For mobile power feeding

Introduction

The UP conductor rail system is a modern power supply system utilising single-pole insulated conductor rails. It provides the electrical power supply to mobile machinery with typical applications including bridge cranes, steel mill cranes, process cranes, people moving systems and other similar types of equipment.

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Certifications

Certificate of Protection IP 23.

Manufactured in accordance with the requirements of 2006/95/EC (LVD Directive) and 2004/108/EC (EMC Di-rective).



Applications and Features

The conductor rail material is aluminum 6063 alloy (from 300Amp to 1250Amp) with a stainless steel contact strip which drastically reduces wear on the conductor.

The conductors can be installed both vertically and horizontally, always keeping the groove in the lower part. Curved systems can also be supplied, minimum radius = 1200mm

Bar length: 4 meters, although other lengths can be manufactured to special order.

Operating temperatures from -20°C to +70°C.

Max voltage: (690V (380V)).

Max. traveling speed: 600m/min.

The entire conductor rail system is insulated and according to current Safety Regulations, it is entirely protect-ed against direct finger contact. Protection degree: IP23.

Earth insulation: Cover is yellow with one green strip on the side over the entire length of the rail. It should not be used as conductor rail for phase.

The expansion joint is necessary for installations longer than 200 meters. Changes in length due to thermal expansion (ambient temperature and conductor heating when used) can be absorbed taking into account the difference in length for the conductor rail and for the PVC housing, which is shorter. The joint cover avoids any undesirable contact against the conductor rail.

Type -R: Curves for R 1200mm.

During the assembly process, the connection pieces between conductor rails should have a cleaning treat-ment (degreasing, debarring), in order to improve the effect of the use of the conductor bar.

The top of the cross section of the conductor rail, where the rail joint is clamped, is slightly larger. The contact surface is more effective which improves the conductive area, reduces the impedance and reduces the joint temperature to prevent excessive heating.

V-shaped connecting plate gives a large contact surface and the lateral gap tolerance is small between differ-ent conductor rails, which improves the carbon brushes wear off when going through the joining areas, reduc-ing the appearance of sparks and increasing the normal life of the conductor rails.

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Feed sets Line feeds (any joints) or end feeds.

End caps The open ends of the conductor are closed by end caps.

Sliding hangers Standard distance between suspension points are 1.500 mm or 1.800 mm, accor-ding to rail model.

Expansion joints

The expansion sections are required to compensate the different expansions between copper conductors and steel or concrete structures, in varying temperature as without interrupting electrical power.

Expansion joints are used when the power rail has curves or when the length is exceeding 200m.

Isolating sections

Isolating sections are required to switch off some parts of the travelling length, in order to make maintenance or repair works without electric shock hazard. Double current collectors should be used to avoid losing contact when going across the sectioned area. As the doubled current collector could serve as electric bridge between sectioned tracks, another supplementary isolating point should be mounted in the next joint.

Current collectors

Spring operated current collectors maintain uniform contact against the conductor rail and they are manufactured from:

- Structure in aluminium with blue epoxi coat.
- Brush holder in reinforced nylon.
- Carbon brushes in metallographite.

Earth current collectors are identified with yellow paint.









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Components

PVC Housing

- Two sizes: UP-1 (32x24mm) and UP-2 (42x32mm).
- Phase pole:
 - Standard (from -20 to + 70°C): Orange color RAL 2004.
- Extreme conditions (from -40 to + 85°C): Grey color RAL 7035.
- Earth pole: Yellow color RAL1021 with a green strip at the side.
- Dielectric strength: 30-40 Kv/mm.
- Flame retardant: Class B1—no flaming particles, self-extinguishing.







PVC Housing

The aluminum conductor rail is manufactured in 6063 alloy and provided with and stainless steel AISI304 contact strip (B) which combines the high conductivity with good wear resistance.

REFERENCE	CODE	TYPE	CROSS SECTION (mm²)	NORMAL CURRENT AT 100% & 35°C (Amp)	RESISTANCE (Ω/km)	STEEL STRIP WIDTH B (mm)	DISTANCE BETWEEN SUPPORTING POINTS (mm)	DISTANCE BETWEEN CONDUCTORS (mm)	WEIGHT (Kg/m)
UPP-1-300	214001	PHASE							
UPE-1-300	214002	EARTH	180	300	0.187	8.5	1500	80	0.71
UPG-1-300	214003	GREY							
UPP-2-500	214004	PHASE		500	0.116	9.8	1800	80	1.13
UPE-2-500	214005	EARTH	285						
UPG-2-500	214006	GREY							
UPP-2-800	214007	PHASE							
UPE-2-800	214008	EARTH	420	800	0.067	9.8	1800	80	1.50
UPG-2-800	214009	GREY							
UPP-2-1250	214010	PHASE							
UPE-2-1250	214011	EARTH	600	1250	0.046	9.8	1800	80	2.01
UPG-2-1250	214012	GREY							

If duty cycle or/and working temperature are lower than indicated, higher current is allowed on the rail.

