

UMS SUMMARY TEST REPORT

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CRANAGE EMC TESTING LIMITED
STABLE COURT
OAKLEY
MARKET DRAYTON
SHROPSHIRE, TF9 4AG



Report No: **U0056R01** Date of Issue: **28/09/2015**

This document summarises the results of testing to ascertain the appropriate Elexon Charge Codes for inclusion in BSCP520

Tested & Inspected for: **Swarco Traffic Limited,
25 Erica Road,
Stacey Bushes,
Milton Keynes.
MK12 6HS.**

Test Dates: **04/09/2015 – 11/09/2015**
Receipt Date of Test Item: **04/09/2015**

Sample 1

Test Item Description: **4-Lamp Vehicle Signal**
Manufacturer: **Swarco Traffic LTD**
Model Number: **Swarco 100mm Mini Signal**
Serial Number: **Production Sample**

Notes: **Operated with typical off the shelf step down transformer
Sample 24/15**

Sample 2

Test Item Description: **4-Lamp Vehicle Signal**
Manufacturer: **Swarco Traffic LTD**
Model Number: **Swarco 100mm Mini Signal**
Serial Number: **Production Sample**

Notes: **Operated with typical off the shelf step down transformer
Sample 24/15**

Sample 3

Test Item Description: **4-Lamp Vehicle Signal**
Manufacturer: **Swarco Traffic LTD**
Model Number: **Swarco 100mm Mini Signal**
Serial Number: **Production Sample**

Notes: **Operated with typical off the shelf step down transformer
Sample 24/15**

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Sample 4

Test Item Description: **4-Lamp Vehicle Signal**
Manufacturer: **Swarco Traffic LTD**
Model Number: **Swarco 100mm Mini Signal**
Serial Number: **Production Sample**

Notes: **Operated with typical off the shelf step down transformer**
Sample 24/15

Sample 5

Test Item Description: **4-Lamp Vehicle Signal**
Manufacturer: **Swarco Traffic LTD**
Model Number: **Swarco 100mm Mini Signal**
Serial Number: **Production Sample**

Notes: **Operated with typical off the shelf step down transformer**
Sample 24/15

Approved Signatories: M. Richens - Technical Director


APPROVED SIGNATORY

Verification Signatories: A. Richardson - Test Engineer


VERIFICATION SIGNATORY

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Mode of Operation 1: The unit was connected to an AC source, which was connected to the transformer (peripheral) and switch box (peripheral) for the individual operation of the lamps, which then was connected to the EUT. The Red lamp was supplied with 48V AC 50Hz supplied via the transformer.

Test Condition: - Stabilisation period of 30 minutes given prior to measurements at 230V 50Hz. Measurements were subsequently taken after 10 minutes at each voltage level. This was found to be an adequate time window for the purpose of the test measurements.

All results are rounded to 2 decimal places.

Mode 1

Watts					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	11.72	11.74	11.85	11.92	11.91
220	12.34	12.38	12.50	12.55	12.54
230	13.08	13.09	13.39	13.28	13.27
240	13.87	13.88	14.18	14.07	14.06
250	14.77	14.76	15.07	14.95	14.93
VA					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	25.99	27.08	26.27	26.45	26.49
220	29.53	30.66	29.90	30.00	30.00
230	34.10	35.13	34.56	34.52	34.39
240	39.70	40.72	40.08	40.11	39.99
250	46.82	47.74	47.33	42.24	47.04

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Mode of Operation 2: The unit was connected to an AC source, which was connected to the transformer (peripheral) and switch box (peripheral) for the individual operation of the lamps, which then was connected to the EUT. The Red lamp was supplied with 27.5V AC 50Hz supplied via the transformer.

Test Condition: - Stabilisation period of 30 minutes given prior to measurements at 230V 50Hz. Measurements were subsequently taken after 10 minutes at each voltage level. This was found to be an adequate time window for the purpose of the test measurements.

All results are rounded to 2 decimal places.

Mode 2

Watts					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	9.52	9.54	9.71	9.72	9.68
220	10.19	10.20	10.37	10.40	10.32
230	10.90	10.93	11.10	11.10	11.05
240	11.68	11.70	11.87	11.87	11.80
250	12.55	12.56	12.74	12.74	12.69
VA					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	25.77	26.75	26.11	27.00	25.97
220	29.47	30.45	29.84	30.67	29.06
230	34.10	35.15	34.56	34.83	33.85
240	39.88	40.91	40.27	40.49	38.82
250	47.185	48.18	47.54	47.83	46.91

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Mode of Operation 3: The unit was connected to an AC source, which was connected to the transformer (peripheral) and switch box (peripheral) for the individual operation of the lamps, which then was connected to the EUT. The Green lamp was supplied with 48V AC 50Hz supplied via the transformer.

Test Condition: - Stabilisation period of 30 minutes given prior to measurements at 230V 50Hz. Measurements were subsequently taken after 10 minutes at each voltage level. This was found to be an adequate time window for the purpose of the test measurements.

All results are rounded to 2 decimal places.

Mode 3

Watts					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	12.80	12.76	12.89	13.00	12.93
220	13.37	13.63	13.49	13.60	13.56
230	14.08	14.07	14.20	14.27	14.25
240	14.87	14.85	14.98	15.03	15.04
250	15.75	15.72	15.85	15.91	15.93
VA					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	26.51	27.53	26.78	27.30	27.36
220	30.00	31.02	30.31	31.02	30.99
230	34.34	35.53	34.78	35.32	35.28
240	39.94	41.11	40.35	40.66	40.98
250	47.05	48.13	47.47	47.76	47.87

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Mode of Operation 4: The unit was connected to an AC source, which was connected to the transformer (peripheral) and switch box (peripheral) for the individual operation of the lamps, which then was connected to the EUT. The Green lamp was supplied with 28V AC 50Hz supplied via the transformer.

