FANINA S.A.

CATALOGUE
OF RAILWAY PRODUCTS
AND SERVICES

We have a pleasure to present our company, which was founded in 1959. Since 1992, we have been operating as a joint-stock company (S. A.). Our manufacturing offer includes the railway, hydraulic and electrical machinery products. Our products have been well known in Poland and many other European countries for years.

Below is the outlined range of our products and offer*.

RAILWAY:

- ZW-1 and ZW-2 couplers for electric heating of railcars,
- solenoids for railcar door interlocks and turnout control,
- coils and valves used in the railway rolling stock,
- AKP4 and 10PP pantograph contact shoes,
- spare parts for Scharfenberg couplers,
- separation transformers for supply of electric turnout heating equipment.

HYDRAULICKS AND PNEUMATICS:

- solenoids for hydraulic and pneumatic distributors,
- solenoids for ATEX-compliant gas valves,
- solenoids and coils for Ex zones,
- electromagnetic coils,
- electromagnetic locks and interlocks,
- electric connectors for solenoids (plugs and sockets).

ELECTRICAL POWER ENGINEERING:

- low-voltage current transformers in class 1; 0.5; 0.5S; 0.2; 0.2S,
- safety transformers in casing (portable),
- single-phase protective transformers,
- toroidal transformers, including those for halogen lighting.

ENGINEERING INDUSTRY:

- BJP electromagnetic chucks for grinders,
- tops for BJP electromagnetic chucks,
- cable handlers (layers) with steel structure.

We also recommend other products that can be made to custom order. We offer the cooperation in manufacturing collaboration, including the development and introduction into production of completely new solutions.
On account of constant drive to make our offer more attractive, the appearance and parameters of some products may differ from those in this catalogue. Not all products could be presented in it. For up-to-date information, contact our Marketing and Sales Department:

ISO 9001:2008 DEKRA Certification DEKRA Certified
Quality Management
We are certified
Voluntary participation in regular monitoring according to ISO 9001:2008

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ELECTRIC COUPLER UNITS FOR HEATING RAILCARS: ZW-1; ZW-2 COMPATIBLE WITH UIC-552

APPLICATION:
Connecting the high-voltage systems between two consecutive railcars or between a locomotive and a railcar.

DESIGN:
The components of the unit are mounted to the railcar or locomotive bed or end sill.

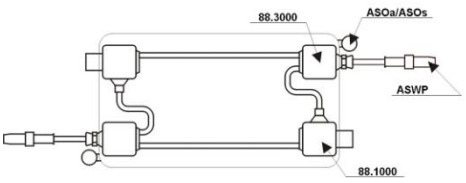
Components:

Unit ZW-1
- Receptacle 88.1000®
- Cable holder 88.2000®
- Distribution box 88.3000®
- Plug with cable ASWP®
- Dummy receptacle ASOs (without interlock)
- Dummy receptacle ASOa® (with interlock)

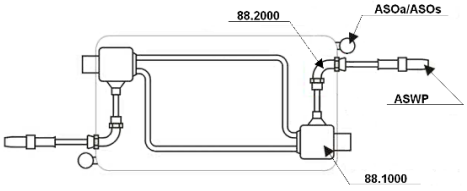
Unit ZW-2
- GSN Receptacle
- SRN Distribution box
- Plug with cable ASWP-D
- Dummy receptacle ASOs (without interlock)
- Dummy receptacle ASOa® (with interlock)

DOCUMENTS PROVIDED WITH THE PRODUCT:
Acceptance certificate 3.1.

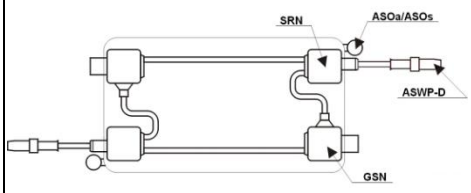
Unit ZW-1 with distribution box



Unit ZW-1 without distribution box



Unit ZW-2



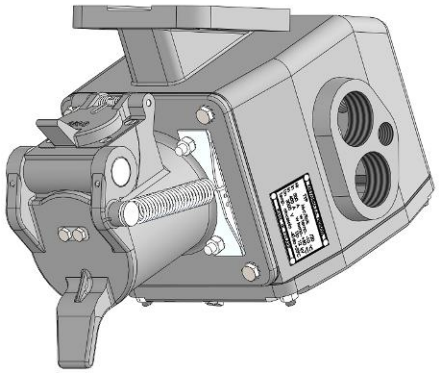
DESIGN IS RESISTANT TO STROKES AND VIBRATIONS THAT OCCUR DURING TRAIN OPERATION AS WELL AS TO HUMIDITY, TEMPERATURE AND POLLUTION.
COUPLER COMPONENTS MEET UIC-552 CARD REQUIREMENTS

SPECIFICATION:

PERMISSIBLE PERMANENT CURRENT LOAD		
Range of ambient temperatures:	CURRENT "I" (A)	
	for 185 mm² cable	for 185 mm² cable
below -10°C	800	800
-10°C ÷ 15°C	600	600
15°C ÷ 30°C	500	500
30°C ÷ 50°C	400	400
OTHER SPECIFICATIONS		
Rated voltage	3kV for direct or alternate current	
Test voltage	12kV for 1 minute	
Protection degree	IP55	

® The coupler socket 88.1000, cable bracket 88.2000, distribution box 88.3000, ASOa casing and plug wired with ASWP cable are registered trademarks of Electromechanical Apparatus Factory "FANINA" S.A.

RECEPTACLE GSN



DESIGN AND APPLICATION:

The GSN receptacle is a sub-assembly of the ZW-2 coupler assembly used to connect the train high voltage heating systems in the railway standard used throughout Western Europe.
The receptacle is used to connect the high-voltage heating systems between railcars using the plug wired with ASWP-D cable. The receptacle lid may be locked with the help of a special key, both when a plug is plugged into the receptacle and when the receptacle is empty.
The receptacle is fixed to the railcar or locomotive using two M20 bolts.
The body is made of an aluminium alloy.

The internal M16 screw clamp allows high-voltage cables to be screwed in through the eye terminals
mounted on cables.
The M10 earth terminal is led out to the outside.
Weight – 11 kg

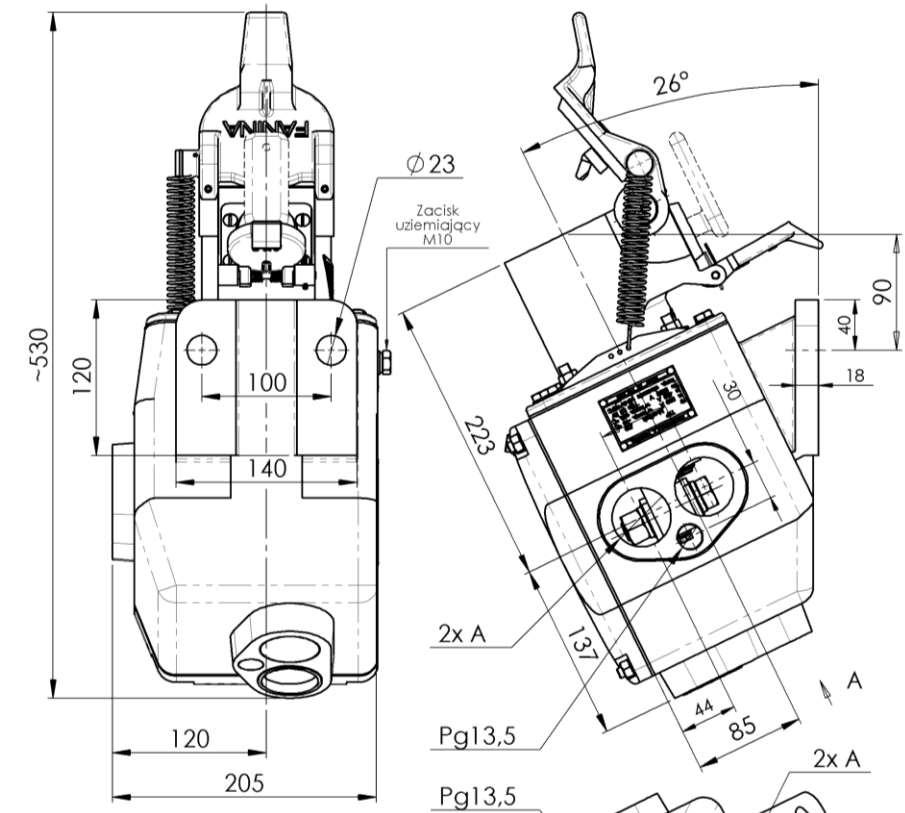
GSN RECEPTACLE VERSIONS:

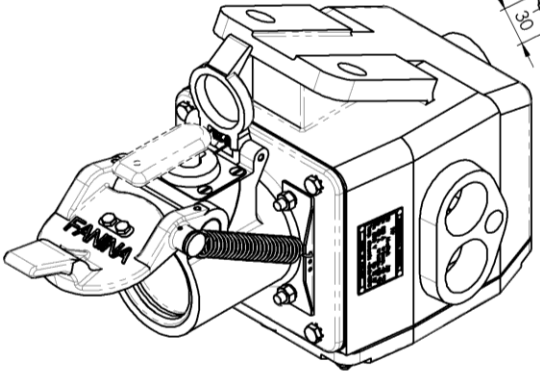
GSN-P – with Pg36 connecting threads
GSN-M – with M40x1.5 connecting threads

PERMISSIBLE PERMANENT CURRENT LOAD		
Range of ambient temperatures:	CURRENT „I" (A)	
	for 185 mm² cable	for 185 mm² cable
below -10°C	800	267
-10°C ÷ 15°C	600	200
15°C ÷ 30°C	500	167
30°C ÷ 50°C	400	134
OTHER SPECIFICATIONS		
Rated voltage	3kV for direct or alternate current	
Test voltage	12kV for 1 minute	
Protection degree	IP55	

DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.

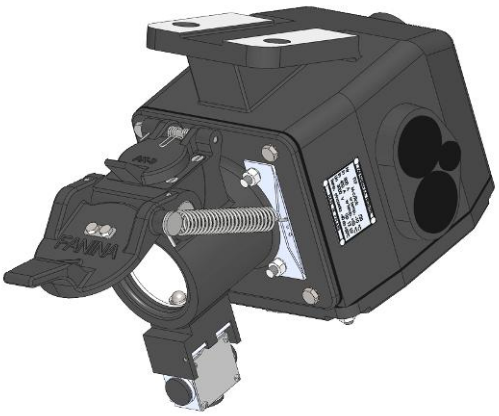




Typ	A
GSN-P	Pg36
GSN-M	M40x1,5

RECEPTACLE GSN-P-S (GSN-M-S)

with signalling device connector



SIGNALLING DEVICE CONNECTOR SPECIFICATION:

Type	Rated switching voltage	Rated switching currents
	U [V]	I [A]
AC	24	10
	120	6
	240	3
	400	1,8
DC	24	2,8
	125	0,55
	250	0,27

Other specifications

Rated insulation voltage	500V
Short-circuit protection	10A
Contact resistance	25mΩ
Cross-section of connection cables	0,75-2,5mm^2

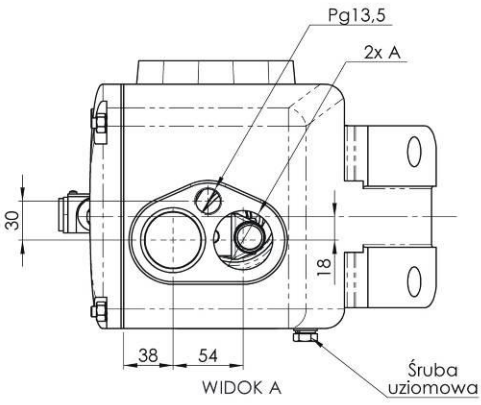
PERMISSIBLE PERMANENT CURRENT LOAD		
Range of ambient temperatures:	CURRENT „I" (A)	
	for 185 mm² cable	for 185 mm² cable
below -10°C	800	267
-10°C ÷ 15°C	600	200
15°C ÷ 30°C	500	167
30°C ÷ 50°C	400	134
OTHER SPECIFICATIONS		
Rated voltage	3kV for direct or alternate current	
Test voltage	12kV for 1 minute	
Protection degree	IP55	

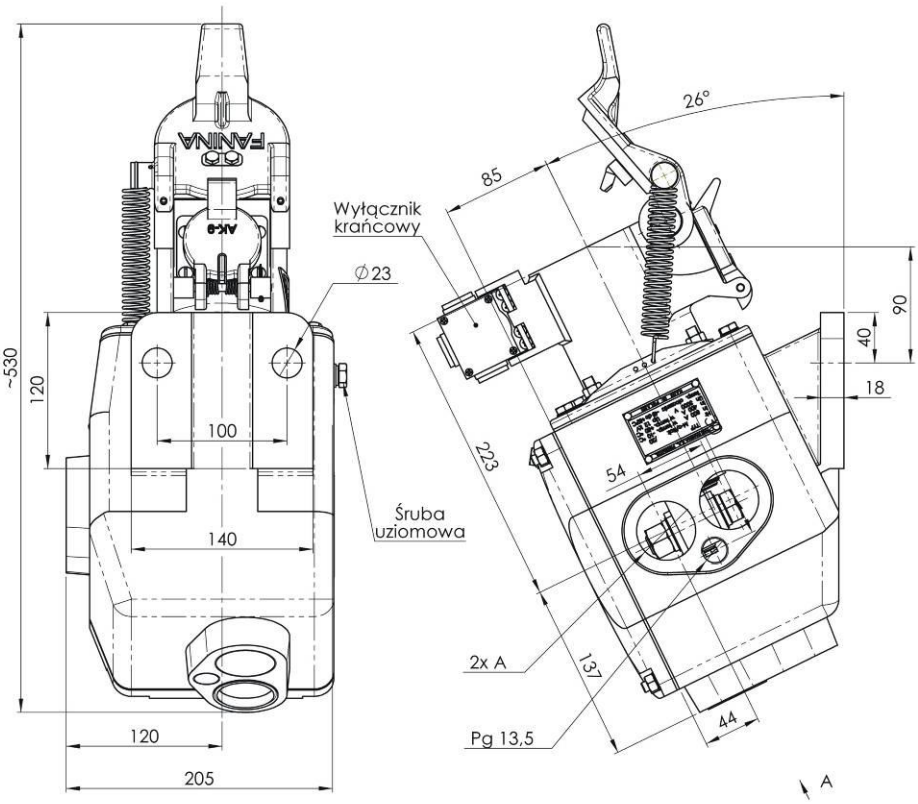
RECEPTACLE GSN WITH SIGNALLING VERSIONS:

GSN-P-S – with Pg36 (A) connecting threads
and signalling device connector with Pg 13.5
GSN-M-S – with M40x1.5 (A) connecting threads
and signalling device connector with Pg 13.5.

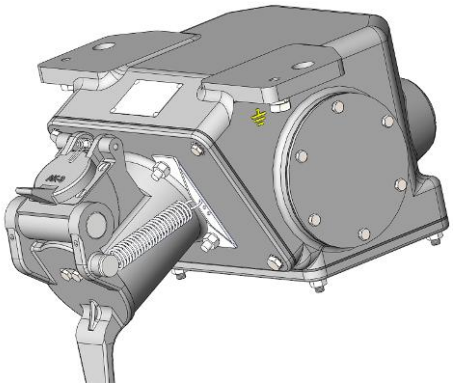
DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.





RECEPTACLE 88.1000®



DESIGN AND APPLICATION:

The 88.1000 receptacle is a sub-assembly of the ZW-1 coupler assembly used to connect the individual railcar segments of the train high voltage heating systems. The receptacle is used to connect the high-voltage heating systems between rail-cars using the ASWP plug wired a cable. The receptacle lid may be locked with the help of a special key, both when a plug is plugged into the receptacle and when the receptacle is empty.

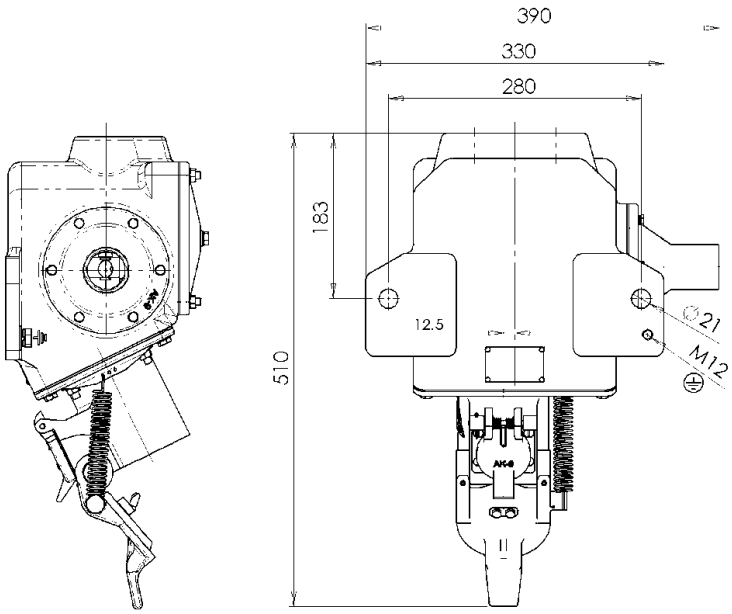
The receptacle is fixed to the railcar or locomotive using two M20 bolts.
The receptacle is also equipped with an M12 grounding bolt located on its housing.
The body is made of an aluminium alloy.
Weight: versions 1, 2 and 5 – 15 kg, versions 3, 4 and 6 – 14.5 kg.

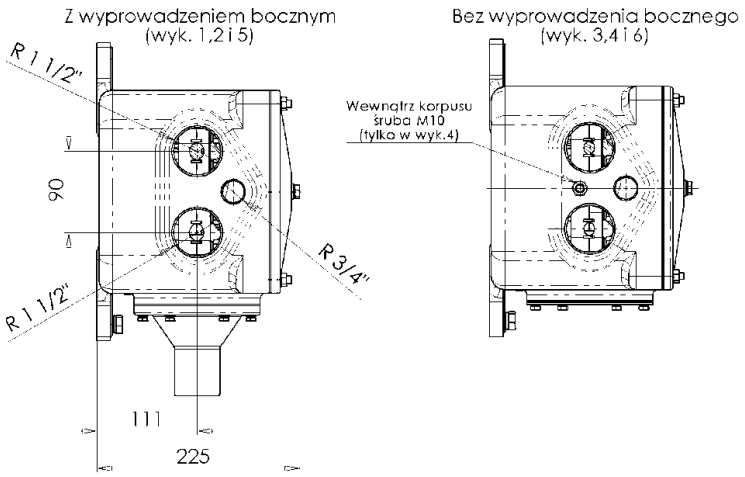
88.1000 RECEPTACLE VERSIONS:

1 – for 185 mm² cable with side cable outlet,
2 – for 95 mm² cable with side cable outlet,
3 – for 185 mm² cable with closed side cable outlet,
4 – for 95 mm² cable with closed side cable outlet, HCP body with M10 hole,
5 – for 95 and 185 mm² cable with side cable outlet,
6 – for 95 mm² cable with closed side cable outlet, without M10 hole in body,

- special versions including, but not limited to: BHV, BDT, SK.

PERMISSIBLE PERMANENT CURRENT LOAD		
Range of ambient temperatures:	CURRENT „I" (A)	
	for 185 mm² cable	for 185 mm² cable
below -10°C	800	267
-10°C ÷ 15°C	600	200
15°C ÷ 30°C	500	167
30°C ÷ 50°C	400	134
OTHER SPECIFICATIONS		
Rated voltage	3kV for direct or alternate current	
Test voltage	12kV for 1 minute	
Protection degree	IP55	





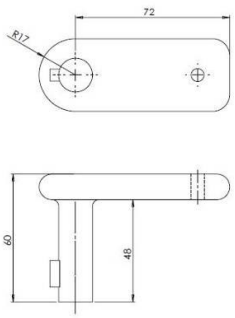
DOCUMENTS PROVIDED WITH THE PRODUCT:

Certificate 3.1.

