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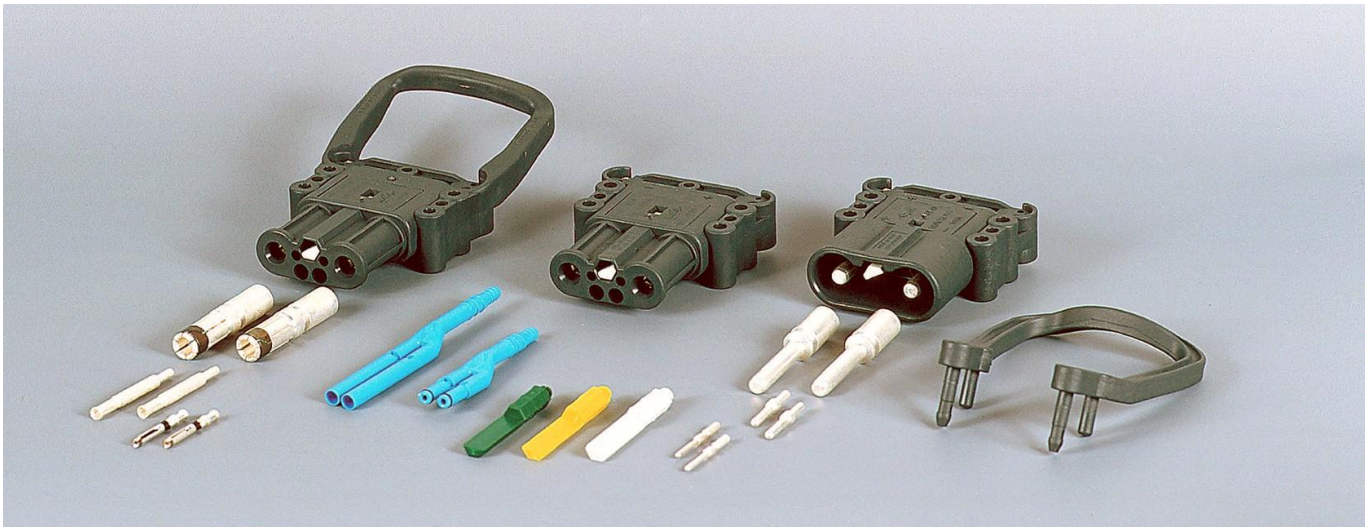

DIN 80, 160, 320

CONNECTOR DATASHEET

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DIN 80, 160 and 320 Connector datasheet

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.

The three traditional sizes of power connectors are based upon the amperage requirements: DIN 80 A, DIN 160 A, DIN 320 A

To meet the demands of newer high-current applications, including "fast charging", REMA® has developed a larger capacity DIN 640 A connector.

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
- Main Contacts are made from E-Cu copper optimized for crimp connection. Only the use of REMA crimp equipment results in full warranty.

REMA connectors for electrically-operated trucks:

- 80 AMP, 160 AMP, 320 AMP
- Materials: Black plastic, Grey plastic, bat.-acid-proof Red plastic, RAL 3000 (80 AMP, 160 AMP)
- with coding pins for wet- or dry batteries
- with or without auxiliary contacts
- with or without sub-auxiliary contacts
- with cable clamp
- Socket optional with moulded on handle
- Plug and Socket optional with screwed or clipped handles
- Plug and Socket optional with red or black removable handles

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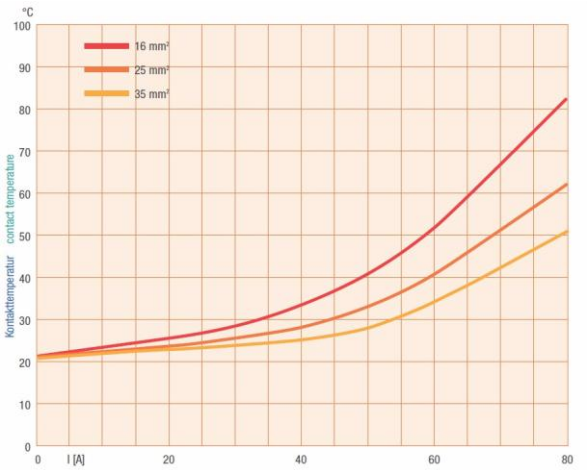
Temperature Chats

