 13,8	1,91
2 x 16	1	1,2	0,21	6,7 x 15,2	1,21
2 x 25	1,1	1,3	0,21	8,1 x 18	0,78
2 x 35	1,1	1,3	0,21	9,1 x 20	0,554
2 x 50	1,2	1,4	0,31	14,6 x 30,6	0,386
2 x 70	1,6	1,6	0,31	16,4 x 34,4	0,27
2 x 95	1,6	1,6	0,31	18,4 x 38,6	0,206

CURRENT CARRYING CAPACITY (A@60°C)										
Nominal Cross-Section (mm2)	2,5	4	6	10	16	25	35	50	70	95
Derating factor	32	42	54	73	98	129	158	198	245	292

325

PRODUCT CODES

Per meter

ORDERING CODE	COLOR	SECTION (mm²)	Factory Packaging (standard drum length in m)
K-ZWI2/2.5GC	Black/Red	2 x 2,5	500
K-ZWI2/4GC	Black/Red	2 x 4	500
K-ZWI2/6GC	Black/Red	2 x 6	500
K-ZWI2/10GC	Black/Red	2 x 10	330
K-ZWI2/16GC	Black/Red	2 x 16	250
K-ZWI2/25GC	Black/Red	2 x 25	170
K-ZWI2/35GC	Black/Red	2 x 35	150
K-ZWI2/50GC	Black/Red	2 x 50	100
K-ZWI2/70GC	Black/Red	2 x 70	100
K-ZWI2/95GC	Black/Red	2 x 95	100

326

ORDERING CODE FOR BULK

Example:
K-ZWI2/16GC-025M-0

Cable:
Twin cable super flexible

Section:
2.5GC - 2,5 mm²
4GC - 4 mm²
6GC - 6 mm²
10GC - 10 mm²
16GC - 16 mm²
25GC - 25 mm²
35GC - 35 mm²
50GC - 50 mm²
70GC - 70 mm²
95GC - 95 mm²

Length:
025M - 25 meter
050M - 50 meter
100M - 100 meter

Packaging:
0 - Ring with cable ties *(standard packaging)*
F - Plastic shrink foil T
- Plywood drum
P - Plastic drum W
- Wooden drum

327

BULK PACKAGING

Code	Description	Picture
0	Ring with cable ties = *standard packaging*	
F	Plastic shrink foil	
T	Plywood drum	
P	Plastic drum	
W	Wooden drum	

328

6.1.2 Single Conductor Cable H01N2

H01N2-D RUBBER CABLE

TECHNICAL SPECIFICATIONS

Cable standards	BS EN 50525-2-81
Voltage rating	100 V
Temperature rating	Fixed: -25°C to +85°C
Flame propagation	According to IEC 60332-1-2:2004, EN 60332-1-2:2004
Cable construction	Generally to class 6 flexible copper conductor according to BS EN 60228 Paper or polyester separator longitudinally over conductor Rubber compound sheath type EM5 according to BS EN 50363-2-2
Minimum bending radius	Flexed: 6 x overall diameter

CABLE DESIGN PARAMETERS

Nominal Cross-Section (mm2)	Nominal thickness of insulation(mm)	Max. Diameter of wires in Conductor (mm)	Nominal overall diameter (mm)	Max. DC Conductor Resistance at 20°C (Ω/km)
10	2	0,21	8	1,91
16	2	0,21	8,9	1,21
25	2	0,21	10,1	0,78
35	2	0,21	11,4	0,554
50	2,2	0,21	13,5	0,386
70	2,4	0,21	15,3	0,272
95	2,6	0,21	17,5	0,206
120	2,8	0,51	19,7	0,161

ELECTRICAL PROPERTIES

Nominal Cross-Section (mm2)	Current rating for single cycle operation over a maximum period of 5 minutes			
	100%	85%	60%	35%
10	100	103	108	122
16	135	145	175	230
25	180	195	230	300
35	225	245	290	375
50	285	305	365	480
70	355	385	460	600
95	430	470	560	730
120	500	540	650	850

CONVERSION FACTOR FOR DEVIATING AMBIENT AIR TEMPERATURE

Ambient air T (°C)	25	30	35	40	45	50	55
Derating factor	1	0,96	0,91	0,87	0,82	0,76	0,71

PRODUCT CODES
Per meter

ORDERING CODE	COLOR	SECTION (mm²)	Factory Packaging (standard drum length in m)
K-H01N2-D-6GC	Black	6	1500
K-H01N2-D-10GC	Black	10	1500
K-H01N2-D-16GC	Black	16	1000
K-H01N2-D-25GC	Black	25	1000
K-H01N2-D-35GC	Black	35	1000
K-H01N2-D-50GC	Black	50	500
K-H01N2-D-70GC	Black	70	400
K-H01N2-D-95GC	Black	95	300
K-H01N2-D-120GC	Black	120	200
K-H01N2-D-6GC-RED	Red	6	1500
K-H01N2-D-10GC-RED	Red	10	1500
K-H01N2-D-16GC-RED	Red	16	1000
K-H01N2-D-25GC-RED	Red	25	1000
K-H01N2-D-35GC-RED	Red	35	1000
K-H01N2-D-50GC-RED	Red	50	500
K-H01N2-D-70GC-RED	Red	70	400
K-H01N2-D-95GC-RED	Red	95	300
K-H01N2-D-120GC-RED	Red	120	200

ORDERING CODE FOR BULK

Example
K-H01N2-D-10GC-025M-0

Cable:
H01N2-D Flexible cable

Section and color:
10GC - 10 mm² Black
10GC-RED - 10 mm² Red
16GC - 16 mm² Black
16GC-RED - 16 mm² Red
25GC - 25 mm² Black
25GC-RED - 25 mm² Red
35GC - 35 mm² Black
35GC-RED - 35 mm² Red
50GC - 50 mm² Black
50GC-RED - 50 mm² Red
70GC - 70 mm² Black
70GC-RED - 70 mm² Red
95GC - 95 mm² Black
95GC-RED - 95 mm² Red
120GC - 120 mm² Black
120GC-RED - 120 mm² Red

Length:
025M - 25 meter
050M - 50 meter
100M - 100 meter

Packaging:
0 - Ring with cable ties *(standard packaging)*
F - Plastic shrink foil
T - Plywood drum
P - Plastic drum
W - Wooden drum

331

BULK PACKAGING

Code	Description	Picture
0	Ring with cable ties = *standard packaging*	
F	Plastic shrink foil	
T	Plywood drum	
P	Plastic drum	
W	Wooden drum	

6.1.3 Single Conductor Cable UL3311

UL3311 & UL3279 EPDM CABLE

TECHNICAL SPECIFICATIONS

Cable E-file number	E361079
Voltage rating	Max 600 V
Temperature rating	UL3311: -50°C to +90°C
	UL3279: -50°C to +105°C
Cable construction	Stranded bare copper wires Paper separator EPDM outer sheath

CABLE DESIGN PARAMETERS

AWG	Cross-Section (mm²)	No. of wires	Copper Outer Diameter (mm)	Nominal Wall Thickness (mm)	Overall Outer Diameter (mm)	Max. Conductor Resistance @20°C (Ω/km)
#8	8,37	168	3,94	2,03	8,20	2,18
#6	13,30	266	5,16	2,03	9,42	1,375
#4	21,15	429	6,32	2,03	10,59	0,863
#2	33,63	676	7,87	2,03	12,14	0,548
#1	42,41	845	9,27	2,41	14,30	0,436
1/0	53,48	1066	10,24	2,41	15,27	0,344
2/0	67,43	1399	11,63	2,41	16,66	0,277
3/0	85,03	1677	13,21	2,41	18,24	0,219
4/0	107,22	2109	14,22	2,41	19,25	0,174

ELECTRICAL PROPERTIES

AWG	#8	#6	#4	#2	#1	1/0	2/0	3/0	4/0
Current Rating (A)	80	105	140	190	220	260	300	350	405

PRODUCT CODES

Per meter

ORDERING CODE	COLOR	SECTION (AWG)	Factory Packaging (standard drum length in ft)
K-UL3311-1/0	Black	1/0	500
K-UL3311-2/0	Black	2/0	500
K-UL3311-3/0	Black	3/0	500
K-UL3311-4/0	Black	4/0	500
K-UL3311-AWG1	Black	1	500
K-UL3311-AWG2	Black	2	500
K-UL3311-AWG4	Black	4	500
K-UL3311-AWG6	Black	6	500
K-UL3311-AWG8	Black	8	500
K-UL3311-1/0-RED	Red	1/0	500
K-UL3311-2/0-RED	Red	2/0	500
K-UL3311-3/0-RED	Red	3/0	500
K-UL3311-4/0-RED	Red	4/0	500
K-UL3311-AWG1-RED	Red	1	500
K-UL3311-AWG2-RED	Red	2	500
K-UL3311-AWG4-RED	Red	4	500
K-UL3311-AWG6-RED	Red	6	500
K-UL3311-AWG8-RED	Red	8	500

ORDERING CODE FOR BULK

Example
K-UL3311-1/0-250F-(

Cable:
UL3311

Section and color:
AWG8 - 8 AWG Black
AWG8-RED - 8 AWG Red
AWG6 - 6 AWG Black
AWG6-RED - 6 AWG Red
AWG4 - 4 AWG Black
AWG4-RED - 4 AWG Red
AWG2 - 2 AWG Black
AWG2-RED - 2 AWG Red
AWG1 - 1 AWG Black
AWG1-RED - 1 AWG Red
1/0 - 1/0 AWG Black
1/0-RED - 1/0 AWG Red
2/0 - 2/0 AWG Black
2/0-RED - 2/0 AWG Red
3/0 - 3/0 AWG Black
3/0-RED - 3/0 AWG Red
4/0 - 4/0 AWG Black
4/0-RED - 4/0 AWG Red

