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TITLE	SPECIFICATION FOR CONTACTORS FOR PUBLIC LIGHTING	REFERENCE	REV
		CP_TSSPEC_016	2
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**FOREWORD**

Recommendations for corrections, additions or deletions should be addressed to the:

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Box 38766

Booyens

2016

## 1. INTRODUCTION

City Power uses contactors (in conjunction with photoelectric control units) to switch sections of public lights on and off. The contactors are expected to give safe and reliable service in exposed positions for extended periods. A working life of at least 20 years is expected. Failure of this equipment impacts on customer service levels as well as road safety. It is therefore important to ensure that the contactors purchased comply with the required specifications and are of acceptable quality.

## 2. SCOPE

This specification covers City Power's requirements for contactors for use in street lighting applications in accordance with SANS 60947-4-3.

## 3. NORMATIVE REFERENCES

The following documents contain provisions that, through reference in the text, constitute requirements of this specification. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision, and parties to agreements based on this specification are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

SANS 60947-4-3	Low-voltage switchgear and control-gear Part 4-3: Contactors and motor-starters — A.C. semiconductor controllers and contactors for non-motor loads
SANS 60947-1	Low-voltage switchgear and control-gear Part 1: General rules
SANS 60947-2	Low-voltage switchgear and control-gear Part 2: Circuit-breakers
SANS 60947-4-1	Low-voltage switchgear and control-gear Part 4-1: Contactors and motor-starters — Electromechanical contactors and motor-starters
IEC 61000-4 (all parts)	Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques
IEC 61000-4-5	Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test
VC 8036	Amendments to the Compulsory Specification for Circuit -Breakers
ISO 9001	Quality Management System
ISO 14001	Environmental Management Systems
ISO 45001	Occupational Health and Safety Provide Safe and Healthy Workplaces

## 4. DEFINITIONS AND ABBREVIATIONS

The definitions and abbreviations in SANS 60947-4-3 shall apply to this specification.

## **5. REQUIREMENTS**

### **5.1. General**

- 5.1.1      The contactors shall be suitable for operation at a mean altitude of 1 800m in temperatures ranging from -10°C to +65°C.
- 5.1.2      The contactors shall be suitable for operation in an environment subject to frequent dust and electrical storms
- 5.1.3      The contactors shall comply fully with the requirements of SANS IEC 60947-4-3.

### **5.2. Electrical Requirements**

- 5.2.1      The contactors shall have a rated insulation voltage of not less than 600V.
- 5.2.2      The contactors shall have an AC3 rating equal to or exceeding 40A, 80A and 115A as per technical schedule. There will be no relaxation of this requirement, since the application in which the contactors will be used (discharge lighting) is extremely onerous. Once de-rating is taken into account (with  $k = 2,2$ ), the total single-phase AC3 current (continuous current) shall not be less than 88A, 176A and 253A.
- 5.2.3      The contactors shall have a coil operating voltage of not less than 230V ( $\pm 10\%$ ) ac RMS at 50Hz. The connections to the coil shall be brought out to separate terminals. The coil current for normal operation and the power loss during normal operation shall be given in the technical schedules.
- 5.2.4      The contactors shall be capable of switching and carrying inductive lighting loads with a lagging power factor of 0,8.
- 5.2.5      The contactors shall be of the quick-acting, solenoid-operated type conforming to SANS IEC 60947-4-1 and VC 8036.
- 5.2.6      Auxiliary contacts are not required.

### **5.3. Mechanical Requirements**

- 5.3.1      All live parts shall be protected against inadvertent contact by sturdy covers constructed of insulating materials. An IP rating of at least 2X is essential to meet this requirement.
- 5.3.2      Preference will be given to contactors offering protection against tampering and incorrect operation.
- 5.3.3      The contactors shall be designed to be mounted onto a 35mm symmetrical DIN rail.

#### **5.4. Packing**

- 5.4.1 All contactors shall be suitably packed in boxes to prevent damage during transport and handling as well as to facilitate storage.

#### **5.5. Documentation**

- 5.5.1 All Documents shall be written in English
- 5.5.2 Full details of the proposed contactor shall be provided – including, but not limited to electrical and mechanical life, maximum reactive switching, dimensions, thermal derating, technical brochures and drawings.
- 5.5.3 Test reports shall be required.

### **6. TESTING**

#### **6.1 Type test**

- 6.1.1 The contactors for Public Lighting shall be type tested as per SANS 60947-4-3.
- 6.1.2 Type tests shall be performed by an independent accredited laboratory.