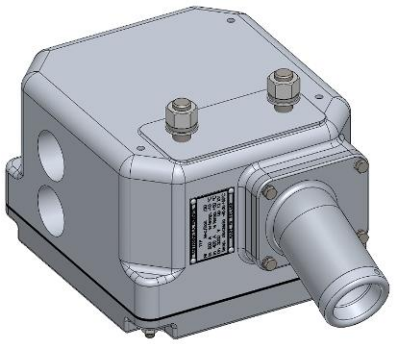
KEY ASG

DESIGN AND APPLICATION:

The ASG key according to UIC-552 standard is used to lock the 88.1000 receptacle, GSN receptacle and ASOa plug cover, both when a plug is plugged into the socket and when the socket is empty.
Material – aluminium casting.



DISTRIBUTION BOX SRN



DESIGN AND APPLICATION:

The SRN distribution box is a sub-assembly of the ZW-2 coupler assembly used to connect individual railcar segments of the train high voltage heating systems in the railway standard used throughout Western Europe.

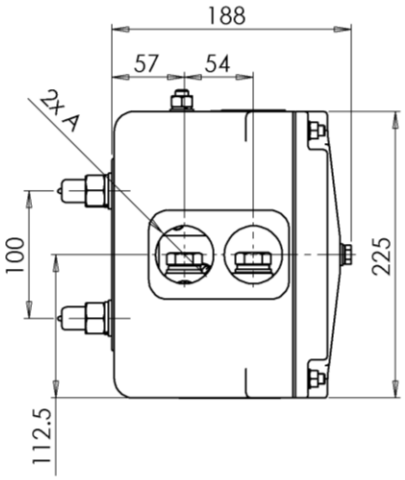
The box acts as a distribution or connection element in a train high-voltage heating system. The SRN box housing is made of an aluminium alloy and equipped with internal clamp for HV cables, mounted on the insulated base.
HV cables are mounted to the box clamp with M16 screws through eye terminals mounted on cables.

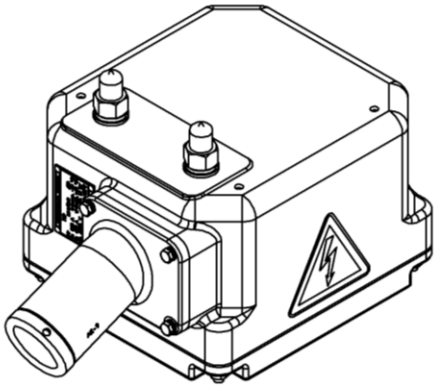
The box is fixed to the locomotive or railcar by means of two M16 bolts with nuts.
The box is equipped with two internal M6 screws used to connect grounding of the plug wired with ASWP-D cable. The M10 earth terminal is led out to the outside.
The cable outlet contains the double choke sealing suitable for a specific cable cross-section (185 or 95 mm²).
Weight – 10 kg.

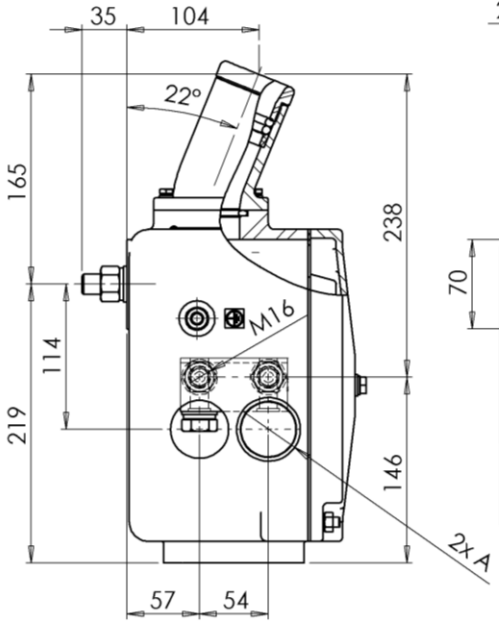
SRN DISTRIBUTION BOX VERSIONS:

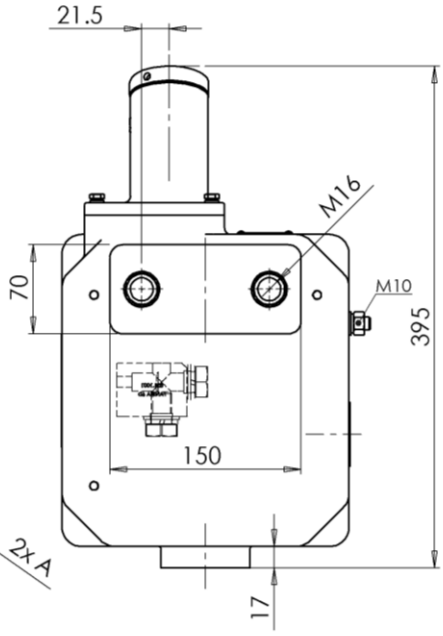
SRN-P/01 – for 185mm² cable, Pg36 connecting threads
SRN-P/21 – for 95mm² cable, Pg36 connecting threads
SRN-M/02 – for 185mm² cable, M50x1.5 connecting thre
SRN-M/22 – for 95mm² cable, M50x1.5 connecting threa

PERMISSIBLE PERMANENT CURRENT LOAD		
Range of ambient temperatures:	CURRENT „I" (A)	
	for 185 mm² cable	for 185 mm² cable
below -10°C	800	267
-10°C ÷ 15°C	600	200
15°C ÷ 30°C	500	167
30°C ÷ 50°C	400	134
OTHER SPECIFICATIONS		
Rated voltage	3kV for direct or alternate current	
Test voltage	12kV for 1 minute	
Protection degree	IP55	







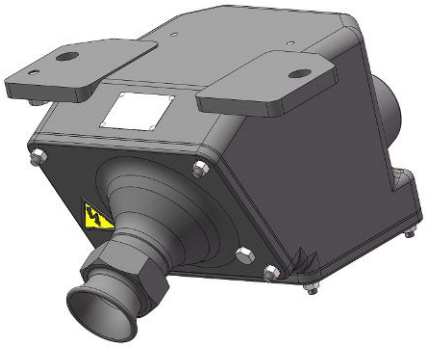


Typ	A
SRN-P	Pg36
SRN-M	M50x1,5

DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.

DISTRIBUTION BOX 88.3000®



DESIGN AND APPLICATION:

The 88.3000 distribution box is a sub-assembly of the ZW-1 coupler assembly used to connect individual railcar segments of the train high voltage heating systems.

The box task is permanently connect HV cables. The box housing is made of an aluminium alloy and equipped with internal clamp for HV cables mounted on an insulating bracket.
HV cables are mounted in a clamp and pressed by three shins. Rubber packing within the box gland may be replaced to match the used ASWP cable gauge.

The box is fixed to the locomotive or railcar by means of two M20 bolts.
The box is equipped with two types of grounding elements:
an M12 bolt outside the box body; an M10 bolt inside the body (for ASWP cables).
Weight – 11 kg.

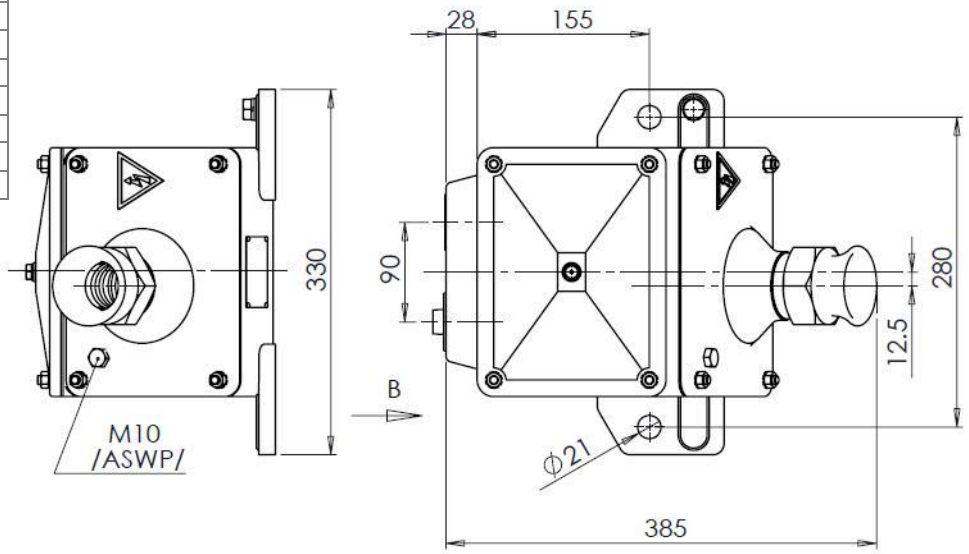
DISTRIBUTION BOX VERSIONS:

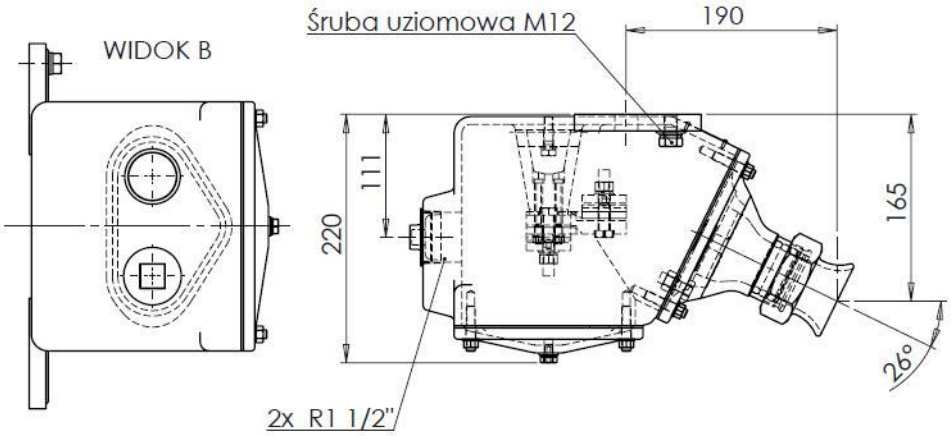
1 – for 185 mm² cable,
2 – for 95 mm² cable.
3 – special BHV version – with side cable outlet.

PERMISSIBLE PERMANENT CURRENT LOAD		
Range of ambient temperatures:	CURRENT „I" (A)	
	for 185 mm² cable	for 185 mm² cable
below -10°C	800	267
-10°C ÷ 15°C	600	200
15°C ÷ 30°C	500	167
30°C ÷ 50°C	400	134
OTHER SPECIFICATIONS		
Rated voltage	3kV for direct or alternate current	
Test voltage	12kV for 1 minute	
Protection degree	IP55	

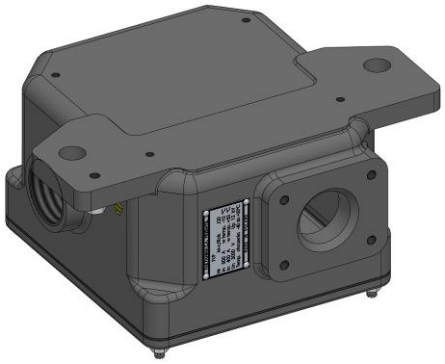
DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.





DISTRIBUTION BOX 88.3000-SCP



DESIGN AND APPLICATION:

The 88.3000-SCP distribution box is a sub-assembly of the ZW-1 coupler assembly used to connect individual railcar segments of the train high voltage heating systems in the railway standard used in the Czech Republic and Slovakia.

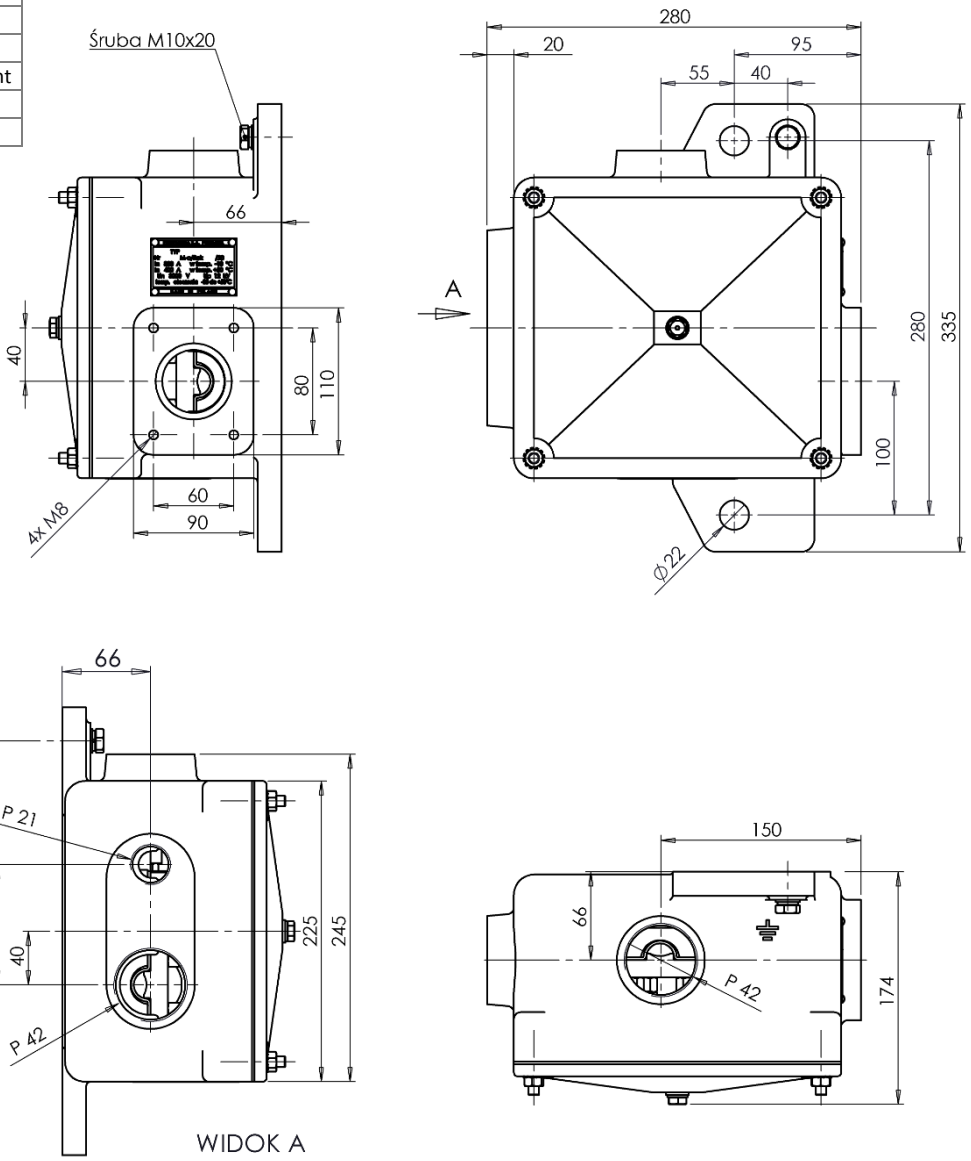
The box task is permanently connect HV cables. It is interfaced with a plug wired with ASWPr-11 or other cable, equipped with an appropriate adapter.
The box housing is made of an aluminium alloy and equipped with internal clamp for HV cables mounted on an insulating base. HV cables are mounted in a clamp by pressing with shins against the contact board.

The box is fixed to the locomotive or railcar by means of two M20 bolts.
The box body is equipped with internal grounding clamp which is an M10 screw.
Weight – 10 kg.

PERMISSIBLE PERMANENT CURRENT LOAD		
Range of ambient temperatures:	CURRENT „I" (A)	
	for 185 mm² cable	for 185 mm² cable
below -10°C	800	267
-10°C ÷ 15°C	600	200
15°C ÷ 30°C	500	167
30°C ÷ 50°C	400	134
OTHER SPECIFICATIONS		
Rated voltage	3kV for direct or alternate current	
Test voltage	12kV for 1 minute	
Protection degree	IP55	

DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.



CABLE BOX ASK

DESIGN AND APPLICATION:

The ASK cable box is designed to permanently connect HV cables in individual railcar segments of the passenger train high voltage heating systems.
The box housing is made of an aluminium alloy and equipped with internal clamp for HV cables mounted on an insulating disk.

The box is fixed to the locomotive or railcar by means of two M16 bolts.
It is equipped with two grounding elements:

- an M10 bolt outside the box body;
- an M10 screw inside the body under the cable entrance guard.

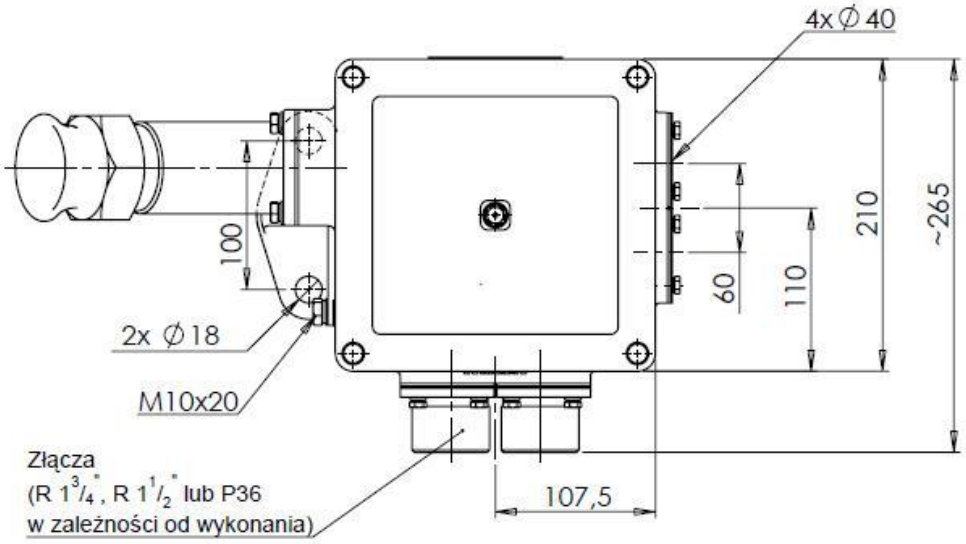
Weight – 10 kg

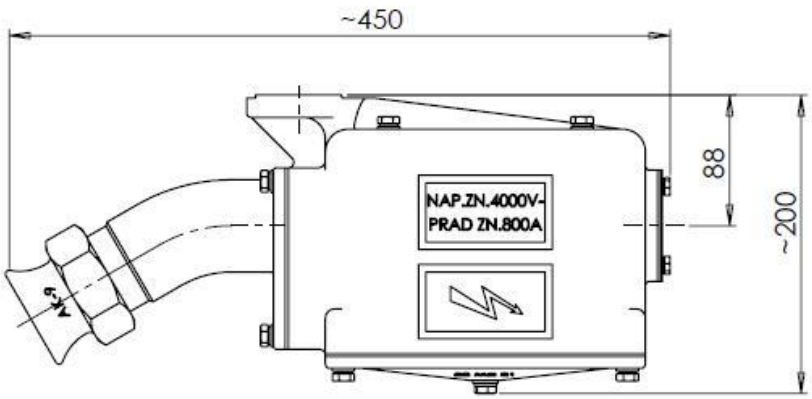
ASK BOX VERSIONS:

2 – for 185 mm² cable (R1¾" connector),
2 – for 95 mm² cable (R1½" connector),
2 – for 185 mm² cable (R1½" connector),
4 – for 185 mm² cable (P36 connector).

DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.

