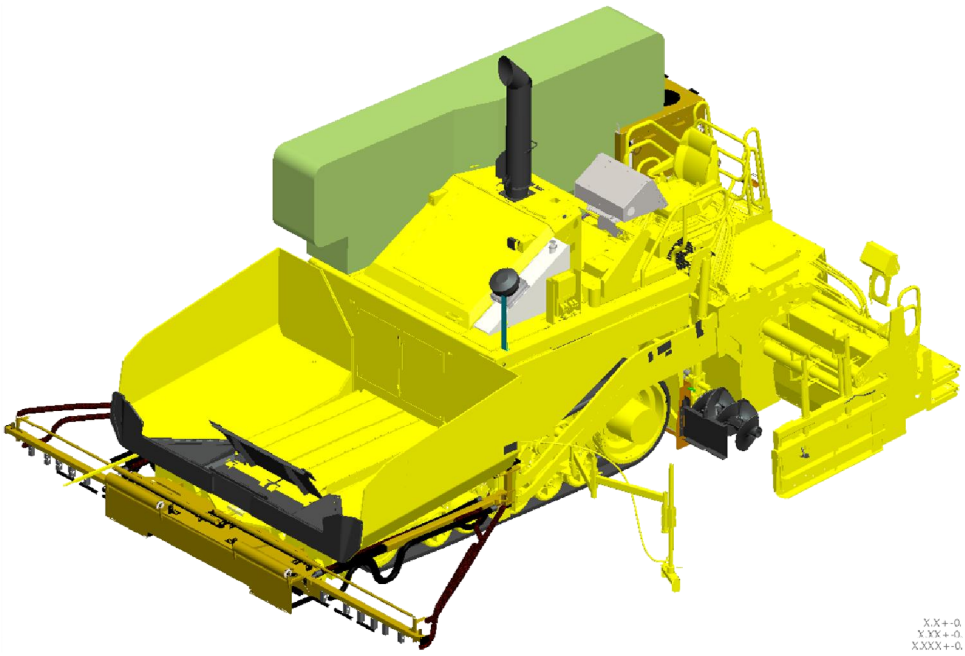
Spray Paver
For
Asphalt Paving Machine
Electrical Design Book



Description:

This Electrical Design Booklet documents the electrical construction details for the Integral dx Spray Paver.

Created by:	R. Scott Jones, P.E. (Electrical Engineer)	Date:	03/21/2014
Checked by:		Date:	
Approved by:		Date:	

SpecSys, Inc.
Specialty Systems Engineering
1111 Cloquet Ave, Cloquet, MN 55720 (320) 269-3227

Outline

Section 1: System Overview & Calculations

System Overview:

The electrical portion of this project will provide all documentation necessary to construct and install the electrical devices needed to control the application of asphalt emulsion onto a road bed. The electrical system will coordinate with the hydraulic and mechanical systems to achieve this objective. A separate Controls Design Booklet is available to document the programming of the computerized logical controls for this apparatus.

Electrical Power Requirements:

The following electrical sources will be incorporated into the total paving apparatus as follows:

The Paverôs electrical system shall provide:

Quantity of (1) 40-amp, 240 VAC, 1-phase branch circuits to be utilized for the operation of two 4000 watt tank heaters. The heaters will be used to maintain the temperature of the asphalt emulsion.

Quantity of (1) 20-amp, 24 VDC branch circuit to provide power for the programmable controller and for all of the solenoid operated valves and hydraulic motors.

The unit shall be furnished with a 15-amp, 120 VAC power inlet for partial operation of one heater. This power inlet can be connected to a 120 VAC power source using any common 15-amp extension cord. This extension cord ***MUST BE CONNECTED TO A GFCI PROTECTED SOURCE***.

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System Calculations:

Power Requirements, 24 VDC

24 VDC Power Analysis						
Branch Circuit	Fuse Designation	Fuse Size	Wire Gauge	Load Description	Device Amps	Device Watts
1	FU-0020	10	16	Air Compressor Solenoid	0.75	18
						0
						0
						0
						0
				Total Load this branch circuit	**0.75**	**18**
2	FU-0050	10	16	CR1085 HMI Display	0.3	7.2
						0
						0
						0
						0
				Total Load this branch circuit	**0.3**	**7.2**
3	FU-0270	10	16	CR0233 Controller	0.32	7.68
				V-ref out	0.4	9.6
						0
						0
						0
				Total Load this branch circuit	**0.72**	**17.28**
4	FU-0330	10	16	CR1085 HMI Display	0.3	7.2
						0
						0
						0
						0
				Total Load this branch circuit	**0.3**	**7.2**
5	FU-0050	10	16	LH Outer nozzle #1	0.08	1.92
				LH Outer nozzle #2	0.08	1.92
				LH Outer nozzle #3	0.08	1.92
				LH Gang nozzle #1	0.08	1.92
				Total Load this branch circuit	**0.32**	**7.68**
6	FU-0050	10	16	LH Gang nozzle #2	0.08	1.92
				LH Gang nozzle #3	0.08	1.92
				Left Wheel nozzle	0.08	1.92
				Center Gang nozzle #1	0.08	1.92
				Total Load this branch circuit	**0.32**	**7.68**
7	FU-0840	10	16	Center Gang nozzle #2	0.08	1.92
				Center Gang nozzle #3	0.08	1.92
				Center Gang nozzle #4	0.08	1.92
				Center Gang nozzle #5	0.08	1.92
				Total Load this branch circuit	**0.32**	**7.68**

Branch Circuit	Fuse Designation	Fuse Size	Wire Gauge	Load Description	Device Amps	Device Watts

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8	FU-0940	10	16	RH Outer Nozzle #1	0.08	1.92
				RH Outer Nozzle #2	0.08	1.92
				RH Outer Nozzle #3	0.08	1.92
				RH Gang Nozzle #1	0.08	1.92
						0
			Total Load this branch circuit		**0.32**	**7.68**
9	FU-1040	10	16	RH Gang Nozzle #2	0.08	1.92
				RH Gang Nozzle #3	0.08	1.92
				Right Wheel Nozzle	0.08	1.92
						0
						0
			Total Load this branch circuit		**0.24**	**5.76**
10	FU-1620	10	16	Right Extension	0.08	1.92
				Left Extension	0.08	1.92
				LH Wing Telescope	0.08	1.92
				RH Wing Telescope	0.08	1.92
						0
			Total Load this branch circuit		**0.32**	**7.68**
11	FU-1620	10	16	Tank return Valve	0.08	1.92
				Spray bar separation Valve	0.08	1.92
				Tank outlet Valve	0.08	1.92
				Spray bar #1 Valve	0.67	16.08
				Spray bar #2 Valve	0.67	16.08
				Large pump speed	1.25	30
				Small pump speed	1.25	30
				Spray bar tilt	0.67	16.08
			Total Load this branch circuit		**4.75**	**114**

24 VDC Power Requirement Summary

Branch Circuit	Amps	Watts
1	**0.75**	**18.00**
2	**0.30**	**7.20**
3	**0.72**	**17.28**
4	**0.30**	**7.20**
5	**0.32**	**7.68**
6	**0.32**	**7.68**
7	**0.32**	**7.68**
8	**0.32**	**7.68**
9	**0.24**	**5.76**
10	**0.32**	**7.68**
11	**4.75**	**114.00**
Grand Total Tabulated Load	**8.66**	**207.84**

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