CJSC "Pskovelectrosvar"

TESO

Concern "INTERSVAR"

EQUIPMENT FOR RAIL WELDING PLANTS

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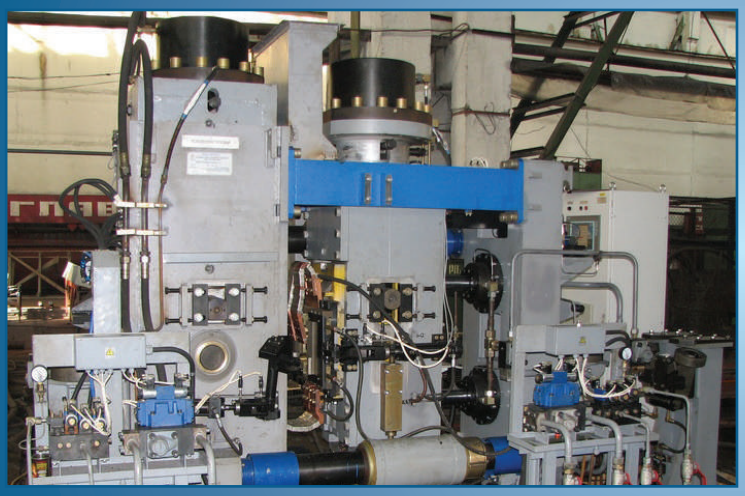
FBW machine of rails MCP-63.01A



The welding machine MCP-63.01A is designed for FBW of rails by continuous or pulsating flashing in stationary plant conditions. The machine provides rail alignment before welding according to the rail axis and to the height of the rail head, welds rails according to the pre-set program, removes weld flash around the entire contour of the joint after welding.

The control system of the machine is based on an industrial controller.

The system provides setting and checking parameters of the welding process. It provides the operator with the current information about technological welding procedure, records this information and issues a report (passport) on every welded joint.

The machine is used in moderately-cold climate conditions, location category 4 as per GOST 15150-69.

TECHNICAL DATA	
CHARACTERISTIC	VALUE
Rated supply main voltage of 3-phase AC, V	380
Supply main frequency, Hz	50
Welding transformers power at rated stage at duty cycle=50%, kVA	350
Adjustment stages number	2
Secondary voltage adjustment limits, V	7,92 - 8,84
Rated upsetting force at pressure 15,7 MPa (157 kg/cm^2), daN (kgf), not less	63 000
Rated gripping force at pressure 18,8 MPa (188 kg/cm^2), daN (kgf), not less	151 000
Movable frame stroke, mm, not less	100
Clampings stroke, mm, not less	60
Max. upsetting speed, mm/s, not less	30
Flashing speed adjustment limits, mm/s	0,2 - 5,0
Max. cross-station area of welded item, mm^2	10 000
Short-term performance at rail welding, welds/h, not less	15
Vertical and horizontal correction interval, mm	±10
Cooling water consumption at pressure 0,15 MPa (1,5 kg/cm^2), l/min	30

FBW machine of rails MCP-80.01

The machine MCP-80.01 is designed for FBW by continuous or pulsating flashing of rails R50 and R65 in field conditions. The machine welds rails according to the pre-set program and removes weld flash around the entire contour of the welded joint after welding.

The control system of the machine is based on an industrial controller. It allows setting and checking the parameters of the welding process. It provides the operator with the current information about technological welding procedure, records this information and subsequently issues a report (passport) on every welded joint.

The machine is used in moderately-cold climate conditions, location category 1 as per GOST 15150-69.

TECHNICAL DATA		
CHARACTERISTIC		VALUE
Rated supply main voltage of 3-phase AC, V		380
Rated voltage of diesel electric station, V		400
Supply main frequency, Hz		50
Welding transformers power at rated stage at duty cycle=50%, kVA		240
Max. secondary current, kA		67
Rated continuous secondary current, kA		19,6
Rated upsetting force, daN		80 000
Gripping force, daN		210 000
Movable frames stroke, mm, not less		95
Max. upsetting speed, mm/s, not less		20
Welding performance for rails R65, welds/h, not less		8
Dimensions, mm (length x width x height)	welding unit	2 000 x 1 080 x 1 095
	hydraulic drive station	1 395 x 780 x 1 640
	control cabinet and station	1 070 x 633 x 1 308
Mass, kg		3 800

FBW machine of rails MCP-120.01A

The suspended machine MCP-120.01A is designed for FBW of rails by pulsating flashing and stretching of continuously welded rails (R50 and R65 rails) in field conditions. Weld flash is cut by the hinged trimmer. The machine is intended for operation as a part of rail-bound welding machinery (ПРСМ) and road-rail welding vehicles (МСК-01).

