

Magnetic connectors

Magnetische Steckverbinder

RoPD Connectors – Exploring Generation LEV

Rosenberger Power Data Connectors are a revolutionary magnetic connector system** – developed for the Light Electric Vehicles Industry (LEV). They are especially suited for data communication and power transmission of voltages up to 48 V and current loads up to 50 A.

RoPD Connectors utilise magnetic locking with a perfect self-locating capability instead of a mechanical plug-in mount. Forced disconnection will not damage the connector or the LEV.



Product Features

- Magnetic locking mechanism
- 4 pins for data communication and 2 pins for power transmission
- 100% self-location
- Shallow mounting depth
- Waterproof and robust
- Shock- and vibration proof
- Reliable contact pressure
- Zero-force mating
- Extremely high mating cycles

RoPD Connectors – Exploring Generation LEV

Rosenberger Power Data Connectors sind neuartige magnetische Steckverbinder-Systeme** – entwickelt für die Leicht-Elektro-Fahrzeug-Industrie (LEV). Sie eignen sich hervorragend für die Datenübermittlung und die Stromversorgung bei Übertragung von Spannungen bis 48 V und Strömen bis zu 50 A.

Anstelle einer mechanischen Verrastung nutzen sie ein magnetisches Verbindungssystem mit 100%-iger Selbstfindung. Bei unbeabsichtigtem Trennen ist eine Beschädigung am Steckverbinder bzw. am LEV ausgeschlossen.



Produkteigenschaften

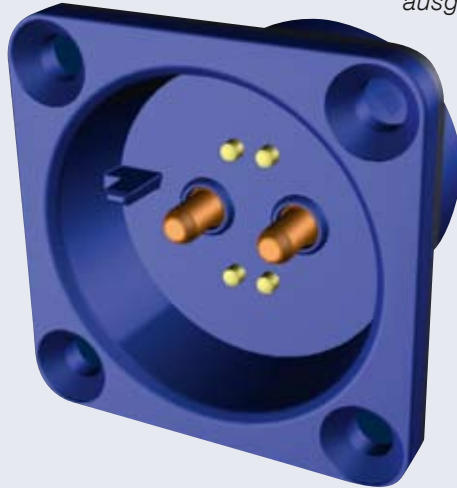
- Magnetisches Verbindungssystem
- 4 Kontakte zur Daten- und 2 Kontakte zur Stromübertragung
- 100% Selbstfindung
- Geringe Einbautiefe
- Wasserdicht und robust
- Schock- und vibrationsbeständig
- Gesicherter Kontaktdruck
- Kraftfreie Verbindung
- Sehr hohe Steckzyklen

Technology

The contact system consists of 4 data contacts and 2 power transmission pins.

Upon successful connection, the data contacts activate the power contacts. The power contacts are based on a pin and socket principle, which balances out tolerances through contact springs and is therefore suitable for high quantity of mating cycles. In the automobile industry this power connection system has proved itself time and again. The 4 data contacts can be used as a BUS-System with additional supply voltage.

Versions of these magnetic Rosenberger Power Data connectors are also suitable for EnergyBus application.



Technologie

Das Kontakt-System besteht aus 4 Kontakten zur Daten- und 2 Kontakten zur Stromübertragung.

Das System ist nicht Hot-Plug-fähig, bei erfolgreicher Kontaktierung geben die Datenkontakte die Stromkontakte frei. Die Stromkontakte basieren auf einem Stift - Buchse Prinzip, welches durch die Kontaktfeder Toleranzen ausgleichen kann und für sehr hohe Steckzyklen

geeignet ist. In der Automobilindustrie hat sich dieses Stromkontaktsystem bereits vielfach bewährt. Die 4 Datenkontakte können für ein BUS-System mit zusätzlicher Versorgungsspannung genutzt werden.

Varianten dieser magnetischen Rosenberger Power Data Steckverbinder werden auch für EnergyBus eingesetzt.

