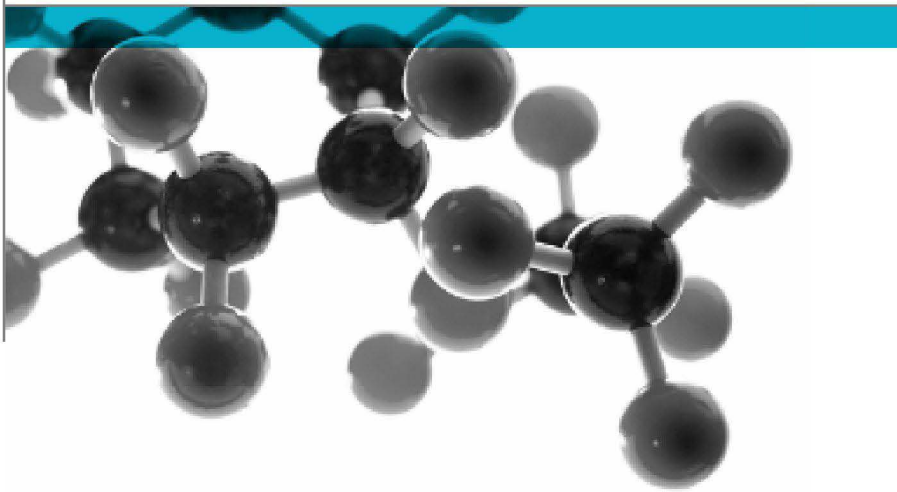


Exova Warringtonapt
Key Industrial Park
Fernside Road
Willenhall
West Midlands
WV13 3YA

T : [REDACTED]
F : [REDACTED]
E : willenhall@exova.com
W: www.exova.com



EN 1154:1997 / A1:2002



TESTS OF :

**ASTRA 3000 SERIES (SIZE 3) CONCEALED
FIXED STRENGTH SINGLE ACTION
CONTROLLED DOOR CLOSING DEVICES**

A Report To: Astra Door Controls Limited
Astra Business Centre
Roman Way
Preston
PR2 5AP

Document Reference: 189810

Date: 19 Jan 2011

Copy: 1

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Testing
Advising
Assuring

Registered Office: Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian EH28 8PL United Kingdom. Reg No.SC 70429
This report is issued in accordance with our terms and conditions, a copy of which is available on request.



0621

TEST CONCLUSIONS

Samples of:

Manufacturer : Astra Door Controls Limited

Product : Concealed door closer

Model : Astra 3000 Series (Size 3)

have been tested in accordance with:

BSEN 1154: 1997./ A1:2002 (Building hardware - Controlled door closing devices.)

By Exova Warringtonapt [A UKAS accredited Testing Laboratory (No. 0621) and EC Notified Body number 1104]

At Key Industrial Park, Fernside Rd., Willenhall. West Midlands. WV13 3YA.

Results and comments as detailed below:

Results as detailed below:

Clause No.	Description	Compliance
5.1	Product information instructions shall contain	
5.1.1	Instructions for installation, regulation and maintenance	Yes
5.1.1	Details of limitation of opening angle	Yes
5.1.2	Power sizes for non-standard applications	Yes
5.2	Performance requirements	
5.2.2	Durability	Yes
5.2.3	Closing moment after 5000 cycles and 500 000 cycles	Yes
5.2.4	Opening moment after 5000 cycles	Yes
5.2.5	Efficiency after 5000 cycles and 500 000 cycles	Yes
5.2.6	Max & min closing time after 5000 & 500 000 cycles	Yes
5.2.6	Change of closing time 5000 cycles to 500 000 cycles	Yes
5.2.7	Angles of operation	Yes
5.2.8	Overload performance at 5000 cycles & 500 000 cycles	Yes
5.2.8	Overload performance for delayed action closers	N/a
5.2.9	Temperature dependence	Yes
5.2.10	Fluid leakage	Yes
5.2.11	Damage	Yes
5.2.12	Latch control (optional)	Yes
5.2.13	Backcheck (optional)	N/a
5.2.14	Delayed closing (optional)	N/a
5.2.15	Adjustable closing force (optional)	N/a
5.2.16	Zero position (double action closers only)	N/a
5.2.17	Corrosion resistance	Yes
5.2.18	Additional requirements for fire door closers	Yes
8	Marking.	Yes

No inferences can be made regarding performance against other requirements of this standard

Tests marked "NA" are not applicable to the type of device under test.