The control system of the machine is based on an industrial computer. It allows setting and checking the parameters of the welding process. The system provides the operator with the current information about technological welding procedure, records the information and subsequently issues a report (passport) on every welded joint.

The machine is used in moderately-cold climate conditions, location category 1 as per GOST 15150-69.

TECHNICAL DATA		
CHARACTERISTIC		VALUE
Welding transformers power at rated stage at duty cycle=50%, kVA, not less		262
Maximum secondary current, kA, not less		72
Rated continuous secondary current, kA		21,4
Secondary contour impedance, microohm, not more		110
Welding transformers transformation ratio		48
Rated upsetting force at pressure 30,8 MPa, kN		1 200
Max. gripping force at pressure 30,8 MPa, kN		2 800
Operating pressure in hydraulic system, MPa (kgf/cm^2)		30,8 (308)
Max. upsetting force, mm/s		100
Flashing speed control limits, mm/s		0,2 - 1,2
Movable frames stroke, mm		95
Machine welding time of rail R65, s, not more		240
Welding performance for rail R65, welds/h, not less		8
Dimensions, mm (length x width x height)	welding unit	1 876 x 993 x 1 130
	hydraulic drive station	572 x 740 x 1 620
	electrics box	1 090 x 550 x 1 670
Mass, kg	welding unit	3 750
	hydraulic drive station	933
	electrics box	650

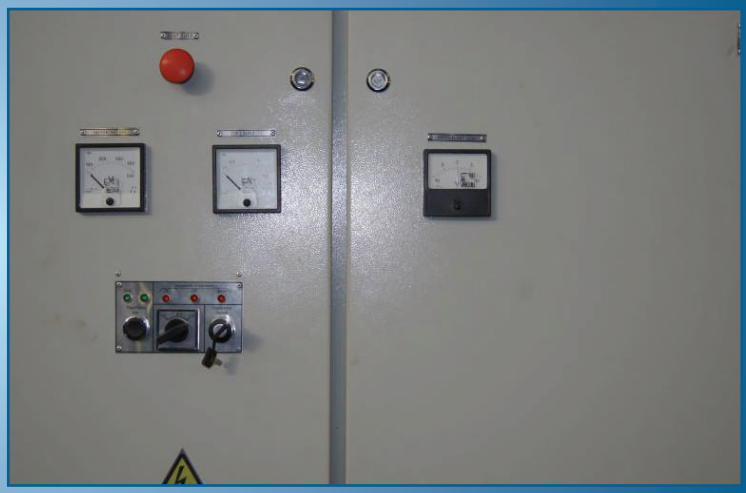
FBW machine of switch points MCPO-84.01

The machine MCPO-84.01 is designed for FBW by continuous or pulsating flashing of switch points and rails alloyed with chromium in stationary plant conditions and hot weld flash removal after welding.

The machine is used in moderately-cold climate conditions, location category 4 as per GOST 15150-69 and GOST 15543.1.

TECHNICAL DATA	
CHARACTERISTIC	VALUE
Rated supply main voltage of 3-phase AC, V	380
Supply main frequency, Hz	50
Welding transformers power at rated stage at duty cycle=50%, kVA	350
Max. secondary current, kA, not less	80
Number of secondary voltage control stages	2
Secondary voltage control limits, V, not less	7,92 - 8,84
Max. upsetting force, kN, not less	840
Max. gripping force, kN, not less	2 100
Movable frame stroke, mm, not less	145
Average upsetting speed, mm/s, not less	30
Flashing speed control limits, mm/s	0,2 - 3,0
Max. short-term performance, welds/ h	15
Vertical and horizontal correction interval, mm, not less	±10
Cooling water consumption at pressure 0,15 MPa (1,53 kgf/cm^2), l/min, not more	60
Mass, kg, not more	17 000

