Circular Connectors

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Introduction

The Neutrik® circular connector program is a range of metal, multi-pole connectors specifically designed for industrial applications. These series provide a variety of male and female cable connectors and receptacles that can be terminated by soldering and crimping or to printed circuit boards. An easy to use and reliable quick-lock system ensures a perfect connection and cannot be released accidentally. The circular connectors offer Neutrik® unique chuck type strain relief and reinforced housing for robust dependability.

The Neutrik® industrial connector range also features a unique power connector for single phase applications up to 32 Amps.

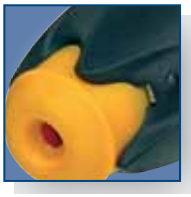
Further features are:

- Number of contacts is 1 to 12
- Self-locking system
- Robust all-metal housing
- Front or rear mounting
- Chuck and crimp type strain relief
- Gold plated contacts
- Solder or crimp termination
- Printed circuit board mounting
- Excellent shielding (crimp type strain relief)

The main areas of applications are in the measurement, test and control, automotive and machine tool industry as well as medical technique.



Ergonomic quick lock



Bushing with secure key and sealing



Overmolded ready made cable



Screw terminals



1/4" flat tabs

UL recognized

ENEC certified

powerCON TRUE1 – Lockable 16 A single phase connector



NAC3FX-W



NAC3MX-W



NAC3FPX



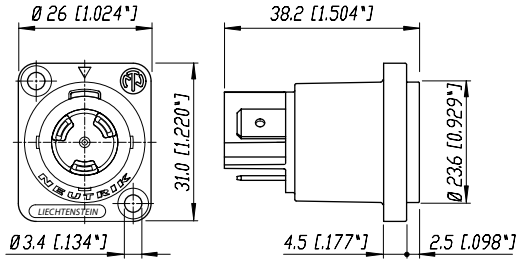
NAC3MPX



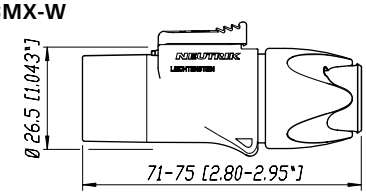
NAC3PX

- True mains connector with breaking capacity (CBC)
- Lockable 16 / 20 A single phase connector
- Complete system with inlet and outlet connectors
- Unique duplex chassis connector – combines inlet and outlet coupler
- IP 65 – water resistant ready-made cord sets
- ENEC certified according to IEC 60320
- Easy and reliable locking system
- UL recognized components

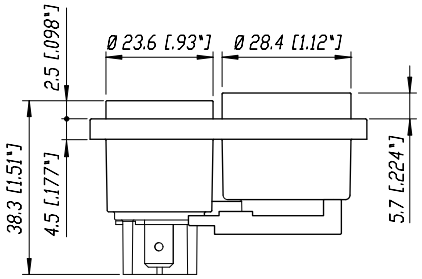
NAC3MPX



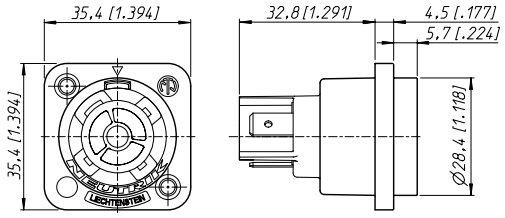
NAC3MX-W

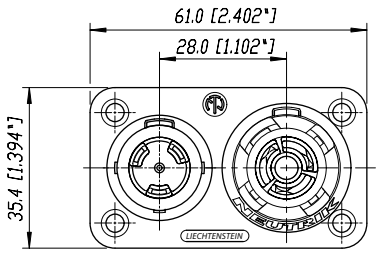


NAC3PX



NAC3FPX





Ordering Information

Cable Connector	
NAC3FX-W	Mains cable connector, female CBC, screw terminals, IP 65
NAC3MX-W	Mains cable connector, male CBC, screw terminals, IP 65

Chassis Connector	
NAC3FPX	Mains chassis connector female CBC, 1/4" flat tab terminals, power outlet
NAC3FPX-ST	Mains chassis connector female CBC, screw terminals, power outlet
NAC3MPX	Mains chassis connector male CBC, 1/4" flat tab terminals, power inlet
NAC3PX	Mains chassis duplex, 1/4" flat tab terminals

Accessories



HTAC


SCDP-*


SCNAC-PX

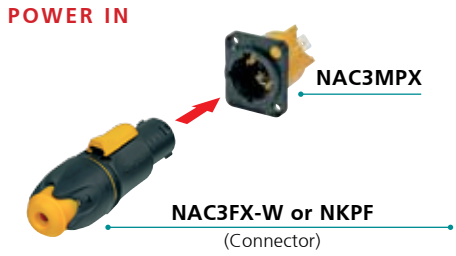

SCNAC-FPX


SCNAC-MPX

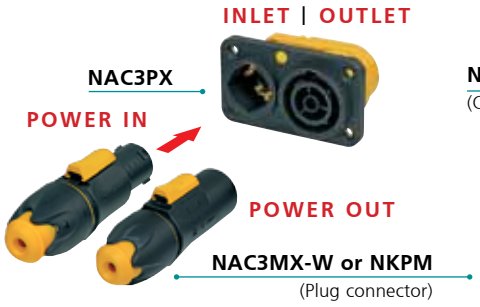
HTAC	Hand tool to tighten the powerCON TRUE1 bushing
SCDP-*	D-Size sealing gaskets, colour coding (*: 0- black, 2- red, 4- yellow, 5- green, 6- blue, 9- white)
SCNAC-PX	Sealing cover duplex IP 65
SCNAC-FPX	Sealing cover for NAC3FPX
SCNAC-MPX	Sealing cover for NAC3MPX