Length:
025M - 25 meter
250F - 250 feet (76,20 meter)
500F - 500 feet (152,40 meter)

Packaging:
0 - Ring with cable ties *(standard packaging)*
F - Plastic shrink foil T
- Plywood drum
P - Plastic drum W
- Wooden drum

BULK PACKAGING

Code	Description	Picture
0	Ring with cable ties = *standard packaging*	
F	Plastic shrink foil	
T	Plywood drum	
P	Plastic drum	
W	Wooden drum	

336

6.1.4 Single Conductor Double Insulated Cable

DOUBLE INSULATED PVC-NBR CABLE

TECHNICAL SPECIFICATIONS

Cable standards	EN 60228, Cl. 6
Voltage rating	600 V / 1000 v
Temperature rating	-35°C to +80°C
Cable construction	Super fine strands of annealed bare copper as per EN 60228, Cl. 6 NBR (80%) and PVC (20%) insulation and outer sheath
Minimum bending radius	5 x overall diameter
Special properties	The heavy duty cable is resistant to flame, oil, abrasions, tar and grease. The cable is suitable for use in open air, in dry as well as in damp interiors. The high degree of flexibility avoids formation of knots in the cable.

CABLE DESIGN PARAMETERS

Nominal Cross-Section (mm2)	Number of strands	Nominal thickness of insulation (mm)	Max. Diameter of wires in Conductor (mm)	Nominal overall diameter (mm)	Max. DC Conductor Resistance at 20°C (Ω/km)	Approx Weight (kg/km)
25	816	3,0	0,20	12,3	0,78	350
35	1144	3,1	0,20	13,6	0,554	460
50	1662	3,2	0,20	15,4	0,386	630
70	2346	3,3	0,20	17,3	0,272	880
95	3050	3,8	0,20	19,8	0,206	1095

ELECTRICAL PROPERTIES

Nominal Cross-Section (mm2)	Current rating at a maximum duty cycle of				
	100%	85%	60%	30%	20%
25	125	136	161	228	279
35	156	169	201	285	349
50	197	214	254	360	440
70	248	269	320	453	555
95	299	342	386	546	669

337

PRODUCT CODES

Per meter

ORDERING CODE	COLOR	SECTION (mm²)	Factory Packaging (standard drum length in m)
K-2IPN-16	Black	16	500
K-2IPN-25	Black	25	500
K-2IPN-35	Black	35	500
K-2IPN-50	Black	50	250
K-2IPN-70	Black	70	250
K-2IPN-95	Black	95	250
K-2IPN-16-ORN	Orange	16	500
K-2IPN-25-ORN	Orange	25	500
K-2IPN-35-ORN	Orange	35	500
K-2IPN-50-ORN	Orange	50	250
K-2IPN-70-ORN	Orange	70	250
K-2IPN-95-ORN	Orange	95	250

338

ORDERING CODE FOR BULK

Example:
K-2IPN-16-025M-0

Cable:
Double insulated Battery Cable

Section and color:
16 - 16 mm² Black
16-ORN - 16 mm² - Orange 25
- 25 mm² Black
25-ORN - 25 mm² - Orange 35
- 35 mm² Black
35-ORN - 35 mm² - Orange 50
- 50 mm² Black
50-ORN - 50 mm² - Orange 70
- 70 mm² Black
70-ORN - 70 mm² - Orange 95
- 95 mm² Black
95-ORN - 95 mm² - Orange

Length:
025M - 25 meter
050M - 50 meter
100M - 100 meter

Packaging:
0 - Ring with cable ties *(standard packaging)*
F - Plastic shrink foil T
- Plywood drum
P - Plastic drum W
- Wooden drum

339

BULK PACKAGING

Code	Description	Picture
0	Ring with cable ties = standard packaging	
F	Plastic shrink foil	
T	Plywood drum	
P	Plastic drum	
W	Wooden drum	

6.1.5 Single Conductor TPE Class 6 Cable

TPE BATTERY CABLE Class 6

TECHNICAL SPECIFICATIONS	
Cable standards	Adapted to BS 6862
Voltage rating	Max 200 V
Test Voltage	1000 V
Temperature rating	-40°C to +90°C
Cable construction	Bare copper wires as per EN 60228, class 6
Insulation	Thermoplastic Elastomer
Special properties	Resists for 60h acid resistance test in sulphuric acid with specific gravity 1,28 at a temperature of 160°C to 210°C No effect on insulation: insulation free from deformation and shrinkage Chemical resistance: resistant to ozone, acids, solvents, detergents, vaseline and oils

CABLE DESIGN PARAMETERS

Nominal Cross-Section (mm2)	No. of Wires	Max. Diameter of wires in Conductor (mm)	Nominal overall diameter (mm)	Max. DC Conductor Resistance at 20°C (Ω/km)
10	334	0,20	8,2	1,91
16	520	0,20	9,1	1,21
25	884	0,20	11,1	0,78
35	1176	0,20	12,8	0,554
50	1568	0,20	14,0	0,386
70	2205	0,20	16,0	0,272
95	2989	0,20	18,0	0,206

ELECTRICAL PROPERTIES

Nominal Cross-Section (mm2)	10	16	25	35	50	70	95
Current Rating (A)	85	113	153	188	223	276	329

CONVERSION FACTOR FOR DEVIATING AMBIENT AIR TEMPERATURE

Ambient air T (°C)	30	35	40	45	50	55	60	65	70	75	80	85
Derating factor	1	0,96	0,91	0,87	0,82	0,76	0,71	0,65	0,58	0,50	0,41	0,29

341

PRODUCT CODES
Per meter

ORDERING CODE	COLOR	SECTION (mm²)	Factory Packaging (standard drum length in m)
K-BAT-NF-10	Black	10	500
K-BAT-NF-16	Black	16	500
K-BAT-NF-25	Black	25	500
K-BAT-NF-35	Black	35	500
K-BAT-NF-50	Black	50	250
K-BAT-NF-70	Black	70	250
K-BAT-NF-95	Black	95	250

ORDERING CODE FOR BULK

Example
K-BAT-NF-10-025M-(

Cable:
TPE Battery Cable

Section and color:
10 - 10 mm² Black
16 - 16 mm² Black
25 - 25 mm² Black
35 - 35 mm² Black
50 - 50 mm² Black
70 - 70 mm² Black
95 - 95 mm² Black

Length:
025M - 25 meter
050M - 50 meter
100M - 100 meter

Packaging:
0 - Ring with cable ties *(standard packaging)*
F - Plastic shrink foil T
- Plywood drum
P - Plastic drum W
- Wooden drum

BULK PACKAGING

Code	Description	Picture
0	Ring with cable ties = *standard packaging*	
F	Plastic shrink foil	
T	Plywood drum	
P	Plastic drum	
W	Wooden drum	

6.1.6 Single Conductor Tri-rated Cable UL1015

Tri-rated – H05V2-K / H07V2-K / BS 6231 - UL1015 CSA 22.2 Flexible PVC Cable

TECHNICAL SPECIFICATIONS

Cable standards	BS EN 50525-2-31 BS 6231 Type CK, UL Subj.758, CSA C22.2 No. 210 (HD 21.7 S2) #LL246095, BS EN/IEC 60332, BS EN 60228
Voltage rating	UL, CSA: 600/1000V BS 6231: 600/1000V BS EN 50525-2-31: 300/500V, 450/750V
Temperature rating	UL, CSA: +105°C BS 6231: +90°C Minimum: -15°C
Cable construction	UL Style Number 1015 Conductor Class 5 flexible copper conductor Insulation PVC (Polyvinyl Chloride) Type TI3
Minimum bending radius	6 x overall diameter

CABLE DESIGN PARAMETERS

Nominal Cross-Section (mm²)	Approximate AWG	Nominal thickness of insulation (mm)	Nominal overall diameter (mm)	Nominal Weight (kg/km)	Max. Resistance of Conductor at 20°C Plain Wires (Ω/km)
0,5	21	0,8	2,7	11	39
0,75	19	0,8	2,85	15	26
1	18	0,8	3	18	19,5
1,5	16	0,8	3,3	23	13,3
2,5	14	0,8	3,75	35	7,98
4	12	0,8	4,35	48	4,95
6	10	0,8	4,85	69	3,3
10	8	1	6,3	117	1,91
16	6	1	8,1	191	1,21
25	4	1,2	9,4	281	0,78
35	2	1,2	10,9	389	0,554
50	1	1,4	13,1	560	0,386
70	2/0	1,4	15,1	774	0,272
95	3/0	1,6	16,1	991	0,206
120	4/0	1,6	17,9	1231	0,161
150	250 MCM	1,8	20,2	1534	0,129
185	350 MCM	2	22,85	1878	0,106
240	450 MCM	2,2	24,4	2381	0,0801