Test Condition: - Stabilisation period of 30 minutes given prior to measurements at 230V 50Hz. Measurements were subsequently taken after 10 minutes at each voltage level. This was found to be an adequate time window for the purpose of the test measurements.

All results are rounded to 2 decimal places.

Mode 4

Watts					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	10.16	10.20	10.30	10.35	10.35
220	10.83	10.87	10.97	11.02	11.03
230	11.55	11.57	11.69	11.74	11.74
240	12.34	12.36	12.47	12.52	12.53
250	13.21	13.22	13.33	13.38	13.39
VA					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	25.75	27.05	26.29	26.64	26.65
220	29.48	30.76	29.97	30.33	30.45
230	34.16	35.36	34.66	34.97	35.01
240	40.04	41.21	40.43	40.69	40.83
250	47.30	48.42	47.64	47.90	48.02

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Mode of Operation 5: The unit was connected to an AC source, which was connected to the transformer (peripheral) and switch box (peripheral) for the individual operation of the lamps, which then was connected to the EUT. The Amber lamp was supplied with 48V AC 50Hz supplied via the transformer.

Test Condition: - Stabilisation period of 30 minutes given prior to measurements at 230V 50Hz. Measurements were subsequently taken after 10 minutes at each voltage level. This was found to be an adequate time window for the purpose of the test measurements.

All results are rounded to 2 decimal places.

Mode 5

Watts					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	11.74	11.91	11.77	12.06	12.00
220	12.36	12.57	12.39	12.63	12.62
230	13.09	13.29	13.12	13.35	13.35
240	13.89	14.08	13.92	14.15	14.14
250	14.77	14.96	14.79	15.04	15.02
VA					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	26.78	25.38	26.34	26.80	26.80
220	30.35	30.06	29.87	30.01	30.36
230	34.87	34.75	34.39	34.47	34.91
240	40.49	40.13	40.00	40.06	40.49
250	47.54	47.31	47.06	47.26	47.57

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Mode of Operation 6: The unit was connected to an AC source, which was connected to the transformer (peripheral) and switch box (peripheral) for the individual operation of the lamps, which then was connected to the EUT. The Amber lamp was supplied with 28V AC 50Hz supplied via the transformer.

Test Condition: - Stabilisation period of 30 minutes given prior to measurements at 230V 50Hz. Measurements were subsequently taken after 10 minutes at each voltage level. This was found to be an adequate time window for the purpose of the test measurements.

All results are rounded to 2 decimal places.

Mode 6

Watts					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	9.50	9.68	9.58	9.74	9.71
220	10.17	10.34	10.25	10.41	10.38
230	11.04	11.06	10.98	11.13	11.10
240	11.83	11.84	11.76	11.90	11.90
250	2.67	12.70	12.61	12.77	12.75
VA					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	26.46	26.19	26.03	26.06	26.38
220	30.18	29.82	29.74	29.78	30.12
230	35.31	34.54	34.45	34.53	34.72
240	41.18	40.32	40.22	40.21	40.63
250	48.17	47.53	47.46	47.56	47.82

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Mode of Operation 7: The unit was connected to an AC source, which was connected to the transformer (peripheral) and switch box (peripheral) for the individual operation of the lamps, which then was connected to the EUT. The White lamp was supplied with 48V AC 50Hz supplied via the transformer.

Test Condition: - Stabilisation period of 30 minutes given prior to measurements at 230V 50Hz. Measurements were subsequently taken after 10 minutes at each voltage level. This was found to be an adequate time window for the purpose of the test measurements.

All results are rounded to 2 decimal places.

Mode 7

Watts					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	12.76	12.54	12.50	12.48	12.40
220	13.33	13.12	13.11	13.09	13.02
230	14.04	13.83	13.81	13.79	13.71
240	14.83	14.61	14.60	14.58	14.53
250	15.70	15.48	15.47	15.46	15.38
VA					
Voltage (Vrms)	Sample No.				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
210	27.56	26.73	26.69	26.64	26.93
220	31.02	30.27	30.21	30.19	30.56
230	35.50	34.79	34.65	34.62	34.88
240	41.06	40.36	40.31	40.27	40.75
250	48.05	47.32	47.36	47.46	47.60

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Mode of Operation 8: The unit was connected to an AC source, which was connected to a switch box (peripheral) for the individual operation of the lamps, which then was connected to the EUT. The lamps were individually supplied with either 48V AC 50Hz or 28V AC 50Hz as indicated within the table below. 48V AC 50Hz was supplied to the white light only at the request of manufacturer.

Test Condition: - A sufficient stabilisation period (up to 30 mins) was given prior to each measurement.

All results are rounded to 2 decimal places.

Mode 8

1 Sample Only				
Voltage (Vrms)	Lamp Type	Status	Power (W)	Power (VA)
48	Green	<i>Fully bright</i>	5.95	6.73
28	Green	<i>Dimmed</i>	3.46	3.77
48	Red	<i>Fully bright</i>	3.02	5.01
28	Red	<i>Dimmed</i>	2.84	3.18
48	Amber	<i>Fully bright</i>	3.50	5.09
28	Amber	<i>Dimmed</i>	2.86	3.38
48	White	<i>Fully bright</i>	5.51	6.51

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Ambient temperature range recorded during test period:
18.0°C

Test Equipment

Asset Number	Description	Calibration Date	Calibration Due
AN288	Power Source	-	-
AN1162	Power Analyser	27/07/2015	27/07/2016
AN452	Timer	-	-

Photograph of the Test Item



Measurement Uncertainty

The 95 % confidence measurement uncertainty for AC Power (Analyser) is 0.17%.