DIN 43589-1

DIN 80

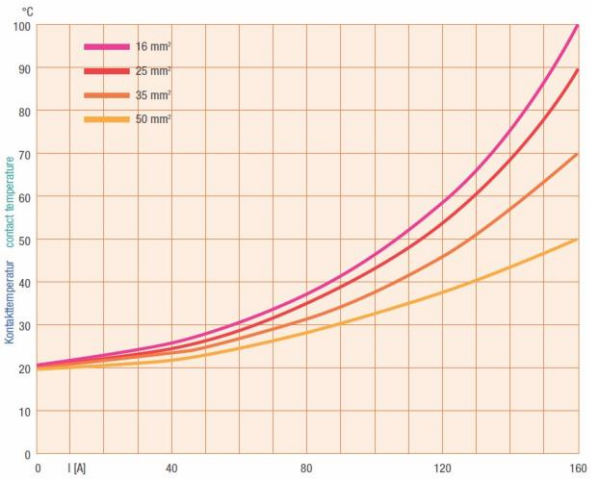
Temperature rise at constant current



DIN 43589-1

DIN 160

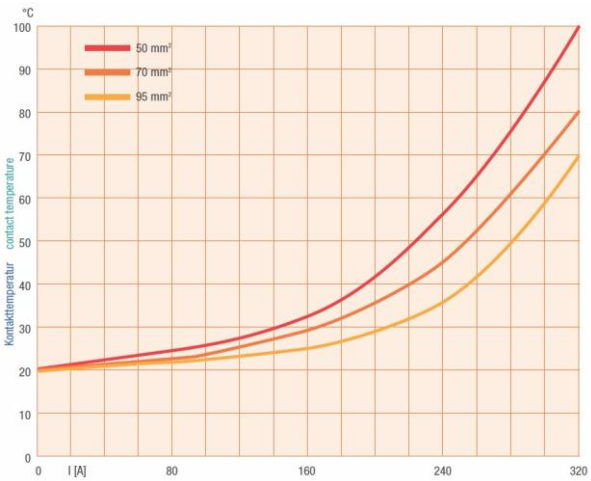
Temperature rise at constant current



DIN 43589-1

DIN 320

Temperature rise at constant current



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Technical specifications

	DIN 80	DIN 160	DIN 320
Electrical			
Rating current (Amperes) according wire size	• 16mm² - 80A • 25mm² - 80A • 35mm² - 80A	• 16mm² - * • 25mm² - * • 35mm² - 160A • 50mm² - 160A	• 50mm² - * • 70mm² - 320A • 95mm² - 320A
Rating voltage (Volts)	150 V	150 V	150 V
Dielectric Withstanding Voltage (AC)	2000 VAC	2000 VAC	2000 VAC
Operating Temperature °C / °F	- 20 °C to + 105 °C - 13 °F to + 221 °F	- 20 °C to + 105 °C - 13 °F to + 221 °F	- 20 °C to + 105 °C - 13 °F to + 221 °F
Mechanical			
Degree of protection	IP23	IP23	IP23
Life cycles (No Load)	5000	5000	5000
Disconnect at Overload Voltage Current inductively	5 mating cycles 96 V 200 A 0,5 mH	5 mating cycles 96 V 400 A 0,5 mH	5 mating cycles 96 V 800 A 0,5 mH
Average Mating / Unmating Force	Mating: 78 N Unmating: 58 N	Mating: 80 N Unmating: 61 N	Mating: 88 N Unmating: 76 N
Advise torque of the fixing screws	2,5 Nm	3,5 Nm	3,5 Nm
Material			
Housing	• Acid proof PP CoPo GF 30 • PA6-GF30	• Acid proof PP CoPo GF 30 • PA6-GF30	• Acid proof PP CoPo GF 30 • PA6-GF30
Main Contacts	• Cu-ETP DIN EN 13601 CW004A • Surface: AG 6µm	• Cu-ETP DIN EN 13601 CW004A • Surface: AG 6µm	• Cu-ETP DIN EN 13601 CW004A • Surface: AG 6µm
Pilot and Auxiliary Contacts	• CuZn40 Pb2 • Surface: AG 6µm	• CuZn40 Pb2 • Surface: AG 6µm	• CuZn40 Pb2 • Surface: AG 6µm
Specifications			
Specifications	• EN 1175-1 • DIN 43589 • UL 1977 • In compliance with machinery directive 2006/42 EG and therefore with “CE” Marking		