FBW machine of frogs MCC-150.01

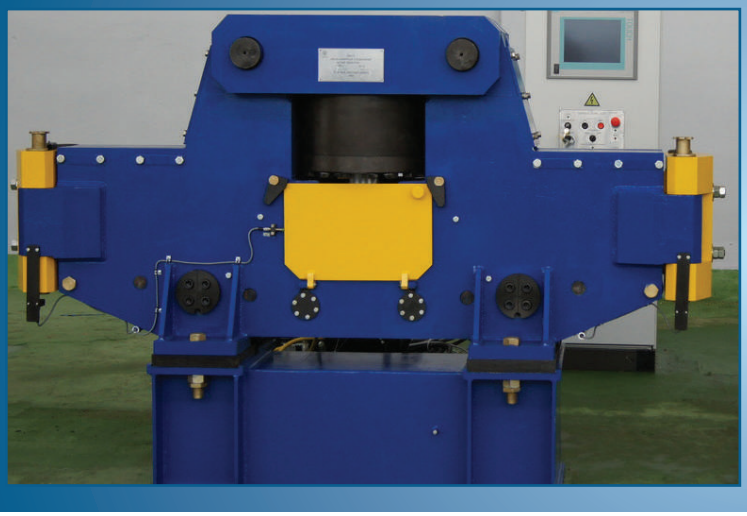


The machine MCC-150.01 is designed for FBW of frogs by continuous or pulsating flashing in stationary plant conditions.

The machine is used in moderately-cold climate conditions, location category 4 as per GOST 15150-69 and GOST 15543.1.

TECHNICAL DATA		
CHARACTERISTIC		VALUE
Rated supply main voltage of 3-phase AC, V		380
Supply main frequency, Hz		50
Rated secondary coil voltage, V		7,92
Number of secondary voltage adjustment stages		2
Secondary voltage control limits, V		7,92 - 8,84
Short circuit power, kVA, not more		800±80
Welding power at duty cycle=50%, kVA		175
Welding transformers transformation ratio		48,43
Distance between conductors, mm	the least	240
	the largest	340
Cooling water consumption at pressure 0,3 MPa, l/min, not less		25
Flashing speed, mm/s		0,2 - 1,0
Max. gripping force, mm/s		200
Rated upsetting force at pressure 26,5 MPa, kN		1 500
Rated gripping force at pressure 28,3 MPa, kN		4 000
Welding performance of rail R65, welds /h, not less		8
Movable frame stroke, mm		100
Clampings stroke, mm		80
Vertical and horizontal correction intervals, mm, not less		±10
Max. cross-section area of welded item, mm^2		15 000
Dimensions, mm (length x width x height)	welding unit	4 881 x 2 764 x 3 735
	hydraulic station	1 708 x 1 417 x 1 522
Mass, kg	welding unit	44 500
	hydraulic station	1 470

Special compact press ПМС-320



The special compact press ПМС-320 is designed for quality control of rail welded joints. It applies sampling method by means of testing check samples by static transversal bending.

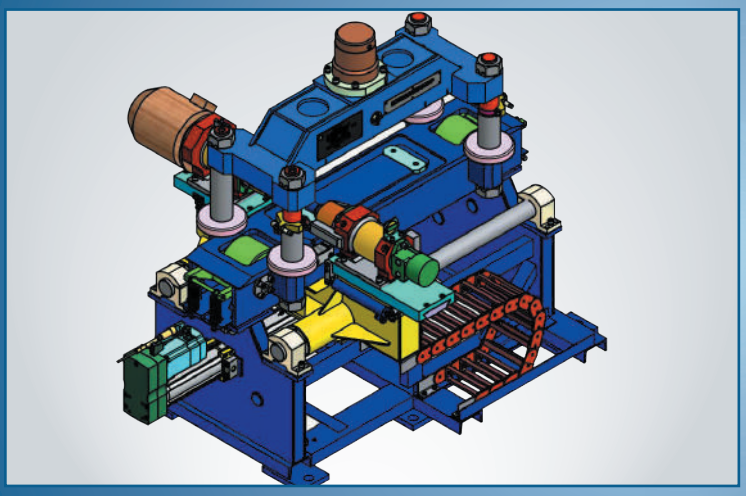
The control system of the press is based on an industrial computer. It allows recording and storing testing procedure information, registering every fracture, displaying load curve of the process and controlling the process in real time mode.

Compact dimensions and mass of the press allow using it both in stationary plant conditions and as a part of rail-bound welding machinery (ПРСМ).

The press is used in moderately-cold climate conditions, location category 4 as per GOST 15150-69 and GOST 15543.1.