Tests marked "NT" cannot be applied to the type of device under test

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1104

AUTHORISATION

Tests performed by: Steve Wilkes, Deputy Operations Manager	
Report issued by: Steve Wilkes, Deputy Operations Manager	
Signed : 	
Date : 19 January 2011 For and on behalf of Exova Warringtonapt	
Report authorised by: Ian Keeling, Operations Manager	
Signed : 	
Date : 19 January 2011 For and on behalf of Exova Warringtonapt	
Report issued: 19 January 2011	
 0621	<p>NOTE.</p> <p>Tests marked "Not UKAS Accredited" are not covered by the Laboratory UKAS accreditation schedule.</p> <p>Tests marked NT were not tested</p> <p>Tests marked NA are not applicable to the product on test.</p> <p>The laboratory has tested the products supplied by the client as sampled in accordance with their own requirements</p>
Exova Warringtonapt is an EC Notified Body Number 1104	

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TEST DETAILS

CLIENT DETAILS

COMPANY NAME

ADDRESS

Post code

Contact

Astra Door Controls Limited
Astra Business Centre
Roman Way
Preston
PR2 5AP

Philip Gallagher

ORDER DETAILS

Order number

Dated

e-mail

21.02.09

SAMPLE DETAILS

Product

Models

Markings

Manufacturer

Date of Manufacture

Other information

Concealed door closer
Astra 3000 Series
To be confirmed
Astra Door Controls Limited
To be confirmed
None

TEST DETAILS

Test specification

Full test

Test to clauses

Corrosion resistance

BS EN 1154: 1997 – controlled door closing devices

Yes

N/a

Grade 3 (96 hrs)

Date sample received

Date test started

Date test completed

21 December 2009

22 December 2009

23 November 2010

Special Test requirements

Other reports to be used in
conjunction with this report

Closer type:

Full test to BS EN 1154

Chilt/RF06118

backcheck

Delay

Arm configuration:

Mounting:

With latch action

No Back check.

Delayed action Not possible.

N/a. Concealed unit.

Overhead Concealed in door.

STANDARD REQUIREMENTS

Test door mass:

No of cycles:

Closing torque 0 - 4°:

88 - 92°:

any angle:

Opening torque 0 - 60°:

Efficiency 0 - 4°:

60 Kg.

500,000

18-26Nm

6Nm

4Nm

47Nm

55%

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INITIAL OBSERVATIONS

Definitions, Clause 3.1, controlled door closing device must contain all parts necessary for installation and operation.

This sample of door closing device contained:-

	Supplied	Details
Body	YES	Concealed
Arms	NO	N/a
Fixing brackets	NO	N/a
Shoes or straps	NO	N/a
Top centres	NO	N/a
Floor pivots	NO	N/a
Fixing screws	YES	Wood screws supplied
Covers	NO	N/a
Special tools	NO	Not supplied

Clause 5.1: Requirements with regard to product information

Device must be supplied with instructions which must contain the following:-

	Supplied	Details
Clear fixing instructions.	YES	Clear fixing instructions supplied
Instructions for regulation.	YES	Instructions to regulate shown
Instructions for maintenance.	YES	Maintenance instructions shown
Limitations of opening angle.	YES	Written confirmation given
Details of closer power for each application and fixing position.	YES	Size 3 shown

Clause 8 Requirements for marking of closing devices and accessories.

Every closer and accessory must be marked with:-

	Marked	Details
Manufacturers name or trademark or other means of identification.	YES	Written confirmation given
Product model identification.	YES	Written confirmation given
Standard number	YES	Written confirmation given
Week and year of manufacture.	YES	Written confirmation given

Every closer must be marked with Classification according to clause 4:-

Category	Number of test cycles	Test door mass	Fire resistance	Safety	Corrosion resistance
3	8	3	1	1	3
Yes	Yes	Yes	Yes	Yes	Yes

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TEST RESULTS

SAMPLE A

Clause 7.2 General Requirements and operation at extremes of temperature

Clause 5.1 - Product information – see Page 6

Clause 8 – Marking – see Page 6

Clause 5.2.12 –Latch angle (optional). If incorporated must be effective over a maximum range of 15° and shall be adjustable.