* Attention: Current Reduction caused by smaller wire size

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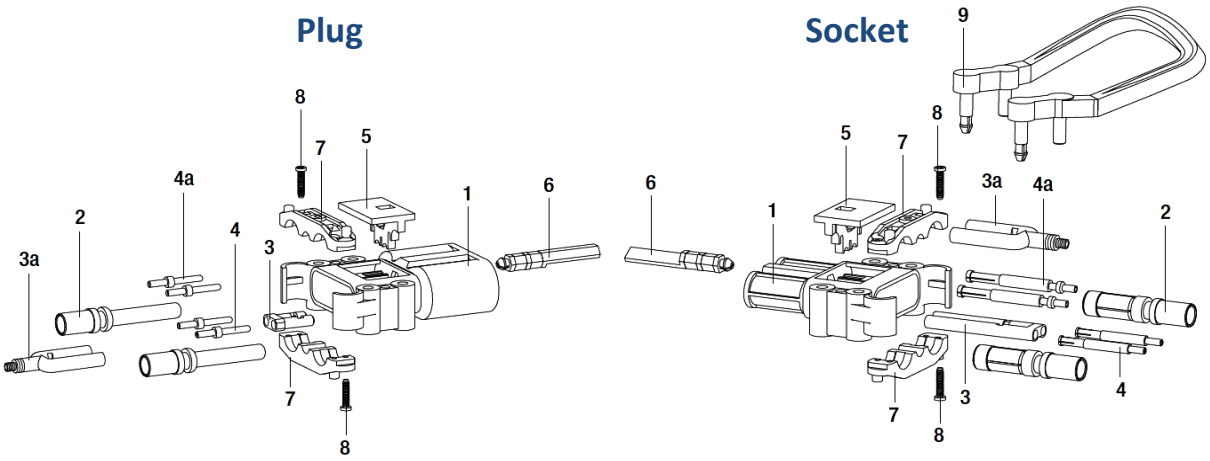
Assembly of REMA DIN connectors



Assembly of REMA twin plug and socket connectors EN 1175-1, DIN 43589 connectors

1. Insert main contacts **(2)** into the contact receiving part **(1)**

Caution: Observe polarity of connections!

2. Snap locking part **(5)** into the contact receiving part. With that, the seat of the main contacts is fixed in the casing.

3. Insert coding pin into the casing from the front. It must now be possible to read the desired operating voltage in the inspection window of the locking part. To facilitate removal of the coding pin, use the ejector tool (Item-No. 75058-01).

4. Screw strain relief **(7)** onto the wires by means of a cross head screw driver.

Caution: To avoid damaging the wire insulations, the screws **(7)** must only be slightly tightened!

Connecting the wires:
Remove insulation from the wire ends by means of a wire stripper or wire stripping knife. Ensure that any paper or plastic residue from possible intermediate layers is removed.

The following stripping lengths must be observed:

Cables for	80 A 16, 25 mm²	160 A 25, 35, 50mm²	320 A 50, 70/95 mm²
Main contacts	18 mm	20 mm	20/25 mm
Auxiliary contacts	7,5 mm	7,5 mm	7,5 mm

Crimp wire ends and contacts with REMA pressing tools (refer to REMA tool catalogue).
Caution:

The crimp inserts must be selected in accordance with the wire diameter. Improper pressing may lead to the plug-in device overheating. Apart from the possible destruction of the casing, this may lead to injuries!

The following combinations are possible:

A. Pilot contacts

- Insert adaptor for pilot contacts **(3)** into the contact receiving part **(1)**
- Connect pilot contacts **(4)** with the connecting lines and insert into the adaptor **(5)**

B. Pilot contacts and auxiliary contacts

- Insert adaptor for pilot contacts **(3)** into the contact receiving part**(1)**
- Connect pilot contacts **(4)** with the connecting lines and insert into the adaptor **(5)**
- Connect auxiliary contacts **(4a)** with the supply lines and insert into the contact receiving part **(1).**

C. Air transport system

- Insert the adaptor for the air transport system **(3a)** into the contact receiving part.