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Components

Rail joint

Snap-in joint splices provide mechanical end electrical continuity.

4449	REFERENCE	CODE	MATERIAL Body Screws		SCREW SIZE	WEIGHT
	RJ-1-300	214013	ALUMINIUM	ZINC PLATED STEEL	M8	0.150 Kg
	RJ-2-500	214014	ALUMINIUM	ZINC PLATED STEEL	M10	0.320 Kg
	RJ-2-800	214015	ALUMINIUM	ZINC PLATED STEEL	M10	0.400 Kg
	RJ-2-1250	214016	ALUMINIUM	ZINC PLATED STEEL	M10	0.820 Kg

Joint cap

Cap avoids any accidental contact with the electrical conductor rail.



REFERENCE	CODE	MATERIAL	WEIGHT
JC-1	214017	POLYAMIDE 6	0.120 Kg
JC-2	214018	POLYAMIDE 6	0.210 Kg

Sliding hanger for steel plate or steel angle

The sliding hanger is assembled on a steel plate or angle which is welded to the beam.



REFERENCE	CODE	MA Body	ATERIAL Screws	SCREW SIZE	WEIGHT
SH-1-S	214019	POLYAMIDE 6	ZINC PLATED STEEL	M8x35	0.050 Kg
SH-2-S	214020	POLYAMIDE 6	ZINC PLATED STEEL	M10x40	0.075 Kg

Sliding hanger with square nut for C-profile

The sliding hanger is assembled on a steel C-profile 40 \times 35mm which would be clamped to the beam.

REFERENCE	CODE	MATERIAL Body Screws		SCREW SIZE	WEIGHT
SH-1-L	214021	POLYAMIDE 6	ZINC PLATED STEEL	M8	0.075 Kg
SH-2-L	214022	POLYAMIDE 6	ZINC PLATED STEEL	M10	0.100 Kg



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Components

Anchor clamp



REFERENCE	CODE	MA Body	WEIGHT	
AC-1	214023	POLYAMIDE 6	ZINC PLATED STEEL	0.060 Kg
AC-2	214024	POLYAMIDE 6	ZINC PLATED STEEL	0.80 Kg

Feed box

Feed box can be installed on any rail joint. Connection cables must go into the box from both ends.





EFERENCE	CODE	MATERIAL	WEIGHT
FB-1	214025	POLYAMIDE 6	0.150 Kg
FB-2	214026	POLYAMIDE 6	2.40 Kg

Cable lug



Tin plated copper.



Use two cable lugs for each feeding point.

REFERENCE	CODE	APPROX. MAX AMPERAGE (Amp)	FIXING BOLT SIZE (D)	DIAMETER (A)	CABLE SIZE (mm²)	WEIGHT (Kg/pc)
CL-70-80	214027	120	M8	7.0	1x25	0.014
CL-80-80	214028	150	M8	8.0	1x35	0.022
CL-90-80	214029	200	M8	9.0	1x50	0.032
CL-115-100	214030	250	M10	11.5	1x70	0.047
CL-120-100	214031	300	M10	12.0	1x95	0.059
CL-155-100	214032	350	M10	15.5	1x120	0.067
CL-170-100	214033	400	M10	17.0	1x150	0.080
CL-185-120	214034	450	M12	18.5	1x185	0.115
CL-210-120	214035	500	M12	21.0	1x240	0.150

End cap



End caps avoid any accidental contact with the electric conductor rail at both sides of the line.

REFERENCE	CODE	MATERIAL	WEIGHT
EC-1	214036	POLYAMIDE 6	0.020 Kg
EC-2	214037	POLYAMIDE 6	0.040 Kg

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Current collectors

Each current collector includes:

- Insulated brush support.
- Carbon brushes in metallographite quality (See SPARE PARTS section).
- Springs in stainless Steel AISI302.



Current collectors for earth pole are separately supplied and identified with yellow colour painted plates.