344

ELECTRICAL CHARACTERISTICS
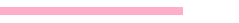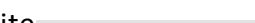
Nominal Cross-Section (mm²)	Current Rating (PEAK) (A)	Voltage Drop (mV/A/m)
0.5	11	46
0.75	14	31
1	17	22
1.5	21	15
2.5	30	9.1
4	41	5.7
6	53	3.8
10	75	2.2
16	100	1.4
25	136	0.89
35	167	0.64
50	204	0.45
70	259	0.32
95	321	0.24
120	374	0.19
150	429	0.16
185	496	0.13
240	595	0.1

DERATING FACTORS

Ambient air T (°C)	45	50	55	60	65	70	75
Derating factor	1	0,97	0,90	0,82	0,73	0,63	0,52
Where cables are to be grouped, the following factors should be applied							
No. of cables in group	2	3	4	5	6	7	8
Derating factor	0,80	0,70	0,65	0,60	0,56	0,53	0,50

PRODUCT CODES

Per meter

ORDERING CODE	COLOR	SECTION (mm²)	Factory Packaging (standard drum length in m)
K-UL1015-0.5	Black	0,5	On request
K-UL1015-0.75	Black	0,75	On request
K-UL1015-1	Black	1	On request
K-UL1015-1.5	Black	1,5	On request
K-UL1015-2.5	Black	2,5	On request
K-UL1015-4	Black	4	On request
K-UL1015-6	Black	6	On request
K-UL1015-10	Black	10	On request
K-UL1015-16	Black	16	On request
K-UL1015-25	Black	25	On request
K-UL1015-35	Black	35	On request
K-UL1015-50	Black	50	On request
K-UL1015-70	Black	70	On request
K-UL1015-95	Black	95	On request
K-UL1015-120	Black	120	On request
K-UL1015-150	Black	150	On request
K-UL1015-185	Black	185	On request
K-UL1015-240	Black	240	On request
K-UL1015-0.5-*	*	0,5	On request
K-UL1015-0.75-*	*	0,75	On request
...	*	...	...

BLU = Blue
BRN = Brown
DBL = Dark Blue
GRN = Green
GYE = Green/Yellow
GRY = Grey
LBL = Light Blue
ORN = Orange
PNK = Pink
RED = Red
VIL = Violet
WHT = White
YEL = Yellow

ORDERING CODE FOR BULK

Example
K-UL1015-70-RED-50M-(

Cable:
UL1015

Section:
0,5 mm²
0,75 mm²
1 mm²
…….
120 mm²
150 mm²
185 mm²
240 mm²

Color:
No color code = Black
BLU = Blue   BRN
= Brown
DBL = Dark Blue
GRN = Green
GYE = Green/Yellow   GRY
= Grey
LBL = Light Blue
ORN = Orange   PNK
= Pink
RED = Red
VIL = Violet
WHT = White
YEL = Yellow

Length:
025M - 25 meter
050M - 50 meter
100M - 100 meter

Packaging:
0 - Ring with cable ties *(standard packaging)*
F - Plastic shrink foil T
- Plywood drum
P - Plastic drum W
- Wooden drum

347

BULK PACKAGING

Code	Description	Picture
0	Ring with cable ties = *standard packaging*	
F	Plastic shrink foil	
T	Plywood drum	
P	Plastic drum	
W	Wooden drum	

348

6.2 Cable Accessories
6.2.1 Accessories

CABLE PROTECTION AND SLEEVES		
Picture	Ordering code	Description
	PMA-12B	Corrugated pipe diam. 12mm
	PMA-14B	Corrugated pipe diam. 14mm
	SPSCH15CON	Spiral wrapping, Black, per meter (packaging 20m)
	BR-PET20	Braided PET cable sleeve Pliosil – min. diam. 20 mm
	BR-PET30	Braided PET cable sleeve Pliosil – min. diam. 30 mm
	MOF-7.5/12-BL	Elastic blue sleeve
	MOF-7.5/12-RED	Elastic red sleeve
	MOF-7.5/12-ZW	Elastic black sleeve
	KY3	Sleeve expander tool - Type KY3
	HSB500-RED-100m	Heat-shrink tubing 12,7 mm / 6,4 mm – Red – per meter
	HSB750-RED-50m	Heat-shrink tubing 19 mm / 9,5 mm – Red – per meter
	HSB500-BLUE-100m	Heat-shrink tubing 12,7 mm / 6,4 mm – Blue – per meter
	HSB750-BLUE-50m	Heat-shrink tubing 19 mm / 9,5 mm – Blue – per meter
	HSB500-BLACK-100m	Heat-shrink tubing 12,7 mm / 6,4 mm – Black – per meter
	HSB750-BLACK-50m	Heat-shrink tubing 19 mm / 9,5 mm – Black – per meter

Cable clamps for battery tray

CABLE CLAMPS		
Picture	**Ordering code**	**Description**
	ZGEL25	Cable clamp for battery tray – 25 mm²
	ZGEL35	Cable clamp for battery tray – 35 mm²
	ZGEL50	Cable clamp for battery tray – 50 mm²
	ZGEL70	Cable clamp for battery tray – 70 mm²
	ZGEL95	Cable clamp for battery tray – 95 mm²

350

Feed-through sealing components

POLYAMIDE CABLE GLANDS	
Picture	**Description**
	- Material: PA 6 - Sealing ring: TPV - Available in white (light grey), grey and black - Temperature: -20 to 100°C - conform N62444 - available in sizes PG7 – PG48 - available in sizes M12 – M63 - counter nut optional

METAL CABLE GLANDS	
Picture	**Description**
	- Material: nickel plated brass - Sealing ring: TPV - O-ring: NBR - Temperature: -20 to 100°C - IP68 - conform N62444 - available in sizes PG7 – PG48 - available in sizes M12 – M63 - counter nut optional

Ordering codes for cable glands

Example:

CGPA-M20-WHT

CG: Cable Gland

Material:

PA – Polyamide

ME – Metal (nickel plated brass)

Size:

PG7 – PG9 – PG11 – PG13,5 – PG16 – PG21 – PG29 – PG36 – PG42 – PG48 M12 – M16 – M20 – M25 – M32 – M40 – M50 – M63

Color (only for Polyamide cable glands): WHT – White (light grey)

GREY – Grey

BLK – Black

MODULAR FEED-THROUGH SEALING COMPONENTS
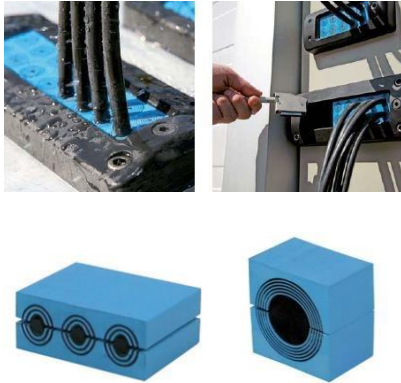
Pictures	Description
	- Lightweight composite frame cable seals. - Fits directly into standard openings. - The seals are available in six sizes. - For cable capacities from 4 to 32 cables. - IP 66/67 protection. - For cables with an outer diameter of 3,5 – 34,5 mm (0.138 – 1.358 inch) - Versions available for FL21 recess and opening for 24-pin connector - Easy install - Mounting type: bolted - Corrosion resistant - Suitable for cables with connector - Also other variants available

353

Polyamide cable ties

CABLE TIES		
Picture	**Ordering code**	**Description**
	PSB120WH	Polyamide cable tie – CV 120 – 100 pieces – White
	PSB150WH	Polyamide cable tie – CV 150 – 100 pieces – White
	PSB200WH	Polyamide cable tie – CV 200 – 100 pieces – White
	PSB250WH	Polyamide cable tie – CV 250 – 100 pieces – White
	PSB140ZW	Polyamide cable tie – CVW 140 – 1000 pieces – Black
	PSB150ZW	Polyamide cable tie – CVW 150 – 1000 pieces – Black
	PSB200ZW	Polyamide cable tie – CVW 200 – 100 pieces – Black
	PSBTG7	Tool for tie wrap 1 - 5,5mm

354

6.2.2 Cable Lugs

METRIC CABLE LUGS DIN EN 13600

Ordering code	Cable Section (mm²)	Bore hole	Packing unit (pieces)
KSECU16M06.	16	M6	100
KSECU16M08.	16	M8	100
KSECU16M10.	16	M10	100
...	...	...	...
KSECU25M06.	25	M6	100
KSECU25M08.	25	M8	100
KSECU25M10.	25	M10	100
...	...	...	...
KSECU35M06.	35	M6	100
KSECU35M08.	35	M8	100
KSECU35M10.	35	M10	100
...	...	...	...
KSECU50M06.	50	M6	100
KSECU50M08.	50	M8	100
KSECU50M10.	50	M10	100
...	...	...	...
KSECU70M06.	70	M6	100
KSECU70M08.	70	M8	100
KSECU70M10.	70	M10	100
...	...	...	...
KSECU95M06.	95	M6	50
KSECU95M08.	95	M8	50
KSECU95M10.	95	M10	50
...	...	...	...
KSECU120M06.	120	M6	50
KSECU120M08.	120	M8	50
KSECU120M10.	120	M10	50
...	...	...	...