D. Air transport system and auxiliary contacts

- Insert the adaptor for the air transport system **(3a)** into the contact receiving part.
- Connect auxiliary contacts **(4a)** with the supply lines and insert into the contact receiving part **(1).**

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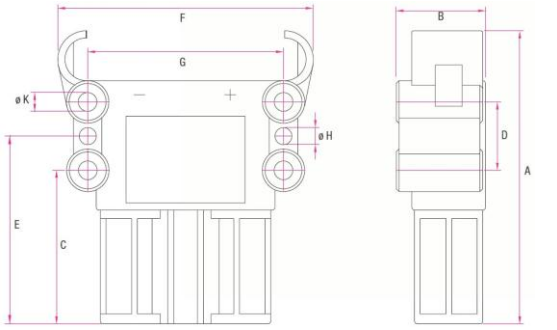
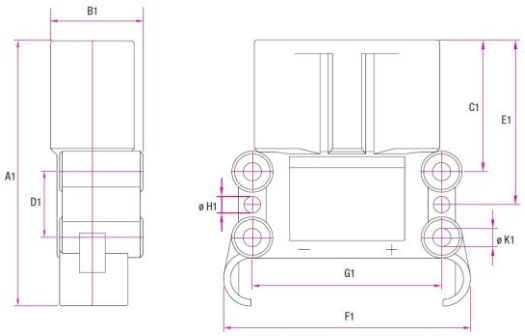
Dimensions Housing DIN 80, DIN 160 and DIN 320

Connectors Plug Dimension
DIN 80, 160, 320



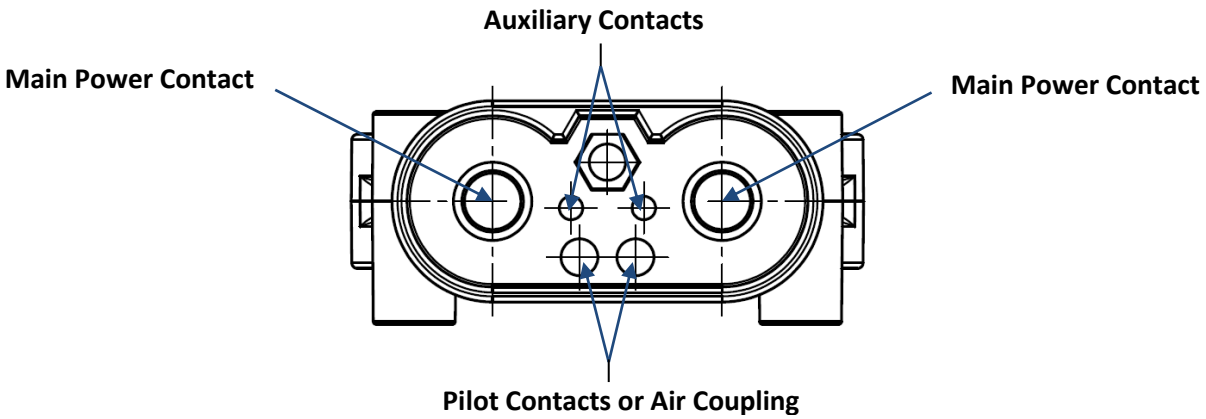
Maße mm	Dimensions mm								
Typ	A	B	C	D	E	F	G	H	K
80A	74	25,0	30 ± 0,3	–	–	77,0	56	–	6,4
160A	103	31,5	54 + 0,5	24	66	90,0	69	6,0	6,6
320A	130	38,0	54 + 0,5	24	66	91,5	69	6,0	6,6

Connectors Socket Dimension
DIN 80, 160, 320



Maße mm	Dimensions mm								
Typ	A	B	C	D	E	F	G	H	K
80A	74	25,0	30 ± 0,3	–	–	77,0	56	–	6,4
160A	103	31,5	54 + 0,5	24	66	90,0	69	6,0	6,6
320A	130	38,0	54 + 0,5	24	66	91,5	69	6,0	6,6

Housing Front View and Assignment



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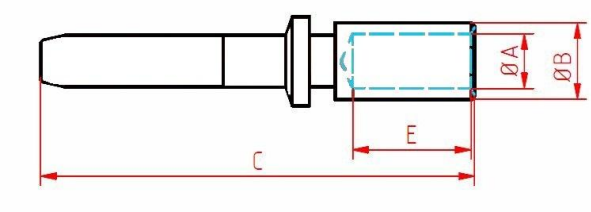
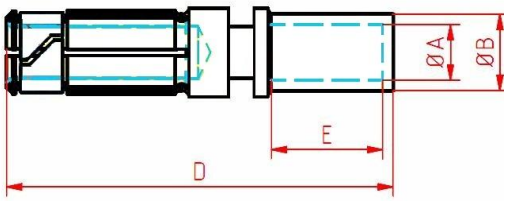
Dimensions of Contact Pin and Contact Bushing of DIN 80, DIN 160 and DIN 320

