SABS

APPROVED INSPECTION AUTHORITY
IN TERMS OF REGULATION 10.1 OF THE MINERALS ACT
(INCORPORATED IN THE MINE HEALTH AND SAFETY ACT
AND REGULATION 9(2) OF HE ELECTRICAL MACHINERY REGULATIONS
OF THE OCCUPATIONAL HEALTH AND SAFETY ACT

Pratley Manufacturing (Pty) Ltd
P O Box 3055
KRUGERSDORP
1745

Date: 20 July 2015

Expiry date: July 2025

IA CERTIFICATE: SABS S/15-0578X

Aluminium Alloy (A/A) Boxes range *(Size no's: 0, 1 and 2)*

Description:

The Boxes range *(Size no's: 0, 1 and 2)* and the accessories were manufactured and supplied by Pratley Manufacturing (Pty) Ltd. The units were manufactured from Aluminium Alloy, containing 7.5% magnesium. Each unit consisted of two main components, the base and lid. Four M5 countersunk Phillips screws were used to tightly secure the lid onto the base. The boxes comprised a gasket fitted between the lid and base to uphold the IP rating. The boxes are available in three different sizes (0,1 and 2) with various cable entry options (Two way, Three way, Four way, Y-type and the H-type). The boxes are powder coated in orange and can also be supplied in black.

Markings

For Size: No 0

Manufacture: Pratley
Type/Model: Aluminium Alloy (A/A)
Size: No 0
Serial No.: All serial number covered by batch examination or covered under SABS mark scheme
I.A No.: SABS S/15-0578X
Ex e II T6 Gb
E nA II T6 Gb (Zone 1 and 2)
Ex t IIIC T85°C Da (Zone 20, 21 and 22)
IP66 rating or IP 68 (2m-cont)

SABS COMMERCIAL SOC Ltd. Reg. No. 2000/013581/30
Directors: Mr J Molobela (Chairman), Dr MJ Ellman, Mr G Harris, Ms V Klein, Ms A Lötter, Mr WK Masvikwa, Dr B Mehlomakulu, Ms N Naraindath, Ms ED Ndlovu, Ms W de Witt (Company Secretary).
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East Coast Region
15 Garth Road, Waterfall Park
PO Box 30087,
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Tel +27 (0) 31 203 2900
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For Size: No 1

Manufacture: Pratley
Type/Model: Aluminium Alloy (A/A)
Size: No 1
Serial No.: All serial number covered by batch examination or covered under SABS mark scheme
I.A No.: SABS S/15-0578X
Ex e II T6 Gb
E nA II T6 Gb (Zone 1 and 2)
Ex t IIIC T85°C Da (Zone 20, 21 and 22)
IP66 rating or IP 68 (2m-cont)

For Size: No 2

Manufacture: Pratley
Type/Model: Aluminium Alloy (A/A)
Size: No 2
Serial No.: All serial number covered by batch examination or covered under SABS mark scheme
I.A No.: SABS S/15-0578X
Ex e II T6 Gb
E nA II T6 Gb (Zone 1 and 2)
Ex t IIIC T85°C Da (Zone 20, 21 and 22)
IP66 rating or IP 68 (2m-cont)

U - Incomplete assembly:
None

X - Special conditions of safe use:
- The unit must be used with Ex approved IP68 cable glands and blanking plugs.

Compliance: The unit as described above and tested/examined in Test Report No:**EPT-150528-00078** is hereby certified "Explosion Protected", and is suitable for use in hazardous locations as stated below, as determined during tests and inspections conducted in accordance with the relevant requirements of SANS Standards: **SANS 60079 "Explosive atmospheres" Part-0: 2009 "Equipment - General requirements", Part-7: 2007 "Equipment protection by increased safety 'e'", Part-15: 2010 "Equipment protection by type of protection 'n'"**and **Part-31: 2009 "Equipment dust ignition protection by enclosure 't'".**

