

PCE

Connection
to the future

INDUSTRIAL PLUGS AND SOCKETS

Made in Austria

2008 09





St. Martin im Innkreis, Austria, aerial photo © air photograph-Scheurecker, Schärding

■ ■ ■ **QUALITY MANAGEMENT**

for maximum customer satisfaction and top performance (EN ISO 9001:2000 Certification)

■ ■ ■ **CUSTOMER FOCUS**

- Partnership relationship
- Reliable service
- Flexible operations
- Customized solutions
- Functional design

■ ■ ■ **GLOBAL MARKET POSITION**

- 80% exports
- Global network and alliances
- Fast communication system – short replying time

■ ■ ■ **SPEED**

Short delivery times due to flexible manufacturing

The PCE group is highly specialized in the production of industrial plugs and sockets, schuko socket outlets and switches and can offer a complete range of distribution boxes in rubber, metallic and plastic.



PC Electric GesmbH, St. Martin im Innkreis, Austria

is specialized in the production of industrial plugs and sockets and distribution boxes (year of foundation: 1973).

During the past few years, the company has gone through a phase of rapid development and is now one of the world's leading manufacturers of CEE plugs and sockets in the industry. 80% of our production is exported.

The company is continually expanding its product range, which now includes around 12,000 items for a wide variety of electrical installation applications. To supplement our standard products, we can produce customer-specific configurations on modern injection moulding and brass department equipment within a few days.

Top quality (ISO 9001:2000), flexibility and the ongoing willingness to innovate are among the most important keys of success in our customercentred strategy, speed is our driving principle. For years, our customers have benefited from fast and on-time delivery, which is made possible by our intelligent production methods and uncomplicated order processing.

This is something we value very highly at our company.

Continuous product and process innovation makes PC Electric an expert partner in the professional use of industrial plugs and sockets for electrical installation applications.



PCE MERZ, Gaildorf, Germany

Merz GmbH is one of the leading manufacturer of mobile distribution boxes, testing boards and switchgears.



Winkler GmbH, Ingolstadt, Germany

Winkler GmbH is specialised in switching and electrical systems up to 6000A, which are made for many industrial areas, public buildings and even up to large scale industry.





























Winkler GmbH have many years of experience. Several well known companies are the well sought-after partners of Winkler GmbH.





INTRODUCTION

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INTRODUCTION

Information

CERTIFICATION ACCORDING TO EN ISO 9001 : 2000

The PCE quality management system has been certified according to the standard DIN EN ISO 9001 : 2000!



CE-MARKING - LOW VOLTAGE GUIDELINE



Purpose:

- mainly a symbol for free trade in the European Community,
- if a product has been traded legally in one of the member countries, it can be traded legally in the whole Community,
- no quality mark or grade labelling,
- no sign of conformity to standards; to a certain extent a safety mark, because it indicates the compliance to the fundamental safety requirements.

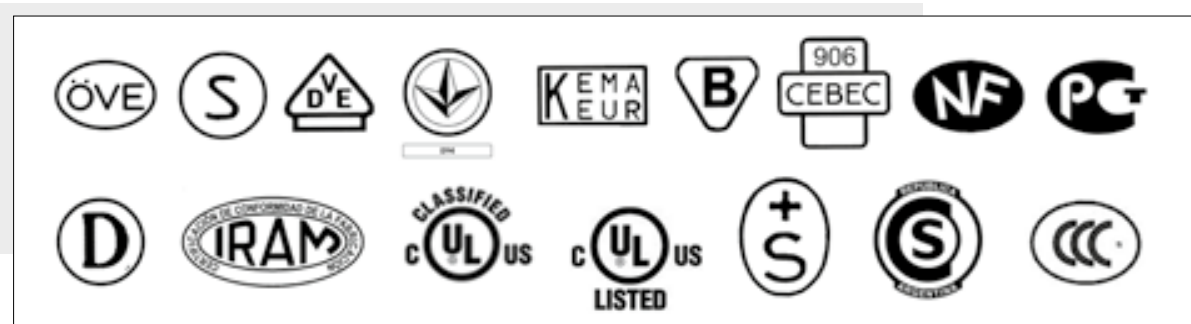
The guidelines determine only basic requirements the products have to meet.