Measured latch angle 13°
 Latch effect adjustable YES

CLAUSE 5.2.18. Additional requirements for closers intended for fire or smoke doors.

Requirement	Test information	P = Pass F = Fail
Capable of closing door from any angle to which it may open	105°	P
Size 1 and 2 closers not permitted Adjustable closers must be adjustable up to size 3	Size 3	P
No hold open unless electrically powered.	No hold open	P
Regulators must be either concealed or operated by a tool	Concealed	P
It must not be possible to inhibit closing action without use of a tool.	Not possible	P
Delayed action closers must be capable of adjustment to <120 secs from 120°	Not delayed action	N/a
Must have been subjected to a fire / smoke test	Chilt/RF06118	P

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CLAUSE 7.2.2 Operation at extremes of temperature.

Closer temperature	Conditioning time (8 hours) minimum	Test requirement	Measured closing time - seconds				P = Pass F = Fail
			1	2	3	average	
Sample "A." closer - Size 3		Test door mass 60 Kg					
+20°C	8hrs	set to 5 secs	5.03	5.08	5.09	5.07	P
-15°C	16hrs	3 secs min	17.06	18.00	15.31	16.79	P
+40°C	8hrs	25 secs max	3.41	3.25	3.25	3.30	P

Closer condition after thermal compensation test: Satisfactory.

SAMPLE B

Clause 7.3 Mechanical performance and durability

Operating angle and test settings.

	Test requirement	Test result	P = Pass F =Fail
Closer strength - size	Test door mass 60Kg.	60kg	P
Maximum opening angle	105° grade 3, 180° grade 4	105°	P
Door closes from	105° grade 3, 180° grade 4	105°	P
Door under control from	70° minimum	70°	P
Set closing time 90° to 0°	3 - 7 secs	4.96 secs	P
Set opening time 0 - 90°	2 - 3 secs	2.40 secs	P

Closer cycled for 5000 cycles

Observations on initial cycling of closer up to 5000 cycles:- Satisfactory.

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Clause 7.3.4 Tests after 5000 cycles

Specification	Requirement	Test result	P = Pass F = Fail
Cycles completed	5,000	5,000 cycles	P
Ambient temp.	15 - 30° C	21°C	P
Closer temp	Within 2° of ambient	21°C	P
Opening moment. (ave of 3 tests)	Max opening torque 0 - 4° Nm	21.67Nm	N/a
Closer size 3	Max opening torque 0 - 60° < 47Nm	44.93Nm	P
	Max opening torque 88 - 92°	38.0Nm	N/a
Closing moment. (ave of 3 tests)	Max closing moment 0 - 4° > = 18 < 26Nm	19.17Nm	P
Closer size 3	Max closing torque 88 - 92° > = 6Nm	29.93Nm	P
	Minimum closing torque at any angle > 4Nm	18.83Nm	P
Efficiency	Size 3 closer min value 55%	88%	P
Closing time	Min 3 secs. Max > = 20 secs.	1.84 secs. 2 mins to 70°.	P
Closing overload test	Abuse weight Closing time 90° - 0° set to 10 secs. Overload abuse weight arrest at 15° 10 abuse tests performed	21kg 9.94secs 15° 10 Performed	P
Delayed action tests	Torque to push door from delay zone max 150 Nm min 2*90° torque for size of closer Position of end of delay zone. Delay time adjustable to >20 secs		N/a

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Continued cycling 5000 cycles to 500,000 cycles