Perfect handling

- No risk of canting or similar
- Reliable connections even for hard-to-reach positions
- Forced disconnection causes no damage to connector or vehicle

Perfektes Handling

- Kein Verkantungs-/Beschädigungsrisiko
- Zuverlässiges Kontaktieren auch an schwer zugänglichen Stellen
- Beschädigungsfrei bei Zwangstrennung (Kontakte und Fahrzeug)





Product Range

Cable Assemblies for different currents (10A, 30A, 50A)

assembled with

- RoPD Charging Connector jack (straight or right angle)
- RoPD Battery Panel plug (round or square)
- RoPD Slide-In Panel jack (flexibly seated)

Technical Data

- Current: 10A, 30A, 50A
- Voltage: flexible 12V – 48V
- Waterproof: IP 67/IP 69 plug,
IP 65/IP 67 jack (mated connection)
- UV-resistant
- Mating cycles > 5000

Technical Data RoPD Connectors

	Cable Assembly Types		
	C001-...-XXX-Y*	C003-...-XXX-Y*	C006-...-XXX-Y*
Electrical data Elektrische Daten			
Rated voltage, Power Pins Spannungsbereich, Strompins	≤ 48V DC/AC	≤ 48V DC/AC	≤ 48V DC/AC
Max. current load, Power Pins (room temperature) Max. Strombelastung Strompins (Raumtemperatur)	10 A	30 A	50 A
Rated voltage, Signal Pins Spannungsbereich, Signalpins	12 V	12 V	12 V
Max. current load, Signal Pins (room temperature) Max. Strombelastung Signalpins (Raumtemperatur)	2 A	2 A	2 A
Mechanical data Mechanische Daten			
Locking mechanism Systemverriegelung.	magnetic	magnetic	magnetic
Mating cycles without load Steckzyklen ohne Last	> 5000 cycles	> 5000 cycles	> 5000 cycles
Max. wire cross section Max. Anschlussquerschnitt	1 mm ²	2.5 mm ²	6 mm ²
Mounting cut-out, male Einbaudurchmesser, Stecker	Ø 25 mm	Ø 25 mm	Ø 25 mm
Mounting depth (with/without fastener ring) Einbautiefe (mit/ohne Befestigungsring)	20 mm	20 mm	20 mm
Environmental data Umweltdaten			
Dust- und water resistance Staub- und Wasserdichtheit			
Plug (frontside, installed) Stecker (Frontseite, eingebaut)	IP 69/IP 67	IP 69/IP 67	IP 69/IP 67
Jack (connected with Plug) Kuppler (verbunden mit Stecker)	IP 65/IP 67	IP 65/IP 67	IP 65/IP 67

Technical changes possible without further notice. Product-specific data available on request.
* XXX: please fill in length in mm. Y: please fill in coding.

Produktspektrum

Kabel-Assemblies für unterschiedliche Stromstärken

(10A, 30A, 50A) **konfektioniert** mit

- RoPD Lade-Steckverbinder (Kuppler gerade/gewinkelt)
- RoPD Batterie-Gehäusestecker (rund oder 4-kant)
- RoPD Slide-In-Gehäusekuppler (flexibel gelagert)

Technische Daten

- Strom: 10A, 30A, 50A
- Spannung: flexibel 12V – 48V
- Wasserdicht: IP 67/IP 69 Stecker,
IP 65/IP 67 Kuppler (gesteckt)
- UV-resistent
- Steckzyklen: > 5000

Technische Änderungen vorbehalten. Artikelspezifische Daten erhalten Sie auf Anfrage.
* XXX: bitte ergänzen Sie die Länge in mm. Y: bitte ergänzen Sie die Kodierung.