The essential points for the CE-identification are:

- it is obligatory for the producer or the EEC importer to put on the CE-identification label,
- the producer, EEC-importer must hold the engineering data for the disposal of the authorities.
- standard marks of conformity are permissible besides the CE-identification - but no longer necessary.

APPROVALS - THE QUALITY MARKS

There has been created a CCA-method (CENELEC Certification Agreement) for mutual recognition of national approvals. PCE has tested all important products according to this method. An outline of certificates obtained is listed below for reference:



■ ■ CEE and IEC

The term "CEE" generally refers to Industrial Plugs and Sockets that comply with International Standard IEC 60309. CEE is the abbreviation of "International Commission on rules for the approval of Electrical Equipment".

■ ■ CONFORMITY TO STANDARDS

CEE plugs and sockets are internationally normalized by **IEC 60309-1** and **IEC 60309-2** equivalent to the European Norms **EN 60309 part 1** and **EN 60309 part 2**.

IEC is the "International Electrotechnical Commission" - which is the world organization for international standardization of electrical equipment.

■ ■ CENELEC

European Committee for Electrotechnical Normalization - members are the national electrotechnical committees from Austria, Belgium, Czech Republic, Denmark, Germany, Finland, France, Greece, Hungary, Ireland, Iceland, Italy, Luxemburg, Malta, Netherlands, Norway, Portugal, Rumania, Slovakia, Sweden, Switzerland, Spain and the United Kingdom.

■ ■ SYSTEM

The standard CEE plugs and sockets according to EN 60309 respectively IEC 60309 are designed in their main dimensions in a way that plugs and sockets with the same rated currents, nominal working voltage ranges, the same number of poles and frequency of different producers are **compatible**.

In order to prevent the insertion of plugs and sockets of **different** voltages and frequencies, 12 positions of the earthing contact are assigned to the polarizing slot of the skirt of a socket.

The number with the following letter „h“ indicates the position of the earth contact tube, comparing the frontside of the **socket** or **connector** with the face of a clock. The keyway is situated at 6 o'clock (see page 9).

■ ■ RoHS — DIRECTIVE 2002/95/EG

We declare that our distribution boxes and industrial plugs and sockets as direct use, do not have to comply to RoHS directive 2002/95/EG.

For our industrial plugs and sockets (including CEE) used and or mounted into products that belong to categories 1-8 they have to comply to RoHS directive. We want to confirm that PC Electric meets all requirements of RoHS directive.

Affective Products of RoHS directive: Large household appliances, small household appliances, IT and telecommunications equipment, consumer equipment, lighting, electrical and electronic tools (except large scale stationary industrial tools), toys, leisure and sports equipment and automatic dispensers.

■ ■ PILOT CONTACT

The pilot contact for levels of current from 63A to 125A is an auxiliary contact – with delayed close when inserted and leading open when pulled – and is used as an electrical interlock. An interlock prevents inserting and pulling under load. CEE couplings and socket-outlets with pilot contact have longer phase contacts and do not guarantee safety from finger-touch. This must be done by an interlock.

As PCE CEE plugs and sockets have sufficient switching capacity, the CEE couplings and socket-outlets are supplied as standard without a pilot contact and shorter phase contact with protection from finger-touch.