REFERENCE	TYPE	CODE	۱ Structure	1ATERIAL Screws	NOMINAL CURRENT	CARBON BRUSH	PRESSING FORCE	LATERAL DEVIATION	WEIGHT
CCP-1-200	PHASE	214038			200 Amp	SINGLE	29.1	±100 mm	1190 Kg
CCE-1-200	EARTH	214039	ALOPINOP	ZINC PLATED STELL	200 Amp	SINOLL	2011	100 11111	1,100 Kg
CCP-1-400	PHASE	214040			400 Amp		2 × 29N	±100 mm	2 250 Kg
CCE-1-400	EARTH	214041	ALOPINOP	ZINC PLATED STEEL	400 Amp	DOUBLE	2 × 2011	- 100 11111	2,230 Kg

Towing arm for CC-1					
		REFERENCE	CODE	MATERIAL	WEIGHT
1 m m	70 100				
	30 x 400 mm	TA-1-30	214042	ZINC PLATED STEEL	2.25 Kg

For mobile power feeding

Components



Current collectors for earth pole are separately supplied and identified with yellow colour painted plates.

REFERENCE	TYPE	CODE	N Structure	1ATERIAL Screws	NOMINAL CURRENT	CARBON BRUSH	PRESSING FORCE	LATERAL DEVIATION	WEIGHT
CCP-2-400	PHASE	214043			400 Amp	SINGLE	7201	+100 mm	2 750 Kg
CCE-2-400	EARTH	214044	ALUMINUM	ZINC PLATED STEEL	400 Amp	SINOLL	3211	100 11111	2,550 Kg
CCP-2-800	PHASE	214045			800 Amp		2 x 32N	+100 mm	4.610 Kg
CCE-2-800	EARTH	214046	ALOPHINOP	ZINC PLATED STEEL	800 Amp	DOUBLE	2 × 3211	100 1111	4,010 Kg

Power current collector for line UP-2

(500 and 1000 amperes) 1030 405 40 x 40 CCP-2-500 CCP-2-1000 Tow arm

CCE-2-500

CCE-2-1000

Current collectors for earth pole are separately supplied and identified with yellow colour painted plates.

REFERE	NCE TY	PE CODE	l Structure	MATERIAL Screws	NOMINAL CURRENT	CARBON BRUSH	PRESSING FORCE	LATERAL DEVIATION	WEIGHT
CCP-2-5	OO PHA	SE 214047			500 Amp	SINGLE	76N	±100 mm	7.050 Ka
CCE-2-5	00 EAR	214048	ALOPHINOP	ZINC PLATED STEEL	500 Amp	SINULL	3014	100 1111	3,050 Kg
CCP-2-10	000 PHA	SE 214049			1000 Amp		2 × 36N	±100 mm	6.010 Kg
CCE-2-10	DOO EAR	214050		ZINC PLATED STEEL	1000 Amp	DOUBLE	2 X 3011	100 mm	0,010 Kg

Towing arm for CC-2	10 × 100 mm	REFERENCE	CODE	MATERIAL	WEIGHT
	40 x 400 mm	TA-2-40	214051	ZINC PLATED STEEL	1,000 Kg

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Auxiliary components

Expansion joint

application area.

application area.

at assembly.

identical.

Example:

30mm.

Max. T = +60°C. Min. T = 0°C.



the m	and the	REFERENCE	CODE	в	M. ody	ATERIAL So	crews		SCREW SIZE	WEIGHT
		EJ-1	214052	ALU B	IMINIUM RASS	ZINC P	LATED STI	EEL	M8x35	1,000 Kg
A		EJ-2	214053	ALU B	IMINIUM RASS	ZINC P	LATED ST	EEL	M10x35	3,230 Kg
1111	1.5	NºOF EXPA JOINTS	NSION (n)	1	2	3	4	5	INTE	RMEDIATE NGTH (a)
					TOTAL	LENGTH	OF COND	UCTOR	RAIL (m)	
		Δt°C								
	F	10		400	600	800	1000	1200		200
		20		387	575	762	950	1138		187
For longer insta shown in this ch	llations than hart, number	30		325	450	575	700	825		125
or expansion joi	nts are:	40		293	387	481	575	669		93
n= (L-200)/a		50		275	350	425	500	575		75
$\Delta t^{\circ}C = \Delta ta + \Delta t$	h			2.0	000	420	500	575		10
∆ta: ambient ter	np. range (°C)	60		262	325	387	450	512		62
∆th: temperature current heating (e rise due to (°C)	70		253	307	360	414	468		53
DUTY CYCLE	Δth (°C)	80		247	294	340	387	434		47
40%	10	90		242	283	325	366	408		42
60% 100%	20 30	100		237	275	312	350	387		37



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Auxiliary components



- Designed to interrupt the flow of electric current in a determined section of the system.
- The use of double current collector is required to allow electrical current to flow along the sectioned área.
- Each isolation section requires one piece of joint cover JC (not included order separately).