TECHNICAL DATA		
CHARACTERISTIC		VALUE
Rated supply main voltage of 3-phase, AC, V		380
Rated voltage of diesel electric station, V		400
Supply main frequency, Hz		50
Max. force, t, not less		320
Max. bending, mm		60
Tested item length, mm		1 100 - 1 800
Hydraulic system operation pressure, MPa		40
Dimensions, mm (length x width x height)	press	2 200 x 560 x 1 541
	hydraulic station	673 x 434 x 725
	control cabinet	622 x 450 x 1 750
Mass, kg	press	3 260
	hydraulic station	105
	control cabinet	130

Rail drilling machine PCC-01



The single-spindle machine PCC-01 with digital program control is designed for drilling holes in rails R65 in stationary plant conditions.

The machine construction allows chamfering.

The machine is installed in automatic production lines for heat treated rails at rail welding plants, as well as in metallurgical facilities manufacturing rails.

The machine is used in moderately cold climate conditions, location category 4 as per GOST 15150-69.

TECHNICAL DATA		
CHARACTERISTIC		VALUE
Rated supply main voltage of 3-phase AC, V		380
Supply main frequency, Hz		50
Drill diameter, mm		36
Drill rotary speed, rpm		1 024
Drill feeding speed, mm/s	at instrument supply	20 - 30
	at drilling	0,7 - 1,2
Chamfer rotation speed, rpm		750
Chamfer feeding speed, mm/s		20 - 30
Lubricating-cooling fluid fed in cutting area, max., l/min.		4
Rated pressure in hydraulic system, bar		140
Dimensions, mm (length x width x height), not more	drilling unit	1 728 x 1 311 x 1 292
	hydraulic drive station	1 141 x 678 x 1 064
	control panel	600 x 500 x 1 055
Mass, kg, not more	drilling unit	1 116
	hydraulic drive station	326
	control panel	200

Brushing machine for rail contact surfaces C3-03

The brushing machine for rail contact surfaces C3-03 is designed for simultaneous brushing of ends of two connected rails to ensure reliable electric contact immediately before flash butt welding.

The machine consists of the brushing unit, control cabinet, filter and ventilation unit. The condition of the treated contact surface meets contemporary requirements to flash butt welding. It permits to achieve optimal electrical parameters of heat balance of flashing ensuring welded joint quality.

The machine can be installed in the technological line and can be operated together with the rail welding machine or separately.

The machine is used in moderately-cold climate conditions, location category 4 as per GOST 15150-69 and GOST 15543.1.

TECHNICAL DATA		
CHARACTERISTIC		VALUE
Rated supply main voltage of 3-phase AC, V		380
Supply main frequency, Hz		50
Time of joint treatment, min., not more		2
Max. length of brushed surfaces, mm		700
Rated power at duty cycle=22%, kW		8,1
Additional stroke (manual movement), mm		1 000
Dimensions, mm (length x width x height)	brushing unit	3 063 x 940 x 1 042
	control cabinet	757 x 410 x 1 533
	filter ventilation unit	970 x 650 x 1 050
Mass, kg	brushing unit	940
	control cabinet	82
	filter ventilation unit	90

Universal technological roller transfer section СУРТ

The universal roller transfer section СУРТ-01 is designed for transportation of rails along the technological line. It allows transporting rails with insulated joints with combined metal composite fishplates.

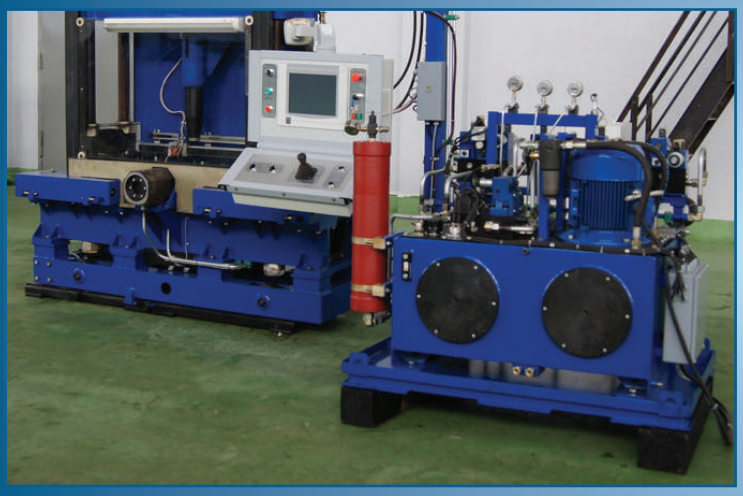
The sections are manufactured in the following versions:

A – СУРТ-01 with drive without roller insulation (6ЯТ.321.007);
B – СУРТ-01 with drive and insulated rollers (6ЯТ.321.007-01);
C – СУРТ-01 without drive, 4 000 mm long (6ЯТ.321.007-02);
D – СУРТ-01 without drive, 3 500 mm long (6ЯТ.321.010);
E – СУРТ-Robel without drive, 2 900 mm long (6ЯТ.321.011);
F – СУРТ-УИН without drive for installation of УИН 001-100 / РТ-С (6ЯТ.321.008);
G – СУРТ-УЗК without drive for installation of ultrasonic control system (6ЯТ.321.009);
H – СУРТ-ВДО without drive for installation of water-cooling system (6ЯТ.321.012).

Sections are produced for various climate conditions, location category 1 as per ГОСТ 15150-69.

TECHNICAL DATA									
CHARACTERISTIC		VALUES							
		A	B	C	D	E	F	G	H
Rated supply main voltage of 3-phase AC, V		380	380	-	-	-	380	380	380
Supply main frequency, Hz		50	50	-	-	-	50	50	50
Drive power, kW		1,5	1,5	-	-	-	-	0,4	-
Max. rail transfer speed, m/s		0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Max. mass of transferred rail, kg		300	300	300	300	300	300	300	300
Transportation height above floor, mm		700	700	700	700	700	700	700	700
Rated frequency inverter power, kW		-	-	-	-	-	75	-	-
Inlet cooling water pressure, MPa		-	-	-	-	-	0,2-0,3	-	-
Air supplying system operating pressure, MPa		-	-	-	-	-	0,5-0,8	0,63	-
Dimensions, mm	length	4 000	4 000	4 000	3 500	2 900	2 950	3 320	4 000
	width	765	765	765	608	608	1 417	850	608
	height	796	796	796	796	796	2 200	1 600	1 170
Mass, kg		565	570	513	398	373	665	500	530

Cold joints straightening unit УПСХ-01



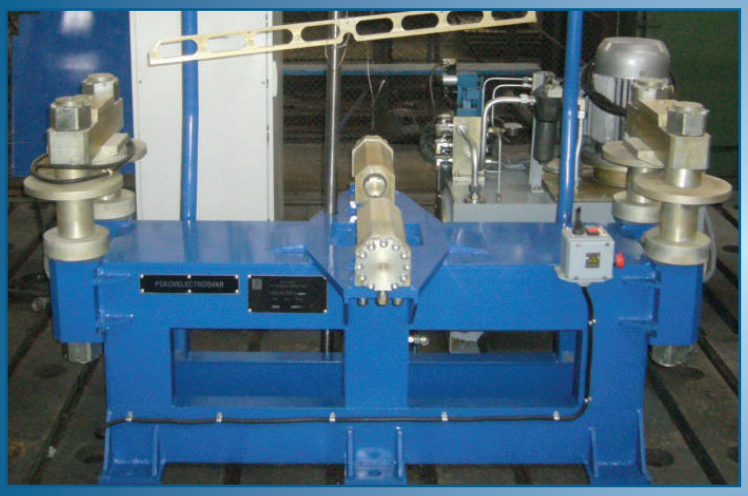
The cold joints straightening unit (УПСХ-01) is designed for straightening cold rail joints to meet the required geometry of the rolling surface and the rail head. The unit straightens the rail in horizontal and vertical planes along standard length of 1 300 mm, checking rail bending along 750 mm length by laser sensors.

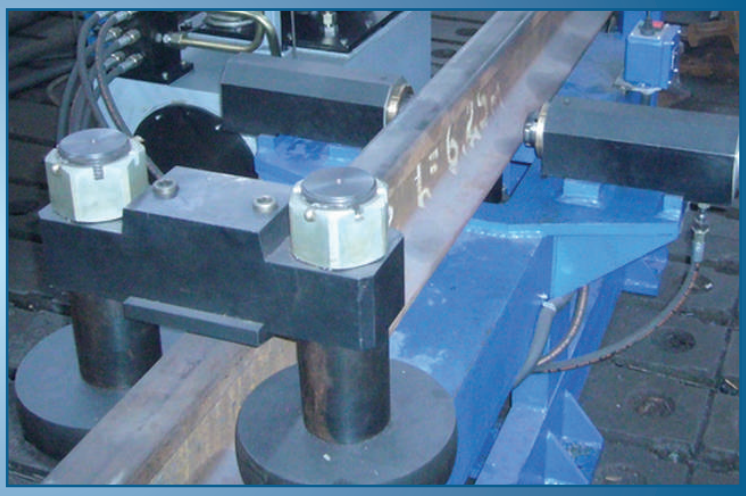
The unit can pass through insulating rail joints with combined metal-composite fishplates.