INTRODUCTION

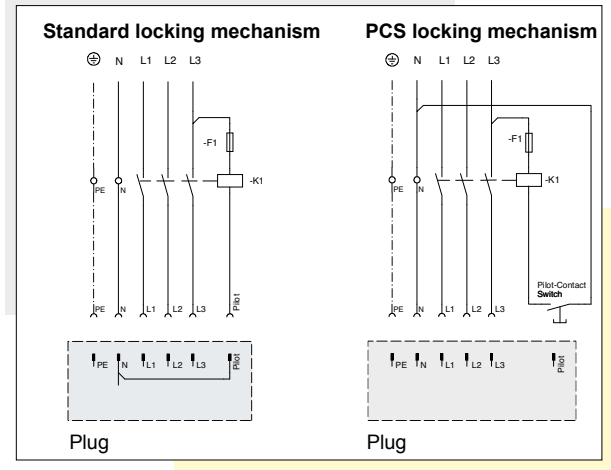
Information

PCS (PILOT CONTACT SYSTEM):

The PCS is a built-in auxiliary contact, used only for 125A connectors and socket-outlets, for protective electrical interlocking or for additional control purposes, with isolated connection in the socket-outlet.

The PCS provides the following advantages:

- no special cable required for the plug
- isolated inserting and pulling



TERMINALS

PCE-sleeve terminals are designed for max. conductor cross sections as follows:

A	conductor cross section	
	flexible mm ²	stranded mm ²
16	4	6
32	6	10
63	16	25
125	50	70

POSITION OF THE EARTHING CONTACT ACC. TO IEC 60309-2 – SERIE I

Voltage V	Frequency Hz	2P+E		3P+E		3P+N+E	
		16+32A	63+125A	16+32A	63+125A	16+32A	63+125A
63,5/110 to 75/130	50+60					4	4
110 to 130	50+60	4	4	4	4		
120/208 to 144/250	50+60					9	9
220 to 250	50+60	6	6	9	9		
220/380 to 240/415	50+60					6	6
220/380; 250/440	50; 60					3	3*
250/400 to 265/460	60					11	11
277	60	5	5				
277/480 to 288/500	50+60					7	7
347/600 to 400/690	50+60					5	5
380 to 415	50+60	9	9	6	6		
380; 440	50; 60			3	3*		
440 to 460	60			11	11		
480 to 500	50+60	7	7	7	7		
600 to 690	50+60			5	5		
> 50	100 to 300	10*	10*	10	10*	10*	10*
> 50	>300 to 500	2	2*	2	2*	2	2*
> 50 to 250	DC	3	3				
> 250	DC	8	8				
supply by isolating transformer	50+60	12	12	12	12		