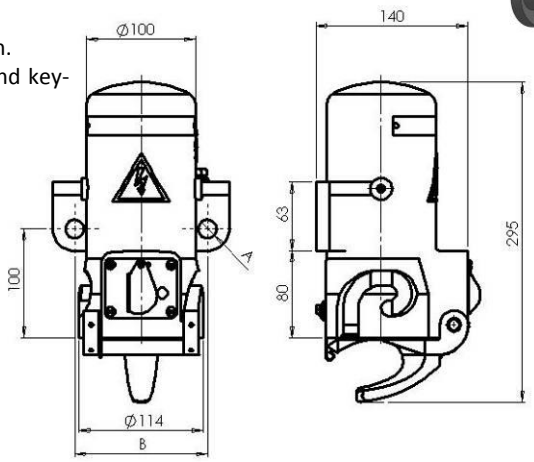


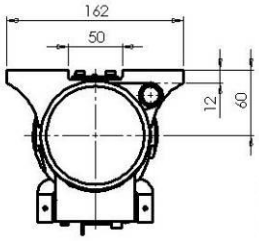


DUMMY RECEPTACLE (CASING) ASOa®

DESIGN AND APPLICATION:

The casing ASOa cable plug cable is a sub-assembly of the ZW-1 or ZW-2 coupler assembly used to connect individual railcar segments of the train high voltage heating systems.
The task of the guard is to house the plug of the cable pulled out of the coupler socket.
Simultaneously, it protects the plug against direct rainfall and pollution.
The guard housing, made of aluminium alloy, is sealed by a sleeve and key-locked flap (once the cable plug is inserted or removed).
The guard is fixed to the railcar or to the locomotive by two screws.
It is equipped with an outside grounding terminal (an M10 screw).
Weight – 3.6 kg.





Version	A	B
ASOa/1	Ø17	122
ASOa/4	Ø14	120

ASOA PLUG GUARD VERSIONS:

ASOa/1,
ASOa/4.

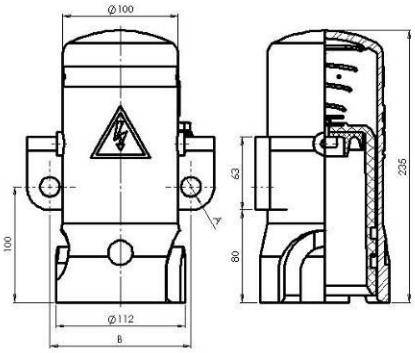
DOCUMENTS PROVIDED WITH THE PRODUCT:

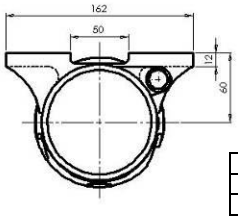
Acceptance certificate 3.1.

DUMMY RECEPTACLE (CASING) ASOs

DESIGN AND APPLICATION:

The casing ASOs cable plug cable is a sub-assembly of the ZW-1 or ZW-2 coupler assembly used to connect individual railcar segments of the train high voltage heating systems.
The task of the guard is to house the plug of the cable pulled out of the coupler socket.
Simultaneously, it protects the plug against direct rainfall and pollution.
The guard housing, made of aluminium alloy,
is sealed by a sleeve which is pressed against the plug housed in the guard.
The cover is available in two versions, which differ in spacing and diameters of the fixing holes.
Weight – 2.6 kg.





version	A	B
ASOs/7	Ø17	122
ASOs/8	Ø14	120

DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.

PLUG ASWr

DESIGN AND APPLICATION:

The ASWr plug is an exchangeable part of the dismountable plug assembly wired with ASWPr cable, included in the ZW-1 HV train heating coupler assembly. The main advantage of the plug is its dismountability.

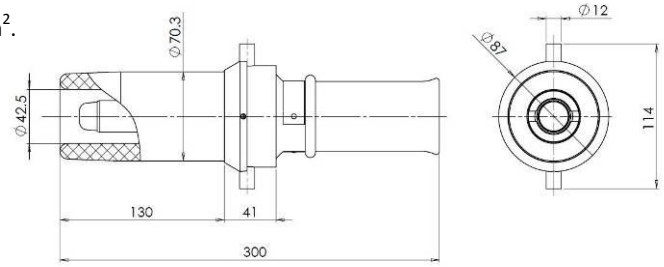
Unlike the ASWa plug used in the ASWP system where the sealing function is provided by the cable filling compound (no possibility to dismount the unit), here the sealing is provided by a rubber profile gasket.

This allows the ASWPr assembly to be dismounted to replace e.g. a damaged insulating sleeve.

It is also possible to replace the HV cable, however it is necessary to solder the main wire and the grounding then.

ASWr PLUG COVER VERSIONS:

- with a seal and conductive finger for HV cable of 3kV, cross-section 1x185 mm²,
- with a seal and conductive finger for HV cable of 3kV, cross-section 1x95 mmmm^2.



PLUG WITH CABLW ASWP®

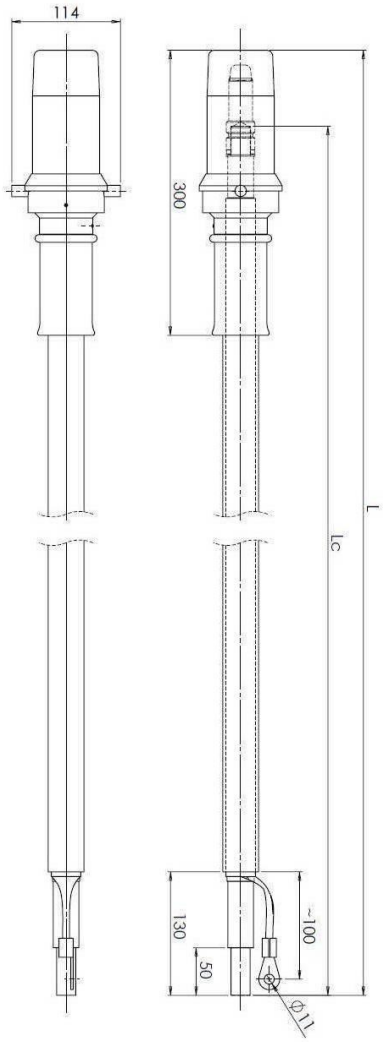
DESIGN AND APPLICATION:

The plug wired with ASWP cable is a sub-assembly of the ZW-1 coupler assembly used to connect individual railcar segments of the train high voltage heating systems.

It acts as a high-voltage system connector between the distribution box mounted on one railcar (locomotive) and the coupler socket on the next coupled railcar. The ASWa plug is equipped with an aluminium alloy handle, insulating sleeve and conductive finger the HV cable is soldered into.

The interior of the plug is filled with a cable filling compound.

Cable connectors are available in different cable lengths, depending on the railcar or locomotive type.



In the connector, HV cable with the main wire cross-sections of 1 x 185mm² or 1 x 95mm² is used. One end of the cable is provided with the ASWa plug and the other end is adapted for connection in the distribution box. The cable has a grounding wire with cross-section of min. 25mm², which protects from electric shock when voltage appears in the handle.

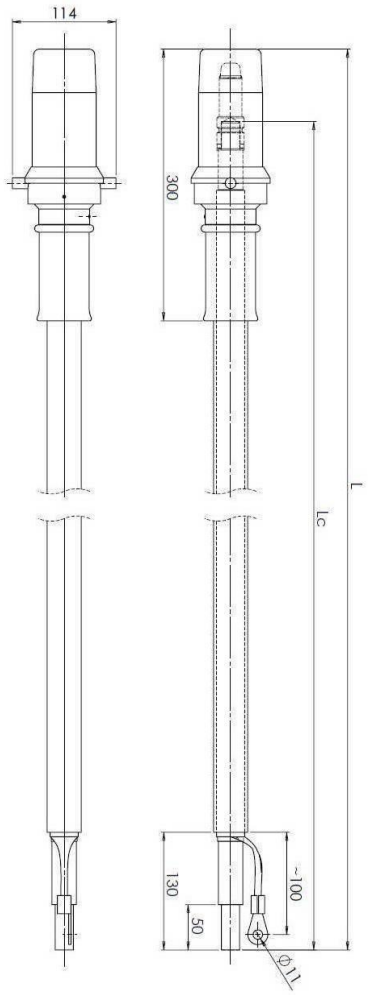
TYPICAL VERSIONS OF PLUG WIRED WITH ASWP CABLE:

VERSION	Main wire cross-section	Length L (mm)	Length Lc (mm)
ASWP 2	95 mm^2	1865	1785
ASWP 5		1815	1735
ASWP 6		1885	1805
ASWP 7a		2085	2005
ASWP 8a		3780	3700
ASWP 8b		4330	4250
ASWP 1	185 mm^2	1840	1760
ASWP 3		1885	1805
ASWP 4		1910	1830
ASWP 7b		2085	2005
ASWP 9		2015	1935
ASWP 10		2070	1990
ASWP 12		4400	4320
ASWP 13		3900	3820
ASWP 14		1950	1870
ASWP 15		1865	1785

DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.

PLUG WITH CABLE ASWPr



DESIGN AND APPLICATION:

The plug wired with ASWPr cable is a sub-assembly of the ZW-1 coupler assembly used to connect individual railcar segments of the train high voltage heating systems. It acts as a high-voltage system connector between the distribution box mounted on one railcar (locomotive) and the receptacle on the next coupled railcar.
The ASWr plug is equipped with an aluminium alloy handle, insulating sleeve and conductive finger the HV cable is soldered into. It is also equipped with a rubber profile gasket to seal the interior.

This allows the insulating sleeve to be dismounted, for example when damaged.
However, the cable replacement does not require soldering the main and grounding wire.
Cable connectors are available in different cable lengths, depending on the railcar or locomotive type.
In the connector, HV cable with the main wire cross-sections of 1 x 185mm² or 1 x 95mm² is used.
One end of the cable is provided with the ASWr plug and the other end is adapted for connection in the distribution box.

The cable has a grounding wire with cross-section of min. 25mm², which protects from electric shock when voltage appears in the handle.

TYPICAL VERSIONS OF PLUG WIRED WITH ASWPr CABLE:

VERSION	Main wire cross-section	Length L (mm)	Length Lc (mm)
ASWPr 2	95 mm²	1865	1785
ASWPr 5		1815	1735
ASWPr 6		1885	1805
ASWPr 7a		2085	2005
ASWPr 8a		3780	3700
ASWPr 8b		4330	4250
ASWPr 1	185 mm²	1840	1760
ASWPr 3		1885	1805
ASWPr 4		1910	1830
ASWPr 7b		2085	2005
ASWPr 9		2015	1935
ASWPr 10		2070	1990
ASWPr 12		4400	4320
ASWPr 13		3900	3820
ASWPr 14		1950	1870
ASWPr 15		1865	1785

DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.

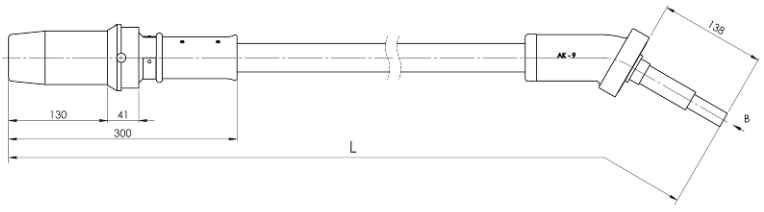
PLUG WITH CABLE ASWPr-11

DESIGN AND APPLICATION:

The plug wired with ASWPr-11 cable is a sub-assembly of the ZW-1 coupler assembly used to connect individual railcar segments of the train high voltage heating systems, applicable in the Czech and Slovak railways
(it is interfaced with the 88.3000-SK and 88.3000-SCP distribution box).

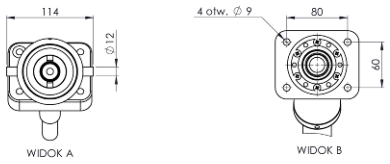
TYPICAL VERSIONS OF PLUG WIRED WITH ASWPR-11 CABLE:

VERSION	Main wire cross-section	Length L (mm)
ASWPr-11	185 mm²	L=1850 mm
ASWPr-11b		L=8000 mm
ASWPr-11d		L=12000 mm
ASWPr-11e		L=15000 mm
ASWPr-11f		L=10000 mm



DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.



PLUG WITH CABLE ASWP-D

DESIGN AND APPLICATION:

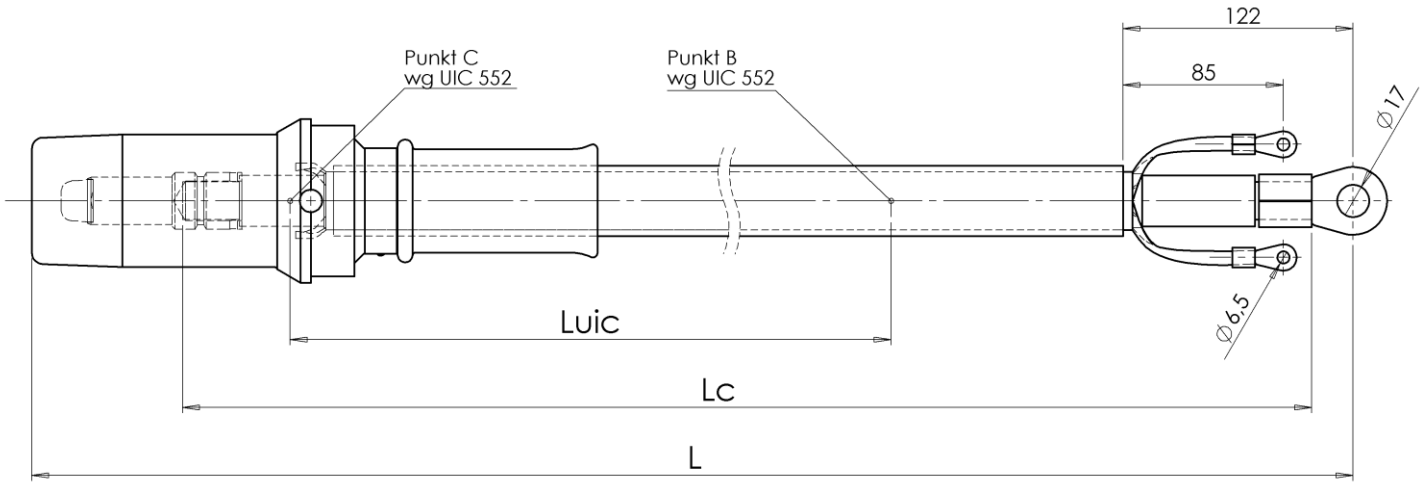
The plug wired with ASWP-D cable is a sub-assembly of the ZW-2 coupler assembly used to connect individual railcar segments of the train high voltage heating systems (it is interfaced with the SRN distribution box).

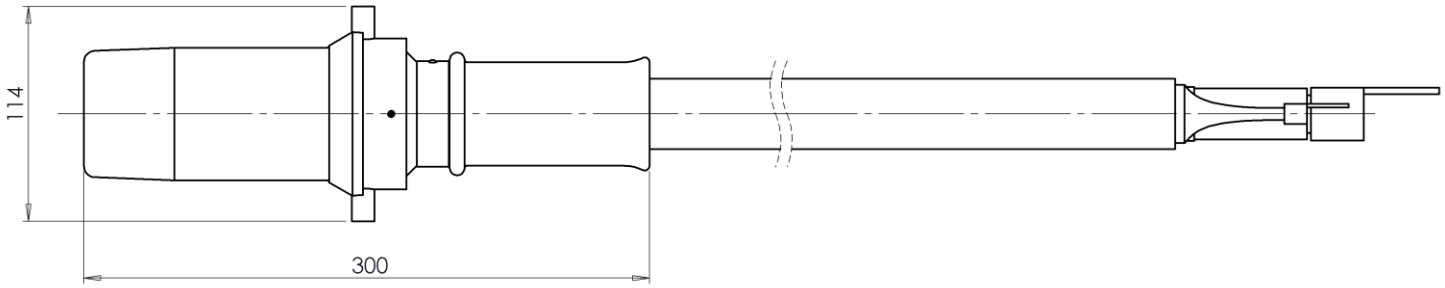
TYPICAL VERSIONS OF PLUG WIRED WITH ASWPR-D CABLE:

Main wire cross-section	Version	Length L_{UIC} (mm)	Length L_C (mm)	Length L (mm)
95 mm^2	51	1300	1580	1682
	52	1420	1700	1802
	53	1505	1785	1887
	54	1570	1850	1952
	55	2200	2480	2582
185 mm^2	01	1300	1580	1682
	02	1420	1700	1802
	03	1505	1785	1887
	04	1570	1850	1952
	05	2200	2480	2582

DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.





STATIONARY CONNECTOR ASWPO

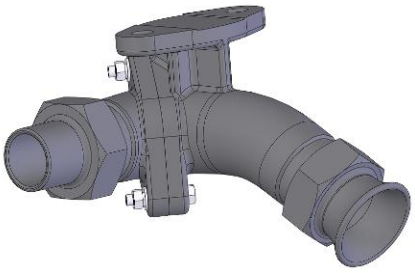
DESIGN AND APPLICATION:

The ASWPO connector is designed to connect a set of railcars staying on the siding (disconnected from the electric locomotive) to the high-voltage system in order, for example, to heat or lit them.
It is available as a 2ASWP connector (with two plugs) or ASWPO connector (2ASWPO – with two plugs and a cable in external protective cover).
Each type of the stationary connector should be ordered individually, with specification of its length and possible accessories (limit switch, control wires, grounding etc.)

DOCUMENTS PROVIDED WITH THE PRODUCT:

Acceptance certificate 3.1.

CABLE HOLDER 88.2000®

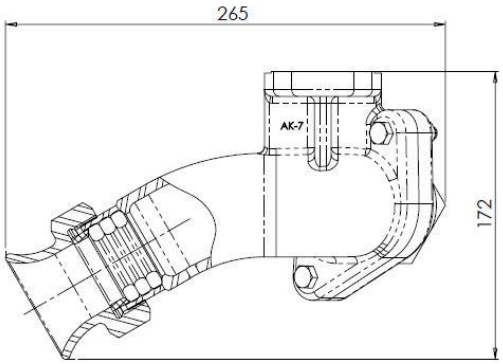


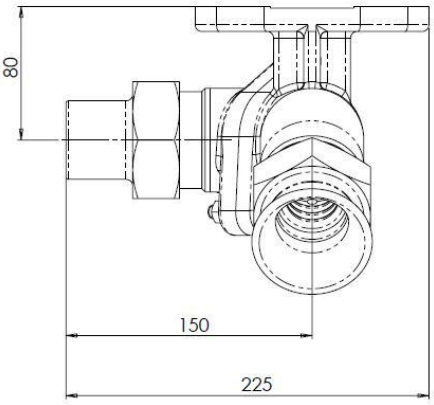
DESIGN AND APPLICATION:

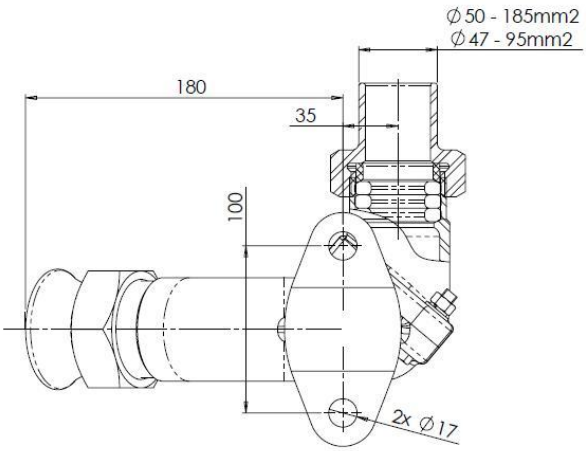
Cable holder is a sub-assembly of the ZW-1 coupler assembly used to connect individual railcar segments of the train high voltage heating systems when the railcar is not equipped with any distribution box.
The holder's task is to support the cable at the point where it is bent at 90° and fix it to the railcar bed.
It is made of aluminium alloy.
Weight – 1.85 kg
It is mounted to the railcar by means of two M16 screws.

CABLE HOLDER VERSIONS:

1 – for 185 mm² cable,
2 – for 95 mm² cable.