355

METRIC CABLE LUGS UL486A

Ordering code	Cable Section (mm²)	Bore hole	Packing unit (pieces)
KSECU16M06C	16	M6	1000
KSECU16M08C	16	M8	500
KSECU16M10C	16	M10	100
...	...	...	...
KSECU25M06C	25	M6	100
KSECU25M08C	25	M8	500
KSECU25M10C	25	M10	100
...	...	...	...
KSECU35M06C	35	M6	100
KSECU35M08C	35	M8	400
KSECU35M10C	35	M10	300
...	...	...	...
KSECU50M06C	50	M6	50
KSECU50M08C	50	M8	200
KSECU50M10C	50	M10	200
...	...	...	...
KSECU70M06C	70	M6	50
KSECU70M08C	70	M8	200
KSECU70M10C	70	M10	200
...	...	...	...
KSECU95M06C	95	M6	25
KSECU95M08C	95	M8	100
KSECU95M10C	95	M10	100
...	...	...	...
KSECU120M06C	120	M6	25
KSECU120M08C	120	M8	25
KSECU120M10C	120	M10	75
...	...	...	...

356

IMPERIAL SIZE CABLE LUGS – UL Listed and CSA Certified

Ordering code	Cable Section (AWG)	Bore hole	Packing unit (pieces)
KSECU-LCA1/0-14-X	1/0	1/4	10
KSECU-LCA1/0-56-X	1/0	5/16	10
KSECU-LCA1/0-38-X	1/0	3/8	10
KSECU-LCA1/0-12-X	1/0	1/2	10
…	…	…	…
KSECU-LCA2/0-14-X	2/0	1/4	10
KSECU-LCA2/0-56-X	2/0	5/16	10
KSECU-LCA2/0-38-X	2/0	3/8	10
KSECU-LCA2/0-12-X	2/0	1/2	10
…	…	…	…
KSECU-LCA3/0-14-X	3/0	1/4	10
KSECU-LCA3/0-56-X	3/0	5/16	10
KSECU-LCA3/0-38-X	3/0	3/8	10
KSECU-LCA3/0-12-X	3/0	1/2	10
…	…	…	…
KSECU-LCA4/0-14-X	4/0	1/4	10
KSECU-LCA4/0-56-X	4/0	5/16	10
KSECU-LCA4/0-38-X	4/0	3/8	10
KSECU-LCA4/0-12-X	4/0	1/2	10
…	…	…	…
KSECU-LCA-250-14-X	250MCM	1/4	10
KSECU-LCA-250-56-X	250MCM	5/16	10
KSECU-LCA-250-38-X	250MCM	3/8	10
KSECU-LCA-250-12-X	250MCM	1/2	10
…	…	…	…

CLOSED CABLE LUGS – OTHER VERSIONS

Also available in 45° and 90° versions
For example:
KSECU95M08-45. = Angled cable lug 45° M8 – 95 mm²
KSECU95M08-90. = Angled cable lug 90° M8 – 95 mm²

Other versions and sizes on request

358

METRIC CABLE LUGS DIN 46234

Ordering code	Cable Section (mm²)	Bore hole	Packing unit (pieces)
QKSECU16M06.	16	M6	100
QKSECU16M08.	16	M8	100
QKSECU16M10.	16	M10	100
…	…	…	…
QKSECU25M06.	25	M6	50
QKSECU25M08.	25	M8	50
QKSECU25M10.	25	M10	50
…	…	…	…
QKSECU35M06.	35	M6	50
QKSECU35M08.	35	M8	50
QKSECU35M10.	35	M10	50
…	…	…	…
QKSECU50M06.	50	M6	50
QKSECU50M08.	50	M8	50
QKSECU50M10.	50	M10	50
…	…	…	…
QKSECU70M06.	70	M6	50
QKSECU70M08.	70	M8	50
QKSECU70M10.	70	M10	50
…	…	…	…
QKSECU95M06.	95	M6	25
QKSECU95M08.	95	M8	25
QKSECU95M10.	95	M10	25
…	…	…	…
QKSECU120M06.	120	M6	25
QKSECU120M08.	120	M8	25
QKSECU120M10.	120	M10	25
…	…	…	…

359

6.2.3 Battery Terminals

Terminals and special bolts

BATTERY TERMINALS		
Picture	Ordering code	Description
	TERM.NEG.15.9	Bolt-on battery terminal negative 17.9/15.9
	TERM.POS.17.5	Bolt-on battery terminal positive 19.5/17.5
	BT-QP-B	Quick Power "OJOP" 16mm² – Blue – Negative terminal
	BT-QP-R	Quick Power "OJOP" 16mm² – Red – Positive terminal

SPECIAL BOLTS AND TERMINALS		
Picture	Ordering code	Description
	EABM10-12	Replacement pole M10 – diam. 12 mm
	DBM10M10	Double sided bolt M10/M10 with "Fixcoat"
	DBM10M10+NUT	Double sided bolt M10/M10 + Nut M10
	SCREWAC	Screw M10x22 with auxiliary contact
	SCREWTERM	Welded terminal with screw + cap
	PACK157	Kit for mounting cable lug onto EnerSys terminal

360

CONICAL END TERMINALS		
Picture	Ordering code	Description
	CON-END-POS	Conical insert with bolt – 35/50 – Positive
	CON-END-NEG	Conical insert with bolt – 35/50 – Negative
	CON-END-L	Connection set terminal with conical insert 35/50 – Left – Positive
	CON-END-L-N	Connection set terminal with conical insert 35/50 – Left – Negative
	CON-END-R	Connection set terminal with conical insert 35/50 – Right – Positive
	CON-END-R-N	Connection set terminal with conical insert 35/50 – Right – Negative

361

Gaskets and rings

GASKETS & RINGS		
Picture	Ordering code	Description
	ROND10-F	Copper ring M10 – 10,4 x 15 x 5 mm
	ROND10-15-2.3	Copper ring M10 – 10,4 x15 x 2,3 mm
	RONDI10	Washer M10 – Diam. 20 mm
	RONDI10-RVS-A2	Washer M10 – Diam. 29mm – Stainless A2
	RONDP375	Ring gasket 37 x 10,5 x 2
	RONDP3753	Ring gasket 37,5 x 15 x 3
	O-RING-15-21	O-Ring 15-21
	ROND10-PP-18-2	Adapter ring between "Flex" connector and EnerSys terminal

362

6.3 Alligator Clamps

		ALLIGATOR/CROCODILE CLAMPS			
Picture	Max. current*	Length	Weight	Max. wire size	Connection
	40A	80 mm	25 gr	4 mm²	With bow to crimp
	80A	125 mm	60 gr	10 mm²	
	100A	160 mm	105 gr	35 mm²	
	300A	160 mm	160 gr	35 mm²	
	500A	165 mm	215 gr	35 mm²	
	600A	160 mm	225 gr	35 mm²	
	800A	150 mm	310 gr	50 mm²	
	900A	165 mm	310 gr	50 mm²	
	1000A	150 mm	320 gr	50 mm²	
	1000A	165 mm	350 gr	50 mm²	
	750A	180 mm	360 gr	50 mm²	
	950A	180 mm	370 gr	50 mm²	

363

ORDERING CODE FOR ALLIGATOR CLIPS

Example:
CRC-FI-600A-RED

"Crocodile Clamp"

Insulation:
FI – Fully Insulated
PI – Partially Insulated (= insulated handles)

Maximum Current:
- 40 A
- 80 A
- 100 A
- 300 A
- 500 A
- 600 A
- 750 A
- 800 A
- 900 A
- 950 A
- 1000 A

Color:
BLA – Black
RED – Red

Remarks:
- 500A, 950A and angled 1000A versions only available in fully insulated version
- Ordering codes for 1000A, angled verions are: CRC-FI-A-1000A-BLA and CRC-FI-A-1000A-RED

7. EV Charging

7.1 EV Charging Components

AC Charging cables		
PHŒNIX CONTACT		- Mode 3 AC charging cables - Type 1 and Type 2 - IEC 62196-2 / SAE J1772 - 1-Phase or 3-Phase - 20/32 A - Different lengths (4, 5, 6, 8m,….) - With or without temperature sensor
Amphenol		- Mode 3 AC charging cables - Type 2 - IEC 62196-2 - 1-Phase or 3-Phase - 20/32 A - Different lengths (4, 5, 6, 8m,….) - With or without temperature sensor

DC Charging cables		
PHŒNIX CONTACT		- Mode 4 DC charging cables - CCS-2 and CCS-1 - 40/80/150/200/250 A - High power charging versions: 400/500 A (cooled) - Different lengths (4, 5, 6, 8m,….) - With or without temperature sensor
Amphenol		- Mode 4 DC charging cables - CCS-2 - 65/125/200 A - Different lengths (4, 5, 6, 8m,….) - With or without temperature sensor

- for other brands and/or other types, please contact us
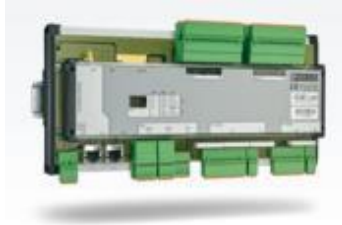
Vehicle inlets		
PHŒNIX CONTACT		- AC or DC - with locking actuator - Type 2 (CCS), AC: 8kw (1-Phase) or 26,6 kW (3-Phase) - Type 1 (CCS), AC: 12 or 20 kW (1-Phase) - CCS Type 1 and 2, DC: 125, 200 or 250 kW - 480 VAC, 32 A - 1000 VDC, 125/200/250 A - Temperature sensor
Amphenol		- 1-Phase or 3-Phase - 250 VAC, 32 A - 480 VAC, 32/63 A - 1000 VDC, 65/125/200 A - Temperature sensor optional (NTC or PT1000) - 4 possible positions for the lock (90° rotatable)