Main Contact PIN



Main Contact Bushing



Main Contact Dimensions			
Cross section / sqmm	**DIN 80**	**DIN 160**	**DIN 320**
16	A = 6,1 B = 8,4 C = 46 D = 44 E = 18	A = 6,1 B = 8,4 C = 71,2 D = 63,5 E = 20	
25	A = 8 B = 11 C = 46 D = 44 E = 18	A = 8 B =11 C = 71,2 D = 63,5 E = 20	
35	A = 9 B = 12,5 C = 50 D = 44 E = 18	A = 9 B = 12,5 C = 71,2 D = 63,5 E = 20	
50		A = 11 B = 14,5 C = 71,2 D = 63,5 E = 20	A = 11 B = 14,5 C = 72,3 D = 68,3 E = 20
70		A = 13,1 B = 17 C = 72,3 D = 64,5 E = 20	A = 13,1 B = 17 C = 82,5 D = 68,3 E = 20
95			A = 15 B = 19,8 C = 103 D = 88,8 E = 25

*All Values in mm

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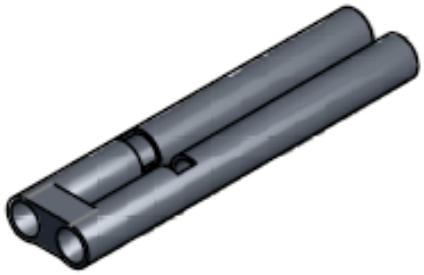
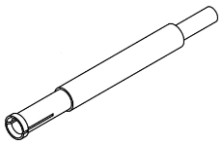
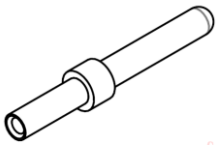
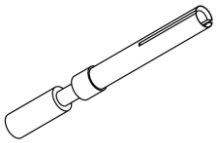
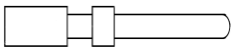
Optional Auxiliary and Pilot Contacts of DIN 80, DIN 160 and DIN 320

Pilot Contact Adapter for Socket	Pilot Contact Adapter for Plug
	

Pilot Bushing	Pilot Pin	Auxiliary Bushing	Auxiliary Pin
 *	 *	 *	 *

Dimensions of Auxiliary and Pilot Contacts of DIN 80, DIN 160 and DIN 320

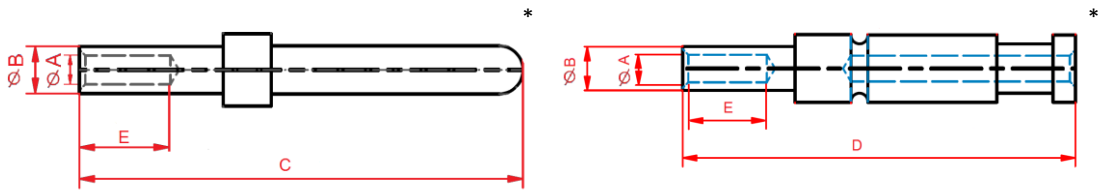


*Image similar

Pilot and Auxiliary Contact Dimensions			
Pilot or Auxiliary	**DIN 80**	**DIN 160**	**DIN 320**
Auxiliary Contacts	A = 2,4 B = 4 C = 36 D = 40 E = 8	A = 2,4 B = 4 C = 36 D = 36 E = 8	A = 2,4 B = 3,9 C = 37 D = 64 E = 7,6
Pilot Contact	A = 2,45 B = 3,9 C = 31 D = 35 E = 7,5	A = 2,45 B = 3,9 C = 31 D = 35 E = 7,5	A = 2,45 B = 3,9 C = 31 D = 35 E = 7,5