Connector Assignment

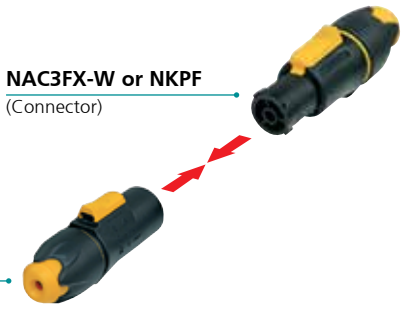
APPLIANCE INLET



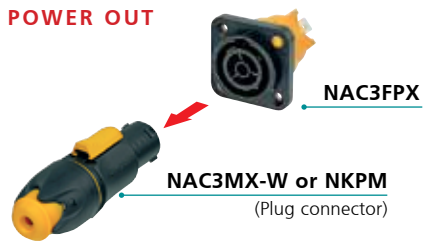
APPLIANCE COMBINATION



CABLE EXTENTION



APPLIANCE OUTLET



Specification
READY-MADE POWER CORDS

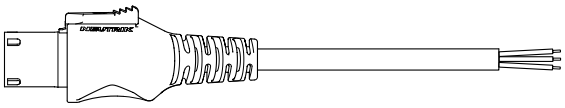
Ready-made overmolded power cord in protection class IP65. The cable utilizes standard duty cord with 3 conductors with cross section 1.5 mm² or 12 AWG.

Cables are equipped with Neutrik TRUE1 powerCON NAC3FXW and NAC3MXW for extention cables or with an open end for termination of local connectors for "power in" supply cables. Overmolded local connectors on request.

Cables are available in different lengths.

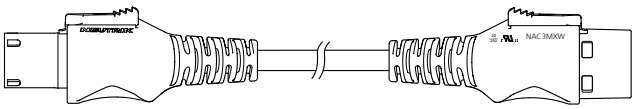
International Cord

International Power Cord 16 A / 250 VAC



Plug / end termination	Neutrik NAC3FXW / stripped open end
Approvals	ENEC, VDE
Standard length	1 m, 1.5 m, 2 m, 3 m, 5 m
Conductor size	3 x 1.5 mm²
Cable type / color / Nom. O.D.	H07RN-F3G1.5 / black / 9.6 mm
Part Number e.g.	NKPF-NC-A-3
Cable type / color / Nom. O.D.	H05VV-F3G1.5 / black / 8.3 mm
Part Number e.g.	NKPF-NC-B-1

International Extension Cord 16 A / 250 VAC



Plug / end termination	Neutrik NAC3FXW / Neutrik NAC3MXW
Approvals	ENEC, VDE
Standard length	0.5 m, 1 m, 1.5 m
Conductor size	3 x 1.5 mm²
Cable type / color / Nom. O.D.	H07RN-F3G1.5 / black / 9.6 mm
Part Number e.g.	NKPF-M-A-0.5
Cable type / color / Nom. O.D.	H05VV-F3G1.5 / black / 8.3 mm
Part Number e.g.	NKPF-M-B-1

Cable Part Number Breakdown

N K P F - X - Y - 3

Neutrik Power Cord

F NAC3FXW
M NAC3MXW

TERMINATION 2. END

M NAC3MXW
NC ..... Stripped open end

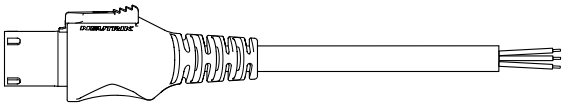
LENGTH in m

CABLE TYPE

A H07RN-F3G1.5
B H05VV-F3G1.5
C ..... SJTOW 12AWG
D ..... SJOOW 12AWG

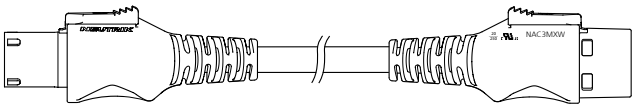
US Cord

US Power Cord 20 A / 250 VAC



Plug / end termination	Neutrik NAC3FXW / stripped open end
Approvals	UL, cUL
Standard length	1 m, 1.5 m, 2 m, 3 m, 5 m
Conductor size	3 x 12 AWG
Cable type / color / Nom. O.D.	SJTOW / black / 11.3 mm
Part Number e.g.	NKPF-NC-C-5
Cable type / color / Nom. O.D.	SJOOW / black / 11.3 mm
Part Number e.g.	NKPF-NC-D-3