Socket Outlets		
PHŒNIX CONTACT		- IEC 62196-2 - 1-Phase or 3-Phase - 20/32A - With or without LED-indicator - With or without temperature sensor - With or without lock 12V
Amphenol		- IEC 62196-2 - 1-Phase or 3-Phase - 16/32/63 A - Optional electronic or solenoid lock - 3 possible positions for the lock (120° rotatable) - With or without temperature sensor

- for other brands and/or other types, please contact us

366

DC Charge Controllers	
PHŒNIX CONTACT	- According to IEC 61851-23 and IEC 61851-1 - AC and DC charging point - Programmable charging controller (IEC 61131) - With integrated 3G modem - CAN bus interface - RS485 / RS232 interface - Ethernet interface (RJ45) - OCPP 1.6J

AC Charge Controllers	
PHŒNIX CONTACT	- According to IEC 61851-1 (mode 3 charging) - Configurable - ISO 15118 compliant (V2G), depending on type - Dynamic load possible - USB interface, depending on type - Ethernet interface and 4G, depending on type - RS-485 bus system - Residual current monitoring module to be ordered separately - DIN rail with backplane bus connectors - RFID possible - web-based management - Open Charge Point Protocol (OCPP)
BENDER	- According to IEC 61851-1 (mode 3 charging) - Master and slave operation configurable - ISO 15118 compliant (V2G) - Dynamic load management - USB interface - Integrated 4G modem possible (SIM card needed) - Modbus - Integrated residual direct current monitoring (RCD module to be ordered separately) - RFID possible - OCPP 1.5 and 1.6 and EEBUS Protocol - Web interface configuration

367

DC Power Electronics		
PHŒNIX CONTACT		- DC power module - 19" rack mounting - CAN bus - 3-phase input - 150-1000 VDC output - 30 kW
PHŒNIX CONTACT		- DC power module - Rack mounting (control cabinet needed) - 3-phase input - 200-920 VDC output - 87,5 kW - combined up to 350 kW charging possible

Surge Protection		
PHŒNIX CONTACT		- Surge protective device type 1/2 - for 3-phase (5 conductor) - Din rail mounted

- for other brands and/or other types, please contact us

368

Energy Meters/Billing Meters		
LEM		- Universal DC Billing Meter - Compliant with VDE-AR-E-2418-3-100 - Compliant with legal metrology for billing systems - Voltage measurement from 150V to 1150V - 400 and 600 A version - Ethernet communication - Bi-directional meter for V2G - Charging cable resistance compensation
BENDER		- MID approved - Modbus RTU interface - 1-Phase / 32A or 3-Phase / 65 A - 7-digit display
PHOENIX CONTACT		- MID approved (AC) energy meter - 3-Phase - Direct measurement up to 80 A - Modbus/TCP , Modbus/RTU or M-bus interface
ABB		- 3-Phase EQ-meter with IR-port - 65 A - Modbus RS-485 optional - MID approved - LCD with backlight
ABB		- 1-Phase EQ-meter with IR-port - 65 A - Modbus RS-485 optional - MID approved - LCD with backlight

369

Ground Fault Detection/Residual Current Monitoring

PHŒNIX CONTACT		- IEC 62955 - Residual current monitoring module - for AC and DC residual voltages in AC installations - In combination with phoenix charge controllers - 100 A (1-phase) / 40 A (3-phase) - Fault Signal Output: Active High Open Drain
PHŒNIX CONTACT		- IEC 61851-1 - Residual current monitoring module - for AC and DC residual voltages in AC installations - 50 A - 1- and 2-channel execution
BENDER		- Residual current monitoring module - 1-Phase or 3-phase (AC) - Up to 32A - LED indication - alarm relay with 1 N/C contact
BENDER		- IEC 61869-1 - Current transformer - To connect directly into Bender charge controller - AC and DC residual current - six-core cable - up to rated voltage of 600V - rated current 48A - available with 3 cable lengths
ABB		- RCD with automatic test and reset function - Type A / AP R - 2- or 4-pole (5 or 7 DIN modules) - 25/40/63 A - optional RS485 Modbus module (ARBus)
Littelfuse		- microprocessor-based ground-fault monitor for resistance-grounded and solid grounded systems - output relay with isolated normally open and normally closed contacts for use in independent control circuits - Current transformer to be ordered separately - SE-701

370

Insulation Monitoring		
BENDER		- ISOMETER - for DC charging stations (mode 4 / IEC 61851-23) - nominal voltage up to 1000 VDC - Measurement of the mains voltage (r.m.s.) with undervoltage and overvoltage detection - Modbus RTU interface
BENDER		- ISOMETER - for DC charging stations (mode 4) - Switchable between CCS and CHAdeMO - nominal voltage up to 1000 VDC - detection of symmetrical and asymmetrical insulation faults - Modbus RTU interface

Switch-disconnectors and Emergency stops		
ABB		- OT Manual Switch-disconnector - Remote operation possible (Motorized) - 160-4000 A (IEC) - Modular system - 3-/4-pole - Front- or side-operated - Auxiliary contact blocks optional
ABB		- 4-pole switch disconnector - 25 and 40 A - 750 V - Front operated - DIN-rail mountable
ABB		- Compact Emergency Stop - 24...300 V - 2NC - Twist release - Mushroom 40 mm - Non-illuminated

- for other brands and/or other types, please contact us

RFID		
PHŒNIX CONTACT		- RS-485 interface - USB interface
PHŒNIX CONTACT		- RS-485 interface - USB interface
BENDER		- RFID module without integrated status LEDs - ISO14443A/MIFARE standard - connected to the charge controller with RJ45 cable

Display		
BENDER		- Display module - 2x16 characters - visualizes the status of the charge controller - two RJ45 sockets
PHŒNIX CONTACT		- Touch panel, TFT Display - different sizes - RJ45 connection - Windows Embedded Compact 7 - 2 USB interfaces - IP65 or IP67 - Sunlight readable display
PHŒNIX CONTACT		- Touch panel, 12,1" TFT Display - IP65 - 2x Ethernet RJ45 - USB interface - COM (RS-232/422/485) interface

- for other brands and/or other types, please contact us

372

7.2 Customized EV Charger Cables and Components

The definition of custom-made is built to a specific order or specifications.

We have in-house manufacturing and sourcing capabilities and a wide selection of tools, allowing us the flexibility to produce cables to your specifications. From one-offs to high volumes, simple or very complex, you can count on us.

As an independent expert we can propose alternatives in order to determine the assembly that best suits your application.

We can make your cables to your wishes:
- with the connection you need: with cable lugs or other connectors.
- cut to exact length
- wires dismantled
- with markings
- provided with cable gland to mount in the cabinet
- with extra protection, for example heat shrink tubing
- ….

We can make the cable completely ready to install which has a lot of advantages for you:
- saving production time
- no need for you to buy and take stock of small components needed to make the cables, saving time and costs in logistics and purchase.

373

7.3 Fuses

7.3.1 General Purpose Fuses

Overcurrent protection is critical to personal safety and protection of your system.

All electrical systems eventually experience overcurrent's. Unless removed in time, even moderate overcurrent's quickly overheat system components, damaging insulation, conductors, and equipment. Large overcurrent's may melt conductors and vaporize insulation. Very high currents produce magnetic forces that bend and twist bus bars. These high currents can pull cables from their terminals and crack insulators and spacers.

Protection against overload and short-circuit:

An overload is an overcurrent confined to normal current paths in which there is no insulation breakdown.

A short-circuit is an overcurrent flowing outside of its normal path. Types of short-circuits are generally divided into three categories: bolted faults, arcing faults, and ground faults.

As an independent supplier, Vandapower can supply a large number of fuses from several brands to protect your system. If you can't find the fuse you need in this folder, just send us a request with the necessary information so that we can help you find the correct fuse.

The most important selection criteria to choose the correct fuse for your application:
• Current Rating
• Voltage Rating
• Interrupting Rating
• Type of Protection and Fuse Characteristics
• Current Limitation
• Physical Size
• Indication

For the ordering codes, please contact us, providing us the above information or the original supplier code.

Forklift fuses

CNN/CNL Mersen			
Type	**Voltage Rating**	**Current Rating**	**Standard**
CNN	130 VAC	10 – 800 A	UL File E60314
CNN	75 VAC	10 – 300 A	UL File E60314
CNN	48 VDC	301 – 800 A	UL File E60314
CNL	80 VAC / 80VDC	35 – 500 A	UL File E60314

DIN CNN/CNL Mersen			
Type	**Voltage Rating**	**Current Rating**	**Standard**
CNN_DIN	130 VAC / 80 VDC	10 – 800 A	DIN43560 / UL
CNL_DIN	80 VAC / 80 VDC	35 – 750 A	DIN43560 / UL

ACK/ACL/ALS Mersen			
Type	**Voltage Rating**	**Current Rating**	**Standard**
ACK	125 VAC / 125 VDC	1 – 400 A	UL File E60314
ACL	125 VAC / 125 VDC	30 – 120 A	UL File E60314
ALS	125 VAC / 125 VDC	100 – 500 A	UL File E60314

CNN/CNL Littelfuse			
Type	Voltage Rating	Current Rating	Standard
CNN	125 VAC / 48 VDC	10 – 800 A	UL File 71611
CNN_E	125 VAC / 80 VDC	35 – 800 A	UL File 71611
CNL	32 VAC / 32 VDC	35 – 500 A	UL File 71611