*All Values in mm

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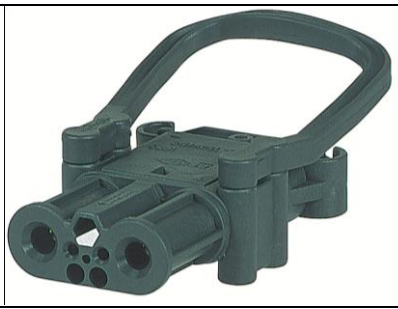
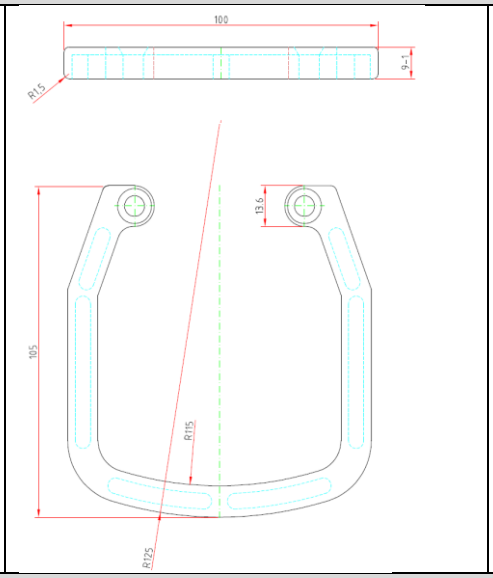
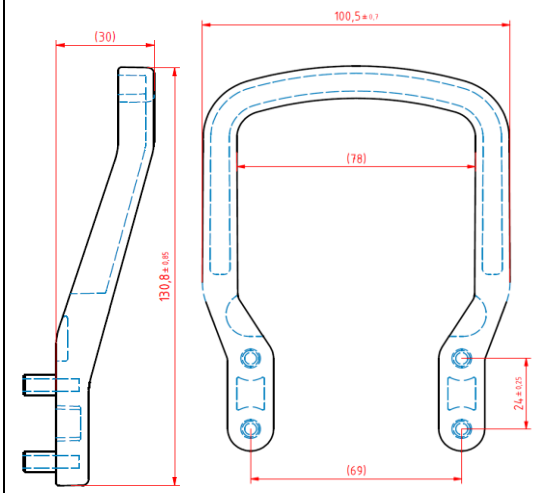
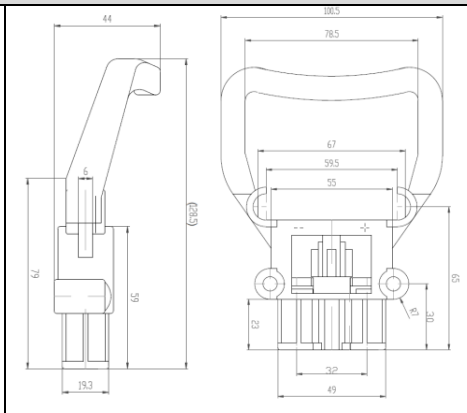
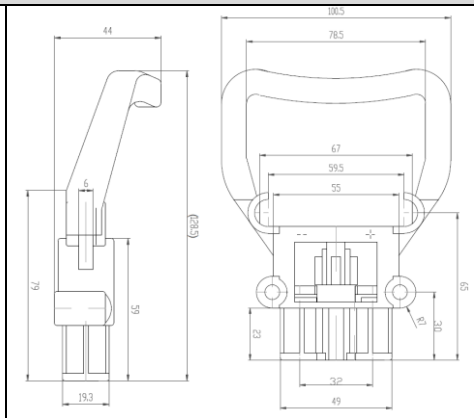
Optional Handles, Screwed or Moulded of DIN 80, DIN 160 and DIN 320

Handles: Screwed or Moulded	
Screwed Version for Socket and Plug	Moulded Version for Sockets only
	

Screwed Handle			
DIN 80		DIN 160 - 320	
Moulded Handle			
DIN 80		DIN 160	

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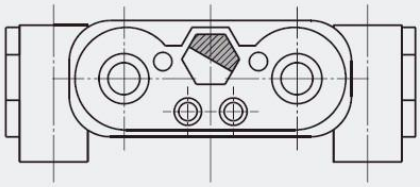
Coding

Currently two types of batteries are used in the market**: Wet batteries | Dry or gel batteries.** Both types work only with chargers which have a particular specification corresponding to the two different types of batteries. A mismatch between battery and charger (e. g. a wet battery to a dry charger or vice versa) can result in the destruction of the battery.