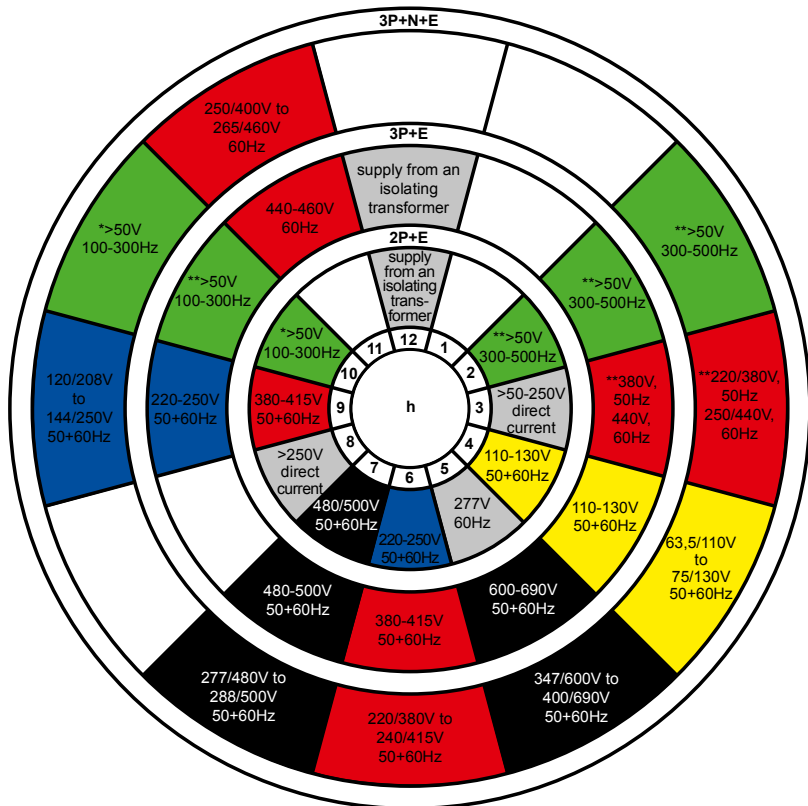
* non standard

COLOUR CODES

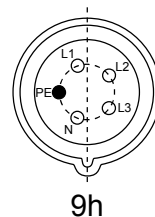
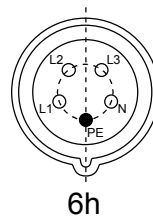
For ease of identification of the various voltages and frequencies all CEE plugs and sockets are colour coded:

Rated operating voltage:	Colour code:
20-25V	violet
40-50V	white
100-130V	yellow
200-250V	blue
380-480V	red
500-690V	black
> 60-500Hz	green
no colour code	grey

INTERNATIONAL RATING – SERIE I

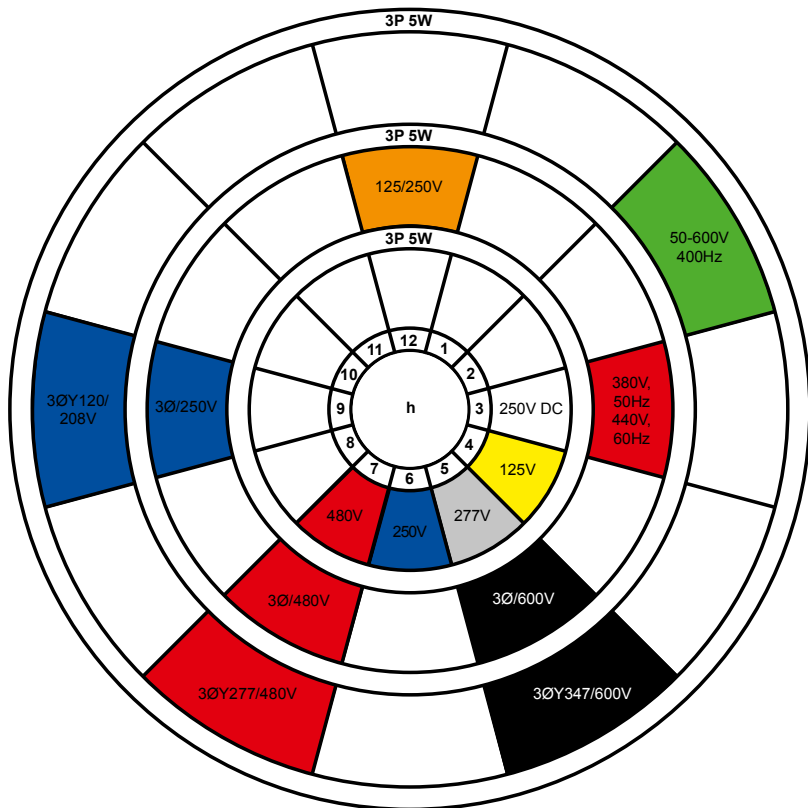


Position of the earthing contact.
View: frontside socket or connector



* non standard
** non standard for 63A, 125A

NORTH AMERICAN RATING – SERIE II





INTRODUCTION

Information

LOCKING DEVICE

A locking device prevents unintended withdrawal by locking the hinged lid in a lug/cavity or a bayonet system with a bayonet ring. According to EN 60309 the following locking devices have to be provided:

rated current	protection degree	sockets and connectors	plugs and appliance plugs
16A and 32A	IP44	hinged lid	lug/cavity
16A and 32A	IP67	bayonet system	lug/cavity and bayonet ring
63A and 125A	IP67	bayonet system	bayonet ring

IP (INGRESS PROTECTION) - RATINGS

CEE-plugs and sockets with rated currents 16A and 32A must meet the system of protection IP44 or IP67;

63A and 125A protection degree IP67 according to EN 60529.