Fuse Strips

Fuse Strips Littelfuse			
Type	Voltage Rating	Current Rating	Standard
156.5610	36 VDC	25 – 250 A	DIN72581/2

V-Fuses SIBA			
Type	Voltage Rating	Current Rating	Standard
A – Open type	80 VDC	20 – 500 A	DIN43560
B – Enclosed type	80 VDC	20 – 500 A	DIN43560
Open type	24 VDC	25 – 150 A	DIN72581/2
Enclosed type	24 VDC	25 – 150 A	DIN72581/2

376

Cylindrical miniature fuses

ATM Mersen			
Type	Voltage Rating	Current Rating	Standard
Size 10x38	600 VAC / 600 VDC	0,1 – 30 A	UL 248-14/ C22.2

FR Mersen			
Type	Voltage Rating	Current Rating	Standard
Size 10x38	400 to 690 VAC	0,5 – 32 A	IEC 60269-1 & -2
Size 14x51	500 to 690 VAC	1 – 50 A	IEC 60269-1 & -2
Size 22x58	500 to 690 VAC	2 – 125 A	IEC 60269-1 & -2

POWR-GARD Littelfuse			
Type	Voltage Rating	Current Rating	Standard
Size 10x38	500 VAC	0,5 – 32 A	IEC 60269
Size 14x51	500 VAC	2 – 50 A	IEC 269-2-1
Size 22x58	500 VAC	16 – 100 A	IEC 269-2-1

377

British style fuses

BS88 Mersen

Type	Voltage Rating	Current Rating	Standard
A-type	415 VAC / 240 VDC	36 – 200 A	BS88 / IEC 60269
F-type	415-550 VAC / 250 VDC	2 – 63 A	BS88 / IEC 60269
B & C-type	415 VAC / 240 VDC	32 – 800 A	BS88 / IEC 60269

Protistor BS88-4 Mersen

Type	Voltage Rating	Current Rating	Standard
URE	250 VAC	5 – 32 A	BS88-4 / IEC 60269
URGS	250 VAC	7 – 80 A	BS88-4 / IEC 60269 / UL248-1
URZ	250 VAC	100 – 180 A	BS88-4 / IEC 60269

URE-Fuses SIBA

Type	Voltage Rating	Current Rating	Standard
SLCT	240 VAC / 150 VDC	5 – 20 A	BS88-4 / IEC 60269-4
SLET	240 VAC / 150 VDC	25 – 180 A	BS88-4 / IEC 60269-4
SLMT	240 VAC / 150 VDC	160 – 450 A	BS88-4 / IEC 60269-4
2x SLMT	240 VAC / 150 VDC	300 – 900 A	BS88-4 / IEC 60269-4
SCT	690 VAC / 450 VDC	6 – 20 A	BS88-4 / IEC 60269-4
SFE	690 VAC	25 – 100 A	BS88-4 / IEC 60269-4
SMT	690 VAC / 450 VDC	100 – 355 A	BS88-4 / IEC 60269-4
2x SMT	690 VAC / 450 VDC	315 – 710 A	BS88-4 / IEC 60269-4

378

Knife fuses

IEC NH Mersen			
Type	Voltage Rating	Current Rating	Standard
Size 000 gG	400 VAC	2 – 100 A	IEC 60269-1 and -2 / VDE 0636-201
Size 00 gG	400 VAC	125 – 160 A	IEC 60269-1 and -2 / VDE 0636-201
Size 1 gG	400 VAC	35 – 250 A	IEC 60269-1 and -2 / VDE 0636-201
Size 2 gG	400 VAC	35 – 400 A	IEC 60269-1 and -2 / VDE 0636-201
Size 3 gG	400 VAC	250 – 630 A	IEC 60269-1 and -2 / VDE 0636-201
Size 000 gG	500 VAC / 250 VDC	2 – 100 A	IEC 60269-1 and -2 / VDE 0636-201
Size 00 gG	500 VAC / 250 VDC	125 – 160 A	IEC 60269-1 and -2 / VDE 0636-201
Size 0 gG	500 VAC / 250 VDC	6 – 250 A	IEC 60269-1 and -2 / VDE 0636-201
Size 1 gG	500 VAC / 250 VDC	16 – 355 A	IEC 60269-1 and -2 / VDE 0636-201
Size 2 gG	500 VAC / 250 VDC	25 – 500 A	IEC 60269-1 and -2 / VDE 0636-201
Size 3 gG	500 VAC / 250 VDC	224 – 800 A	IEC 60269-1 and -2 / VDE 0636-201
Size 000 gG	690 VAC / 250 VDC	2 – 80 A	IEC 60269-1 and -2 / VDE 0636-201
Size 00 gG	690 VAC / 250 VDC	32 – 125 A	IEC 60269-1 and -2 / VDE 0636-201
Size 0 gG	690 VAC / 250 VDC	6 – 160 A	IEC 60269-1 and -2 / VDE 0636-201
Size 1 gG	690 VAC / 250 VDC	16 – 250 A	IEC 60269-1 and -2 / VDE 0636-201
Size 2 gG	690 VAC / 250 VDC	32 – 355 A	IEC 60269-1 and -2 / VDE 0636-201
Size 3 gG	690 VAC / 250 VDC	250 – 500 A	IEC 60269-1 and -2 / VDE 0636-201

A15QS Amp Trap Mersen			
Type	Voltage Rating	Current Rating	Standard
A15QS*	150 VAC / 150 VDC	1 – 6000 A	UL File E60314

URM NH Siba

Type	Voltage Rating	Current Rating	Standard
Size 000 gG	400 VAC	2 – 100 A	IEC 60269-1 and -2 / VDE 0636-201
Size 00 gG	400 VAC	125 – 160 A	IEC 60269-1 and -2 / VDE 0636-201
Size 1 gG	400 VAC	35 – 250 A	IEC 60269-1 and -2 / VDE 0636-201
Size 2 gG	400 VAC	35 – 400 A	IEC 60269-1 and -2 / VDE 0636-201
Size 3 gG	400 VAC	250 – 630 A	IEC 60269-1 and -2 / VDE 0636-201
NH 000/00 gR/aR	500 VAC	6 – 200 A	IEC 60269-4 / VDE 0636-4
NH 0 gR/aR	500 VAC	16 – 160 A	IEC 60269-4 / VDE 0636-4
NH 1 gR/aR	500 VAC	63 – 315 A	IEC 60269-4 / VDE 0636-4
NH 2 gR/aR	500 VAC	32 – 630 A	IEC 60269-4 / VDE 0636-4
NH 3 aR	500 VAC	160 – 700 A	IEC 60269-4 / VDE 0636-4
NH 3 DIN110 gR	660 VAC	150 – 500 A	IEC 60269-4 / VDE 0636-4
NH 000/00 gR/aR	690 VAC	10 – 160 A	IEC 60269-4 / VDE 0636-4
NH 000/00 gRL (gS)	690 VAC	16 – 200 A	IEC 60269-4 / VDE 0636-4 / UL248-13
NH 1 gR/aR	690 VAC	40 – 315 A	IEC 60269-4 / VDE 0636-4
NH 1 gRL (gS)	690 VAC	63 – 315 A	IEC 60269-4 / VDE 0636-4 / UL248-13
NH 2 aR	690 VAC	160 – 450 A	IEC 60269-4 / VDE 0636-4
NH 2 gRL (gS)	690 VAC	160 – 500 A	IEC 60269-4 / VDE 0636-4 / UL248-13
NH 3 aR	690 VAC	315 – 800 A	IEC 60269-4 / VDE 0636-4
NH 3 gRL (gS)	690 VAC	315 – 800 A	IEC 60269-4 / VDE 0636-4 / UL248-13
NH 0 gR/aR	1000 VAC	16 – 160 A	IEC 60269-4 / VDE 0636-4
NH 3 DIN130	1000 VAC	100 – 500 A	IEC 60269-4 / VDE 0636-4
NH 3 aR	2000 VAC	200 – 710 A	IEC 60269-4 / VDE 0636-4
NH 1 gR	750 VDC	32 – 200 A	
NH 1 gPV	1000 VDC	50 – 160 A	IEC 60269-6 / UL2579
NH 3L gPV/gR	1000 VDC	125 – 400 A	IEC 60269-4 / VDE 0636-4
NH 1XL gPV/gR	1100 VDC	50 – 250 A	IEC 60269-6 / UL4248-13
NH 1XL gPV	1100 VDC	50 – 200 A	IEC 60269-6 / UL2579
NH 3L gPV	1100 VDC	200 – 400 A	IEC 60269-6 / UL2579

7.3.2 EV and Motor Protection Fuses

Overcurrent protection is critical to personal safety and protection of your system.

All electrical systems eventually experience overcurrent's. Unless removed in time, even moderate overcurrent's quickly overheat system components, damaging insulation, conductors, and equipment. Large overcurrent's may melt conductors and vaporize insulation. Very high currents produce magnetic forces that bend and twist bus bars. These high currents can pull cables from their terminals and crack insulators and spacers.

Protection against overload and short-circuit:

An overload is an overcurrent confined to normal current paths in which there is no insulation breakdown.

A short-circuit is an overcurrent flowing outside of its normal path. Types of short-circuits are generally divided into three categories: bolted faults, arcing faults, and ground faults.

As an independent supplier, Vandapower can supply a large number of fuses from several brands to protect your system. If you can't find the fuse you need in this folder, just send us a request with the necessary information so that we can help you find the correct fuse.