Produkte / Product Range



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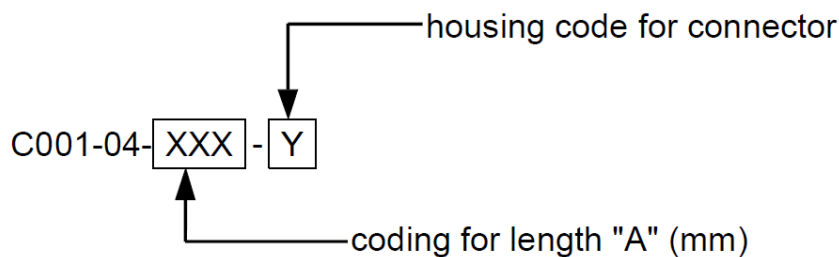
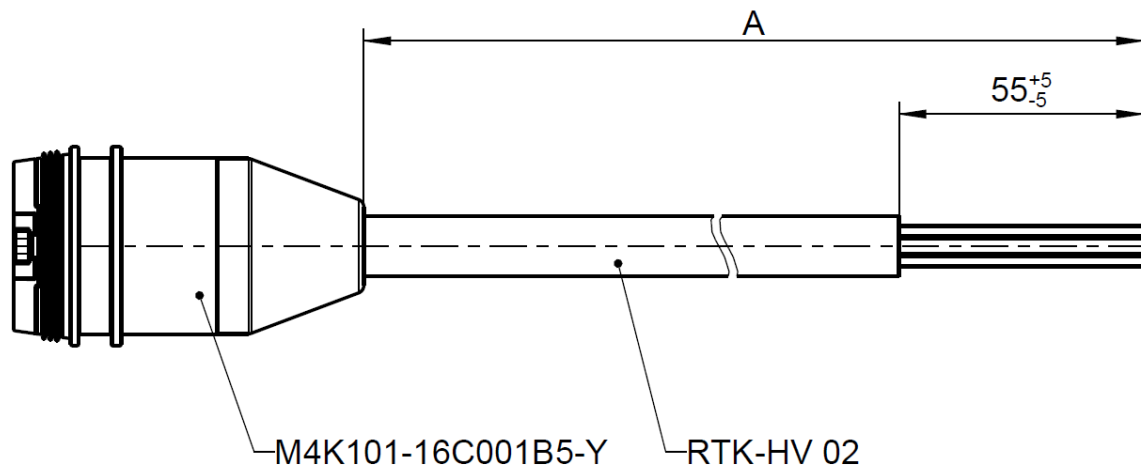
Technical Data Sheet

RoPD®

Cable assembly

C001-04-XXX-Y

Cable assembly



All dimensions are in mm

	cable length [mm]				
Range length "A"	50 to 100	100 to 1000	1001 to 2000	2001 to 5000	> 5000
Tolerance for "A"	± 3	± 5	± 10	± 20	± 1%

Documents

Interface
Connector data sheet
Customer drawing
Cable data sheet
Handling instruction

Rosenberger internal standard
M4K101-16C001B5-Y
C001-04-XXX-Y_LV
RTK-HV_02
HI_003

Caution!

Magnets can impact the function of pace makers and implantable cardioverterdefibrillators (e.g. actuation of reed switch). Keep a minimum distance of 0,2m (20cm) between the magnetic connector and the implanted devices to prevent malfunction and danger to health.

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Technical Data Sheet

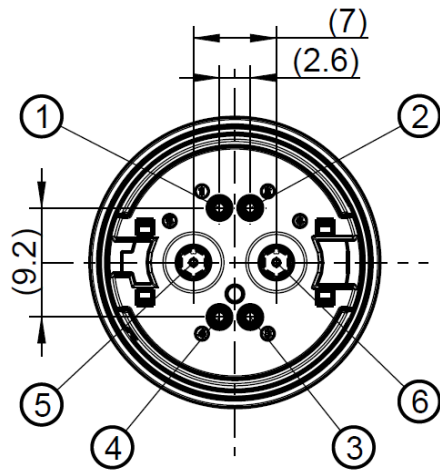
RoPD®

Cable assembly

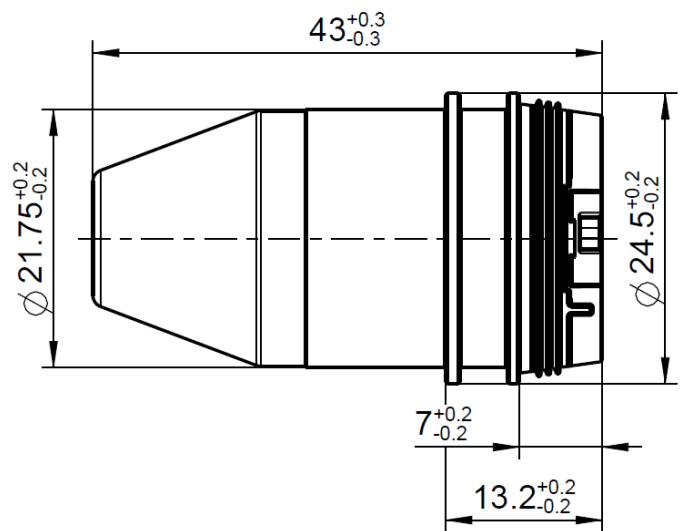
C001-04-XXX-Y

Connector straight jack

M4K101-16C001B5-Y



○ = pinning



All dimensions are in mm

Pinning

Pin	colour	cable cross section
1	green	0.35 mm ²
2	blue	0.35 mm ²
3	orange	0.35 mm ²
4	brown	0.35 mm ²
5	red	1.0 mm ²
6	black	1.0 mm ²

Warning!