The unit is used in moderately-cold climate conditions, location category 4 as per GOST 15150-69.

TECHNICAL DATA		
CHARACTERISTIC		VALUE
Rated supply main voltage of 3-phase AC, V		380
Supply main frequency, Hz		50
Straightening mode		manual/semiautomatic
Straightening time, min, not more		5
Measuring system precision, mm/m		0,1
Distance between supporting elements, mm		1 300
Max. bending moment, kgm, not less	horizontal straightening	15 460
	vertical straightening	53 485
Operating hydraulic system pressure, MPa		31
Rated pneumatic system pressure, MPa		0,617
Max. bending moment, kN (kgf)	horizontal straightening	477,21 (47 721)
	vertical straightening	1 645,9 (164 590)
Stroke of hydraulic cylinder rods, mm	horizontal straightening	160
	lower rod vertical straightening	45
	upper rod vertical straightening	115
	straightening device movement	400
Dimensions, mm (length x width x height)	straightening device	2 030 × 1 110 × 2 090
	hydraulic drive station	1 370 × 1 070 × 1 244
	control cabinet	703 × 400 × 1 162
Mass, kg	straightening device	3 050
	hydraulic drive station	790
	control cabinet	110

Hot joints straightening unit УПС-02





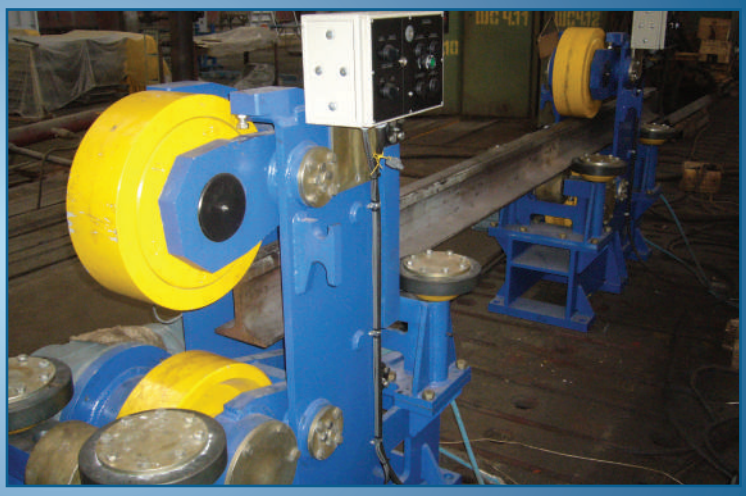
The hot joints straightening unit УПС-02 is designed for straightening hot welded joints to meet the requirements of the rolling surface and the rail head geometry. The unit straightens the rail in horizontal and vertical planes along standard length of 1 700 mm. The straightness of the welded joint is checked on the rolling surface of the rail head.

The unit can pass through insulated rail joints with combined metal-composite fishplates.

The unit is used in moderately-cold climate conditions, location category 4 as per GOST 15150-69.

TECHNICAL DATA		
CHARACTERISTIC		VALUE
Rated supply main voltage of 3-phase AC, V		380
Supply main frequency, Hz		50
Operating hydraulic system pressure, MPa (kgf/cm^2)		16 (160)
Straightening speed, mm/s, not less		30
Hydraulic cylinders driving force, kN (kgf)	horizontal straightening	80 (8 000)
	vertical straightening	196 (19 600)
Hydraulic cylinders rod stroke, mm	horizontal straightening	170
	vertical straightening	80
Dimensions, mm (length x width x height)	straightening device	1 740 × 990 × 985
	hydraulic drive station	850 × 610 × 1 300
Mass, kg	straightening device	780
	hydraulic drive station	480

Pulling unit УТ-02



The pulling unit УТ-02 is designed for transportation of continuously welded rails along technological lines of stationary rail welding plants up to the pulling transporter.