The protection degree is tested:

- on sockets and connectors, with and without inserted plug or appliance plug
- on plugs and appliance plugs, when fully inserted into the socket or connector.

1st digit	Protection against ingress of solid objects	2nd digit	Protection against penetration of water
2	∅ 12,5 mm	0	non protection
3	∅ 2,5 mm	3	spraying water at an angle up to 60° from the vertical
4	∅ 1 mm	4	splashing water from any direction
5	dustproof	5	water jets from any direction
6	dust-tight	6	strong water jets from any direction
		7	temporary immersion in water
		8	continuous submersion in water

Example: IP44 = 1st digit = 4 . protection against solid objects larger than 1mm ∅
 2nd digit = . 4 protection against splashing water from any direction

IK-CODE:

The IK code is a coding system according to EN 50102, which defines the degree of protection provided by an enclosure against damaging mechanical loads.

Each characteristic numerical group of the IK Code represents a load energy value as per the table:

IK-Code	IK01	IK02	IK03	IK04	IK05	IK06	IK07	IK08	IK09	IK10
Load energy in joule	0,14	0,2	0,35	0,5	0,7	1	2	5	10	20

■ ■ PLASTIC MATERIAL

Our plugs and sockets are produced from **POLYAMIDE 6**. The main characteristics of this material are:

- excellent impact resistance combined with high rigidity and solidity,
- high thermal stability (self-extinguishing),
- very good insulating qualities,
- high disruptive strength,
- high abrasion resistance,
- high weathering resistance,
- very good chemical resistance to various chemicals,
- free from cadmium and halogen (fluorine, chlorine, bromine, iodine, astatine)
- conform to RoHS-directiv 2002/95/EG (page 7)

■ ■ CONTACTS

The contacts are made of a copper-zinc alloy. The most important features are:

- high electric conducting capacity 15m/(Ohm mm²);
- high resistance to extension up to 103 kN/mm²);
- high corrosion resistance in areas of: industrial atmosphere, agriculture , . . .
- with nickel-plated contacts increased corrosion resistance in areas of: seawater, steam, sulphur hydrides, agriculture, dairies.
- conform to RoHS-directiv 2002/95/EG (page 7)
- PCE sockets 63A and 125A have a CuBe lamellar spring for a well contacting and anti-corrosion contacts (page 13).

■ ■ TEMPERATURES

IEC/EN 60309 applies to CEE plugs and sockets which are used at an ambient temperature that does not normally exceed the range from -25°C to +40°C. PCE CEE plugs and sockets themselves have an operating temperature of -25°C to +80°C (100°C for 1 hour).

The temperature of the contacts is allowed to rise by 50°C under the test conditions set out in Table 8.

Table 8 Operating current A	Test duration h	Test current A	Cross section of the conductors	
			Plugs, and connectors mm ²	Sockets mm ²
			16	1
32	1	42	6 ¹⁾	10
63	2	63	16	25
125	2	125	50	70

¹⁾ The values are increased to 10mm² for plugs and sockets with up to 50V rated operating current.



LET'S TAKE **TWIST** - IT'S EASY QUICK AND SAVE

■ ■ ■ TWIST

Contact screws

- accessible from one direction
- captive and open
- with multi-slot

No screws needed to assemble the plug

- multi-ramp quick-lock system
 - easy fitting by twist-lock action
- saves your time

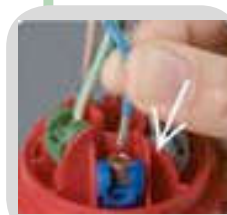
Dismantling

- simply unlock and twist to open

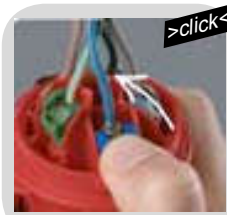
■ ■ ■ ADVANTAGES OF THE NEW CABLE LOCK GLAND