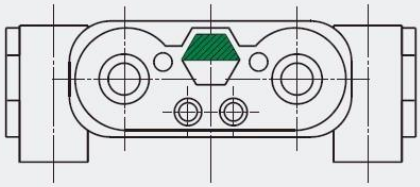
To help prevent a mismatch REMA® has developed a special coding system where only matching batteries and chargers can be connected. Nevertheless the usage of the wet/dry coding pin allows the connection between the electric motor and both types of batteries. For the motors, no difference between the wet and dry batteries exists.

This system can be set for six different voltages ranging from 24V - 96V. The hexagonal coding pin shows these different voltages on each side. When assembling the plugs and sockets the correct voltage is chosen by turning the coding pin, so that the required voltage number appears in a window of the housing. With the help of this registered design, licensed to the other German plug manufacturers, the plugs and sockets from REMA® are particularly suitable for the requirements of daily use.

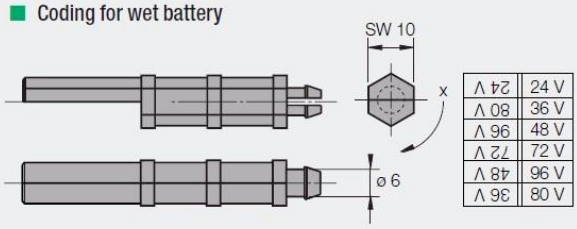
■ Kodierung für Nassbatterie/Dose
■ Coding for wet battery/Socket



■ Kodierung für Trockenbatterie/Dose
■ Coding for dry battery/Socket

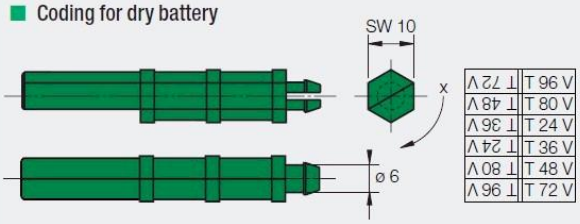


■ Kodierung für Nassbatterie
■ Coding for wet battery



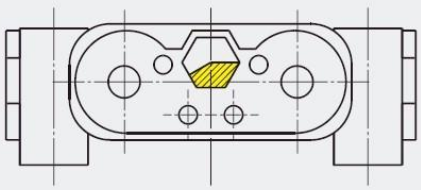
■ x: Zahlenfolge in Pfeilrichtung, Farbmarkierung: grau
■ x: Numbering sequence in direction of arrow, colour marking: grey

■ Kodierung für Trockenbatterie
■ Coding for dry battery

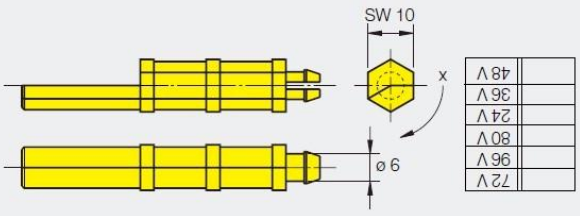


■ x: Zahlenfolge in Pfeilrichtung, Farbmarkierung: grün
■ x: Numbering sequence in direction of arrow, colour marking: grey

■ Universal-Kodierung für Nass- + Trockenbatterie/Stecker
■ Universal coding for wet + dry battery/Plug



■ REMA®-Universal-Kodierstift Nass/Trocken
■ REMA® Universal coding pin wet/dry



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Connector with air coupling

Air circulation during a battery charging cycle provides several benefits including:

- Reduction in charging time
- Increased battery charging capacity
- Extended overall battery life

This technology was developed for battery-driven submarines. Air introduced into the bottom of the battery cell creates air bubbles that circulate and cool the electrolyte.

REMA has developed optional adapters which can be mounted in the connector housings thus creating a „two-in-one“-connection: electrical energy and air.

This integral connection is favored over two independent systems for the obvious benefits of handling and security.

DIN80, DIN160, DIN 320
Airadapter for tubes with an inside ø of 6 mm + 8 mm

DIN 160
Airadapter for tubes with an inside ø of 6 mm + 9 mm

Material: PP, batt.-acid proof

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Appendix 1.