#### **6.2 Routine test**

- 6.2.1 Routine Test shall be done as per SANS 60947-4-3.

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## **7. QUALITY MANAGEMENT**

A Quality Management System shall be set up in order to assure the quality of the contactors for public lighting solution during design, development, and production and servicing. Guidance on the requirements for a quality management system may be found in the following standards: ISO 9001:2015. The details shall be subject to agreement between the City Power and Supplier/Contractor.

## **8. ENVIRONMENTAL MANAGEMENT**

An Environmental Management Plan/System shall be set up in order to ensure the proper environmental management and compliance of the contactors for public lighting solution during its entire life cycle (i.e. during design, development, production, installation, operation and maintenance, decommissioning as well as Rehabilitation, Recycling or Disposal phase/s). Guidance on the requirements for an environmental management plan/system may be found in ISO 14001:2018 standards. The details shall be subject to agreement between City Power and the Supplier. This is to ensure that the asset created conforms to environmental standards and City Power SHERQ Policy.

## **9. HEALTH AND SAFETY**

A Health and Safety Plan/System shall be set up in order to ensure proper management and compliance of the contactors for public lighting solution during installation, operation, maintenance, and decommissioning phase/s. Guidance on the requirements of a Health and Safety Plan/System may be found in ISO 45001 standards. This is to ensure that the asset/service conforms to standard operating procedures and City Power SHERQ Policy. The details shall be subject to agreement between City Power and the Supplier/Contractor.

**ANNEX A – Bibliography**

None



## **ANNEX B - Revision information**

<b>DATE</b>	<b>REV. NO.</b>	<b>NOTES</b>
Oct.2002	0	First Issue
Nov 2010	1	Addition to Annexure D Addition of 40A small contactor  Inclusion of Quality Management Clause  Inclusion of Environmental Management Clause
June 2022		Testing  Update normative reference  Addition of new work group  Update of Quality Management Clause  Update of Environmental Management Clause  Inclusion of health and safety Clause  Addition of note in Annexure D

**ANNEX C – Item 1 - 40 A Contactor small – SAP NO. 2392**

**Technical schedules A and B**

**Schedule A: Purchaser's specific requirements**

**Schedule B: Guarantees and technical particulars of equipment offered**

Item	Sub-clause of CP_TSSPEC_016	Description	Schedule A	Schedule B
<b>1</b>		Name of manufacturer	Required	
		Place of manufacture	Required	
		Manufacturer's identification reference	Required	
	5.1.3	Specification to which contactor complies	SANS IEC 60947-4-3	
	5.2.1	Rated insulation voltage V	600	
	5.2.3	Rated coil voltage V	230 (± 10%)	
	5.2.2	Rated continuous current (AC3, per pole) A	40	
	5.2.3	Operating coil current mA	Required	
	5.2.3	Continuous power loss during operation W	Required	
		Rated electrical life (operations)	Required	
		Rated mechanical life (operations)	Required	
	5.2.6	Auxiliary contacts	Required	
	5.3.4	Mounting configuration	DIN rail	
	5.5	Documentation supplied Yes/No	Yes	
		Physical dimensions (height, depth)	Required	
	6.	Testing According SANS 60947-4-3	Required	

**Note: Ticks, Cross [✓, X], Astrick [\*], Word [Noted] or TBA ["To Be Advice"] will not be accepted**

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters      Signature

Full name of company: \_\_\_\_\_

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**Deviation schedule**

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Clause	Proposed deviation

**Note: Ticks, Cross [√, X], Astrick [\*], Word [Noted] or TBA ["To Be Advice"] will not be accepted**

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters      Signature

Full name of company: \_\_\_\_\_

**ANNEX C – Item 2 - 40 A Contactor – SAP NO. 5219**

**Technical schedules A and B**

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_016	Description	Schedule A	Schedule B
2		Name of manufacturer	Required	
		Place of manufacture	Required	
		Manufacturer's identification reference	Required	
	5.1.3	Specification to which contactor complies	SANS IEC 60947-4-3	
	5.2.1	Rated insulation voltage V	600	
	5.2.3	Rated coil voltage V	230 (± 10%)	
	5.2.2	Rated continuous current (AC3, per pole) A	40	
	5.2.3	Operating coil current mA	Required	
	5.2.3	Continuous power loss during operation W	Required	
		Rated electrical life (operations)	Required	
		Rated mechanical life (operations)	Required	
	5.2.6	Auxiliary contacts	Required	
	5.3.4	Mounting configuration	DIN rail	
	5.5	Documentation supplied Yes/No	Yes	
	6.	Testing According SANS 60947-4-3	Required	