US Extension Cord 20 A / 250 VAC



Plug / end termination	Neutrik NAC3FXW / Neutrik NAC3MXW
Approvals	UL, cUL
Standard length	0.5 m, 1 m, 1.5 m
Conductor size	3 x 12 AWG
Cable type / color / Nom. O.D.	SJTOW / black / 11.3 mm
Part Number e.g.	NKPF-M-C-1
Cable type / color / Nom. O.D.	SJOOW / black / 11.3 mm
Part Number e.g.	NKPF-M-D-1



Quick lock



Neutrik hologram



3/16" flat tabs



Locking area on chassis connector

powerCON – Locking 3 Pole Power Connectors



NAC3FCA



NAC3MPA-1



NAC3FCB



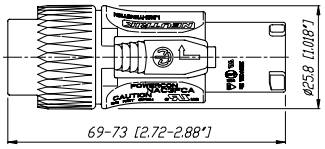
NAC3MPB-1



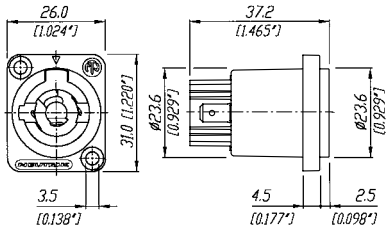
NAC3MM-1

- Lockable 3 pole equipment (AC) connector with contacts for line, neutral and premating safety ground
- High current capacity, rated at 20 A / 250 V ac
- Colour coded for easy identification, powerCON offers power-in (blue) and power-out (grey) versions with different keying to avoid the possibility of intermating
- Fast and easy locking system
- Extremely robust and reliable
- Excellent cable retention
- UL, cUL recognized components (file no. E 135070)
  VDE certified (Reg. No. 6360),
  SEV approved (No. 96.1 10096)
- New latch design for easier handling and secure locking
- Branded with unique hologram – guarantees genuine and authentic Neutrik product
- Coupler for linking cables (couples NAC3FCA to NAC3FCB)

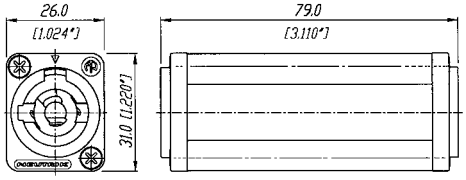
NAC3FCA(B)



NAC3MPA(B)-1



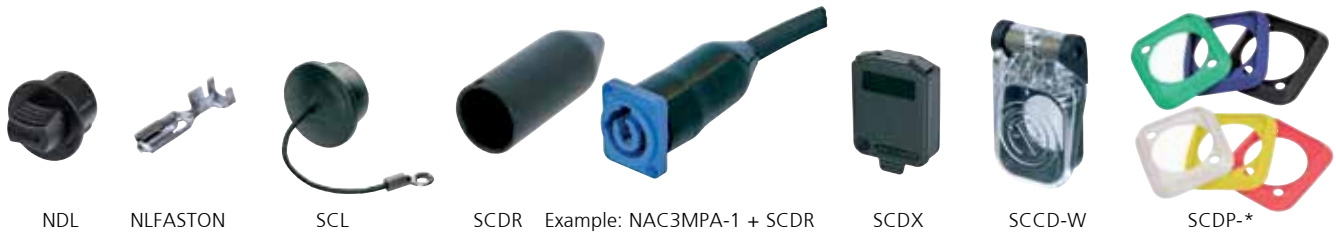
NAC3MM-1



Ordering Information

NAC3FCA	Cable connector, quick lock with securing lever, A-type for power inlet, screw terminals
NAC3MPA-1	Air tight chassis connector, A-type for power inlet, flat tab terminals, blue
NAC3MPA-1-WOT	Chassis connector, power-out, 3/16'' flat tab terminals, blue, without insulation divider
NAC3FCB	Cable connector, quick lock with securing lever, B-type for power outlet, screw terminals
NAC3MPB-1	Air tight chassis connector, B-type for power outlet, flat tab terminals, grey
NAC3MPB-1-WOT	Chassis connector, power-out, 3/16'' flat tab terminals, grey, without insulation divider
NAC3MM-1	Coupler for linking cables (couples NAC3FCA to NAC3FCB)

Accessories



NDL NLFASTON SCL SCDR Example: NAC3MPA-1 + SCDR SCDX SCCD-W SCDP-*

NDL	dummyPLUG for powerCON 20 A chassis connector
NLFASTON	FASTON® receptacle for tabs with "positive lock" for use with NL4MP, NL4MPR, NL8MPR, Pack of 100 pcs.
SCL	Plastic sealing cover to protect the connectors against dust and moisture
SCDR	Rear end protection cover for D-size chassis connectors
SCDP-*	D-Size sealing gaskets, colour coding (*: 0- black, 2- red, 4- yellow, 5- green, 6- blue, 9- white)
SCDX	Hinged cover seals D-size chassis connectors, IP 42 rated
SCCD-W	Spring-loaded cover to seals D-size chassis connectors, IP65 rated

KEYWAYS:
With the two non-interchangeable types of connectors (A type and B type) it is impossible to produce a short circuit. Mating connectors (combination) are identified by mechanical keyways and by color.