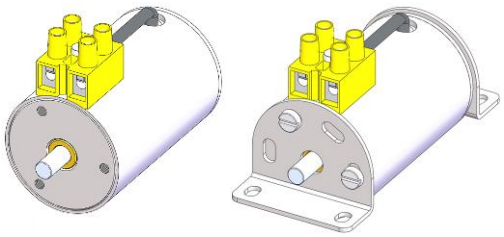






DOOR INTERLOCK SOLENOIDS

EBD



APPLICATION:

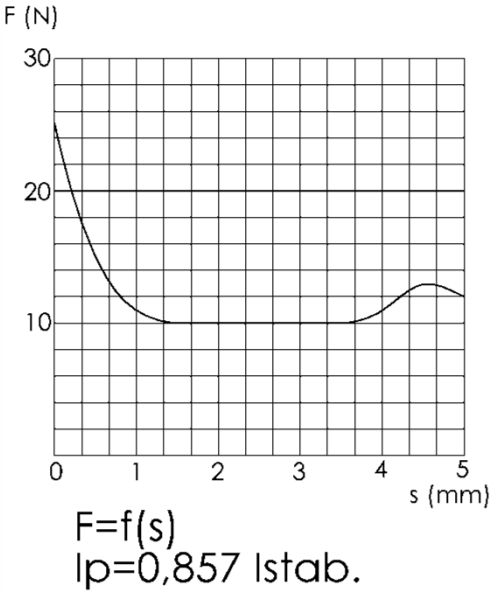
As railcar door handle interlocks.

TECHNICAL DESCRIPTION:

EBD is supplied with direct current and operates in dry environment.
Mode of operation – “pushing”.
The spool is made of metal, protected against corrosion by electrolytic zinc coating.
Available in a version with or without mounting grips.

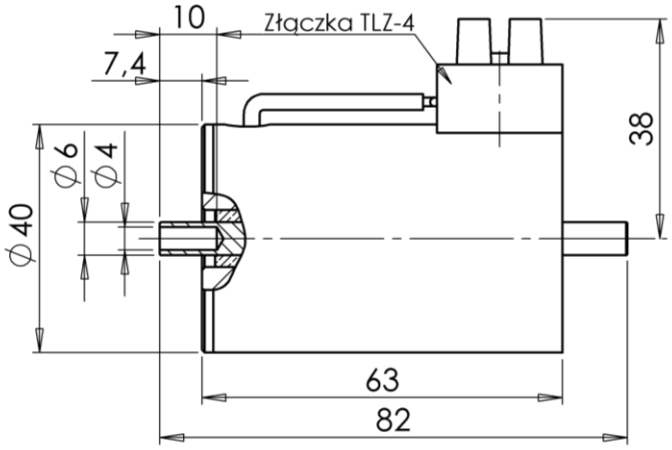
SPECIFICATION:

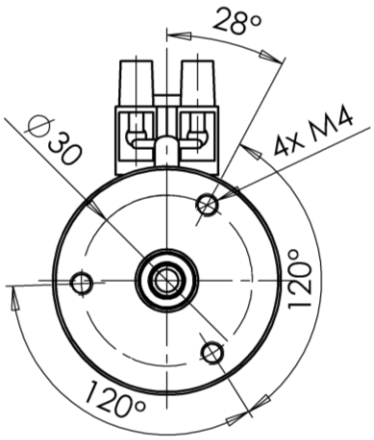
Rated voltage	[VDC]	24
Rated power	[W]	12
Stroke	[mm]	5,0
Minimum force	[N]	10
Work time	[%] ED	100
Working environment		suchy
Weight	[kg]	0,5
Max ambient temperature	[°C]	+50
Mode of operation		pushing
Type of electric connector		TLZ-4

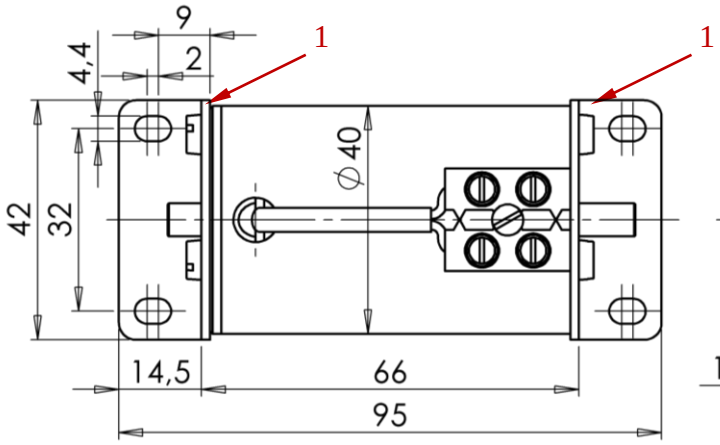


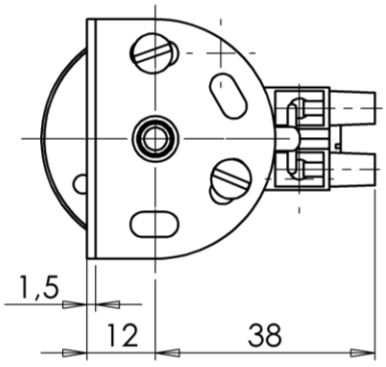
AVAILABLE SPARE PARTS:

1. Set of mounting grips (2 grips + 8 screws.

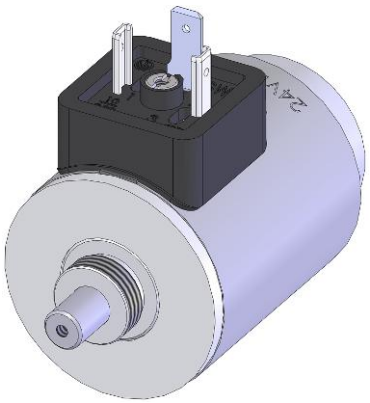






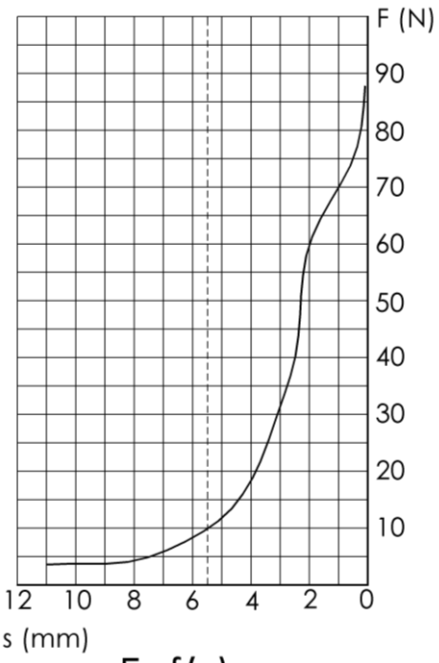


LOCKING SOLENOIDS
UZE-2



APPLICATION:
As interlocks in the railway turnout control equipment.

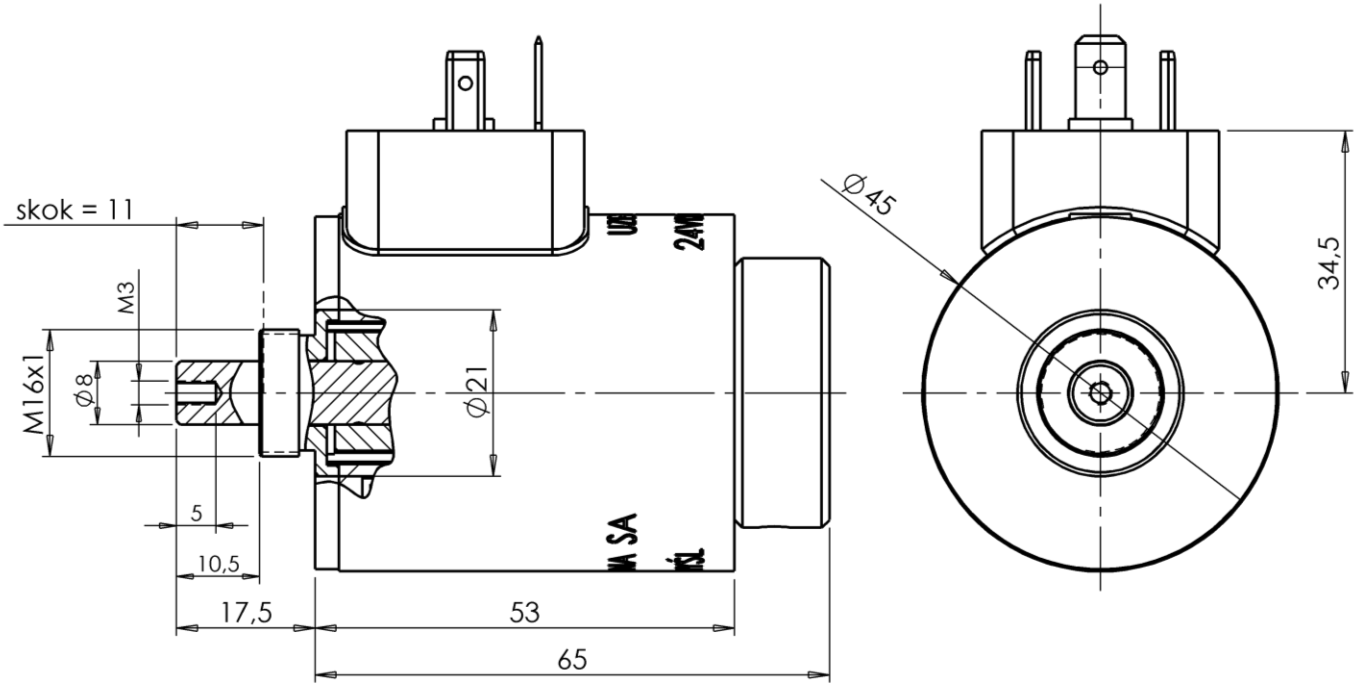
TECHNICAL DESCRIPTION:
UZE-2 is supplied with direct current and operates in dry environment.
Mode of operation – "pulling" with return spring.
The spool is made of metal, protected against corrosion by electrolytic zinc coating.
The internal metal components are protected against corrosion by electrolytic zinc coating.
The solenoid is not equipped with a manual control button (emergency control).



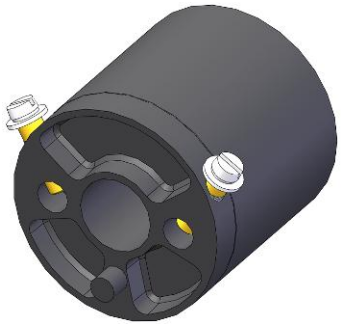
F=f(s)
Up=Unom.

SPECIFICATION:

Rated power	[W]	70
Max / working stroke	[mm]	11 / 5,5
Work / interval time	[s]	5 / 60
Max ambient temperature	[°C]	+70
Voltage configurations	[VDC]	24
Mounting dimensions		M16 x 1
Weight	[kg]	0,55
Working environment		dry
Min working stroke force	[N]	10
Overall dimensions	[mm]	Ø 45 x 82,5
Type of electric connector		DIN 43650A



Coil FAE-34050-T



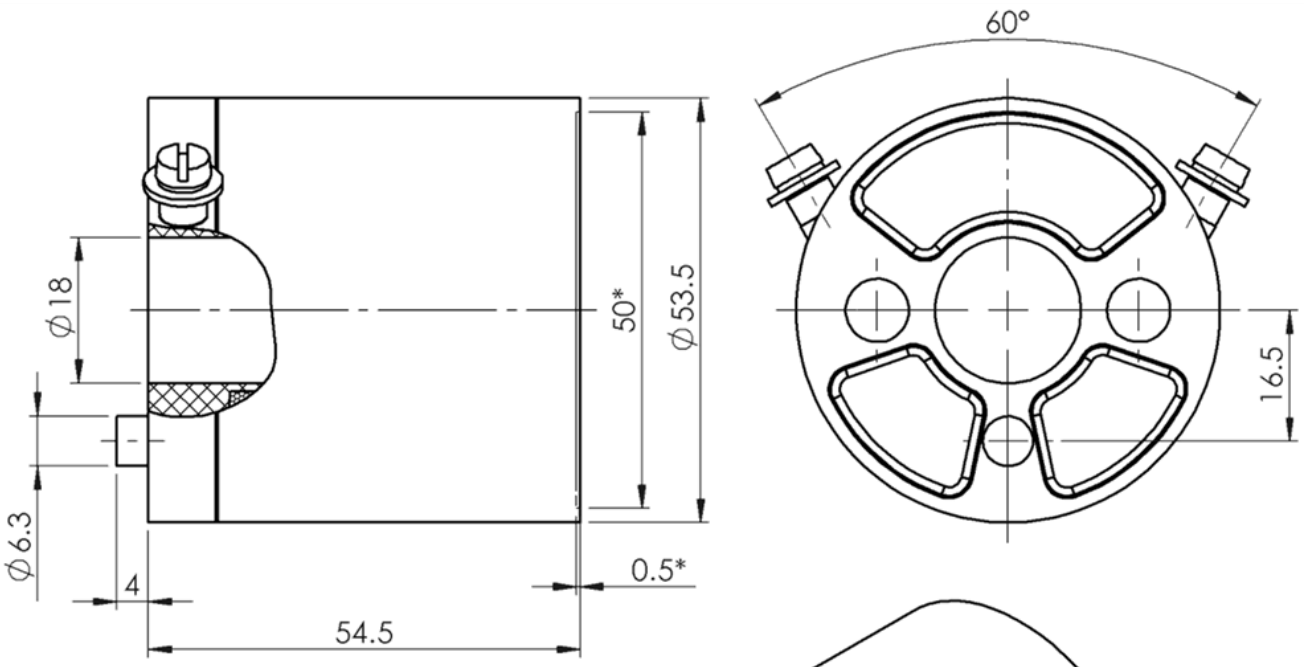
APPLICATION:

As a spare part of pneumatic solenoids which control the door closing system in rail vehicles.

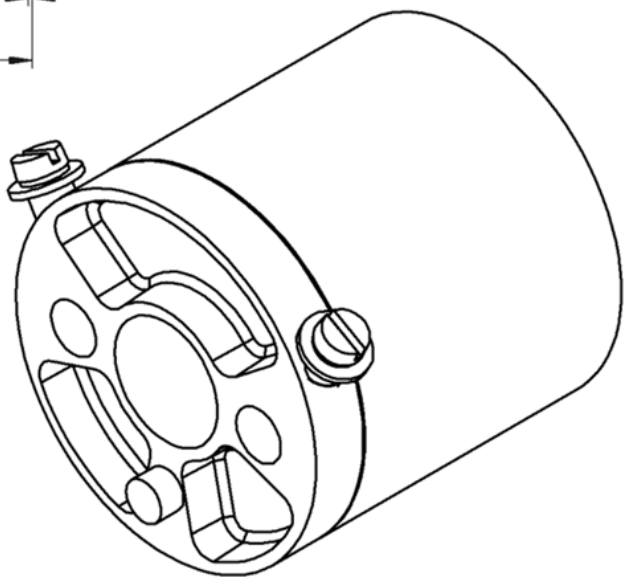
TECHNICAL DESCRIPTION:

The spool is made from plastic in black colour – when wound, the coil is overmoulded with plastic under pressure to make it difficult to steal copper contained in it.

SPECIFICATION:		ver. 1	ver. 3	ver. 4 impulse
Rated voltage	[VDC]	24	110	110
Rated power	[W]	12	13	40
Rated resistance	[Ω]	48	930	300
Insulation class		F	F	F
Work time	[%] ED	100	100	impulse
Max ambient temperature	[°C]	+50	+50	+50
Weight	[kg]	0,43	0,43	0,41
Coil opening diameter	[mm]	Ø 18	Ø 18	Ø 18
Overall dimensions	[mm]	Ø53,5x54,5	Ø53,5x54,5	Ø53,5x54,5



* - wymiary pogłębienia
(dotyczy tylko cewek 110VDC)



Coil CWE

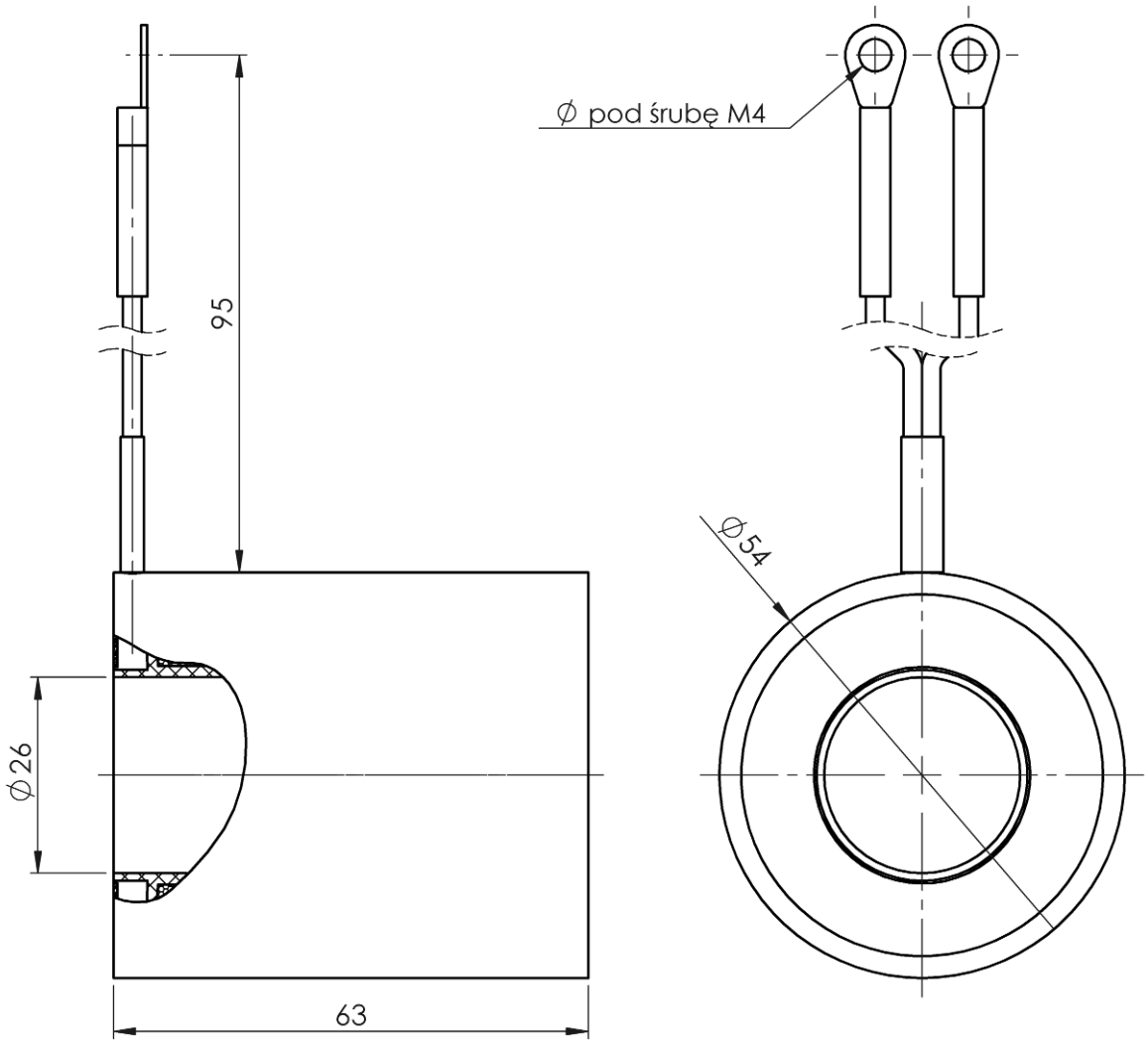
APPLICATION:

As a spare part of electro-pneumatic solenoids used in rail vehicles (including, but not limited to, H9E1, H9E2, H908a, H909).

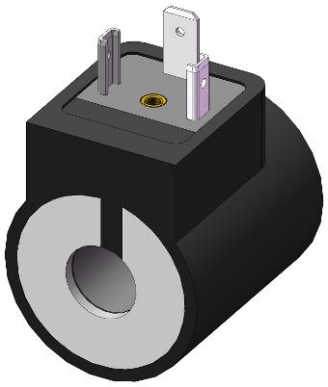
TECHNICAL DESCRIPTION:

The spool is made from plastic in black colour – when wound, the coil is overmoulded with plastic under pressure to make it difficult to steal copper contained in it.