**Note: Ticks, Cross [✓, X], Astrick [\*], Word [Noted] or TBA ["To Be Advice"] will not be accepted**

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
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**Deviation schedule**

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Item	Clause	Proposed deviation

**Note: Ticks, Cross [√, X], Astrick [\*], Word [Noted] or TBA ["To Be Advice"] will not be accepted**

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters      Signature

Full name of company: \_\_\_\_\_

## **ANNEX C – Item 3 - 80 A Contactor – SAP NO. 5218**

### **Technical schedules A and B:**

**Schedule A: Purchaser's specific requirements**

**Schedule B: Guarantees and technical particulars of equipment offered**

Item	Sub-clause of CP_TSSPEC_ 016	Description	Schedule A	Schedule B
<b>3</b>	5.1.3	Name of manufacturer	Required	
		Place of manufacture	Required	
		Manufacturer's identification reference	Required	
		Specification to which contactor complies	SANS IEC 60947-4-3	
	5.2.1	Rated insulation voltage V	600	
	5.2.3	Rated coil voltage V	230 (± 10%)	
	5.2.2	Rated continuous current (AC3, per pole) A	80	
	5.2.3	Operating coil current mA	Required	
	5.2.3	Continuous power loss during operation W	Required	
	5.2.6	Rated electrical life (operations)	Required	
		Rated mechanical life (operations)	Required	
		Auxiliary contacts	Required	
		Mounting configuration	DIN rail	
	5.5	Documentation supplied Yes/No	Yes	
	6.	Testing According SANS 60947-4-3	Required	

**Note: Ticks, Cross [√, X], Astrick [\*], Word [Noted] or TBA ["To Be Advice"] will not be accepted**

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
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**Deviation schedule**

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Clause	Proposed deviation

**Note: Ticks, Cross [√, X], Astrick [\*], Word [Noted] or TBA ["To Be Advice"] will not be accepted**

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters                      Signature

Full name of company: \_\_\_\_\_

## ANNEX C – Item 4 - 115 A Contactor – SAP NO. 5217

### Technical schedules A and B:

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_016	Description	Schedule A	Schedule B
4	5.1.3	Name of manufacturer	Required	
		Place of manufacture	Required	
		Manufacturer's identification reference	Required	
		Specification to which contactor complies	SANS IEC 60947-4-3	
	5.2.1	Rated insulation voltage V	600	
	5.2.3	Rated coil voltage V	230 (± 10%)	
	5.2.2	Rated continuous current (AC3, per pole) A	115	
	5.2.3	Operating coil current mA	Required	
	5.2.3	Continuous power loss during operation W	Required	
	5.2.6	Rated electrical life (operations)	Required	
		Rated mechanical life (operations)	Required	
		Auxiliary contacts	Required	
		Mounting configuration	DIN rail	
	5.5	Documentation supplied Yes/No	Yes	
	6.	Testing According SANS 60947-4-3 2015	Required	

Note: Ticks, Cross [√, X], Astrick [\*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

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Tenderer's Authorised Signatory: \_\_\_\_\_  
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**Deviation schedule**

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Clause	Proposed deviation

**Note: Ticks, Cross [✓, X], Astrick [\*], Word [Noted] or TBA ["To Be Advice"] will not be accepted**

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**ANNEX D – Stock Items**

**Material Group: STL-ACCS**

Item	SAP No.	SAP Short Description	SAP Long Description
1	2392	CONTACTOR SL 40A 3 PHASE AC3 SMALL	CONTACTOR STREET LIGHT 400V 3 POLE DIN MOUNT 40A PER POLE 3 AC3 230V COIL SMALL CP_TSSPEC_016
2	5219	CONTACTOR SL 40A 3 PHASE AC3	CONTACTOR STREET LIGHT 400V 3 POLE DIN MOUNT 40A PER POLE 3 AC3 230V COIL CP_TSSPEC_016
3	5218	CONTACTOR SL 80A 3 PHASE AC3	CONTACTOR STREET LIGHT 400V 3 POLE DIN MOUNT 80A PER POLE 3 AC3 230V COIL CP_TSSPEC_016
4	5217	CONTACTOR SL 115A 3 PHASE AC3	CONTACTOR STREET LIGHT 400V 3 POLE DIN MOUNT 115A PER POLE 3 AC3 230V COIL CP_TSSPEC_016