ATTENTION

The technical data of the powerCON connectors refer to connectors without breaking capacity, meaning connecting devices not to be engaged and disengaged in normal use when live or under load.



Robust metal housing



Screw-type terminals

powerCON

powerCON 32 A Connectors



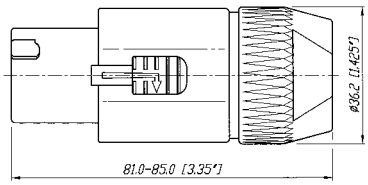
NAC3FC-HC



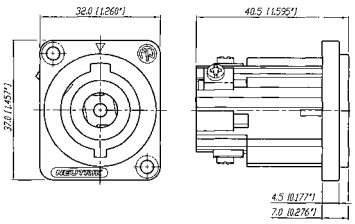
NAC3MP-HC

- Locking single phase AC appliance coupler
- High current capacity (32 A rated)
- Fast and easy locking system
- Excellent cable handling and protection
- Extremely robust and reliable
- 250 V ac, 32 A single-phase (for ambient temperatures up to 35 °C)
- Premating contact for protective earth
- Locking system to prevent unintentional disengagement
- Cable O.D. range: 8 – 20 mm
- Wiring with screw-type terminals for wires 2.5 to 6.0 mm² (AWG 14 – 10)

NAC3FC-HC



NAC3MP-HC



Ordering Information

NAC3FC-HC	Cable connector, quick lock with securing lever, screw terminals
NAC3MP-HC	Fast and easy locking system, screw-type terminals

Specification		powerCON TRUE1	powerCON Series	32 A powerCON Series
Electrical				
Number of contacts	2 + PE	●	●	●
Rated current per contact		20 A rms [1)]	20 A rms	32 A rms
Rated voltage	250 V ac	●	●	●
Dielectric strength	4 kV ac	●	●	●
Contact resistance	≤ 3 mΩ	●	●	●
Insulation resistance after	> 0.1 GΩ	●	●	●
damp heat test (IEC 68-2-30)				
Mechanical				
Retention method	Quick lock	●	●	●
Cable O.D. range		6 – 12 mm	6 – 15 mm	8 – 20 mm
Wiring	Cable: screw type terminals	●	●	●
		2.5 mm² / 12 AWG	2.5 mm² / 14 AWG	2.5 – 6 mm² / 14-10 AWG
	or soldering	●	●	●
	Chassis: flat tabs for Faston (4.8 x 0.5 mm)	-	●	●
	(6.35 mm x 0.8 mm)	●	-	-
	or soldering	●	●	●
Solderability complies with	IEC 68-2-20	●	●	-
Material				
Housing cable connector		PA 6 30% GR	PA 6 30% GR	PA 6 30% GR
Housing receptacle		PA 6.6 30% GR	PA 6.6 30% GR	PA 6.6 25% GR
Insert		PA 6.6 30% GR	PA 6 30% GR	PA 6.6 25% GR
Contacts	Female:	CuSn0.2	CuZn39Pb3	CuZn39Pb3
	Male:	CuNi1Si0.2	CuNi1Si0.2	CuSn0.2
Contact surface		2 µm Ag plated	4 µm / 2 µm Ag plated	4 µm Ag
Chuck POM		●	●	●
Environmental				
Flammability	UL 94 HB	-	●	● plug housing
	UL 94 V-0	●	●*	●*
Temperature range:	-30 °C to +80 °C	●	●	●
Protection class (mated)		IP 65	IP 20	IP 2X unmated
Safety Requirements	EN / IEC61984	-	●	●
	IEC 60320	●	-	-

[1)] : Appliance coupler acc. IEC 60320 limited to 16 A ac

* : Receptacle

FASTON® is a trademark of AMP Inc.



Connector locking



PCB receptacle



Panel mount receptacle

nanoCON – 3 Pole Subminiature Connectors



NSC3F



NP3F-H



NP3M-V



NR3M-S



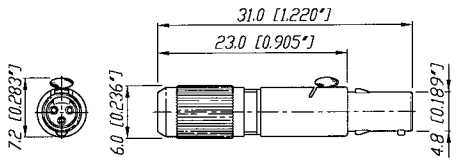
NR3F-S

- World's smallest circular lockable multipole connector
- Robust metal housing with gold plated contacts
- Male and female receptacles for vertical or horizontal PCB mount or solder termination
- Cable connector and receptacle with interchangeable male and female inserts
- Reliable and versatile in applications like medical equipment, control systems, sensors or audio applications such as miniature and wireless microphones and portable mixers
- Pre-mating contact 1