SPECIFICATION:		ver. 1	ver. 2	ver. 3	ver. 4
Rated voltage	[VDC]	24	48	110	72
Rated power	[W]	22	23	28	25
Rated resistance	[Ω]	26	100	430	212
Insulation class		F	F	F	F
Work time	[%] ED	100	100	100	100
Max ambient temperature	[°C]	+50	+50	+50	+50
Weight	[kg]	0,45	0,45	0,45	0,45
Coil opening diameter	[mm]	Ø 26	Ø 26	Ø 26	Ø 26
Overall dimensions	[mm]	Ø 54 x 63	Ø 54 x 63	Ø 54 x 63	Ø 54 x 63



Coil EQ



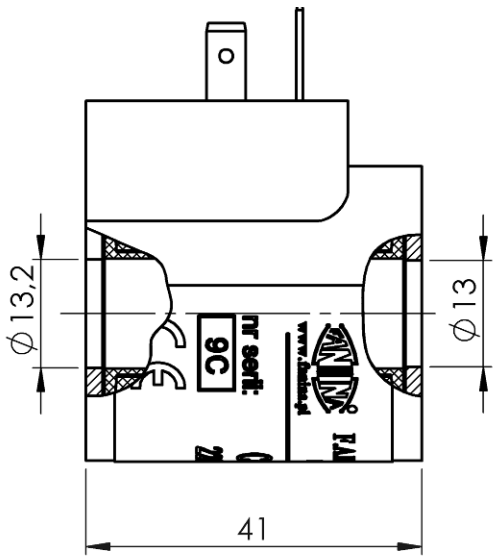
APPLICATION:

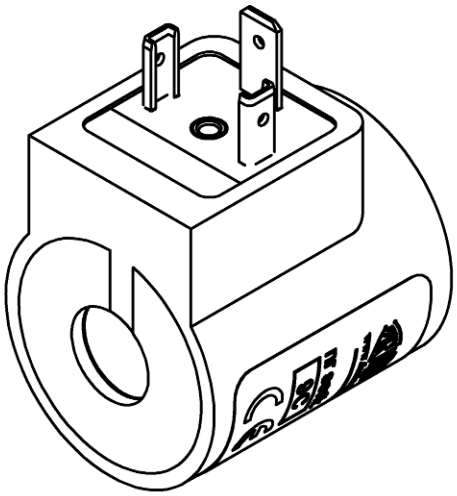
Power supply of solenoids used, among other things, to control water supply to railcar WCs.

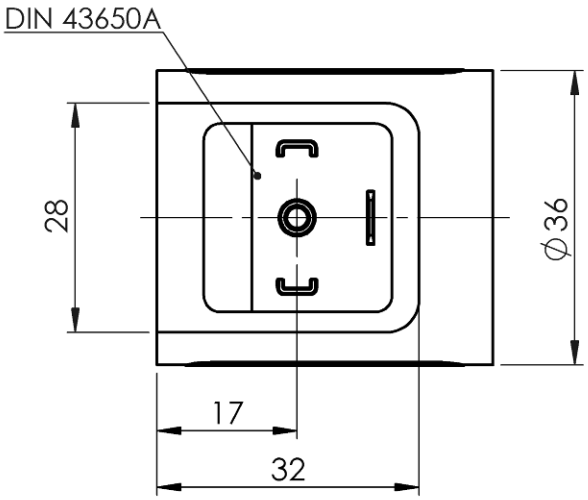
TECHNICAL DESCRIPTION:

The spool is made from plastic in black colour.
The winding is completely overmoulded to make it difficult to steal copper contained in it.

SPECIFICATION:		8W	14W
Rated power for DC	[W]	8	14
Active power for AC	[W]	8	14
DC voltage configurations	[VDC]	12; 24; 110	12; 24; 110
AC voltage configurations	[VAC]	24; 110; 220	24
Coil wire insulation class		180	180
Protection degree		IP65	IP65
Work time	[%] ED	100	100
Max ambient temperature	[°C]	+50	+50
Weight	[kg]	0,18	0,18
Coil opening diameter	[mm]	Ø 13	Ø 13
Overall dimensions	[mm]	Ø 36 x 41	Ø 36 x 41
Type of electric connector		DIN 43650A	DIN 43650A





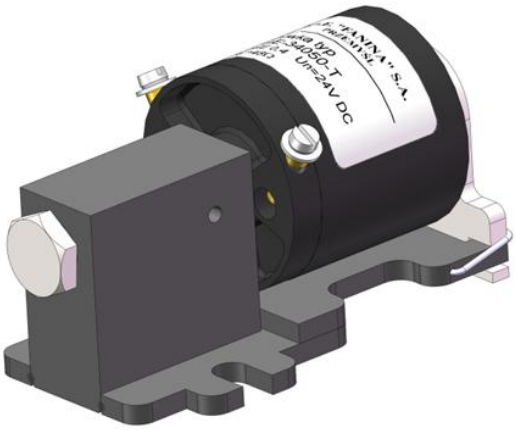


ELECTRO-PNEUMATIC SOLENOID VALVE ZPEb

INTENDED USE:

* valves, automatic door wagon and EMUs,
* drives, contactors and electrical apparatus.

ZPEb valves are completely interchangeable with valves used in rail vehicles (ZPP, UW, etc).
They work in both systems 24V and 110 VDC.

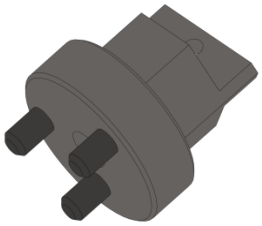


TECHNICAL DESCRIPTION:

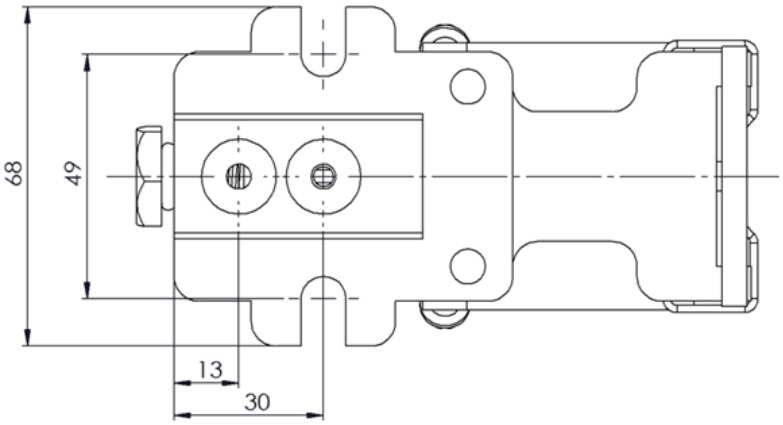
The **ZPEb** valve has input and output ports for the pneumatic system located on the rear wall of the body as distinct from the ZPEa valve where the ¼" air supply line connector is located on the bottom surface of the solenoid's body. In addition, as the only one on the market, it has a unique protection system to prevent the coil from being disassembled by unauthorised persons (FAE-34050-T coil).
The coil cannot be dismounted without a special **key** (attached to every batch free of charge).
Thus, this solution absolutely minimises the likelihood of stealing the coils.
As a spare part of ZPEb valve, we recommend the use of our FAE-34050-T coil. *(data sheet http://www.fanina.pl)*

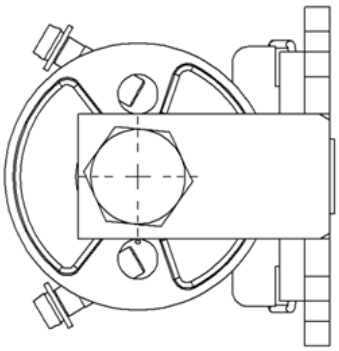
SPECIFICATION:

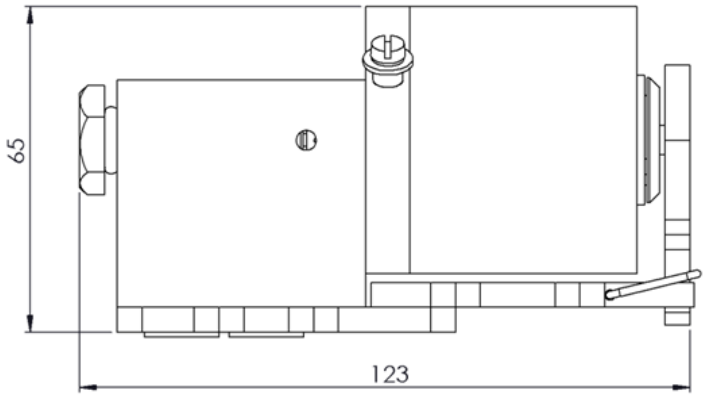
Rated coil voltage Un	[VDC]	24; 110
Range of permissible voltage variation		0,6÷1,2 U_n
Rated control pressure	[MPa]	0,5
Range of permissible pressure variation	[MPa]	0,35÷0,6
Protection degree		IP00
Weight with coil	[kg]	0,9
Weight without coil	[kg]	1,3

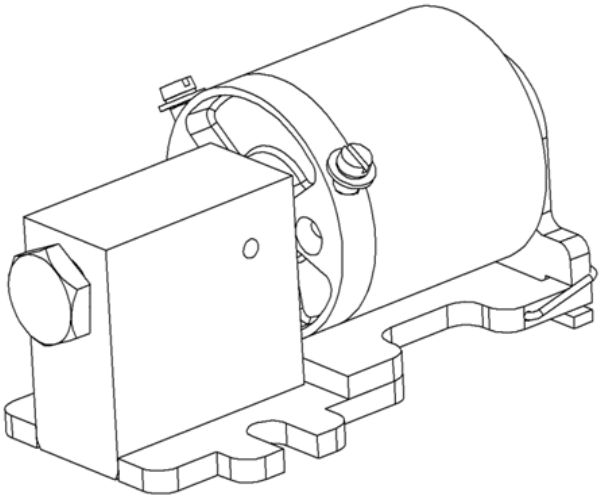


specjal key for dismounting the coil

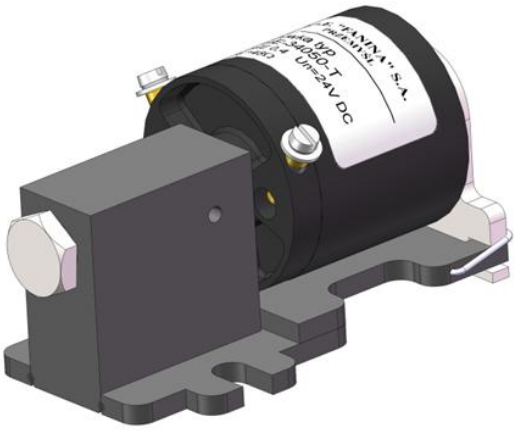








ELECTRO-PNEUMATIC SOLENOID VALVE ZPEbs



INTENDED USE:

* valves, automatic door wagon and EMUs,
* drives, contactors and electrical apparatus.

ZPEbs valves are completely interchangeable with valves used in rail vehicles (ZPP, UW, etc).
They work in both systems 24V and 110 VDC.

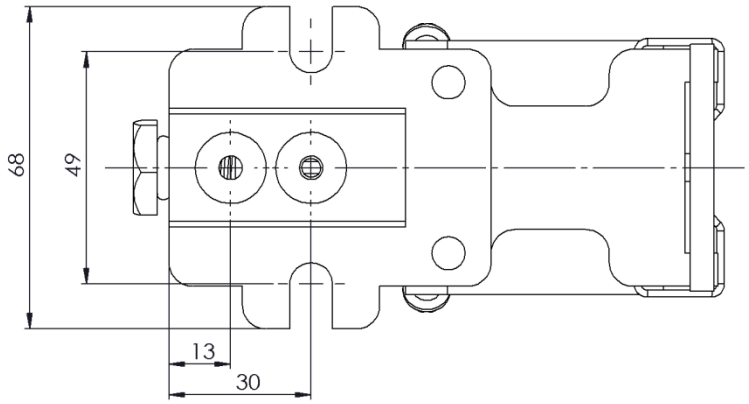
TECHNICAL DESCRIPTION:

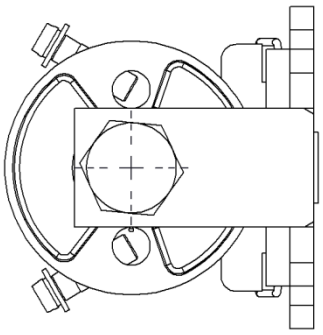
The **ZPEbs** valve has input and output ports for the pneumatic system located on the rear wall of the body as distinct from the ZPEas valve where the ¼" air supply line connector is located on the bottom surface of the solenoid's body.
The **ZPEbs** valve is designed mainly to provide high working parameters and reliability.
The coils of the valve's solenoid are overmoulded, which makes it much difficult to steal copper contained in it.

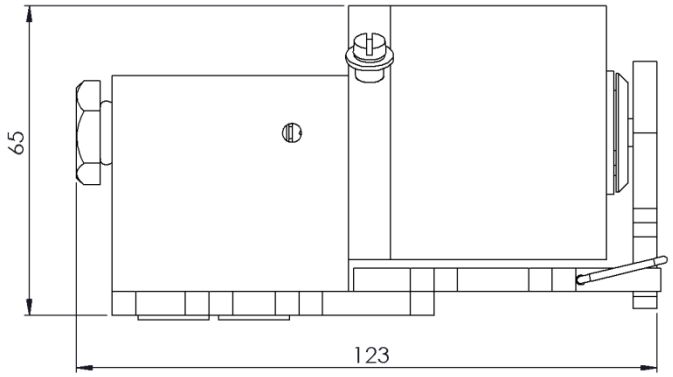
As part of the replacement valve coil ZPEbs recommend that FAE-34050-T production FAE FANINA SA. *(data sheet http://www.fanina.pl)*

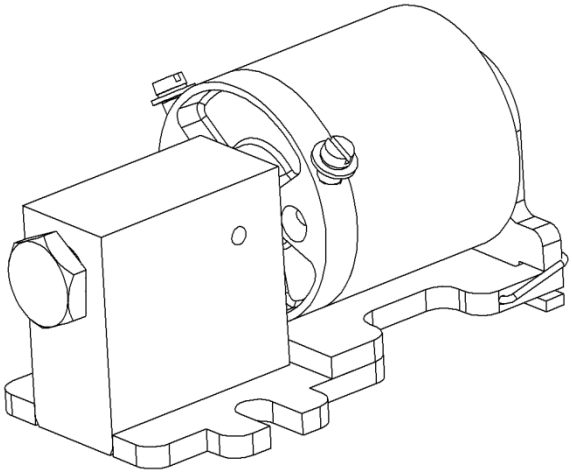
SPECIFICATION:

Rated coil voltage Un	[VDC]	24; 110
Range of permissible voltage variation		0,6÷1,2 U_n
Rated control pressure	[MPa]	0,5
Range of permissible pressure variation	[MPa]	0,35÷0,6
Protection degree		IP00
Weight with coil	[kg]	0,9
Weight without coil	[kg]	1,3







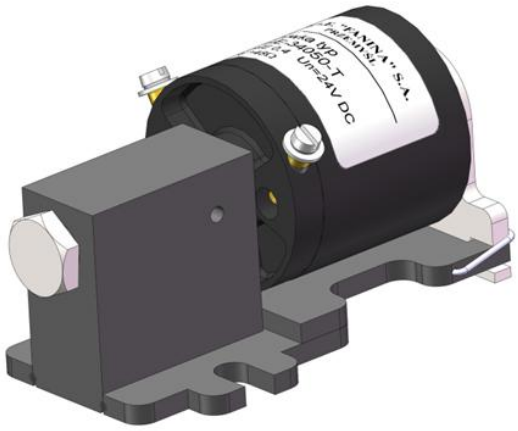


ELECTRO-PNEUMATIC SOLENOID VALVE ZPEa

INTENDED USE:

* valves, automatic door wagon and EMUs,
* drives, contactors and electrical apparatus.

ZPEa valves are completely interchangeable with valves used in rail vehicles (ZPP, UW, etc).
They work in both systems 24V and 110 VDC.

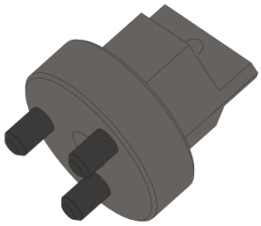


TECHNICAL DESCRIPTION:

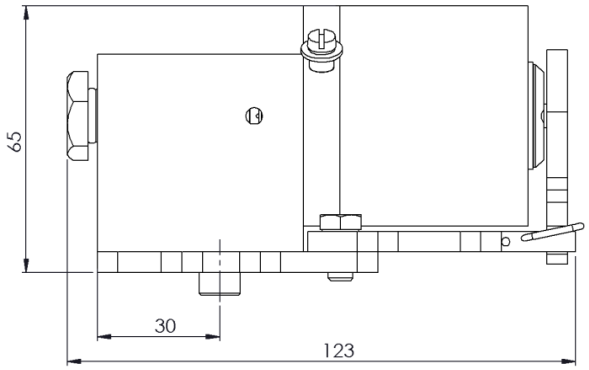
The **ZPEa** valve has input and output ports for the pneumatic system located on the rear wall of the body as distinct from the ZPEb valve where the ¼" air supply line connector is located on the bottom surface of the solenoid's body.
In addition, as the only one on the market, it has a unique protection system to prevent the coil from being disassembled by unauthorised persons (FAE-34050-T coil).
The coil cannot be dismounted without a special **key** (attached to every batch free of charge).
Thus, this solution absolutely minimises the likelihood of stealing the coils.
As a spare part of ZPEb valve, we recommend the use of our FAE-34050-T coil. *(data sheet http://www.fanina.pl)*

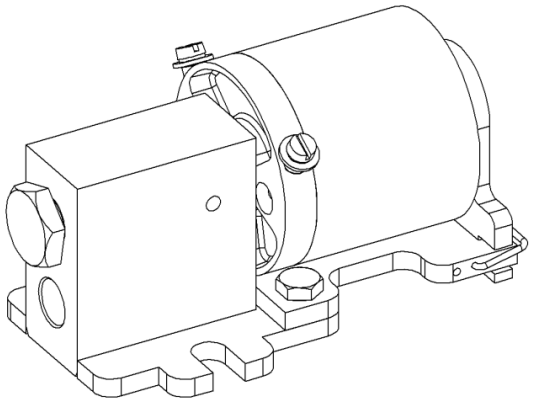
SPECIFICATION:

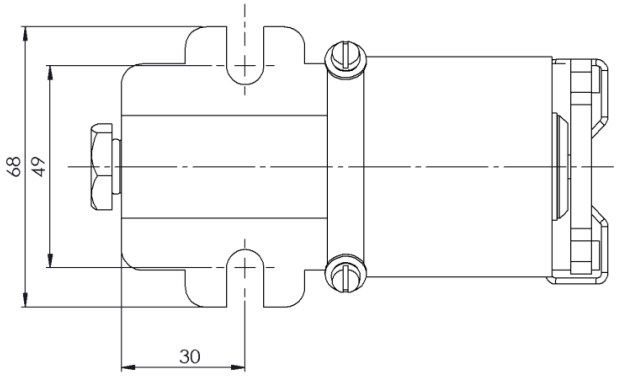
Rated coil voltage Un	[VDC]	24; 110
Range of permissible voltage variation		0,6÷1,2 U_n
Rated control pressure	[MPa]	0,5
Range of permissible pressure variation	[MPa]	0,35÷0,6
Protection degree		IP00
Weight with coil	[kg]	0,9
Weight without coil	[kg]	1,3

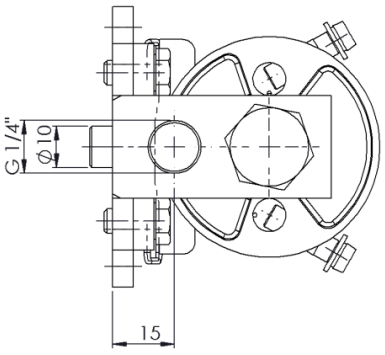


specjal key for dismounting the coil

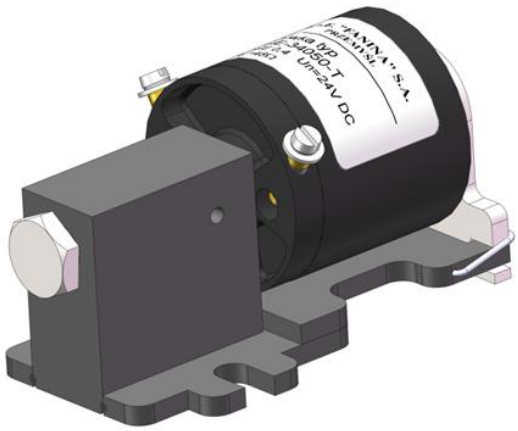








ELECTRO-PNEUMATIC SOLENOID VALVE ZPEas



INTENDED USE:

* valves, automatic door wagon and EMUs,
* drives, contactors and electrical apparatus.