Customer is responsible for implementing adequate safety measures:
Power supply to Pins 5 & 6 must be deactivated unless they are completely plugged in.
Power to pins 5 & 6 must only be activated upon full insertion of signal pins 1 – 4!
Misuse may damage contact!

Technical Data Sheet

RoPD®

Cable assembly

C001-04-XXX-Y

Material and plating

Parts

Housing
Dielectric
Magnets
Sealing
Bend Protection

Material

PBT-GF30 FR
PBT-GF30 FR
NdFeB
Silicone
TPU

Plating / Colour

black, sim. RAL 9005
black, sim. RAL 9005
Nickel

Pins 1-4:

Contact Pin

Brass

Gold, 0,4 µm (contact)

Pins 5-6:

Power Pin
Contact spring

Brass
Beryllium copper

White bronze (e.g. Optalloy®), min. 2 µm
Silver, min. 3 µm

Electrical data

Pins 1-4:

Insulation resistance $\geq 100 \text{ M}\Omega$
Contact resistance $\leq 40 \text{ m}\Omega$ initial
Working voltage 12 V (24 VDC)
Max. Current 3 A (0.5 A) per pin

Pins 5-6:

Insulation resistance $\geq 100 \text{ M}\Omega$
Power current $\leq 10 \text{ A DC}$
Contact resistance $\leq 7 \text{ m}\Omega$
Working voltage $\leq 60 \text{ V DC}$

Mechanical data

Locking mechanism
Mating cycles
Disengagement force
Weight (connector only)

magnetic
min. 2500
min. 20N
20 g

Environmental data

Temperature range
Dust and water resistance
Glow-wire flammability test
for end products
(GWT850°C; GWT750°C)

-40°C to + 65°C
DIN-EN-60529 IP 64 / IP 67; mated
IEC 60695-2-11:2014

Technical Data Sheet

RoPD®

Cable assembly

C001-04-XXX-Y

Cable

RTK-HV_02

Material and Dimensions

Conductor (pinning 1-4)	Bare copper strand Cu-ETP1 acc. EN13602	0.35 mm ²	AWG 22
Conductor (pinning 5-6)	Bare copper strand Cu-ETP1 acc. EN13602	1.0mm ²	AWG 18
Outer diameter	PU, color: black	max. Ø 7.7 mm	

Mechanical data

Bending radius Single	10 x d
Bending radius Multiple (<10x)	15 x d
Net. weight of cable	ca. 66 kg/km

Environmental data

Temperature resistance (3000h)	-40° C up to +105° C
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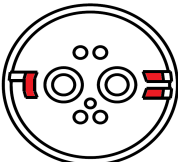
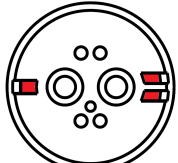
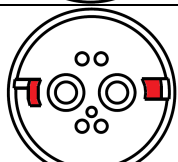
Technical Data Sheet

RoPD®

Cable assembly

C001-04-XXX-Y

Coding

Coding	Plug	Part-Number
B		C001-04-XXX-B
C		C001-04-XXX-C
D		C001-04-XXX-D

While the information has been carefully compiled to the best of our knowledge, nothing is intended as representation or warranty on our part and no statement herein shall be construed as recommendation to infringe existing patents. In the effort to improve our products, we reserve the right to make changes judged to be necessary.