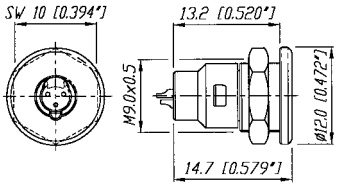
M 1:1



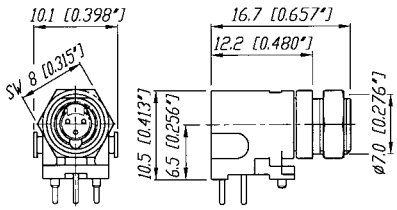
NSC3F(M)



NR3F(M)-S



NP3F(M)-H

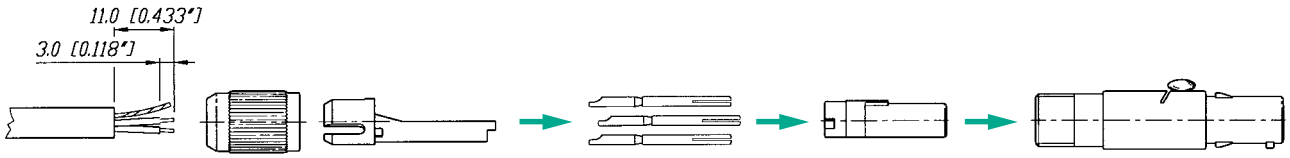


Ordering Information

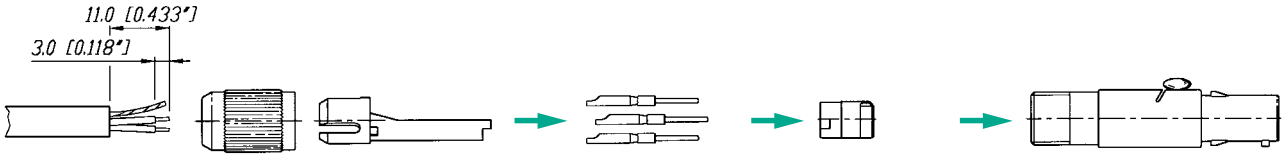
Female		Male	
NSC3F	Cable connector, chuck principle, solder contacts	NSC3M	Cable connector, chuck principle, solder contacts
NR3F-S	Chassis connector panel mount, solder contacts	NR3M-S	Chassis connector panel mount, solder contacts
NP3F-H	Chassis connector horizontal PCB mount	NP3M-H	Chassis connector horizontal PCB mount
NP3F-V	Chassis connector vertical PCB mount	NP3M-V	Chassis connector vertical PCB mount

Ordering Information for modular nanoCON system

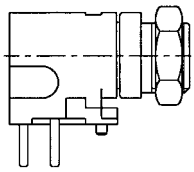
NSC3F



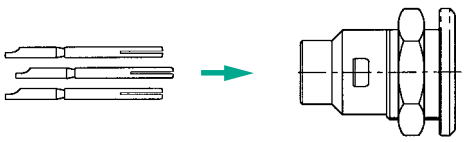
NSC3M



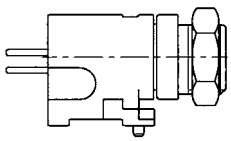
NP3F-H
NP3M-H



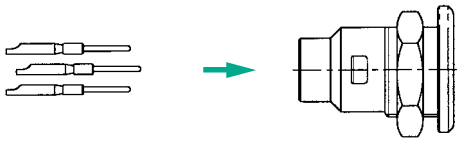
NR3F-S



NP3F-V
NP3M-V



NR3M-S



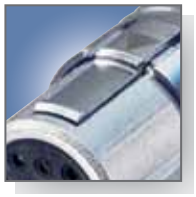
Contact Arrangement

Male



Female





Push Pull locking



Gold solder contacts



Horizontal PCB mount

miniCON – 12 Pole Miniature Connectors



MSCM12



MMC* (modular system)



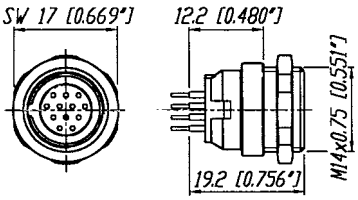
MRF12



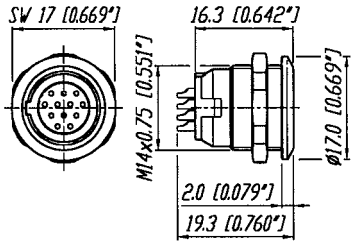
MRF12-H

- Up to 12 pole miniature connector
- Complete set or modular system
- Push-pull self-locking system
- Precisely machined, rugged all metal design
- Fully loaded male and female receptacles for horizontal or vertical PCB mount
- Gold plated contacts, crimp or solder, velour chromium housing
- Special crimp type strain relief establishes an ideal coaxial connection of the cable shield to the connector shell for best EMC shielding
- Easy assembly: contact soldering in disassembled condition avoids awkward wiring of wight density contacts
- Interchangeable insert (male-female)