ZPEas valves are completely interchangeable with valves used in rail vehicles (ZPP, UW, etc).
They work in both systems 24V and 110 VDC.

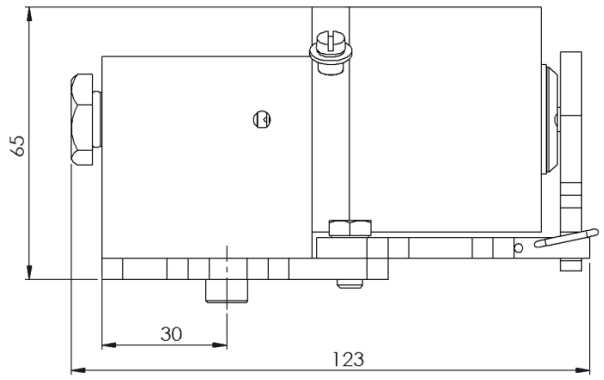
TECHNICAL DESCRIPTION:

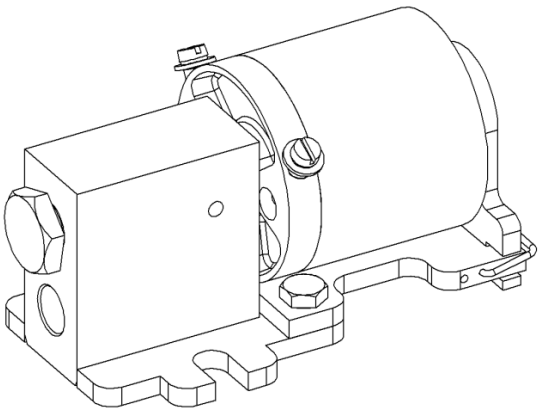
The **ZPEas** valve has input and output ports for the pneumatic system located on the rear wall of the body as distinct from the ZPEbs valve where the ¼" air supply line connector is located on the bottom surface of the solenoid's body.
The **ZPEas** valve is designed mainly to provide high working parameters and reliability.
The coils of the valve's solenoid are overmoulded, which makes it much difficult to steal copper contained in it

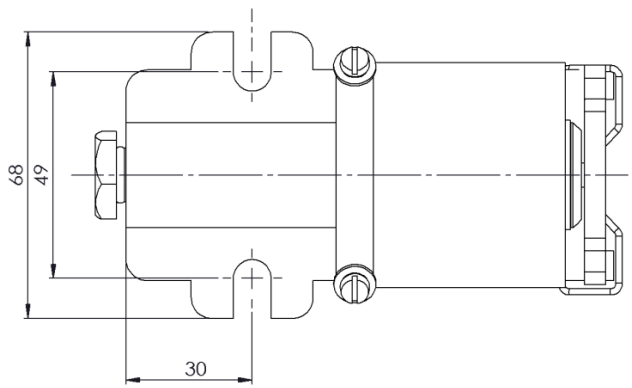
As part of the replacement valve coil ZPEas recommend that FAE-34050-T production FAE FANINA SA *(data sheet http://www.fanina.pl)*

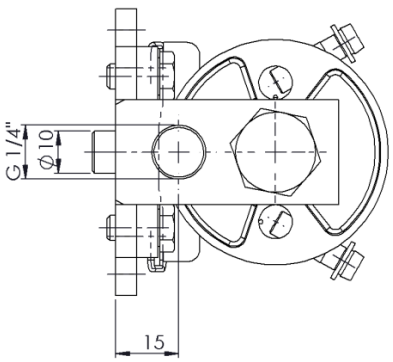
SPECIFICATION:

Rated coil voltage Un	[VDC]	24; 110
Range of permissible voltage variation		0,6÷1,2 U_n
Rated control pressure	[MPa]	0,5
Range of permissible pressure variation	[MPa]	0,35÷0,6
Protection degree		IP00
Weight with coil	[kg]	0,9
Weight without coil	[kg]	1,3

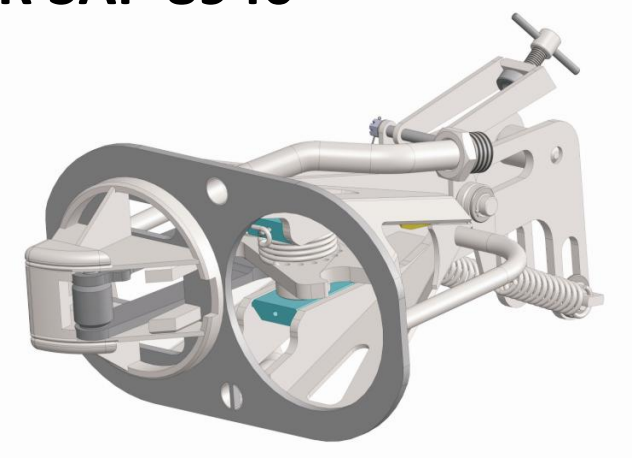








ADAPTER COUPLER SAF-8940



Adapter coupler (called also as a rescue coupler Or half-coupler), produced by FAE FANINA S.A. serves to uniting of the equipped vehicle into the draw-bar UIC with the vehicle equipped into the automatic interconnector eg. the type ZEa.
The small weight of the indirect interconnector and the unique solution of the levelling of the interconnector, let on the service of the interconnector even by one, trained operator.

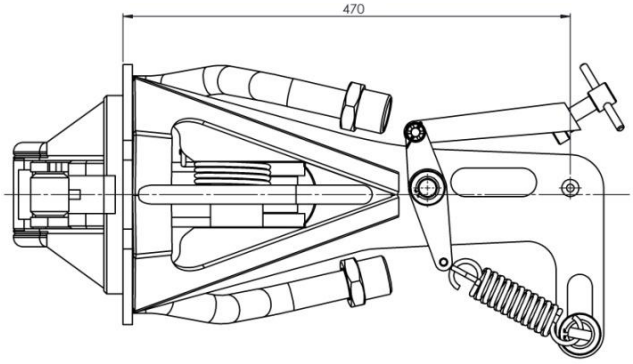
Technical data:

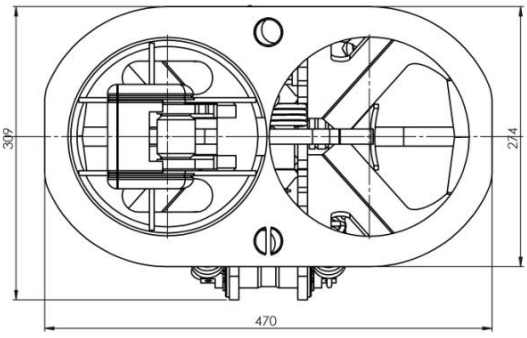
1.	The compression strength	- 250kN
2.	The endurance on the extension	- 400kN
3.	The distance of the axis of the hook to the frontal area	- 470 mm
4.	Weight of adapter coupler approx.	- 34.0kg
5.	The speed of uniting approx.	- 0,6km/h

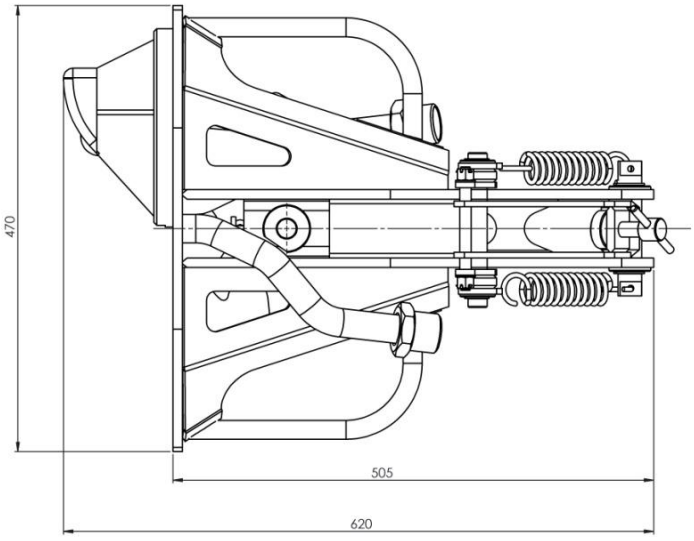
The interconnector became projected and performed in compliance with norms:

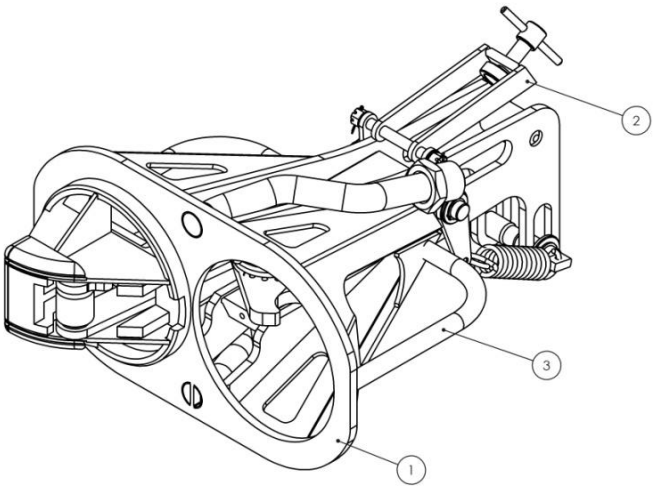
- PN EN 15020+A1:2011 Railway – adapter coupler
- PN-EN 15085 The welding of rail vehicles and their component parts.

FAE FANINA S.A. is certified by TDT Company, according norms PN-EN-ISO-3834 and PN-EN 15085 class CL-1 and have necessary powers to designing and realisation railway welded constructions.

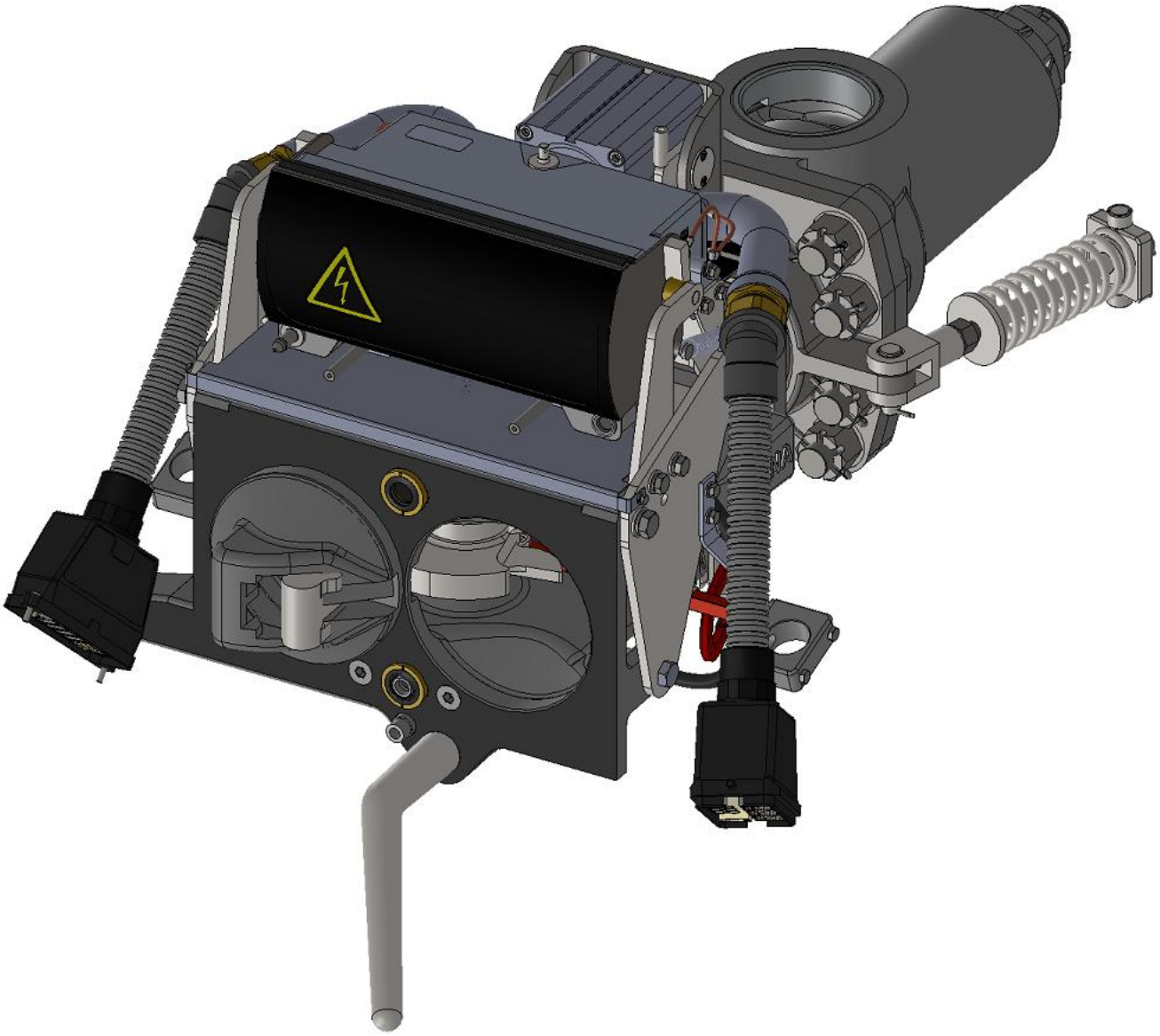








MODERNISATION OF ZEa COUPLER



The Electromechanical Equipment Factory "FANINA" offers the renovation of front couplers type ZEa including modernisation.

1. The modernised ZEa-FA automatic front coupler is used for:
   - mechanical,
   - electrical,
   - pneumatic

   connection of two units equipped with the same type of coupler without manual support.

2. Parameters of modernised front couplers:
   - couplers of the same type are interchangeable,
   - height of the coupler axis from the coupler rail head level – 950^{+10}_{-5} mm,
   - allowable compression and tensile load – 1000 kN (100 t),
   - load transferred by springs (elastomers) – 250 kN (25 t),
   - pressure in the pneumatic system 0.5 –0.8 MN/m2 (5-8 kG/cm^2).

3. The modernised ZEa-FA coupler consists of three basic subassemblies:
   - coupler head,
   - coupler housing assembly,
   - electrical coupler.

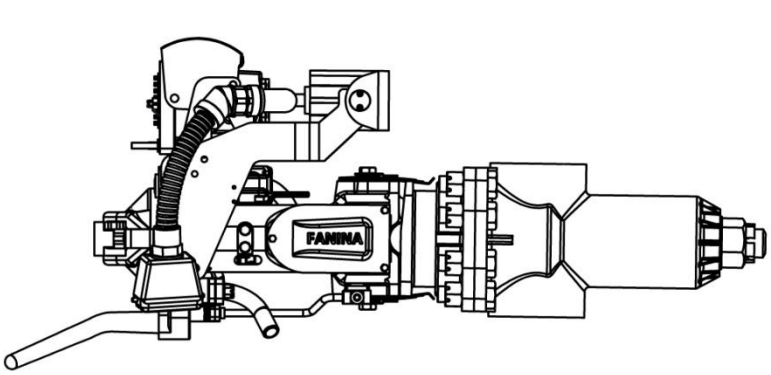
4. The renovation of the coupler head and housing assembly is carried out in accordance with the technology approved by the Transport Technical Supervision. The plant has CL1 certificate in accordance with PN-EN 15085-2 and PN-EN ISO 3834-2.The repair consists in restoring worn parts to their construction dimensions by hard-facing and heat treatment, considerably enhancing the durability of renovated components. After consultation with the Customer, the components and parts, which are not eligible for renovation are replaced with new ones made according to the original documentation. The subassemblies are controlled before treatment, during the renovation and after manufacture by the independent Quality Control in accordance with the quality management system applicable in the plant pursuant to ISO 9001:2008.All materials used for renovation are certified. As a part of the coupler renovation, it is possible, after consultation with the Customer, to install the coupler with elastomers instead of a set of annular and spiral springs.

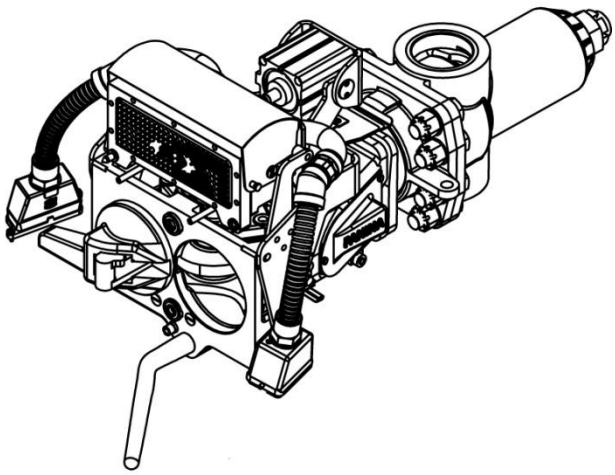
5. The electrical coupler used in the modernised ZEa-FA coupler is a new device for automatic electrical connection of two electric trains. The electric coupler consists of a casing (moving in a linear manner on guides and controlled actuator), inside which there is a panel with electrical contacts (the panel is available in different configurations) and wiring harnesses with plugs for connecting the coupler to the unit.

6. The front panel is equipped with:
   - set of Ø4mm gilded pins (male and female) for signals supplied over shielded cables,
   - set of Ø4mm silvered pins (male and female) for signals supplied over single cables,
   - module connector for Ethernet data transmission (minimum CAT5) 100Mbit/s with redundancy, equipped with gilded pins (male and female) for signals supplied over shielded cables.