Locations	Zone 1,2/20, 21 & 22	Surfaces
Hazard Frequency	Intermittent as could occur under normal operating conditions in a hazardous area	
Environment	Group II/IIIC	Hydrogen and Conductive dust
Limiting Temp	40°C	

The use of the apparatus in hazardous locations is subject to the following provisions, which shall be adhered to:
i) SANS 10086 requirements;
ii) Any relevant requirements of the MHS Act or the OHS Act;
iii) Codes of Practice enforced in terms of Regulations 21.17.2 of the Minerals Act, by the Chief Inspector of Mines;
iv) Any restrictions and conditions enforced by the Chief Inspector of Mines, Principal Inspector (Group I equipment) or Chief Inspector of Factories (Group II equipment);
v) Any conditions mentioned in the above test report.

Evaluated by: I Kekana
SENIOR TEST OFFICER

Reviewed by: T Matsobe
SENIOR TEST OFFICER

Authorized by: Duke Nene
Manager

EXPLOSION PREVENTION TECHNOLOGY

SABS

TEST REPORT

SANS 60079 "Explosive atmospheres" Part-0: 2009 "Equipment - General requirements", Part-7: 2007 "Equipment protection by increased safety 'e'", Part-15: 2010 "Equipment protection by type of protection 'n'", Part-31: 2009 "Equipment dust ignition protection by enclosure 't'" and SANS 60529: 2001.
(Aluminium Alloy Boxes range *(Size no's: 0 , 1 and 2)*)

Report

Reference No .....: EPT-150528-00078

Tested and Compiled by .....: I Kekana ..... SENIOR TEST OFFICER

Revived and Checked by .....: T Matsobe ..... SENIOR TEST OFFICER

Authorized by .....: DR Nene ..... MANAGER

Date of issue .....: 2015-07-20

Contents .....: Page 1 to 10 Appendix A to C

Testing Laboratory

Name .....: SABS Commercial SOC Ltd - (E.P.T and RM Lab)

Address .....: 1 Dr Lategan Road, Groenkloof, Pretoria, 0001

Customer

Name .....: Pratley Manufacturing (Pty) Ltd

Address .....: Jackson Street, Factoria, Krugersdorp, GP

Test specification

Standard .....: SANS 60079-0: 2009, SANS 60079-7: 2007, SANS 60079-15: 2010, SANS 60079-31: 2009 and SANS 60529:2013.

Testing start date: 28/05/2015 **Testing Completion date:** 10/07/2015

Conclusion

The Aluminium Alloy (A/A) Boxes range *(Size no's: 0, 1, and 2)* **Complied** with the relevant requirements of the above mentioned test specifications.

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SABS Commercial SOC Ltd conducted a conformity assessment pertaining to a sample of the product, commodity or system identified and the outcome recorded in this test report only relates to that specified sample. The conformity assessment outcomes recorded in the test report do not imply SABS Approval of the quality and/or performance of the sample(s) in question and the test results do not apply to any similar sample that has not been tested. (Refer also to the conditions of test printed on the back of this page.) This report may not be reproduced except in full. The authenticity of this report and its contents can be confirmed by contacting the person who signed it.

Item Description

The Boxes range *(Size no's: 0, 1 and 2)* and the accessories were manufactured and supplied by Pratley Manufacturing (Pty) Ltd. The units were manufactured from Aluminium Alloy, containing 7.5% magnesium. Each unit consisted of two main components, the base and lid. Four M5 countersunk Phillips screws were used to tightly secure the lid onto the base. The boxes comprised a gasket fitted between the lid and base to uphold the IP rating. The boxes are available in three different sizes (0,1 and 2) with various cable entry options (Two way, Three way, Four way, Y-type and the H-type). The boxes are powder coated in orange and can also be supplied in black.

General Remarks

- The test results presented in this test report relate only to the item tested.
- Throughout the report a point is used as the decimal separator.
- **Special Condition of use:**
  - ***The unit must be used with Ex approved IP68 cable gland and blanking plugs.***

- As Pratley Manufacturing (Pty) Ltd is a SABS permit holder for the manufacture of Aluminum alloy (A/A) Boxes, this report is considered to cover all identical units as described above and manufactured under the SABS approved quality system.