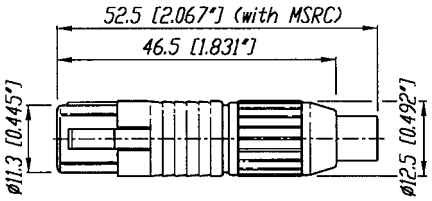
MPF(M)12-V



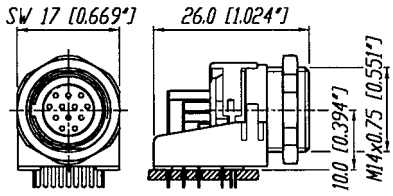
MRF(M)12



MSCF(M)12 (+MSRC)



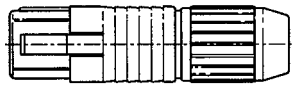
MPF(M)12-H



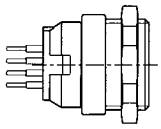
Ordering Information for complete miniCON set

Complete set (consisting of housing, insert, 12 contacts and chuck for cable connector)			
Female		**Male**	
MSCF12	Cable connector, chuck principle, solder contacts	MSCM12	Cable connector, chuck principle, solder contacts
MRF12	Receptacle panel mount, solder contacts	MRM12	Receptacle panel mount, solder contacts
MPF12-H	Receptacle horizontal PCB mount	MPM12-H	Receptacle horizontal PCB mount
MPF12-V	Receptacle vertical PCB mount	MPM12-V	Receptacle vertical PCB mount

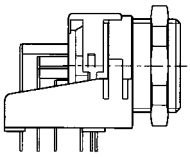
MSCF(M)12



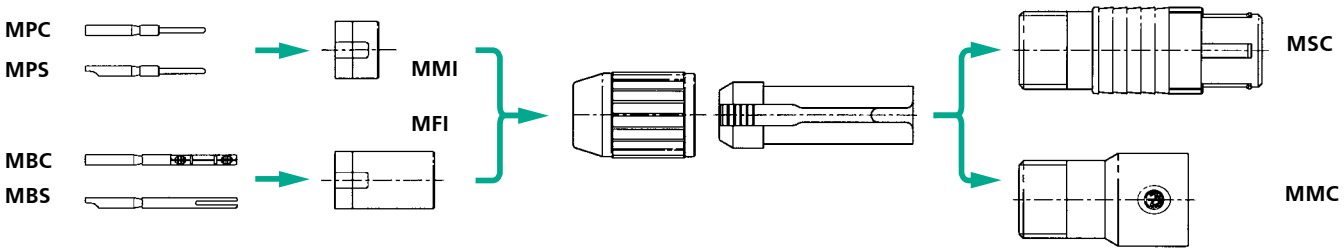
MPF(M)12-V



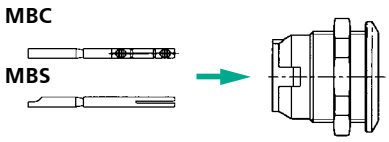
MPF(M)12-H



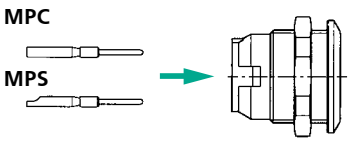
Ordering Information for modular miniCON system



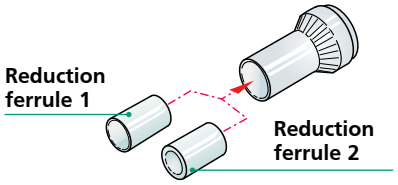
MRF



MRM



MSRC



Housing and insert pre-assembled, contacts must be ordered separately.

Modular system			
Female		**Male**	
MFI	Insert for cable connector	MMI	Insert for cable connector
MBC	Crimp contacts for cable connector and receptacle	MPC	Crimp contacts for cable connector and receptacle
MBS	Solder contacts for cable connector and receptacle	MPS	Solder contacts for cable connector and receptacle
MRF	Receptacle housing and insert pre-assembled	MRM	Receptacle housing and insert pre-assembled
MMC	Cable connector extension, incl. chuck (for male and female)		
MSC	Cable connector housing, incl. chuck (for male and female)		
MSRC	Set of strain relief crimp version (consisting of crimp ferrule & reduction ferrule 1 + 2, tools see page 130)		



Push Pull locking



All metal housing



Colored bushing available

neutriCON

neutriCON – Versatile Circular Connectors



OSC8F



MC8M-Ni



ORP8F-Ni



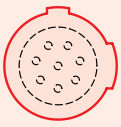
ORP8M

- Complete set or modular system for any desirable configuration
- Contact configuration can be selected from 1 to 8 contacts
- Special crimp type strain relief establishes an ideal circumferential connection of the cable shield to the connector shell as required by best EMC working practice
- Precise and robust all metal housing absorbs vibration forces and protects contact inserts
- Easy, fast and screwless assembly
- Push-pull self-locking system

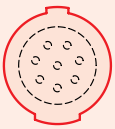
Polarization

Housing: Two variants of metal polarizing guides (90° and 180°).