Draft	Date	Approved	Date	Rev.	Engineering change number	Name	Date
F. Huber	27.07.21	C. Biermann	08.05.23	a00	22-s191	P. Bossa	08.05.23
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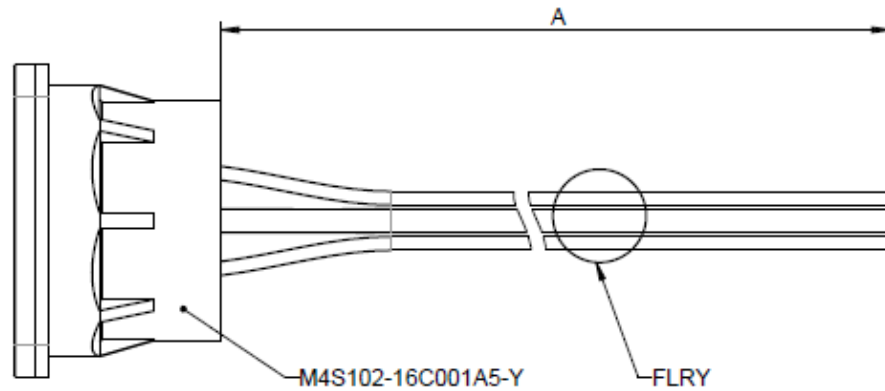
Technical Data Sheet

RoPD®

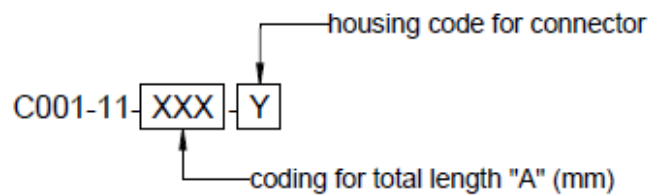
Cable assembly

C001-11-XXX-Y

Cable assembly



All dimensions are in mm



	cable length [mm]				
Range length "A"	50 to 100	100 to 1000	1001 to 2000	2001 to 5000	> 5000
Tolerance for "A"	± 3	± 5	± 10	± 20	± 1%

Dokuments

Interface
Connector data sheet
Customer drawing
Cable data sheet
Handling instructions

Rosenberger internal standard
M4S102-16C001A5-Y
C001-11-XXX-Y_LV
FLRY 0,35-B / FLRY 1,0-B
HI_003

Caution!

Magnets can impact the function of pace makers and implantable cardioverterdefibrillators (e.g. actuation of reed switch). Keep a minimum distance of 0,2m (20cm) between the magnetic connector and the implanted devices to prevent malfunction and danger to health.