Test case and verdicts

Test case not applicable to the sample .....: **NA (Not applicable)**

Test sample meets the requirement .....: **P (Pass)**

Test sample does not meet the requirement .....: **F (Fail)**

Test case applicable to the sample .....: **APP (Applicable)**

Test sample not Tested .....: **NT (Not Tested)**

Documentation

The units were detailed on the following Pratley Manufacturing and Engineering (Pty) Ltd drawing:

#	Drwg No	Description	Revision	Date
1.	08041 GA	Ex e/n/t A/A Box – General Arrangement	---	03/15

The original drawing and a copy thereof were endorsed with the official SABS stamp. The copies are kept by SABS and the originals by Pratley.

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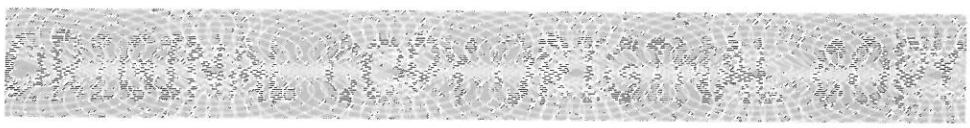


Markings

The units shall additionally be marked and identified as follows:

For Size: No 0

Manufacture: Pratley
Type/Model: Aluminium Alloy (A/A)
Size: No 0
Serial No.: All serial number covered by batch examination or covered under SABS mark scheme
I.A No.: SABS S/15-0578X
Ex e II T6 Gb
E nA II T6 Gb (Zone 1 and 2)
Ex t IIIC T85°C Da (Zone 20, 21 and 22)
IP66 rating or IP 68 (2m-cont)

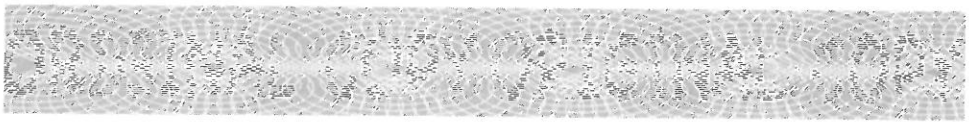
For Size: No 1

Manufacture: Pratley
Type/Model: Aluminium Alloy (A/A)
Size: No 1
Serial No.: All serial number covered by batch examination or covered under SABS mark scheme
I.A No.: SABS S/15-0578X
Ex e II T6 Gb
E nA II T6 Gb (Zone 1 and 2)
Ex t IIIC T85°C Da (Zone 20, 21 and 22)
IP66 rating or IP 68 (2m-cont)

For Size: No 2

Manufacture: Pratley
Type/Model: Aluminium Alloy (A/A)
Size: No 2
Serial No.: All serial number covered by batch examination or covered under SABS mark scheme
I.A No.: SABS S/15-0578X
Ex e II T6 Gb
E nA II T6 Gb (Zone 1 and 2)
Ex t IIIC T85°C Da (Zone 20, 21 and 22)
IP66 rating or IP 68 (2m-cont)

This report relates only to the specific sample(s) tested as identified herein. It does not imply SABS approval of the quality and/or performance of the item(s) in question and the test results do not apply to any similar item that has not been tested. (Refer also to the complete conditions printed on the back of official test report)