When the unit is in operation, the drivers of the roller sections are automatically switched off ensuring electricity saving. The unit has a variable-frequency drive providing smooth changing of traverse speed of continuously welded rails.

The unit can pass through insulated rail joints with combined metal-composite fishplates.

The unit is used in moderately-cold conditions, location category 4 as per GOST 15150-69.

TECHNICAL DATA	
CHARACTERISTIC	VALUE
Rated supply main voltage of 3-phase AC, V	380
Supply main frequency, Hz	50
Consumption power, kW, not more	6,62
Traction force, kN, not less	10,4
Roller gripping force, kN, not less	70
Speed of continuously welded rail at stabilized conditions, m/s	0,5
Max. acceleration (slow down) of continuously welded rails, m/s, not more	0,02

Rough grinding station ПГШ-01

Final grinding station ПЧШ-01

The rough grinding station ПГШ-01 and the final grinding station ПЧШ-01 are intended for abrasive treatment of the joint around the perimeter in accordance with the main rail profile.

The stations are cabins fitted with local input-exhaust ventilation. The stations include grinding machines for treating lateral sides, foot and head of the rail.

The stations can pass through insulated rail joints with combined metal-composite fishplates.

The stations are used in moderately-cold climate conditions, location category 4 as per GOST 15150-69.

TECHNICAL DATA	
CHARACTERISTIC	VALUE
Rated supply main voltage of 3-phase AC, V	380
Supply main frequency, Hz	50
Rated power, kW	12
Dimensions, mm (length x width x height)	3 600 x 3 000 x 3 520

ELECTRIC GRINDING MACHINES	
CHARACTERISTIC	VALUE
Grinding machine type	electric
Rated supply main voltage, 3-phase AC, V	380
Supply main frequency, Hz	50
Electric motor power, kW	3
Grinding wheel rotation, rpm	2 850
Grinding wheel dimensions, mm	Ø 300 x Ø 76 x 32
Grinding wheel circumferential speed, m/s	40

Modular pulling transporter TT

The transporter TT is designed for transportation of continuously welded rails as a part of the rail welding plant process line.

The control system is based on an industrial computer. The conveying speed of continuously welded rails and the driving force of the transporter are determined by the variable frequency drive. Depending on the length of the continuously welded rail, the pulling transporter can be made in two versions: TT-02, consisting of four modules and TT-03, consisting of five modules.

The transporter can pass through insulating rail joints with combined metal-composite fishplates.

The stations are used in moderately-cold climate conditions, location category 4 as per GOST 15150-69.

TECHNICAL DATA		
CHARACTERISTIC	VALUE	
	TT-02	TT-03
Rated supply main voltage of 3-phase AC, V	380	380
Supply main frequency, Hz	50	50
Pulling force, kg	6 820	8 280
Number of pushing rollers	8	10
Max. conveying speed of continuously welded rails, m/s	0,5	0,5
Rated power, kW	37,92	47,12
Method of speed change of continuously welded rail	variable frequency	variable frequency
Dimensions, mm (length x width x height) (without hydraulic station and control cabinet)	3 500 x 900 x 1 750	4 500 x 900 x 1 750
Mass, kg	4 500	5 500

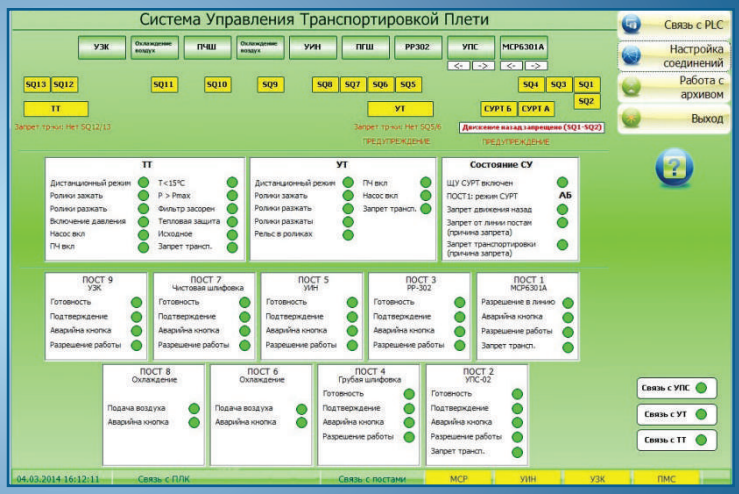
Transporter-distributor of continuously welded rails ТРП-01

The transporter-distributor ТРП-01 is designed for re-distribution of continuously welded rails when loading them on rail-carrying trains in conditions of multiple-flow production. The transfer of continuously welded rails from one flow to another is carried out by switch screw mechanisms, movable guides and carriages with a chain drive.