Technical Data Sheet

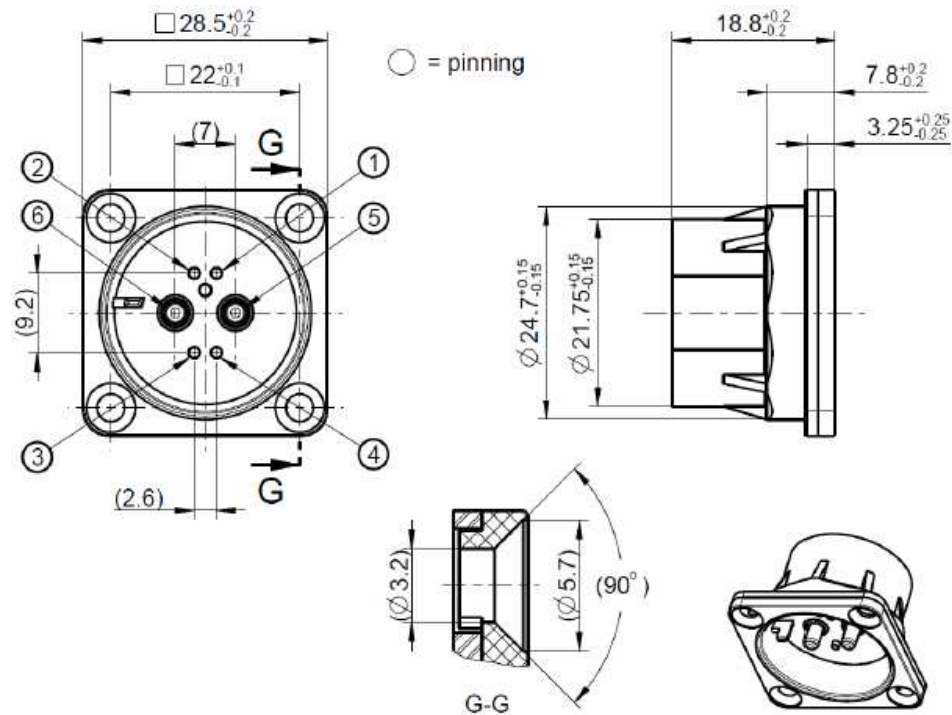
RoPD®

Cable assembly

C001-11-XXX-Y

Connector straight plug 4-hole flange

M4S102-16C001A5-Y



All dimensions are in mm

Pinning

Pin	colour	cable cross section
1	green	0.35 mm ²
2	blue	0.35 mm ²
3	orange	0.35 mm ²
4	brown	0.35 mm ²
5	red	1.0 mm ²
6	black	1.0 mm ²

Warning!

Customer is responsible for implementing adequate safety measures:
Power supply to Pins 5 & 6 must be deactivated unless they are completely plugged in.
Power to pins 5 & 6 must only be activated upon full insertion of signal pins 1 – 4!
Misuse may damage contact!

Technical Data Sheet

RoPD®

Cable assembly

C001-11-XXX-Y

Material and plating

Parts

Housing
Casting compound
Magnets
Sealing

Material

PBT-GF30 FR
PU casting resin
NdFeB
Silicone

Plating / Color

black, sim. RAL 9005

Nickel

Pins 1-4:

Contact Pin

Brass

Gold, 0.15µm

Pins 5-6:

Power Pin

Copper

Nickel, min. 3 µm

Electrical data

Pins 1-4:

Insulation resistance $\geq 100 \text{ M}\Omega$
Contact resistance $\leq 40 \text{ m}\Omega$ initial
Working voltage 12 V (24 VDC)
Max. Current 3 A (0.5 A) per pin

Pins 5-6:

Insulation resistance $\geq 100 \text{ M}\Omega$
Power current $\leq 10 \text{ A DC}$
Contact resistance $\leq 7 \text{ m}\Omega$
Working voltage $\leq 60 \text{ V DC}$

Mechanical data

Locking mechanism
Mating cycles
Disengagement force
Weight (connector only)

magnetic
min. 2500
min. 20N
15 g

Environmental data

Temperature range -40°C to + 65°C
Dust and water resistance DIN-EN-60529 IP 64 / IP 67; mated
Glow-wire flammability test for end products (GWT850°C; GWT750°C) IEC 60695-2-11:2014

Mounting note

Required screws
Tightening torque

M3, countersunk head, non magnetic
25 Ncm

Technical Data Sheet

RoPD[®]

Cable assembly

C001-11-XXX-Y

Cable

FLRY

Material and Dimensions

Conductor (pinning 1-4)	Bare copper strand Cu-ETP1 acc. EN13602	0.35 mm ²	AWG 22
Conductor (pinning 5-6)	Bare copper strand Cu-ETP1 acc. EN13602	1.0 mm ²	AWG 18
Outer diameter pinning 1-4	Soft-PVC	max. Ø 1.4 mm	
Outer diameter pinning 5-6	Soft-PVC	max. Ø 2.1 mm	

Mechanical data

Bending radius Single (1.0 mm ²)	2 x d
Bending radius Multiple (<10x) (1.0 mm ²)	6 x d
Bending radius Single (0.35 mm ²)	2 x d
Bending radius Multiple (<10x) (0.35 mm ²)	6 x d
Net. weight of each cable (1.0 mm ²)	ca. 11 kg/km
Net. weight of each cable (0.35 mm ²)	ca. 5 kg/km

Environmental data

Temperature resistance (3000h)	-40° C up to +105° C
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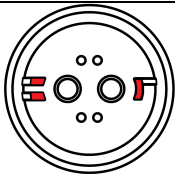
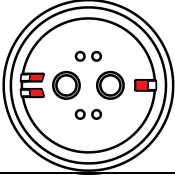
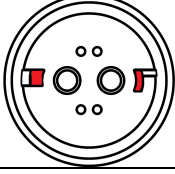
Technical Data Sheet

RoPD®

Cable assembly

C001-11-XXX-Y

Coding

Coding	Plug	Part-Number
B		C001-11-XXX-B
C		C001-11-XXX-C
D		C001-11-XXX-D

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N. Naus	17.02.2	C. Biermann	22.09.21	100	21-1329	F. Huber	22.09.21

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