Appendix A to Test Report No.: EPT-150528-00078 SANS 60079-0: 2009 & SANS 60079-31: 2009		
No.:	**Requirement – Test**	**Verdict**
1	***Equipment Grouping and Level of Protection (EPL)*** The Aluminium Alloy (A/A) Boxes were tested and evaluated to meet the requirements of Group IIIC equipments, level of protection EPL Da (Zone 20, 21 and 22).	**APP**
2	***Temperatures*** A terminal blocks and a conductor were used as the worst case for heat generation. They were fitted inside the unit and a maximum current was supplied and did not exceed the rated current of the conductor. The units were covered with 500mm of dust from all directions. The measure maximum temperature did not exceed 85°C. Therefore the units were assigned a temperature class of T85°C.	**P**
3	***Joints*** Joints in the structure of the units were evaluated to verify if they fit closely together and they are sealed against the ingress of dust. Also the number of engaged threads for threaded joint employing parallel threads without an additional seal or gasket were evaluated to verify if they were not less than five threads. Also the units mating parts were aligned correctly.	**P**
4.	***Gasket and Seals*** The seals on the cable entries were evaluated to verify if they were of one-piece continuous construction with an uninterrupted periphery and if they were not over stressed. And also if they were protected against external mechanical damages.	**P**
5.	***Thermal Endurance To Heat*** The boxes were manufactured out of metallic material, no further consideration was necessary	**N/A**
6.	***Thermal Endurance To Cold*** The boxes were manufactured out of metallic material, no further consideration was necessary.	**N/A**
7.	***Impact Test*** The samples were subjected to impact energy of 7 Joules conducted in accordance with SANS 60079-0: 2009, clause 26.4.2. No damages were observed after the test.	**P**
8.	***Pressure Test*** A positive pressure of 4kPa was applied to the units for 60 seconds.	**P**

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	And no evidence of damage was observed.	

Appendix A to Test Report No.: EPT-150528-00078 SANS 60079-0: 2009 & SANS 60079-31: 2009		
No.:	**Requirement – Test**	**Verdict**
9.	***Ingress protection (Test for Dust Exclusion)*** The units were tested and evaluated for an IP66 and IP 68 rating test conducted in accordance with the requirements of SANS 60529: 2001. Neither dust nor water entered the samples when tested.	**P**
10.	***Documentation*** The drawings supplied were compared with the physical construction of the actual unit and they were deemed satisfactory.	**P**
11.	***Markings*** The samples shall be marked and identified as shown in page 2 of 5 in this test report under **markings**.	**APP**

This report relates only to the specific sample(s) tested as identified herein. It does not imply SABS approval of the quality and/or performance of the item(s) in question and the test results do not apply to any similar item that has not been tested. (Refer also to the complete conditions printed on the back of official test report)

Appendix A to Test Report No.: EPT-150528-00078

SANS 60079-0: 2009, SANS 60079-7: 2007 and SANS 60079-15.

<table>
<tr><th>No.:</th><th>Requirement – Test</th><th>Verdict</th></tr>
<tr><td>1</td><td><u>Connection facilities</u>

The requirements for external connections, clearances and solid insulation materials are covered by the use of Ex e / Ex n certified terminal block connected to a terminal rail inside the enclosure or by use of certified Pratley Non-Sparking end connectors and sleeves. These connections were protected by the IP68 rating of the enclosure.</td><td>APP</td></tr>
<tr><td>2</td><td><u>Connection facilities for earthing conductors</u>

The continuity of the earth equi-potential bonding system affected by means of embedded Copper Earth Conductors between entries. A connection facility for an earthing conductor was provided inside the enclosure and consisted of a brass cheese head screw, brass washer, - the latter stopping the conductor from self-loosening.</td><td>P</td></tr>
<tr><td>3</td><td><u>Cable entries</u>

The results for the integral armoured cable glands when tested as per Annex B.3.2.1 were as follows:
<table>
<tr><th>Size</th><th>Diameter over Armouring</th><th>Load</th><th>Torque Applied</th><th>1.5 Torque</th><th>Results</th></tr>
<tr><td>0</td><td>10 mm</td><td>200 N</td><td>4 Nm</td><td>6 Nm</td><td>No slip / damage</td></tr>
<tr><td>1</td><td>14.5 mm</td><td>290 N</td><td>4 Nm</td><td>6 Nm</td><td>No slip / damage</td></tr>
<tr><td>2</td><td>18.4 mm</td><td>368 N</td><td>5 Nm</td><td>8 Nm</td><td>No slip / damage</td></tr>
</table>
The results for unarmoured (flexible) cable when tested as per Annex B.3.1 were as follows:
<table>
<tr><td>Size</td><td>Mandrel Size</td><td>Load</td><td>Torque</td><td>1.5 Torque</td><td>Results</td></tr>
<tr><td>0</td><td>6 mm</td><td>120 N</td><td>20 Nm</td><td>30 Nm</td><td>No slip / damage</td></tr>
<tr><td>1</td><td>12.6 mm</td><td>252 N</td><td>40 Nm</td><td>60 Nm</td><td>No damage 1 mm slip</td></tr>
<tr><td>2</td><td>15.7 mm</td><td>314 N</td><td>40 Nm</td><td>60 Nm</td><td>No damage 3 mm slip</td></tr>
</table></td><td>P</td></tr>
</table>