The most important selection criteria to choose the correct fuse for your application:
• Current Rating
• Voltage Rating
• Interrupting Rating
• Type of Protection and Fuse Characteristics
• Current Limitation
• Physical Size
• Indication

For the ordering codes, please contact us, providing us the above information or the original supplier code.

EV – Battery pack fuses

MEV100 Ferrule fuse Mersen				
Type	Voltage Rating	Current Rating	Rated breaking capacity DC	Standard
MEV100C	1000 VDC	8 – 30 A	20 kA	JASO D622 / ISO-TS16949

MEV100 Surface mount fuse Mersen				
Type	Voltage Rating	Current Rating	Rated breaking capacity DC	Standard
MEV100Cxx-S	1000 VDC	8 – 30 A	20 kA	JASO D622 / ISO-TS16949

MEV100 Round body fuse Mersen				
Type	Voltage Rating	Current Rating	Rated breaking capacity DC	Standard
MEV100A	1000 VDC	50 – 300 A	100 kA	JASO D622 / ISO-TS16949
MEV100J	1000 VDC	350 – 600 A	20 kA	JASO D622 / ISO-TS16949

Motor protection fuses

Class RK5 fuse Mersen			
Type	Voltage Rating	Current Rating	Standard
TR-R	250 VAC / 250 VDC	0,1 – 400 A	UL 248-12 / CSA C22.2
TR-R	160 VDC	3 – 600 A	UL 248-12 / CSA C22.2
TRS-R	600 VAC / 600 VDC	0,1 – 600 A	UL 248-12 / CSA C22.2
TRS-R	300 VDC	15 – 60 A	UL 248-12 / CSA C22.2

Class RK5 Littelfuse			
Type	Voltage Rating	Current Rating	Standard
IDSR	600 VAC / 600 VDC	0,1 – 600 A	UL 248-12 / UL 198M / CSA (File: LR29862)
FLNR	250 VAC / 125 VDC	0,1 – 600 A	UL 248-12 / CSA (File: LR29862)
FLSR	600 VAC / 300 VDC	0,1 – 600 A	UL 248-12 / CSA (File: LR29862)

7.4 E-Mobility Motors and Drivers

Today, electric motors form an essential part of the energy-efficient drive technology of industrial machines and electrical transportation. As an independent supplier, Vandapower can supply various type of electrical motors with the wide range of torque and speed.

384

Servo Motors

BAUMÜLLER		**AC Servo Motor** - General purposes - High dynamic - High speed - High precision - High torque - 0.3 - 150 [kW] - 2 - 1 050 [Nm] - 1 000 - 6 000 [rpm] - 230 - 400 [V]
maxon		**DC Motor Compact Driver Gear and Electronics** - Integrated commutation electronics with 4-Q speed control - Short design with high torque - Compact drive with integrated EPOS4 positioning and speed controller - High power density - 230 - 316 [W] - 376 - 779 [Nm] - 2 700 - 4 500 [rpm] - 24 - 48 [V]

385

AC Motors

Three-Phase Synchronous Motors

- Variety of IP classes
- With smooth shaft and parallel key shaft options
- Cooling system
- 5.3 - 295 [kW]
- 43 - 1 330 [Nm]
- 500 - 4 500 [rpm]

Three-Phase Asynchronous Motors

- All models are optionally available with a brake
- High torque accuracy
- 3.5 - 400 [kW]
- 25 - 3 200 [Nm]
- 400 - 3 000 [rpm]

AC Disc Motors

- Ironcore and Ironless
- High torque thanks to NeFeBr magnets
- Optionally available with brake, tachometer, encoder and gearbox
- 400 - 6 300 [kW]
- 0.6 - 80 [Nm]
- 350 - 4 500 [rpm]

MI Asynchronous Motors

- Available individually or as a complete system with separate suitable motor controller (MC-040)
- Robust or light, efficient and compact versions with permanent magnet
- Complete low voltage drive systems with high power density
- 4 - 8 [kW]
- 90 [Nm]
- 8 000 [rpm]

386

DC Motors

Brushed

- Compact motor due to its ironless winding
- Minimal electromagnetic interference
- With an efficiency of up to 90%
- Speeds of more than 20 000 rpm have been attained with some special versions
- 0.3 - 250 [W]
- 0.3 - 888 [Nm]
- 4 000 - 9 000 [rpm]
- 3 - 70 [V]

Brushless

- The motor has a rotating permanent magnet, with or without ironless winding
- It has a Hall sensor to know the position of the motor and thus have a controlled starting of the motor
- 0.3 - 600 [W]
- 0.8 - 1 040 [Nm]
- 6 000 - 110 000 [rpm]
- 3 - 60 [V]

Compact Driver Electronics

- Integrated commutation electronics with 4-Q speed control
- Short design with high torque
- Compact drive with integrated EPOS4 positioning/speed controller
- High power density
- 230 - 316 [W]
- 376 - 779 [Nm]
- 2 700 - 4 500 [rpm]
- 24 - 48 [V]

387

DC Motors

BAUMÜLLER

Disc Motors

- Direct current disc motors are permanent magnet motors with an ironless rotor and barrel commutator
- The shortest design requires only 39.5 mm installation space in the axial direction
- 16 - 204 [W]
- 0.055 - 1.73 [Nm]
- 1800 - 4800 [rpm]
- 12 - 48 [V]

Compact Synchronous Motors

- Permanent magnet synchronous motors with integrated power inverters
- The PowerMELA drive concept consists of a permanently excited synchronous reluctance motor and an integrated four-quadrant frequency converter.
- 50 - 280 [kW]
- 160 - 1 220 [Nm]
- 3 000 - 6 000 [rpm]
- 400 - 695 [V]

DC Motor - Compact Designs

maxon		
		Wheel Drive - The system is a modular, highly integrated, and compact drive system - The standard configuration consists of the motor, gearhead and encoder - It can be individually supplemented with brake, controller and wheel as desired - 8.5 - 27 [Nm] - 20 - 290 [rpm] - 12 - 60 [V]
		Bike Drive - Accelerates from 0 to 9 m/s in less than 3 seconds - It enables an average weight cyclist (79.5 kg) to climb an altitude of 975 m at 10% average incline in less than 30 minutes - 500 - 600 [W] - 19 - 26 [Nm] - 183 - 290 [rpm] - 48 [V]
Ketterer DRIVES		**Wheel Drive** - No gearbox – no wear - Longer service life compared to conventional drive technology - Three standard sizes - Possible to replace the wheel - Can be combined with various controllers - Customer-specific mechanical integration and system connection - 3 - 10 [Nm] - 154 - 530 [rpm] - 48 [V]

389

		Ket-Rob Drive platform for AGV/AGC
Ketterer DRIVES		- Complete basic drive module for AGV/AGC - Customer-specific adaptions of the drivers or systems are possible - Dimensioning of the drive platform according to individual requirements - 24 - 48 [V] - 7 [km/h] - 210 [W] - Load capacity: 100 [kg]

AC Motor - Compact Designs		
BAUMÜLLER		**Wheel Hub Gears** - Available in single and multilevel versions with different ratios - Optional decoupled version - Running noise < 68 [dB] - Wheel load 700 - 2 100 [kg] - 160 - 800 [Nm] - 6 000 [rpm]
		Ship Motors - Water cooling in a stainless steel design - Suitable for sophisticated direct drive technology - Encoders: Resolver, SinCos (optional) and Digital encoder (optional) - IP54 type of protection - Other encoders on request - 2.7 - 1 542 [kW] - 140 - 39 500 [Nm] - 100 - 1 500 [rpm]

390

Controllers and Drivers

		Frecuency Converter - Numerous protection and overload functions, such as phase failure detection on the power supply and motor - Extensive control and data management continuously provide an accurate overview of the current drive status - Electronics supply external 24 [VDC] - Supply frequency 47 - 63 [Hz]
BAUMÜLLER		**Servo Driver** - Servo drive for higher output ratings - All devices have integrated rectifiers, DC link capacitors and inverters - Water cooling system - 1.1 - 315 [kW] - 2.5 - 615 [A]
		Modular Servo Driver - Individual modules easily can be removed or added over an integrated drive connect system without having to disconnect the entire drive system - With high-performance power units in air-cooled, water-cooled and cold plate cooling versions - 5 - 200 [kW] DC link power - 3 - 180 [A]

Controllers and Drivers

maxon		**Programable Master Controllers** - Controlled Variables: Speed, Position and Current - Servo amplifiers for controlling the fast reacting - Programmable multi-axis masters - The frequency ranges depend on which kind of motor and controller you use - 2 - 12 [A] - 10 - 70 [V]
BAUMÜLLER		**Drive System for Mobile Applications** - The b maXX mobil can brake in both directions and recover energy in addition to generating drive - With and without galvanic isolation - 40 - 225 [A] - 12 - 14 V

8. AC & DC Contactors

Possible features
The contactors are available in a lot of posible executions, with several options, all depending on the brand and type:
- AC or DC
- Bidirectional switching possible
- Up to 4800 V and 1100 A
- Single pole and double pole
- NO (Normally Open) or NC (Normally Closed) main contacts
- Several coil voltages possible (12, 24, 48,… VDC)
- Coil suppression possible
- Mounting orientation: horizontal, vertical,…
- Auxilliary contacts possible
- Sealed versions possible
- With gas chamber or with blowout magnets
- Monostable or bistable switching

Possible brands/suppliers	
SCHALTBAU	
	GIGAVAC
TE connectivity	
	ravioli
ABB	

9. Truck and Trailer

ERICH JAEGER CONNECTORS

For more than 90 years, ERICH JAEGER has been developing and manufacturing high-quality connector systems for different branches of industry, particularly the light and commercial vehicle sector. And they are taking their products to the next level with developing high-speed data connectors for the data transmission between towing vehicle and trailer.