Coding 90°

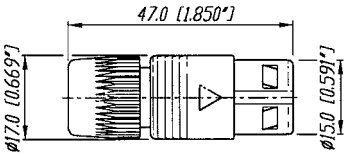


Coding 180°

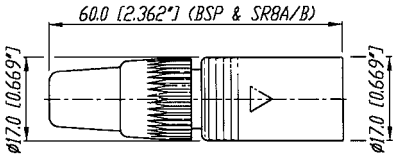


Insert: The male and female insert can be assembled in all three housings.

OSC8F / OSC8M

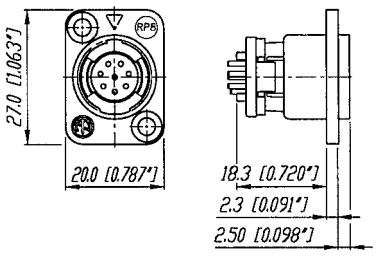


MODULAR SYSTEM



MC8 + SR8A/B + insert

ORP8F / ORP8M

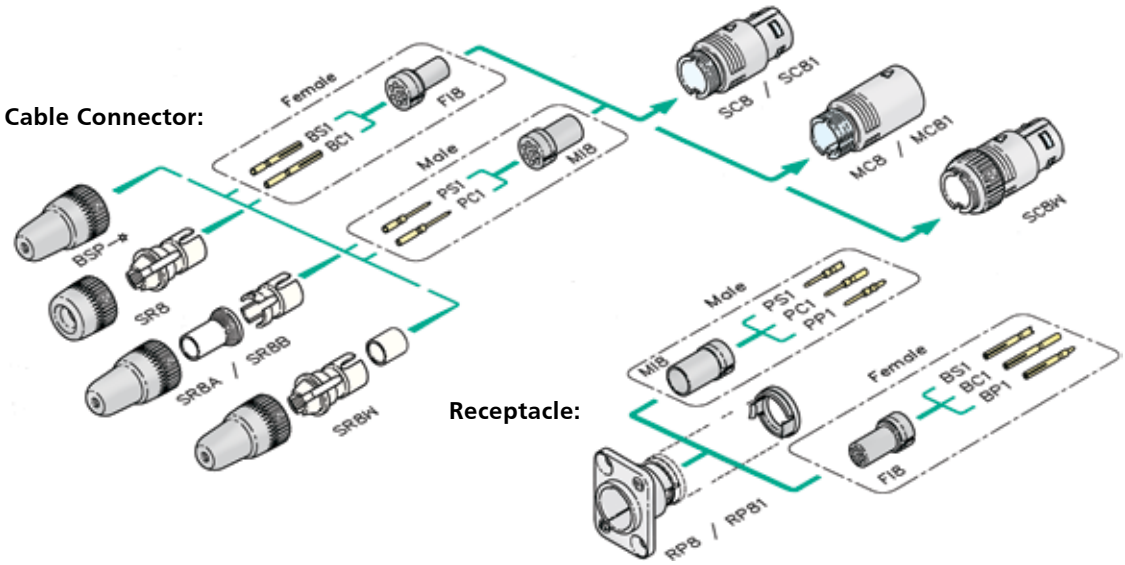


Ordering Information for complete neutriCON set

Complete set (consisting of housing, insert, 8 contacts and chuck for cable connector)

OSC8F	Female cable connector, chuck principle, black housing, solder contacts
OSC8F-Ni	Female cable connector, chuck principle, nickel housing, solder contacts
OSC8M	Male cable connector, chuck principle, black housing, solder contacts
OSC8M-Ni	Male cable connector, chuck principle, nickel housing, solder contacts
ORP8F	Female panel mount receptacle, black housing, solder contacts
ORP8F-Ni	Female panel mount receptacle, nickel housing, solder contacts
ORP8M	Male panel mount receptacle, black housing, solder contacts
ORP8M-Ni	Male panel mount receptacle, nickel housing, solder contacts

Ordering Information for modular neutriCON system



Modular system

Female		Male	
FI8	Insert for cable connector and receptacle	MI8	Insert for cable connector and receptacle
BS1	Solder contact	PS1	Solder contact
BC1	Crimp contact	PC1	Crimp contact
BP1	PCB contact	PP1	PCB contact
SC8	Cable housing, black coated, 180° coding	MC8	Mating cable housing, black coated, 180° coding
SC8-Ni	Cable housing, nickel coated, 180° coding	MC8-Ni	Mating cable housing, nickel coated, 180° coding
SC81	Cable housing, black coated, 90° coding	MC81	Mating cable housing, black coated, 90° coding
SC81-Ni	Cable housing, nickel coated, 90° coding	MC81-Ni	Mating cable housing, nickel coated, 90° coding
SC8W	Cable housing, black coated, 180° coding, waterproof multipin connector according IP54		
RP8	Receptacle, black coated, 180° coding		
RP8-Ni	Receptacle, nickel coated, 180° coding		
RP81	Receptacle, black coated, 90° coding		
RP81-Ni	Receptacle, nickel coated, 90° coding		
SR8	Bushing and chuck type strain relief (standard)		
SR8A	Crimp type strain relief for cable O.D. 3 – 3.8 mm (Hex crimp 5.41 mm acc. IEC 803, see also page 130)		
SR8B	Crimp type strain relief for cable O.D. 6 – 7 mm (Hex crimp 7.01 mm acc. IEC 803, see also page 130)		
SR8W	Bushing and chuck type strain relief for waterproof solution IP 54		
BSP-*	Coloured boot, available in 10 resistor colours		

* color coding: 0 - Black, 1- Brown, 2 - Red, 3 - Orange, 4 - Yellow, 5 - Green, 6 - Blue, 7 - Violet, 8 - Grey, 9 - White

Crimptool



Crimptool HX-CONTACT DMC crimptool AFM8 acc. M22520/2-01

+



MPOS-* Modified DMC positioner (K155) Contact positioner helds contact in position when crimping.