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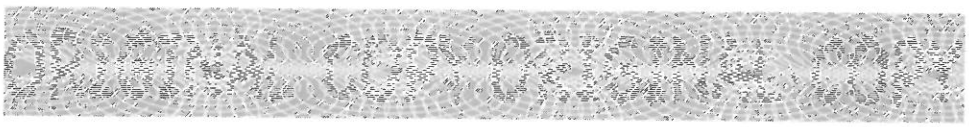

4.	***Resistance to impact*** Impact energy of 7 joules was applied to the integral glands which were terminated with the smallest cable as specified. (As per SABS IEC 60079-0 B3.4). The tests were conducted at -25˚C and 50 ˚C. No damage that would invalidate the type of protection was observed.	**P**
5.	***Temperature Limitations*** The internal temperature limitation of 70˚C at 40˚C ambient was considered as the most significant temperature limitation. See tests that have been conducted on 7 below. Further at T6 rating was considered for the temperature classification. This was a result of temperatures during test, including the bundled internal conductors and the terminal blocks not exceeding 85˚C for the T6 requirement.	**P**
6.	***Degree of protection provided by the enclosure*** The tests below were conducted after the resistance to impact (mechanical) test. The seal is maintained in its position by a groove around the periphery of the base. The tests required were for IP66 and IP68. Verification for the degree of IP protection by enclosures (SANS 60529, sub-clause 13.4, 13.6, 14.1, 14.2.6 and 14.2.8). • IP6X: The unit was positioned inside an enclosed dust chamber. Talcum powder was maintained in suspension around the enclosure which had a vacuum of 2kPa maintained inside it. No dust was observed inside the enclosure at completion of the test. • IPX6: After testing in accordance with SANS 60529, Sub-clause 14.2.6 no water was observed inside the box. • IPX8: Testing in accordance with SANS 60529, Sub-clause 14.2.8 in an approximate water depth of 2m for one hour, no water was observed inside the box. The above IP tests considered the seal of the enclosure and the glands connected to the unit.	**P**
7.	***Rating for General Purpose Connection and Junction Box*** The approach for this enclosure was the rated maximum power value. The rated power (W) was determined as follows: • Testing has been conducted according to SANS 60079-7, Sub-clause 6.7. • The maximum current used did not exceed the rated current of the conductor(s) used. • The 2.5mm^2 terminal blocks and conductors were used as the	**P**

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worst case for heat generation.

- The limiting temperature considered was for the 70˚C for PVC at 40˚C ambient.

The results were as follows:

Enclosure Size	Terminal Size (Number of Terminals)	Enclosure Height (mm)	Enclosure Diameter (mm0	Dissipated Power (W)	Max. Temp Recorded at 40°C ambient	Temperature classification
0	IK 3 (8)	45 mm	89 mm	1.49 watt	62.1˚C	T6
1	IK 3 (10)	49 mm	110 mm	2.39 watt	66.1˚C	T6
2	IK 3 (16)	60 mm	135 mm	3.78 watt	62.4˚C	T6

Note: For more information regarding thermal power dissipation and the maximum number of terminals/ conductors that can be fitted per enclosure, see Annexure E, SANS 60079-7.