Standards

We offer trailer connector systems including plugs, sockets and cables according to more than 25 different international standards covering all kinds of vehicles from agricultural machinery to cars and commercial vehicles to defense technology. Our products cover different types of standards like ISO, DIN, SAE, VG and more.

394

2-Pole Connectors (VG 96917)

Female connector		
Ordering code	**Description**	
EJ-151208*	Erich Jaeger - 2P/24V socket - 135A - kit	
EJ-151211*	Erich Jaeger - 2P/24V socket - 168A - kit	
EJ-382092	2P/24V main contact - 135A - 35 mm²	
EJ-382093	2P/24V main contact - 168A - 50 mm²	

Male connector		
Ordering code	**Description**	
EJ-251097*	Erich Jaeger - 2P/24V plug - 135A - kit (rubberized)	
EJ-251098*	Erich Jaeger - 2P/24V plug - 168A - kit (rubberized)	
EJ-251269*	Erich Jaeger - 2P/24V plug - 135A - kit	
EJ-251270*	Erich Jaeger - 2P/24V plug - 168A - kit	
EJ-021797-1	2P/24V main contact - 135a - 35 mm²	
EJ-021814-1	2P/24V main contact - 168a - 50 mm²	

395
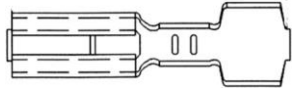
7-Pole/12V Connectors - Iso 1724 (Type N)

Socket connector	
Ordering code	**Description**
EJ-101371	Erich Jaeger - 7P/12V - socket - kit
EJ-382510	7P/12V - socket - housing
EJ-382509	7P/12V socket - socket - contact insert
EJ-380511	Crimp contact insert
EJ-034915	Seal for multi core cable
EJ-052675-4	Main contact - female - 1-2.5 mm²
EJ-025462-3 EJ-025434-3 EJ-025436-3	Main contact - male - 1 mm² Main contact - male - 1.5 mm² Main contact - male - 2.5 mm²
EJ-025463-3 EJ-025020-3 EJ-025148-3 EJ-025277-3	Main contact - female - 1 mm² Main contact - female - 1.5 mm² Main contact - female - 2.5 mm² Main contact - female - 4 mm²
EJ-055632	Single wire seal - 1-2.5 mm²

396

EJ-026077	3P receptacle housing - left	
EJ-026076	3P receptacle housing - right	
EJ-056077-4	Type N - receptacle	
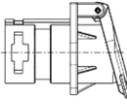
Plugs and adapters		
Ordering code	**Description**	
EJ-201240	Erich Jaeger - 7P/12V - screw contact - cable diameter 6.30-8.30 mm	
EJ-201212	Erich Jaeger - 7P/12V - screw contact - cable diameter 9.20-11.50 mm	
EJ-311009-BK	Short adapter 13P-7P - nickel	
EJ-311041	Short adapter 13P-7P - standard	
EJ-311067-BK	Shorty - mini short adapter 13P-7P	
EJ-311164	Economy shorty - mini short adapter 13P-7P	
EJ-311104-BK	Mika 2 - mini short adapter 7P-13P	

397

EJ-311188	Economy - mini short adapter 7P-13P	

7-Pole/24V Connectors - ISO 1185 (Type N)
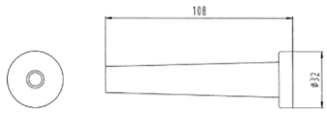
Socket connector		
Ordering code	**Description**	
EJ-111317	Erich Jaeger - 7P/24V - socket - kit	
EJ-383357	7P/24V - socket - housing	
EJ-383175	7P/24V socket - socket - contact insert	
EJ-037742-4	Contact sleeve - 1.5-2.5 mm²	
EJ-055648	Single wire seal - 1.5-2.5 mm²	
EJ-037743	Single wire seal - 2.5-3.5 mm²	
EJ-026230	7P/12,24V weather lock seal	

| EJ-382620 | 180° end cap | |
| EJ-382521 | 90° end cap | |

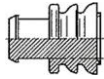| Plug connector	
Ordering code	**Description**
EJ-111317	Erich Jaeger - 7P/24V - plug - kit
EJ-038444	Cable outlet for plugs - 8.5-10.5 mm
EJ-035490	Cable outlet for plugs - 10-12 mm
EJ-036102	Seal
EJ-035880	Sealing plug - 5.80-6.20 mm
EJ-035206	Single wire seal - 7-8 mm
EJ-036488	Single wire seal - 7.60-9.80 mm
EJ-035310	Single wire seal - 9.20-11.50 mm
EJ-035878	Single wire seal - 5.60-6.40 mm
EJ-025308	Union nut
EJ-025309	Sliding ring
EJ-026206	Screw cap

399

13-Pole/12V Connectors - ISO 11446

Socket connector		
Ordering code	**Description**	
EJ-121314	Erich Jaeger - 13P/12V Jaeger expert - socket - tin contact - kit	
EJ-121322	Erich Jaeger - 13P/12V Jaeger expert - built in socket - nickel contact - kit	
EJ-382594	13P/12V Jaeger expert socket - tin contact - without switch	
EJ-382595	13P/12V Jaeger expert - socket - tin contact - reed switch opening	
EJ-382596	13P/12V Jaeger expert - socket - tin contact - captive screws	
EJ-382597	13P/12V Jaeger expert - socket - tin contact - captive screws - switch opening	
EJ-383085	13P/12V Jaeger expert - built in socket - housing	
EJ-026988	End cap	
EJ-037752	Bending protection grommet	
EJ-382598	Contact insert	

EJ-031828	Reed switch	
EJ-053861-4	Main contact - female - 0.5-1 mm²	
EJ-052675-4	Main contact - female - 1-2.5 mm²	
EJ-059124	Stuff plug	
EJ-053862	Single wire seal - 0.5-1 mm²	
EJ-05362	Single wire seal - 1-2.5 mm²	
EJ-037129	Multi core cable seal	
EJ-037841	Multi core cable seal - with water drainage	

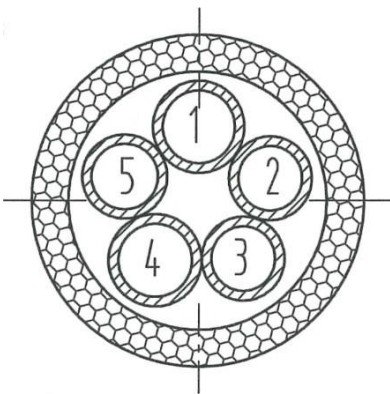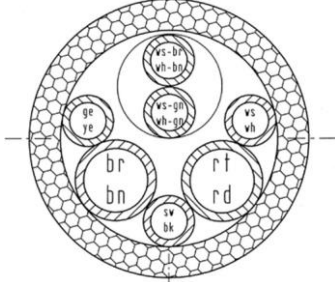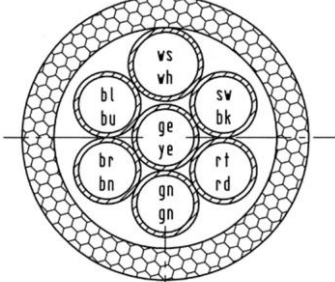| Plug connector	
Ordering code	**Description**
EJ-221097-BK	Erich Jaeger - 13P/12V - plug - nickel - 5.60-6.40 mm - 8x contact
EJ-221019	Erich Jaeger - 13P/12V - plug - nickel - 9.20-11.50 mm
EJ-221036-BK	Erich Jaeger - 13P/12V - plug - bronze - 9.20-11.50 mm + sealing ring
EJ-221029-BK	Erich Jaeger - 13P/12V - plug - standard - 11.40-14 mm
EJ-221032	Erich Jaeger - 13P/12V - plug - standard - 11.40-14 mm + sealing ring
EJ-380382	Screw contact pin - short
EJ-380381	Screw contact pin - long
EJ-301161	Coupler

Coils and cables

Coils	
Ordering code	**Description**
K-EJ-016558	2-pole coil - 35 mm² - 3.5-4 m*
K-EJ-016559	2-pole coil - 35 mm² - 3.5-4 m*
K-EJ-016271	7-pole coil - 6x 1.5 mm² + 1x 2.5mm² - 4-4.5 m* - black
K-EJ-017672	7-pole coil - 6x 1.5 mm² + 1x 2.5mm² - 4-4.5 m* - green
K-EJ-016769	15-pole coil - 12x 1.5 mm² + 3x 2.5mm² - 3-4 m* - black

Cables		
Ordering code	**Description**	
K-EJ-784863	2-pole click in cable 2x 1.5 mm² 100 m ring	

402

K-EJ-784969	5-pole ABS cable 3x 1.5mm² + 2x 4 mm² 25 m ring	
K-EJ-784970	7-pole EBS cable 5x 1.5 mm² + 2x 4 mm² 25 m ring	
K-EJ-784972	7-pole cable 6x 1 mm² + 1x 1.5 mm² 50 m ring	
K-EJ-784971	15-pole cable 12x 1.5 mm² + 3x 2.5 mm² 25 m ring	

403