The transporter can pass through insulating rail joints with combined metal-composite fishplates.

The stations are used in moderately-cold climate conditions, location category 4 as per GOST 15150-69.

TECHNICAL DATA	
CHARACTERISTIC	VALUE
Rail transportation height, mm	700
Distance between flows, mm	4 200
Distance between beginning of transporter and special rail-carrying train, m	59
Rail bend angle by transfer to another flow, not more	$4^{0}\ 15'$
Mass, kg	40 500



Continuously welded rail passportization system

The passportization system of continuously welded rails is designed for collecting technological information from computers of the operating machines of rail welding plants and thus creating the general welding plant information database.

The data processing system gathers information from computers of operating machines of the technological process line: welding machine, induction heating unit, cold straightening unit, ultrasonic testing unit, press.

The passportization system server communicates through network with the computers of the operating machines within pre-set scanning time interval.

Using archives

The system allows sorting archival data according to the number of the line and time period, viewing data archives, making reports and printing them out.

The size of the window for working with archives depends on chosen detailization, thus providing maximum convenience of processing necessary data.

Control system of technological line of rail welding plants

The system is designed for controlling transportation of continuously welded rails along the technological lines of rail welding plants.

The diagnostics and visualization system of the line displays mnemonic diagrams showing the conditions of all sensors and actuating mechanisms of the equipment of the line control system (modes of operation, direction and speed of continuously welded rails, failures and emergencies). The system monitors equipment condition without using additional control and measuring tools.

Control stations are equipped with light-signal columns providing light and sound signaling when transporting continuously welded rails and in emergency cases.

The systems of video observation and central control room allow recording and controlling all stages of technological process in real time mode. Closed circuit TV cameras video monitor the rail welding process 24 hours a day in conditions of middle and low light, also providing detalization of elements at night time.

The 16-channel video recorder is used for saving the information received from the closed circuit TV cameras.

Road-rail welding vehicle MCK-01

The road-rail welding vehicle MCK-01 was designed by Pskovelectrosvar, CJSC in 2012. It is a special-purpose vehicle permitted to travel by public roads and intended for welding rails in the railway track.

Based on DAF vehicle chassis and equipped with the suspended rail welding machine MCP-120.01A and the high frequency inductive heating unit, this vehicle is a competitive alternative to rail-bound welding machinery.

The vehicle manufactured for Russian Railways, JSC is equipped with safety system for special self propelled rolling stock КЛУБ-УП-162, radio set РВС-1-05, shunting units.

TECHNICAL DATE	
CHARACTERISTIC	VALUE
Basic parameters of the machine on vehicle chassis DAF:	
Overall dimensions with box van, mm (length x width x height)	11 440 x 2 550 x 4 150
Mass, kg	34 500
Max. vehicle speed on routes, km/h	80
Wheel arrangement	8 x 2
Fuel tank size, l	560
Basic parameters of vehicle in railway track	
Time required for driving the vehicle onto the track, min., not more	10
Max. speed on straight line sections of railway track, km/h, forward/back	30/20
Max. speed passing switches, special railway track sections and curved track with radius less then 200 m, km/h	5
Max. down grade of the track, ‰	20
Time required for box van opening and positioning welding head on a joint, min., not more	10
Manipulator parameters	
Rotation angle of welding head, deg	±60
Lifting capacity, kg	4 500
Lifting height of welding head above the track, mm	550
Boom length of lifting device, mm	4 000

TECHNICAL DATE	
CHARACTERISTIC	VALUE
Welding parameters	
Machine welding time of rail R65, s, not more	240
Power at duty cycle=50%, kVA, not less	262
Rated upsetting force, t	120
Max. upsetting speed, mm/s, not less	30
Parameters of joint heat treatment	
Heating temperature, ˚C	850 - 900
Heating time, s, not more	240
Cooling time, s, not less	180
Diesel generator AC 400	
Power ДГУ, kVA	400
Tank size ДГУ, l	350

Note

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