REFERENCE	CODE	MATERIAL Body Screws		SCREW SIZE	WEIGHT
IP-1	214054	POLYAMIDE 6	ZINC PLATED STEEL	M8x35	0,070 Kg
IP-2	214055	POLYAMIDE 6	ZINC PLATED STEEL	M10x35	0,130 Kg

Support arm

Beam clip

2500-1 (600mm) (h



REFERENCE	CODE	MATERIAL	HOLE SIZE	WEIGHT
2500-1 (600mm)	805220	ZINC PLATED STEEL	-	1,302 Kg
D-2500-1 (600mm)	805221	ZINC PLATED STEEL	Ø10,5mm	1,250 Kg



REFERENCE	CODE	MATERIAL	WEIGHT
2340-12-500	309006	ZINC PLATED STEEL	0,156 Kg

Weld-on bracket for support arm



REFERENCE	CODE	MATERIAL	WEIGHT				
2600-120	310011	STEEL	0,156 Kg				
Support Arm not included – order separately							

For mobile power feeding

Auxiliary components



- Manufactured in resin of polyester, reinforced with fiber of glass (Color RAL8012).
- Screws and nuts: Zinc plated steel.

REFERENCE	CODE	INSER Top	TIONS Bottom	SCREW SIZE	WEIGHT
240-HH	102038	FEMALE	FEMALE	M8	0,100 Kg
240-MH	102039	MALE	FEMALE	M8	0,110 Kg
240-HH (M10)	102063	FEMALE	FEMALE	M10	0,100 Kg
240-MH (M10)	102064	MALE	FEMALE	M10	0,110 Kg

Spare parts



Spare carbon brush	for	С
147		
3		

REFERENCE	CODE	MATERIAL	WEIGHT
CB-2-400	214057	COPPER GRAPHITE	0,270 Kg
CB-2-500	214058	COPPER GRAPHITE	0,730 Kg

Assembly instructions



For mobile power feeding

Assembly instructions

1- Security

- Disconnect the electrical current from the system before beginning any assembly operation.
- Do not use the UP conductor rail system for higher loads than the specified voltage and current.

2- Installation

The support structure for the power line must be capable of supporting the total weight of the system. Place the support points along the beam through which the hoist will move. These points should be located every 1500mm or every 1800mm depending on the type of line in question and according to previous sketch.

Maximum paralelism tolerance, in vertical and in horizontal planes, between the beam of the crane and the conductor rail should be +/- 20 mm.

2.1 Support installation

Assemble the supporting points for the conductor rail according to the specified distance (See page 5): Every 1.500 mm. for profiles UP-1 and every 1.800 mm for profiles UP-2.



2.2 Joints installation

The connection part of the conductor and the connector should be polished with abrasive cloth to remove oxide layer, apply the electrical conductive pastes and tighten the bolts,

Check correct alingment of the contact piece and the minimum gap between conductor rails. Assemble the joint covers.



2.3 Fixed point clamp installation

Conductor rails have to be fixed in at least one point of the travelling length in order to direct the expansion in the correct way.

For installations with travelling length ≥100m, we advise to assemble the fixed point clamps at the middle of the travel.

Two fixed clamps should be assembled, one at each side of the fixed point.

In case the line requires expansion joints, please contact our Technical department.





For mobile power feeding

Assembly instructions

2.4 Feeding point installation





Connect electric cables at both sides using the cable lugs

Current collectors installation Ensure the correct alignment between the carbon brush and the conductor rail

Ensure the correct alignment between the carbon brush and the conductor rail. Connection cable should be long enough to avoid any lateral force or torsion to the carbon brush.



Check the vertical distance between the conductor rail and the current collector towing arm according to pages 8 and 9.

2.6 End cap

2.5

Install the end caps on both sides and tighten them with rubberised fabric.

3- Inspection

Check that the difference in parallelism between the Up conductor rail and the hoist unit does not exceed 20 mm. Make a running test to check the passage of the brushes in the joint areas and tighten all connecting / fastening pieces again.

4- Operation

4.1 **Previous tests**

Carry out several travels by hand with the current collector to check that it moves throughout its length without problems. The extra-flexible cable of the current collector must be connected to the towing arm in a loop, without causing torsion of the trolley. Make the electrical connection to the line and test its insulation.

4.2 Final tests

Once the electric current is connected, check that the current collector moves forward and backward without problems. Check that the device that the UP system is powered on works correctly.

4.3 Normal functioning

Do not exceed the máximum voltage and / or amperage specified for UP. Use the UP line within its corresponding electrical and / or mechanical specifications.

5- Maintenance

Perfom periodic maintenance tasks to ensure the status of the UP line. The maintenance operations will depend on the use given to the system.

During each inspection the following points should be checked:

• Wear of carbon brushes.

- Electric cables: cuts, cracks, etc...
- Ensure screws are correctly tightened.
- The profile must be clean in the running edges.
- Separation or alignment in the joints.