Datasheet of Acid proof Material PP CoPo GF 30

Crealien -EP8G6HS / L * 0083 Natur
PP-Copo.30%GF

Properties		Unit	Standard	Values
PHYSICAL				
Density		g/cm³	ISO 1183	**1,12**
Mould Shrinkage (Plate 61*61*2) [md/pmd]		%	ISO 294-4	**0,2/0,4**
(24 h) Water Absorption		%	ISO 62	**0,02**
(to saturation) Water Absorption		%	ISO 62	**0,10**
Melt Flow Rate (MFR)		g/10 min	ISO 1133 A	**5**
MECHANICAL				
Izod-Impact Strength notched	+23°C / -30°C	kJ/m²	ISO 180/A	**16**
Charpy-Impact Strength notched	+23°C / -30°C	kJ/m²	ISO 179-1/1eA	
Charpy-Impact Strength	+23°C / -30°C	kJ/m²	ISO 179-1/1eU	
Tensile Yield Strength		MPa	ISO 527-1/-2	**80**
Elongation at Break		%	ISO 527-1/-2	**4**
Flexural Strength		MPa	ISO 178	**100**
Flexural Modulus	+23°C	MPa	ISO 178	
Tensile Modulus		MPa	ISO 527-1/-2	**6600**
THERMAL				
1,81 MPa Heat Distortion Temperature (HDT)		°C	ISO 75-1/-2	**148**
0,45 MPa		°C	ISO 75-1/-2	**161**
50°C/h 49 NVICAT Softening Temperature		°C	ISO 306	**132**
50°C/h 9,8 N		°C	ISO 306	**163**
Ball Identation test		°C	DIN EN 60695-10-2	**>125**
ELECTRICAL				
Solution ATracking Index - CTI Solution B		V V	IEC 60112 IEC 60112	**>600M >600**
FLAMMABILITY				
Burning rate (2mm/750/850/960 °C) Glow wire test 2mm (3,2/1,6/0,8mm) UL94 (3,2mm)		mm/min class -	DIN EN 60695-11-10 DIN EN 60695-2UL 94	**HG/HB/--**

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REMA – TECHNICAL INFORMATION

Appendix 2.

Datasheet of Material PA6-GF30

Purpose-build Polyamide 6 (30% GF, highly impact resistant modified)

	Testing Standard	Unit	Values
Product Features			
Abbreviation	ISO 1043	--	----
Density	ISO 1183	g/cm^3	1,29
Viscosity index	ISO 307	ml/g	120
Water absorption at saturation (+23 °C)	ISO 62	%	6-7
Water absorption (+23 °C)	ISO 62	%	1,5-2,0
Shrinkage longitudinal	ISO 294-4 **	%	0,3-0,8
Shrinkage transvers	ISO 294-4 **	%	0,8-1,0
Material Constants for Flammability			
Flammability	UL-94	HB-V0	----
Automobile interior fittings: thickness =1mm	FMVSS 302	----	----
Glow Wire GWFI	DIN EN 60695-2-12	----	----
Glow Wire GWIT	DIN EN 60695-2-13	----	----
Mechanical features			
Tensile modulus	ISO 527	N/mm^2	7700
Tensile strength	ISO 527	N/mm^2	110
Tensile elongation at break	ISO 527	%	3,2
Flexural strength	ISO 178	N/mm^2	----
Charpy impact (+23 °C)	ISO 179/1eU	kJ/m^2	46
Charpy impact (-30 °C)	ISO 179/1eU	kJ/m^2	45
Charpy impact, notched (+23 °C)	ISO 179/1eA	kJ/m^2	9
Charpy impact, notched (-30 °C)	ISO 179/1eA	kJ/m^2	6
Surface hardness	ISO 2039-1	N/mm^2	110
Thermal features			
Melting point	ISO 11357-1	°C	221
Distorsion temp. under load (Meth. A)	ISO 75	°C	210
Distorsion temp. under load (Meth. B)	ISO 75	°C	220
Temp. index applied to 50% falling of tensile strength after 20 000h	IEC 216-1	°C	100
Electrical features			
Volume resistivity	IEC 60093	OHM cm	1 E 15
Surface resistivity	IEC 60093	OHM	----
Dissipation factor (1MHz)	IEC 250	----	0,02
Comparative figure of tracking CTI 50 drops	IEC 60112	----	----
Tracking index (CTI 100)	IEC 112	----	550
Comparative figure of tracking CTI-M 50 drops	IEC 60112	----	----
Tracking index (CTI-M 100)	IEC 112	----	----