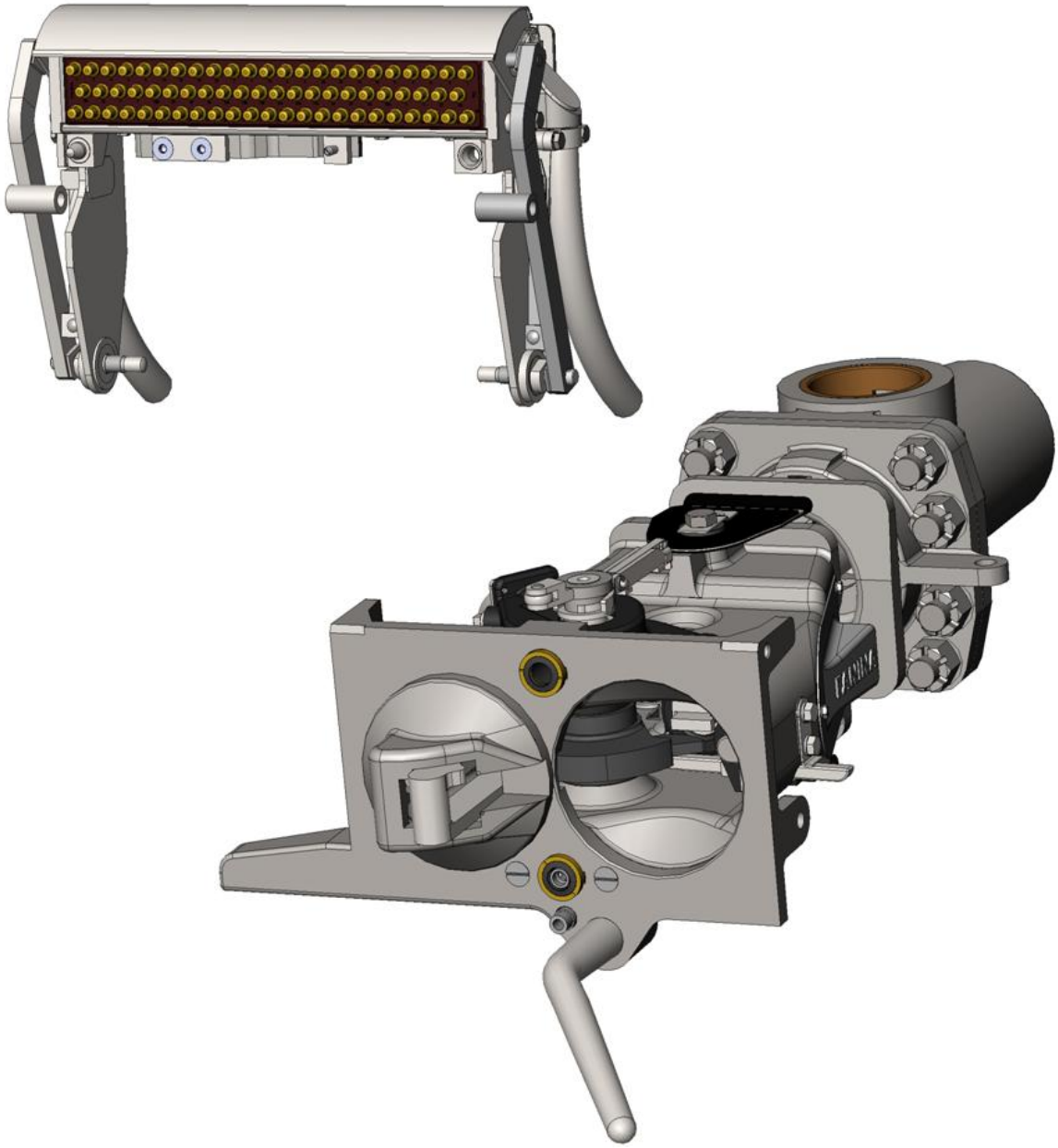
7. All pins can be replaced from outside without the need of opening the coupler casing (the replacement of Ethernet pins is possible after the Ethernet module connector has been unscrewed from the front).

8. All halogen-free cable with radiation cross-linked insulation.





RENOVATION OF THE SCHARFENBERG COUPLER
type ZEa

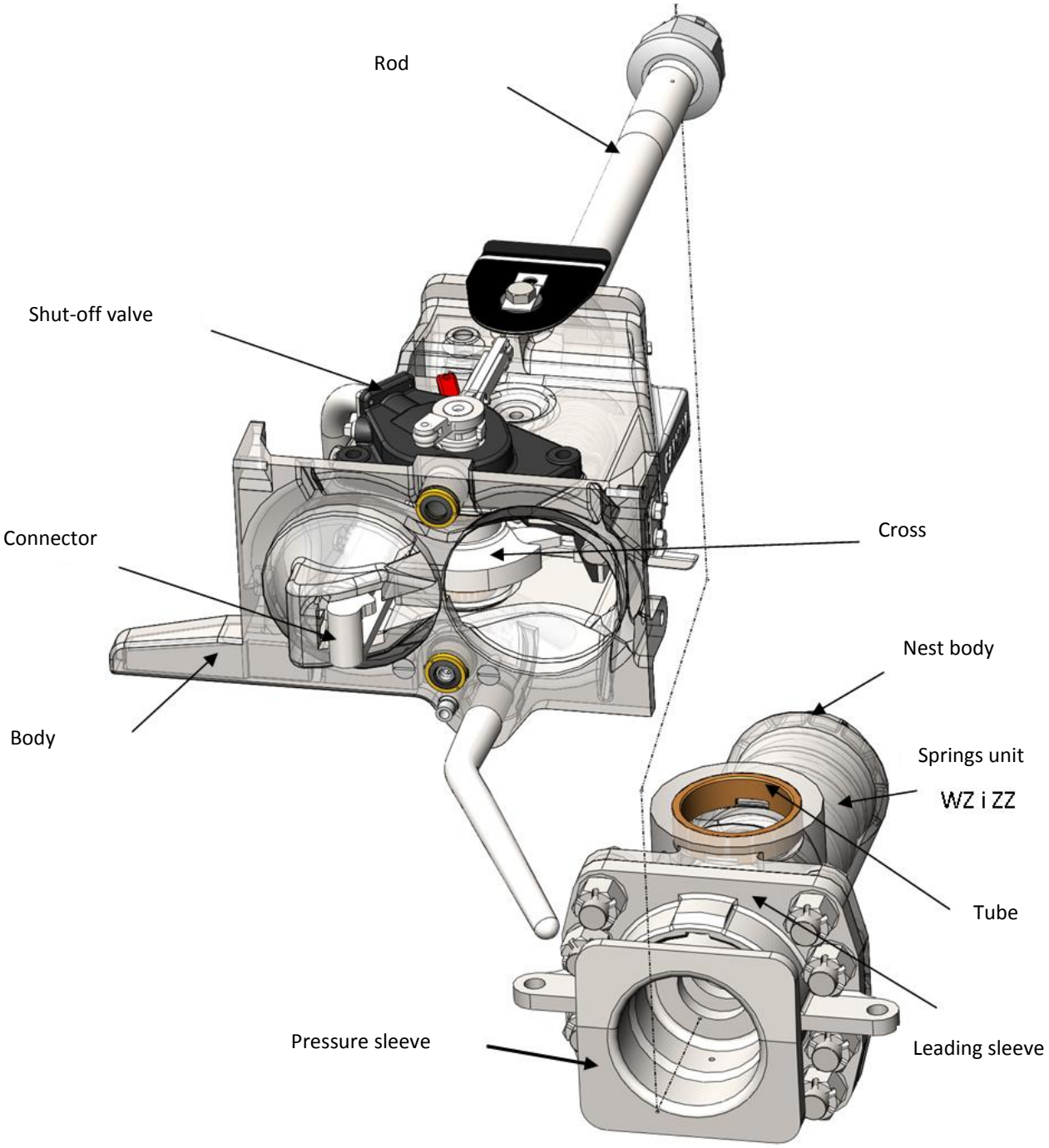


The Electromechanical Apparatus Factory “FANINA” offers the renovation of the mechanical and electrical
part Scharfenberg couplers at P4 (revision repair) or P5 (major repair) level in accordance with the Repair and Acceptance Requirements R-149.

We also renovate single parts and subassemblies of the front and inter-car couplers.

On request, we manufacture new parts and subassemblies for ZEa and ZEk couplers.

REENOVATION OF SCHARFENBERG COUPLER type ZEa – mechanical part



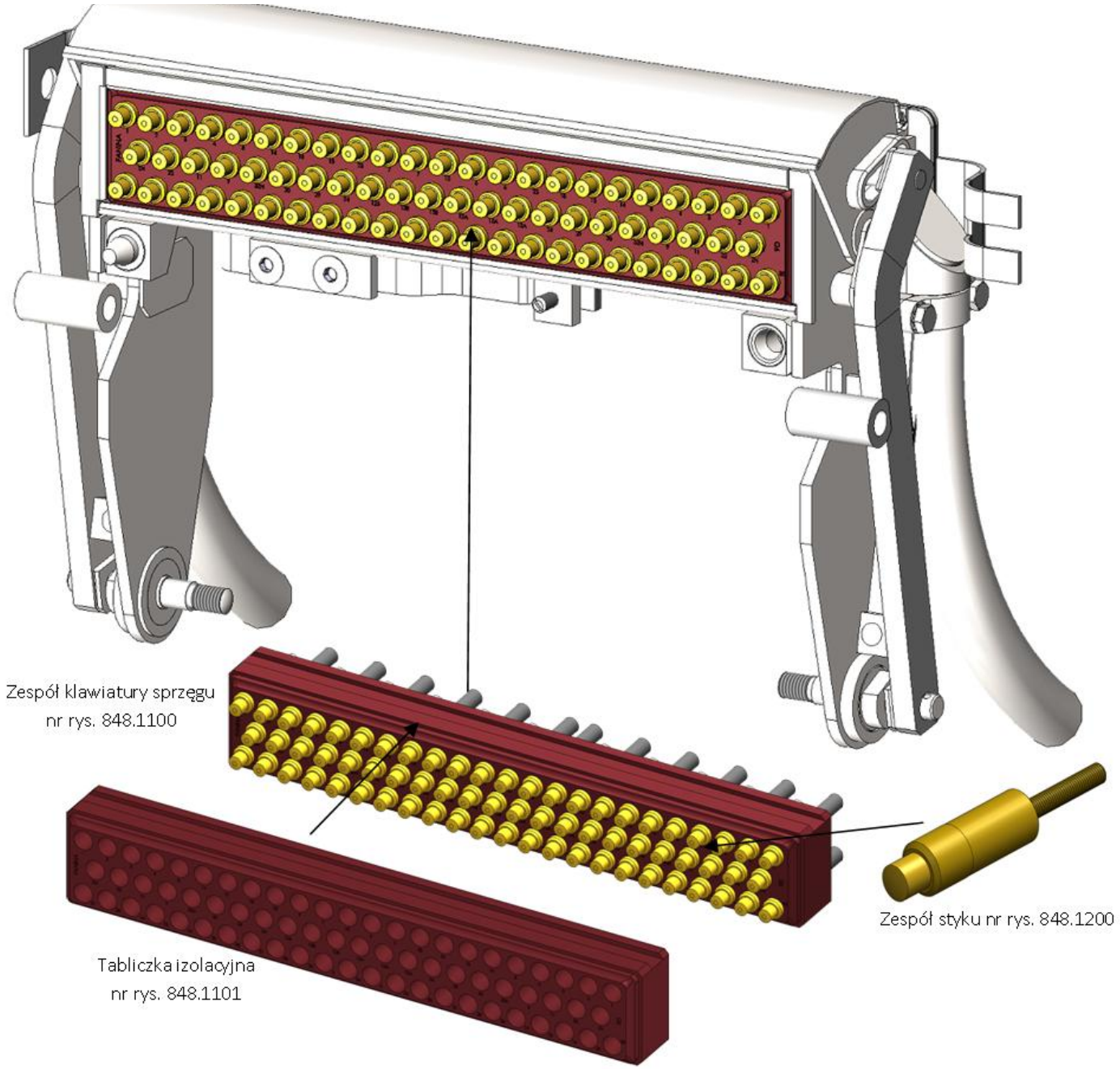
As a part of the P4 renovation, we provide repair dimensions for all parts and subassemblies that make up the mechanical part of a Scharfenberg coupler.

As a part of the P5 renovation, we provide the repair of all parts and subassemblies up to design dimensions or their replacement with new ones in accordance with the Repair and Acceptance Requirements R-149.

DOCUMENTS PROVIDED WITH THE PRODUCT:

Tests report
Acceptance certificate 3.1.

REENOVATION OF SCHARFENBERG COUPLER type ZEa – electrical part

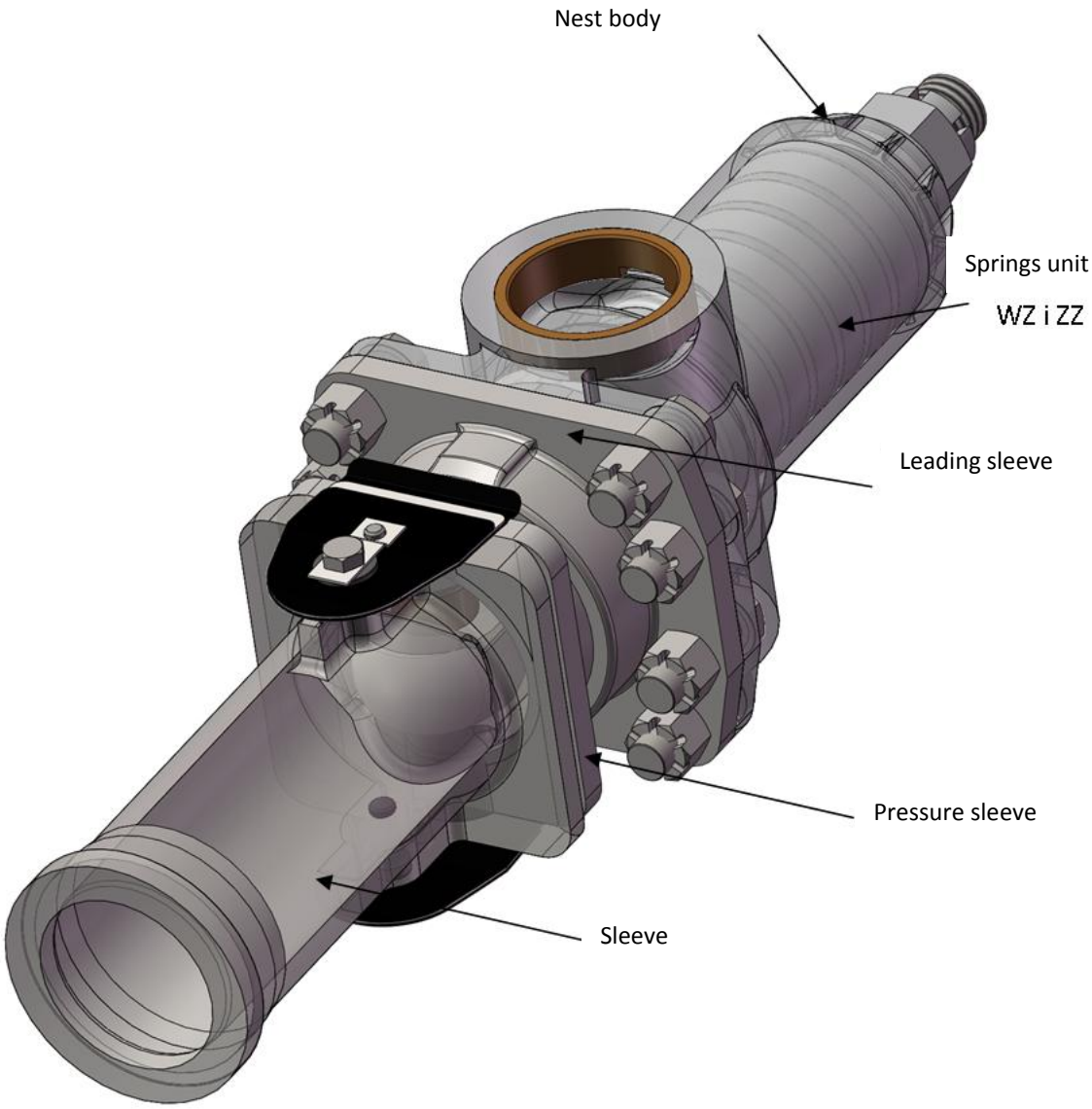


As a part of the P4 renovation, we perform a complete revision and repair of all electrical subassemblies and connections.

As a part of the P5 renovation, we provide the repair of all parts and subassemblies up to design dimensions or their replacement with new ones in accordance with the Repair and Acceptance Requirements R-149.

DOCUMENTS PROVIDED WITH THE PRODUCT:
Acceptance certificate 3.1.

RENOVATION OF INTER-CAR COUPLER type ZEk

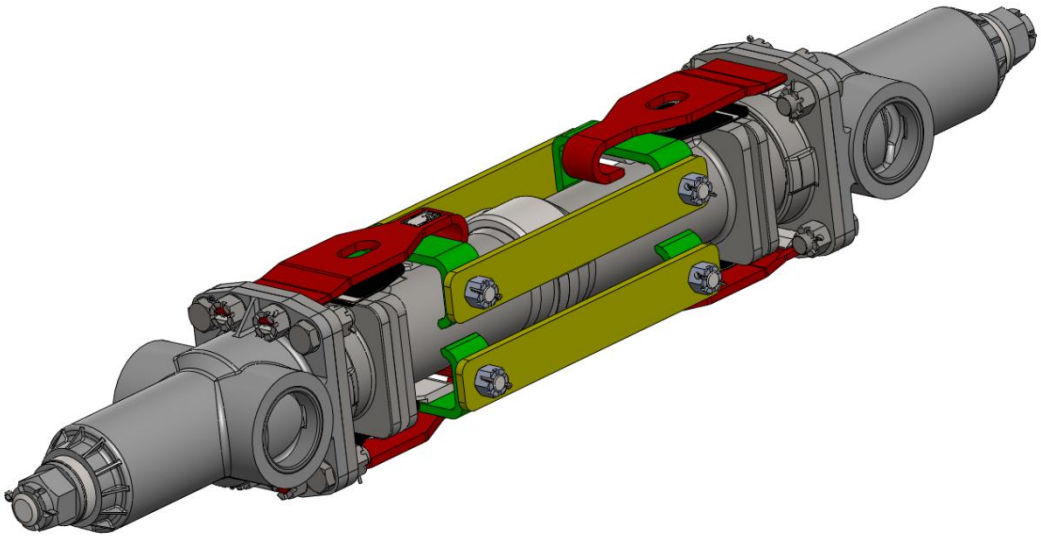


As a part of the P4 renovation, we provide repair dimensions for all parts and subassemblies that make up the mechanical part of an inter-car coupler.
In the event when limit dimensions are exceeded, the subassemblies are, upon agreement with the employer, renovated up to design dimensions or replaced with new ones.

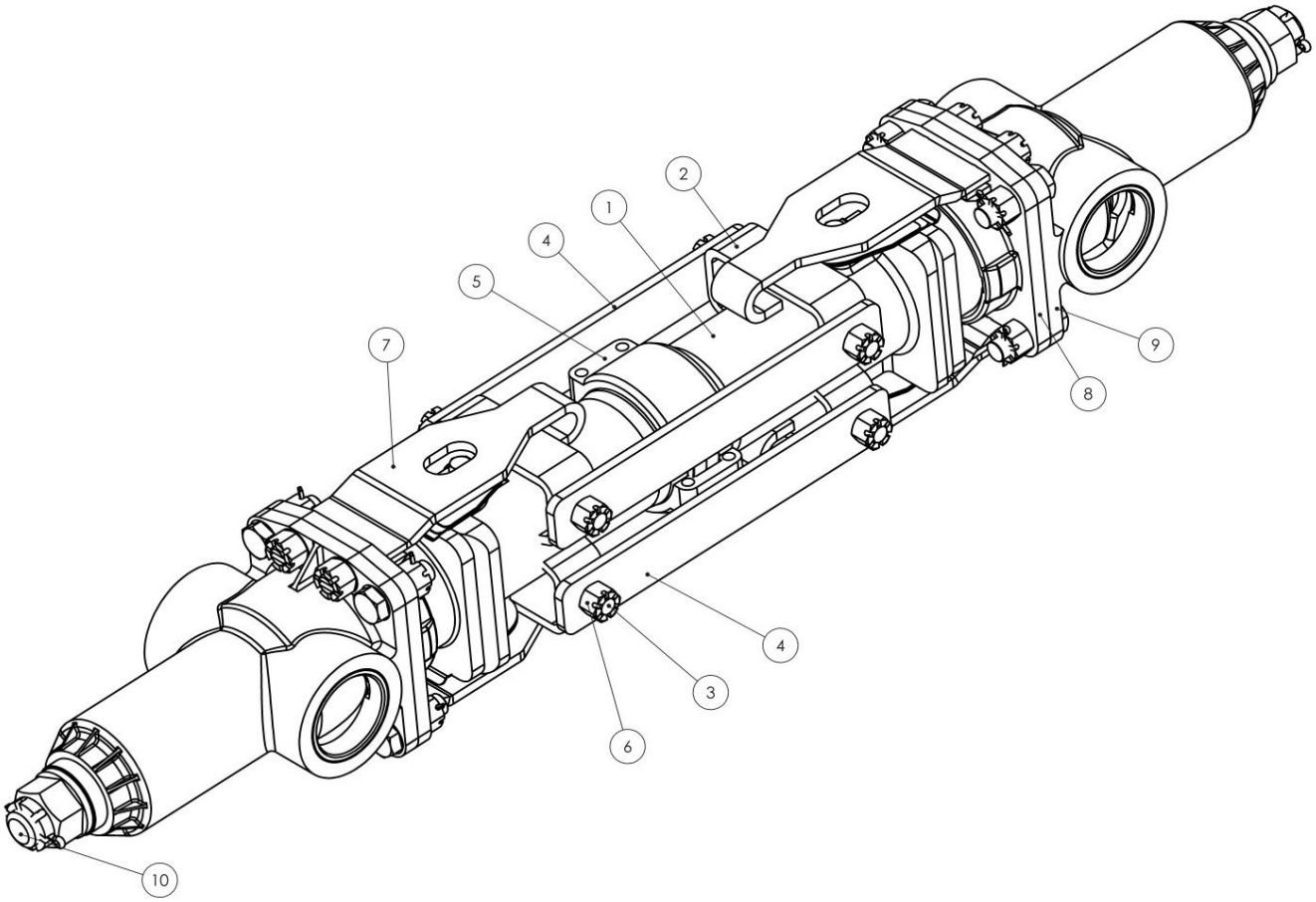
As a part of the P5 renovation, we provide the repair of all parts and subassemblies up to design dimensions or their replacement with new ones in accordance with the Repair and Acceptance Requirements R-149.