8.	***Dielectric Strength Test*** The enclosure did not fail a dielectric strength test at 2600V AC. (The maximum of 550 V AC for the enclosure was considered for this test.).	**P**
9.	***Mechanical Tests*** Degree of protection against external mechanical impacts of 7J was applied on the enclosure body and lid in compliance with SANS 60079-0 Sub-clause 23.4.3 and SANS 60079-15, Sub-clause 26.3.3. No visual damage, invalidating the type of protection, occurred on any impacted part of the enclosure.	**P**
10.	***Temperature Index*** The boxes were manufactured out of metallic material, no further consideration was necessary	**N/A**
11.	***Resistance to Light*** The boxes were manufactured out of metallic material, no further consideration was necessary.	**N/A**
12.	***Fasteners*** The assessment of the requirement for opening the lid only by means of the tool was met by:	**P**

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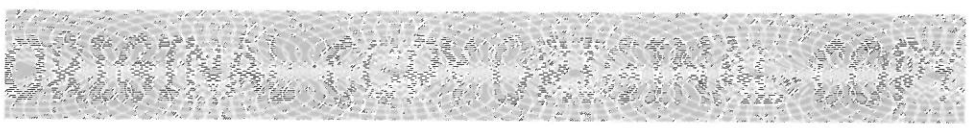

	stainless steel screws.	
13.	***Earthing and Bonding*** Bonding between different cables/ structures was achieved via armoured cables, appropriate gland and the encapsulated copper conductors between the entries of the enclosure. An internal facility was supplied. Earthing continuity was achieved through the internal facility, rail and or via appropriate terminal blockes.	**P**
14.	***Cable and Conduit entries*** A maximum of four cable gland entries was provided with integral glands for use with armoured or flexible cable. These integral glands are capable of maintaining the relevant IP66 and IP68 rating. The cable entry point temperature was not tested. It was assessed that when proper derating values according to the relevant codes of practice are used, the cable entries (branching point) will not exceed 70˚C (80˚C). Considering the maximum dissipation allowed for the enclosure in conjunction with the small number of terminal blocks in the enclosure and the consequent current that may at a single entry point. Also considered for this was the actual temperature tests conducted on the unit for the 70˚C requirement.	**P**

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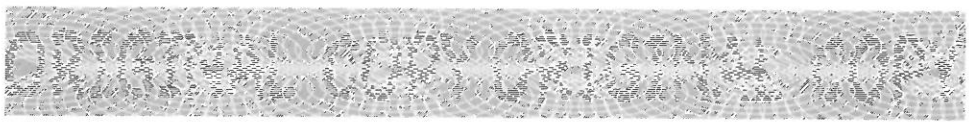
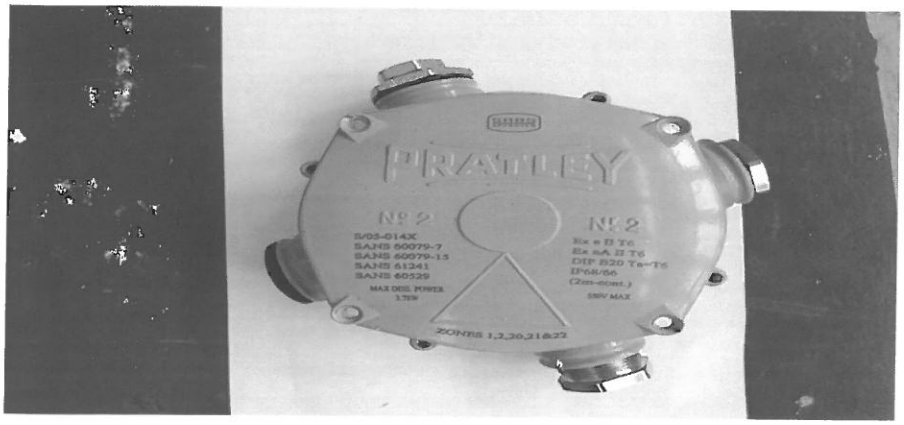


PHOTOGRAPHS

Size No: 0

Size No: 1

Size No: 2



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