Specification	Requirement	Test result	P = Pass F = Fail
Delayed action closers only	Delay time set to 20 secs, Dwell time set to 270 secs Perform 500 cycles Delay time for last 5 cycles 10s – 30 s		N/a
Closing time	Closing time 90° - 0° set to 3 -7 secs	3.42 secs.	P
Backcheck	Opening speed at 60° between 51.6 and 63° / sec. Arrest angle < 80°		N/a
Backcheck closers cycle up to 100,000 cycles with backcheck as set.			N/a
Backcheck	Opening speed at 60° between 51.6 and 63° / sec. Arrest angle < 90°		N/a
Backcheck closers cycle from 100,000 cycles to 500,000 without backcheck			N/a
Nonbackcheck closers cycle from 5000 cycles to 500,000 cycles		500,000 cycles	P

Observations on cycling of closer from 5000 cycles to 500,000 cycles:- No visual signs of any problems.

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Specification	Requirement	Test result	P = Pass F = Fail
Cycles completed	500,000	500,000 cycles	P
Ambient temp.	15 - 30° C	22°C	P
Closer temp	Within 2° of original ambient.	22°C	P
Closing time	< 2* original > 0.7* original	3.12secs(0.91*)	P
Opening moment Closer size	Max opening torque 0 - 4°	22.3Nm	N/a
	Max opening torque 0 - 60° <div style="text-align: right;">< 47Nm</div>	29.5Nm	P
	Max opening torque 88 - 92°	27.0Nm	N/a
Closing moment Closer size 3	Max closing torque 0 - 4° ≥ <div style="text-align: right;">≥ 18 < 26Nm</div>	19.0Nm	P
	Max closing torque 88 - 92° <div style="text-align: right;">≥ 6Nm</div>	20.0Nm	P
	Min closing torque at any angle <div style="text-align: right;">> 4Nm</div>	17.31Nm	P
Efficiency	Size 3 closer Minimum value 55%	85%	P
Closing time	Mjn ≤ 3 secs Max ≥ 20 secs	1.74 secs 2 mins to 60°	P
Closing overload test	Abuse weight, Closing time 90° - 0° set to 10 secs Overload arrest at 15° 10 abuse tests performed.	21kg 10.01secs 15° 10 Performed	P
Delayed action tests	Torque to push door from delay zone max 150 Nm min 2*90° torque for size of closer. Position of end of delay. Delay time adjustable to >20 secs.		N/a

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1.1. Clause 7.4 Sample "C" Corrosion resistance tests

Specification	Requirement	Test result	P = Pass F = Fail
Sample "C"	Closer set to Minimum strength	Size 3	P
Ambient temp.	15 - 30° C	21.5°C	P
Closer temp	Within 2° of ambient	21.5°C	P
Closing moment. (ave of 3 tests) Closer size 3	Max closing moment 0 - 4° > = 18 < 26Nm	25.3Nm	N/a
	Max closing torque 88 - 92° > = 6Nm	22.53Nm	N/a
	Minimum closing torque at any angle > 4Nm	19.85Nm	N/a
Grade of corrosion resistance	Exposure time	96hrs	P
Ambient temp.	15 - 30° C	21.5°C	P
Closer temp	Within 2° of ambient	21.5°C	P
Closing moment. (ave of 3 tests) Closer size 3	Max closing moment 0 - 4° > 80% of above	25.3Nm (100%)	P
	Max closing torque 88 - 92° > 80% of above	22.93Nm (102%)	P
	Minimum closing torque at any angle > 80% of above	20.3Nm (102%)	P

Details of any Visual corrosion or damage during test : Satisfactory.

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UNCERTAINTY OF MEASUREMENT

Clause 7.1.1 of the standard specifies the following tolerances on values:

MASS IN KG	± 2%	LENGTH IN MM	± 2%	ANGULAR POSITION	± 2°
Force in N	± 2%	time in secs	± 5%	temp °C	± 2°C
Moment in Nm	± 2%				

The uncertainty of measurements calculated for a confidence level of 95% throughout these tests are within the limits of these tolerances.

OBSERVATIONS AND COMMENTS

The Astra 3000 series (Size 3) concealed door closer sent for testing fully to BS EN 1154 met with all the temperature dependence, durability and corrosion resistance test requirements with no visual or mechanical signs of any problems.

Written confirmation has been given confirming all markings shall comply with BS EN 1154 requirements.

----- END OF REPORT -----

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