- saves time
- simply insertion of the cable in less time
- strain relief and sealing of the cable by tightening the cable-lock gland
- self-adjusting gasket for different cable diameters
- maximum cable security

■ ■ ■ TURBO TWIST



1) Insert wire



2) Close terminal



3) Reopen terminal

Screwless connection technology

- Time saving
- Screwless TT-terminal (PCE-patent in process)
- Open contact terminals, ready for assembly
- Fast cable installation
- Simple closing and opening just by thumb pressure

For all standard cable diameters

- 16A: from 2,5mm² flexible to 4mm² solid stripped wires
- 32A: from 6mm² flexible to 10mm² solid stripped wires

Flexible stripped wires

- with or without end sleeve or solid stripped wires

63/125A

SAFETY

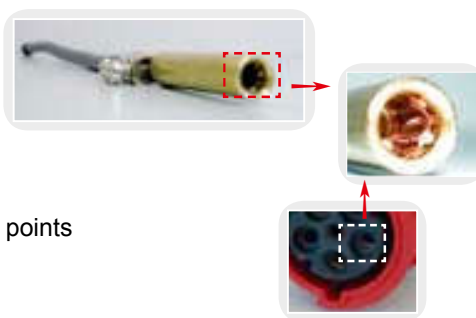
HEAVY DUTY

TIME SAVING

SAFETY

Lamellar spring

- low insertion and extraction forces
- minimum contact resistance
- self-cleaning
- optimum contact - at least 10 contact points



TWIST-cable gland

- secures the cable firmly in position
- protects from water and dust
- Safety screw locks the screw cap in position



POWER
TWIST



HEAVY DUTY

For extreme environments

Exceptional high impact resistance

Extreme heat resistant contact carriers

Anti-corrosion contacts

- offer protection in aggressive atmospheres, e.g. in chemical plants, food industries

TIME SAVING

TWIST-cable gland

Optimum grip

Wide connection space

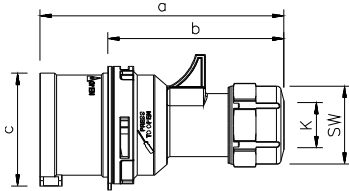
- fast cable installation

Open contact terminals, ready for assembly



INDUSTRIAL PLUGS + SOCKETS

Plugs

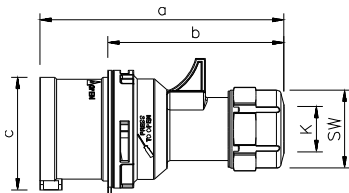


Poles	16 Amp			32 Amp		
	3	4	5	3	4	5
a	118	124	131	146	146	152
b	82	88	95	100	100	106
c	47	53	61	63	63	70
K	6-15	6-15	8-16	10-20	10-20	12-22
SW	38	38	42	50	50	50
Weight	104	127	150	181	200	230

„Twist“ Plug

- to order nickel-plated contacts please add a "v" e.g. 013-6v

IP44 splashproof

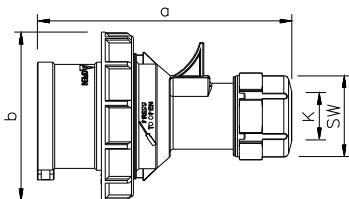


Poles	16 Amp			32 Amp		
	3	4	5	3	4	5
a	118	124	131	146	146	152
b	82	88	95	100	100	106
c	47	53	61	63	63	70
K	6-15	6-15	8-16	10-20	10-20	12-22
SW	38	38	42	50	50	50
Weight	110	135	158	187	208	242

„Turbo Twist“ Plug

- to order nickel-plated contacts please add a "v" e.g. 013-6TTv
- screwless connection technology