Contact and connector assembly



Crimptool HX-R-BNC Neutrik® HEX crimptool

+



DIE-R-BNC-* Neutrik® DIE's for various HEX sizes.

neutriCON - Ordering Information Assembly Tools

		Cable O.D. / Wire	Crimptool	Die/Positioner	HEX-Size/Standard
SR8A	Strain relief	3 – 3.8 mm	HX-R-BNC	DIE-R-BNC-PJ	5.41 mm / IEC 803
SR8B	Strain relief	6 – 7 mm	HX-R-BNC	DIE-R-BNC-PS	7.01 mm / IEC 803
BC1	Female crimp contact	AWG 22 – 26	HX-CONTACT	MPOS-BC1	No. 5 / M22520/2-01
PC1	Male crimp contact	AWG 22 – 26	HX-CONTACT	MPOS-PC1	No. 5 / M22520/2-01

miniCON - Ordering Information Assembly Tools

		Cable O.D. / Wire	Crimptool	Die/Positioner	HEX-Size/Standard
MSRC	Crimp ferrule only	4.5 – 6 mm	HX-R-BNC	DIE-R-BNC-PDC*	6.47 mm / IEC 803
MSRC	Crimp ferrule & reduction ferrule 1	3.3 – 4.4 mm	HX-R-BNC	DIE-R-BNC-PDC*	6.47 mm / IEC 803
MSRC	Crimp ferrule & reduction ferrule 2	2.5 – 3.2 mm	HX-R-BNC	DIE-R-BNC-PDC*	6.47 mm / IEC 803
MBC	Female crimp contact	24 AWG / 0.22 mm^2	HX-CONTACT	MPOS-MBC	No. 5 / M22520/2-01
MPC	Male crimp contact	24 AWG / 0.22 mm^2	HX-CONTACT	MPOS-MPC	No. 5 / M22520/2-01

*: DIE-R-BNC-PJ or PS also possible

Specification	nanoCON Series	miniCON Series	neutriCON Series
Electrical			
Number of contacts	3	12 (1-12 modular system)	8 (1-8 modular system)
Rated current per contact	2 A	3 A	7.5 A (solder), 5 A (crimp)
Rated voltage	50 V ac	50 V ac	50 V ac
Dielectric strength	1000 V dc	1000 V dc	1500 Vdc
Contact resistance	≤ 12 mΩ	≤ 8 mΩ	≤ 5 mΩ
Insulation resistance after damp heat test (IEC 68-2-30)	> 1 GΩ	> 500 MΩ	> 500 MΩ
Mechanical			
Retention method	latch	Push-pull	Push-pull
Cable O.D. range	3.4 mm max.	3 – 5 mm (grey chuck)	3 – 7 mm
		5 – 7 mm (white chuck)	3 – 3.8 mm (SR8A)
		2.5 – 6 mm	6 – 7 mm (SR8B)
		(crimp version MSRC)	
Wiring	0.2 mm² / 24 AWG	0.5 mm² / 20 AWG	1.0 mm² / 18 AWG
	for solid wire	for solder	for solder
	0.14 mm²	0.22 mm²	0.14 - 0.34 mm²
	26 AWG	24 AWG	22 - 26 AWG
	for stranded wire	for crimp	for crimp
Solderability complies with IEC 68-2-20	●	●	●
Material			
Housing cable connector	CuSn4Pb4Zn4	ZnAl4Cu1 / CuZn39Pb3	ZnAl4Cu1
			gal Ni or black chrome
Housing receptacle	CuZn39Pb2	ZnAl4Cu1	ZnAl4Cu1,
			gal Ni or black chrome
Insert	PETP	PA 6.6	PBTP 15% GR
Contacts	CuZn35Pb2	CuZn35Pb2 (solder)	CuZn35Pb2 (solder)
		CuZn39Pb3 (crimp)	CuZn39Pb3 (crimp)
		CuSn6	
Contact surface	0.5 µm Au	0.2 µm AuCo	0.3 µm Au hard
			alloy over 2 µm Ni
Chuck POM	●	●	●
Environmental			
Flammability	UL 94 HB	-	-	●
Flammability	UL 94 V-0	●	●	-
Temperature range	-30 °C to +80 °C	●	●	●
Protection class (mated)		IP 40*	IP 5X	IP 5X
Safety Requirements EN/IC61984		-	-	-

*: Receptacle

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