DOCUMENTS PROVIDED WITH THE PRODUCT:
Tests report
Acceptance certificate 3.1.

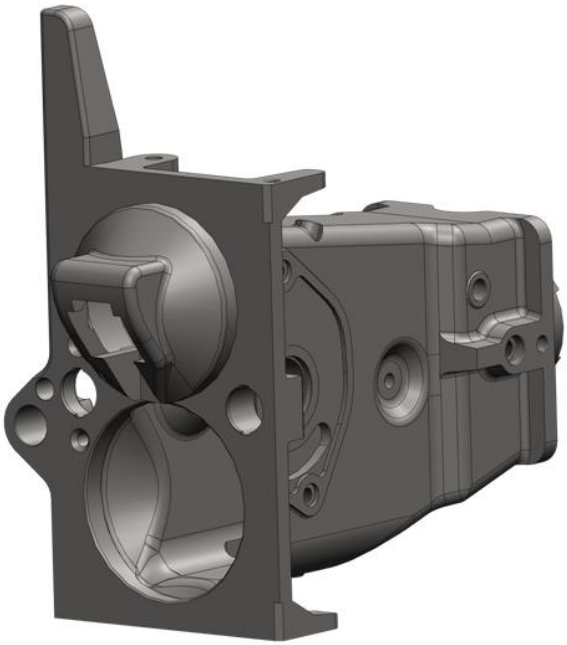
RENOVATION OF INTER-CAR ZEk COUPLER
equipped with additional protection against tearing the coupler apart – version ZEk-FAz after renovation



The ZEk-FAz inter-car coupler is equipped with two protections to prevent cars from being detached in case of a damage to the stretcher (10) and connectors (5).The first protection is realised by means of a hook (7), which is mounted to the coupler housing body (9) and guide bushing (8) with nuts. When the stretcher (10) is damaged, the hook (7) catches on the eye (2) **to prevent cars from being detached**. The second protection is realised by means of covers (4), screwed to the protection eye (2) with nuts (6), to prevent cars from being detached in case of a failure to connectors (5) – figure no. 6.



TECHNOLOGY FOR RENOVATION OF COUPLERS type ZEa and ZEk used by F.A.E. FANINA S.A.



Technology for repairing steel castings:

- Sandblasting
- Heating up to 300°C (process time 3h)
- Re-surfacing at heating temperature
- Inspection of padding welds
- Stress relief soaking at 600°C (process time 8h)
- Sandblasting
- Machining and locksmithing
- Final acceptance
- Painting

Technology for repairing forgings and toughened parts:

- Sandblasting
- Heating up to 380°C (process time 4h)
- Re-surfacing using special filler metal at heating temperature (padding weld hardness min. 35 HRC)
- Inspection of padding welds
- Stress relief soaking at 650°C (process time 10h)
- Sandblasting
- Machining and locksmithing
- Final acceptance
- Painting/anticorrosion protection

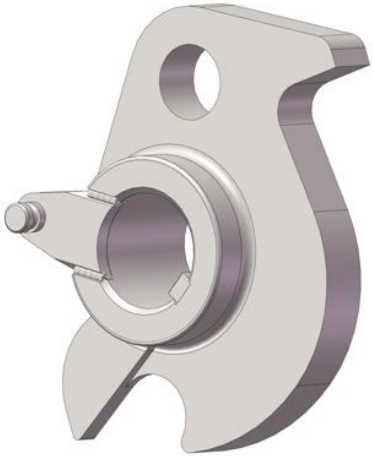
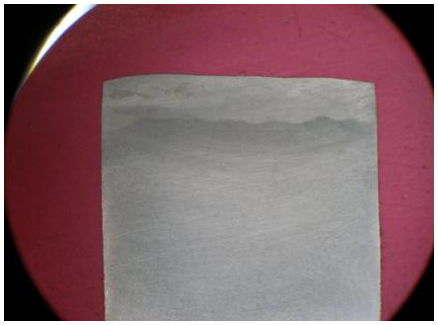
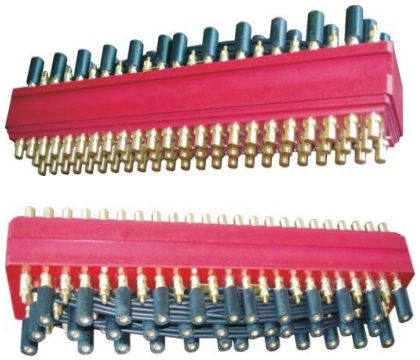


Photo (Laboratory TDT – Kraków)



ELECTRIC SCHARFENBERG COUPLER
COUPLER INTERFACE UNIT



APPLICATION:
The Scharfenberg coupler interface unit is a complete subassembly of the Electric Scharfenberg coupler used to connect electric circuits of EN 57/71-series vehicles connected mechanically and pneumatically by means of the Scharfenberg coupler.

It consists of the insulation plate with mounted set of 68 contacts and internal electric connections of the contacts.

The unit meets the technical conditions specified in the Repair and Acceptance Requirements (R-149).

DOCUMENTS PROVIDED WITH THE PRODUCT:
Acceptance certificate 3.1.

INTERFACE INSULATION PLATE

APPLICATION:
The insulation plate is the main component of the coupler interface unit. The plate ensures reciprocal insulation between the sets of contacts as well as between the sets of contacts and the interface housing.

It is made from red electro insulation laminate.
It has 68 openings to mount the set of contacts.

The insulation plate meets the technical conditions specified in the Repair and Acceptance Requirements (R-149).

DOCUMENTS PROVIDED WITH THE PRODUCT:
Acceptance certificate 3.1.

INTERFACE CONTACT UNIT

APPLICATION:
The contact unit is the main component mounted in the coupler's interface insulation plate. It provides the electric connection with opposite contact unit in the second coupled electric train.

The unit meets the technical conditions specified in the Repair and Acceptance Requirements (R-149).

DOCUMENTS PROVIDED WITH THE PRODUCT:
Acceptance certificate 3.1.

PANTOGRAPH CONTACT SHOE FAN-37-195-103

APPLICATION:

The universal FAN-37-195-103 contact shoe is designed for installation on AKP-4E or 10PP4/M pantographs.
It is adapted for installation with pantograph pans with carbon contact tips the profile of which is in compliance with PN-EN 50367:2006 v. B.3.

TECHNICAL DESCRIPTION:

The contact shoe is available in two versions:

01 – for installation on AKP-4E or 10PP4/M pantographs,
02 – for installation on AKP-4E pantographs only.

A complete FAN-37-195-103 contact shoe consists of the following subassemblies:
Complete horn – 2 pcs/set, which comprises:

a) Horn – 2 pcs,
b) Frame – set,
c) Contact pan – 2 pcs,
d) Suspension bracket I,
e) Set of fastening elements (screws, washers, nuts).

The pantograph pans with carbon contact tips are not a part of the set, but they can be supplied at additional request.

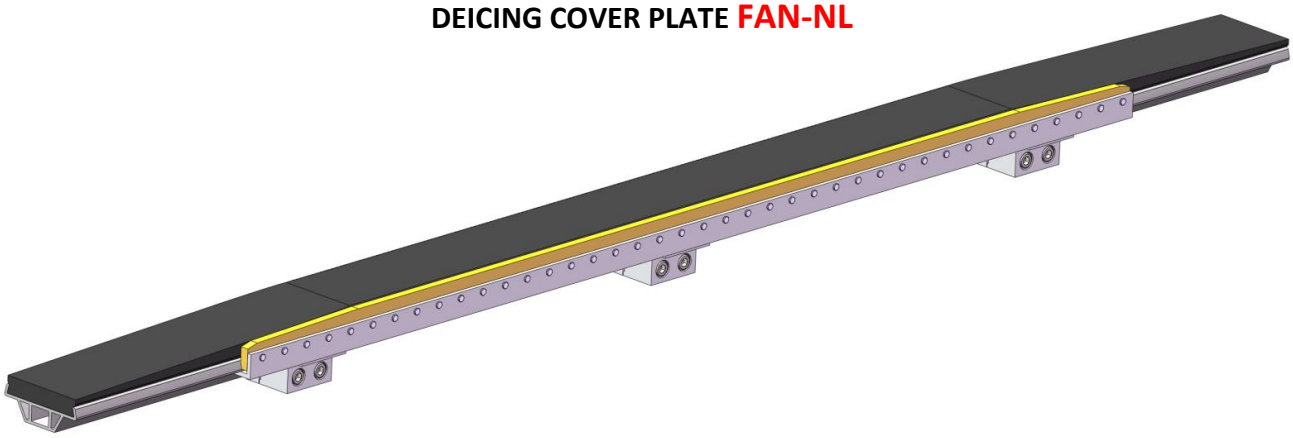
AVAILABLE SPARE PARTS:

1. Horn, set – 872.1000/A.01,
2. Horn, set – 872.1000/A.02,
3. Horn – 872.1100/A,
4. Complete frame – 872.1200.01,
5. Complete frame – 872.1200.02,
6. Suspension bracket I – 872.1300.01,
7. Contact pan – 872.1400/A.

DOCUMENTS PROVIDED WITH THE PRODUCT:

1. Acceptance certificate 3.1,
2. Document confirming the compliance with WTWiO-09/FANINA/SG-01 (on request of the customer),
3. Permission No. T/2010/0554/EL or No. T/2010/0555/EL to operate the typical railway vehicle element (on request of the customer).

DEICING COVER PLATE FAN-NL



APPLICATION:

The **FAN-NL-B3 (B8)** deicing cover plate is mounted on standard pantograph pans with carbon contact tips the profile of which is in compliance with PN-EN 50367:2006 v. B.3 and B8, respectively.
Thanks to simple and quick installation, it allows the removal of icing and hoar frost from the contact lines under changing weather conditions.
It is the only patent-pending solution for hard winter conditions.

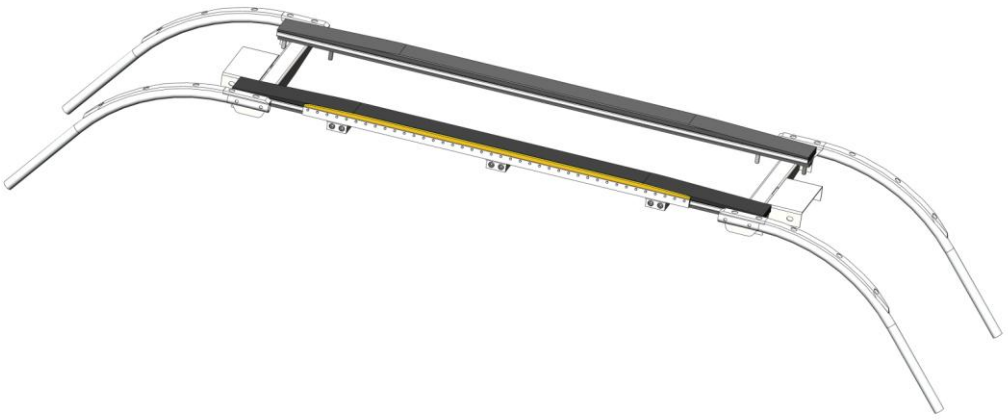
TECHNICAL DESCRIPTION:

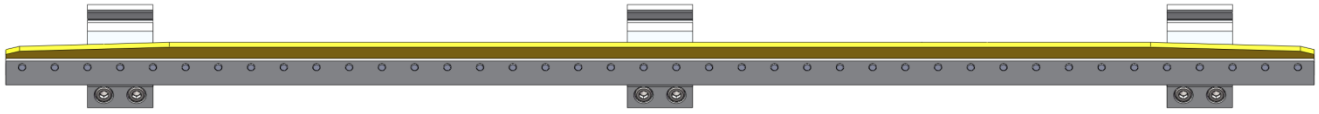
The cover plate is available in two versions:
- **FAN-NL-B3** for installation on B3 pantograph pans
- **FAN-NL-B8** for installation on B8 pantograph pans

There is a possibility to make the cover plate as adapted for installation on other types of pantograph pans, in accordance with an agreed order.
The complete deicing cover plate consists of a duralumin clamping ring as well as a replaceable brass knife and an assembly to mount the knife to a pantograph pan. Such a solution provides proper strength and rigidity of the cover plate and makes it possible to replace the knife as a part of renovation by the manufacturer.

TECHNICAL DATA:

- Knife length: 800mm
- Assembly weight: 1200g





SOLUTION FOR NEW-GENERATION LOCOMOTIVES
COUPLER UNIT ZW-4LOK
GSN-4Lok RECEPTACLE + ASWP-4Lok DOUBLE-PLUG CABLE

The **GSN-4Lok** receptacle and the associated **ASWP-4Lok** double-plug cable represent a variant of **ZW-2** train heating coupler unit dedicated to new-generation locomotives where now, instead of the former distribution box with a cable and plug and an ASO Dummy Receptacle, only the second identical socket is used at the face of the locomotive, to its left-hand side, and the auxiliary equipment is a double-plug cable to be used when there is a need for emergency connection between the locomotive and a carriage.

As the solution used so far has a significant fault related to the electric shock hazard in the event when the double-plug cable insulation gets damaged, FAE FANINA S.A. has developed a solution consisting of **GSN-4Lok** Receptacle and **ASWP-4Lok** cable, which completely eliminates the electric shock hazard, as it makes the earthing circuits be connected before the current circuits during the operation of joining the coupler.

The **GSN-4Lok** receptacle is fitted with a double earth contact, and its earth contacts are connected with earthed socket housing.

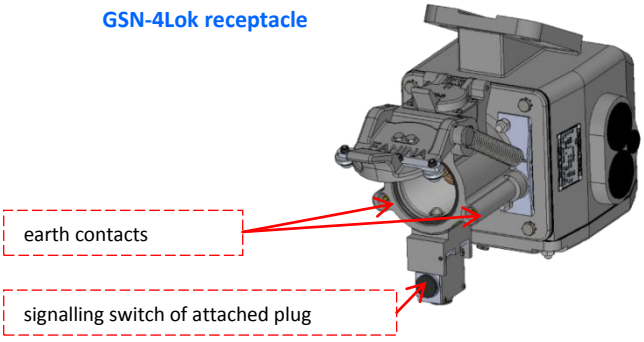
The **GSN-4Lok** receptacle does not receive a typical ASWP plug compliant with UIC 552 standard; only the special plug with a double earth contact that the cable's earthing wire and plug handle are joined to can be connected. This imposes proper connection and correct sequence of connecting the coupler.

Such a connection is used in case of an emergency when there is no possibility to connect heating circuits using the right (typical) locomotive socket that the cable with plug is connected to during normal operation.

The **GSN-4Lok** receptacle also fulfils all functions of a typical GSN Receptacle with signalling switch of attached plug.

GSN-4Lok receptacle	
Permissible permanent current load	
Range of ambient temperature:	Current „I" (A)
below -10°C	800
-10°C ÷ 15°C	600
15°C ÷ 30°C	500
30°C ÷ 50°C	400
Other technical data	
Rated voltage	3kV for direct or alternate current
Test voltage	12kV for 1 minute
Protection class	IP55
Weight	11,5 kg

GSN-4Lok receptacle



ASWP-4Lok is a special double-plug version of the heating coupler connector where one plug is dedicated to connection with **GSN-4Lok** receptacle mounted on the left-hand side of locomotive (with earth contacts) and the other one is a standard plug in compliance with UIC 552 card. The connector consists of HV cable with the main conductor of 1 x 185mm² and the earth conductor of min. 25mm², which prevents from electric shock if voltage appears in the handle.

When connecting the heating circuits with this set, first should be connected plug to the receptacle GSN-4Lok. The imposed sequence of connecting the earthing circuits before the current ones ensures safety to the operator. In case of a damage to the cable or plug insulation. The second (typical) plug of the cable should be connected to the receptacle of the second (supplied) vehicle.

ASWP-4Lok cable

standard plug

plug dedicated to GSN-4Lok Receptacle

OUR SERVICES:

HEAT TREATMENT:

We carry out heat treatment according to the Customer processes and also develop processes by ourselves in accordance with the Customer's assumptions.

We perform the following:

- quench hardening,
- tempering,
- annealing,
- normalising.

Bigger furnace specification:

- inside dimensions: 750 × 850 × 450 (height) mm
- charge weight – up to 200 kg
- max temperature – 1250°C
- no protective atmosphere
- possibility of precise computer-controlled programming the heat treatment process
- possibility of printing the process course.

Heat treatment is followed by hardness testing – HR

WELDING:

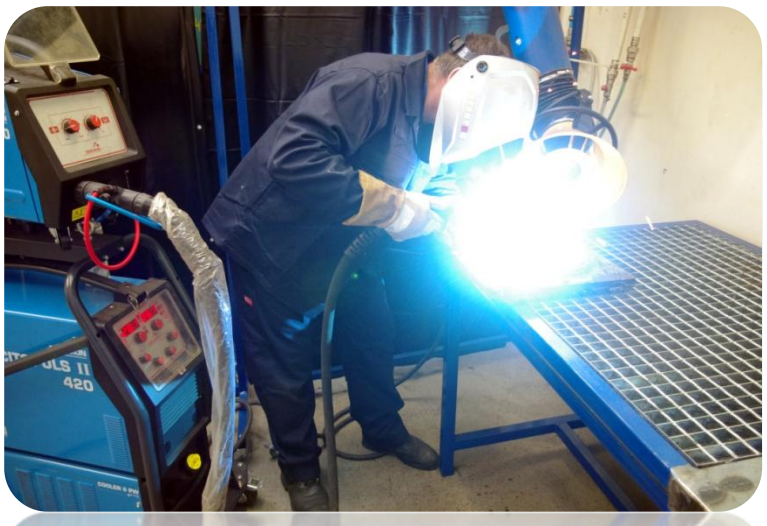
We provide MIG/MAG and TIG welding and building up services for:

- constructional and stainless steels,
- quenched and tempered steels,
- building up and regeneration.

Welding equipment specification:

MIG/MAG (OERLIKON – CITOPULS II 420 welder):

- range of welding current: 15 ÷ 420A
- welding current 350A – 100%.



TIG – MASTERING AC/DC PULSE (KEMPPI 2000)

- range of welding current: 15 ÷ 200A

TIG – CEMONT TXH 250 AC/DC

- range of welding current: 15 ÷ 250A

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