IP44 splashproof

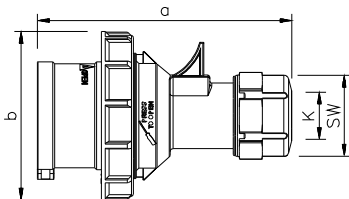


Poles	16 Amp			32 Amp		
	3	4	5	3	4	5
a	118	124	131	146	146	152
b	71	79	87	93	93	100
K	6-15	6-15	8-16	10-20	10-20	12-22
SW	38	38	42	50	50	50
Weight	122	147	172	210	230	263

„Twist“ Plug

- to order nickel-plated contacts please add a "v" e.g. 0132-6v

IP67 watertight



Poles	16 Amp			32 Amp		
	3	4	5	3	4	5
a	118	124	131	146	146	152
b	71	79	87	93	93	100
K	6-15	6-15	8-16	10-20	10-20	12-22
SW	38	38	42	50	50	50
Weight	128	155	180	216	238	275

„Turbo Twist“ Plug

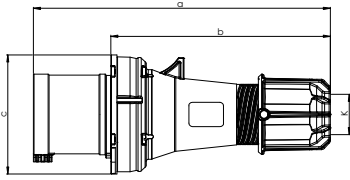
- to order nickel-plated contacts please add a "v" e.g. 0132-6TTv
- screwless connection technology

IP67 watertight



INDUSTRIAL PLUGS + SOCKETS

Plugs

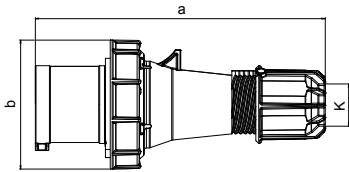


Poles	63 Amp		
	3	4	5
a	257	257	257
b	190	190	190
c	102	102	102
K	14,5-36	14,5-36	14,5-36
Weight	500	549	603

„Power Twist“ Plug

- with Twist cable gland
- nickel-plated contacts with pilot contact (see page 7)

IP44 splashproof

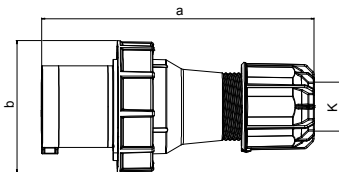


Poles	63 Amp		
	3	4	5
a	257	257	257
b	114	114	114
K	14,5-36	14,5-36	14,5-36
Weight	547	596	650

„Power Twist“ Plug

- with Twist cable gland
- nickel-plated contacts with pilot contact (see page 7)

IP66/67 watertight



Poles	125 Amp		
	3	4	5
a	270	270	270
b	131	131	131
K	22,5-50	22,5-50	22,5-50
Weight	1318	1433	1545

„Power Twist“ Plug

- with Twist cable gland
- nickel-plated contacts with pilot contact (see page 7)

IP66/67 watertight

110V~ 50/60Hz 4h	230V~ 50/60Hz 3p=6h 4p+5p=9h	400V~ 50/60Hz 3p=9h 4p+5p=6h	500V~ 50/60Hz 7h	>50- 500V~ 100-300Hz 10h	>50- 500V~ 301-500Hz 2h
Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.	Cat.No.

Amp.	Poles	pack. unit	110V~	230V~	400V~	500V~	>50-500V~	>50-500V~
63	3	2	0331-4	0331-6	0331-9	0331-7	0331-10	0331-2
63	4	2	0341-4	0341-9	0341-6	0341-7	0341-10	0341-2
63	5	2	0351-4	0351-9	0351-6	0351-7	0351-10	0351-2
63	3	2	033-4	033-6	033-9	033-7	033-10	033-2
63	4	2	034-4	034-9	034-6	034-7	034-10	034-2
63	5	2	035-4	035-9	035-6	035-7	035-10	035-2
125	3	2	043-4	043-6	043-9	043-7	043-10	043-2
125	4	2	044-4	044-9	044-6	044-7	044-10	044-2
125	5	2	045-4	045-9	045-6	045-7	045-10	045-2

NEW



0351-6

035-6

045-6