



CE Marking to BS EN 12101-3

**F300 (300°C, 2 hrs), Smokevent Axial Fans
Foot Mount Motors**

Report Number 60942/1

Carried out for
Elta Fans Ltd

By Mark Roper

22 March 2018



CE Marking to BS EN 12101-3

F300 (300°C, 2 hrs), Smokevent Axial Fans
Foot Mount Motors

Carried out for:

Elta Fans Ltd
17 Barnes Wallis Road
Fareham
Hampshire
PO15 5ST

Contract: **Report 60942/1**

Date: **22 March 2018**

Issued by: **BSRIA Limited**
Old Bracknell Lane West,
Bracknell,
Berkshire RG12 7AH UK

Telephone: +44 (0)1344 465600

Fax: +44 (0)1344 465626

E: bsria@bsria.co.uk W: www.bsria.co.uk

Compiled by: Name: Mark Roper Title: Principal Test Engineer BSRIA Test	Checked by: Name: Tom Garrigan Title: Test House Manager BSRIA Test	Approved by: Name: Tom Garrigan Title: Test House Manager BSRIA Test
--	--	---

DISCLAIMER

This report must not be reproduced except in full without the written approval of an executive director of BSRIA. It is only intended to be used within the context described in the text.

This report has been prepared by BSRIA Limited, with reasonable skill, care and diligence in accordance with BSRIA's Quality Assurance and within the scope of our Terms and Conditions of Business.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.



SUMMARY

This report contains information to support the CE marking (in accordance with BS EN 12101-3:2015) of the ventilator range shown in Table 1, for the application classes and temperature/time classification listed.

Table 1 Range Summary

Ventilator Range Details	
Ventilator Manufacturer	Elta Fans Ltd
Ventilator Range Title	Smokevent, Foot Mount Motors
Ventilator Type	Axial
Motor Mounting	Foot
Smallest Diameter Fan	250mm
Largest Diameter Fan	2000mm
Impeller Range 1	
Impeller Range Details	Elta Smokevent Impellers
Smallest Diameter Fan	250mm
Largest Diameter Fan	2000mm
Most Highly Stressed Model	LCS080R2-A3/16/B (800mm, 2 pole, 3 blades)
Motor Range 1 Details	
Motor Manufacturer	Leroy Somer
Motor Range	LSHT Smoke Extraction Motors, 300°C/2 Hours
Smallest Frame, Largest Output	80, 1.1 kW
Largest Frame, Largest Output	160MR, 15 kW
Bearing Fit	C3
Bearing Lubricant	ENS Grease
Motor Range 2 Details	
Motor Manufacturer	Leroy Somer
Motor Range	LSHT Smoke Extraction Motors, 300°C/2 Hours
Smallest Frame, Largest Output	160L, 18.5 kW
Largest Frame, Largest Output	315SP, 75.0 kW
Bearing Fit	C3
Bearing Lubricant	Unirex N3 Grease
Motor Range 3 Details	
Motor Manufacturer	Weg
Motor Range	Smoke Extraction Motors, 300°C/2 Hours, Silicone Varnish
Smallest Frame, Largest Output	80, 1.73 kW (AOR)
Largest Frame, Largest Output	200, 63.3 kW (AOR)
Bearing Fit	C3
Bearing Lubricant	Krytox GPL 226 or Polyrex EM
Motor Range 4 Details	
<i>For current production, this specification is only used for frames from 225 to 315 - for smaller frames, see Range 3</i>	
Motor Manufacturer	Weg
Motor Range	Smoke Extraction Motors, 300°C/2 Hours, Polyester Modified
Smallest Frame, Largest Output	80, 1.73 kW (AOR)
Largest Output	315, 185 kW (AOR)
Bearing Fit	C3
Bearing Lubricant	Krytox GPL 226 or Polyrex EM
Motor Range 5 Details	
<i>Materials spec as for range 3 – included as separate range as tested at a higher voltage and frequency</i>	
Motor Manufacturer	Weg
Motor Range	Smoke Extraction Motors, 300°C/2 Hours, Silicone Varnish, 60 Hz, 460V
Smallest Frame, Largest Output	80, 2.07 kW (AOR)
Largest Frame, Largest Output	200, 58.3 kW (AOR)
Bearing Fit	C3
Bearing Lubricant	Krytox GPL 226 or Polyrex EM
Motor Range 6 Details	
Motor Manufacturer	Teco Electric and Machinery SDN. BHD
Motor Range	High Temperature Resistant Motors, 300°C/2 Hours, 2 pole
Smallest Frame, Largest Output	80, 1.1 kW
Largest Frame, Largest Output	160, 11 kW
Bearing Fit	C4
Bearing Lubricant	High temperature lubricating grease BLP 747

Motor Range 7 Details	
Motor Manufacturer	Teco Electric and Machinery SDN. BHD
Motor Range	High Temperature Resistant Motors, 300°C/2 Hours, 4 and 6 pole
Smallest Frame, Largest Output	80, 0.75 kW
Largest Frame, Largest Output	250, 75 kW
Bearing Fit	C3
Bearing Lubricant	High temperature lubricating grease BLP 747
Test and Application Classes	
BS EN 12101-3 Test Class	F200 F300 (300°C, 1Hr), Unclassified (300°C, 2Hr)
Test Temperature	300°C
Test Time (Hours)	2 Hours
Application Classes	Thermally uninsulated Smoke Reservoir and Non Smoke Reservoir Dual Purpose No Ducted Cooling Air Required Horizontal and Vertical orientation Form A and Form B operation

NOTE: Table 1 is a summary of the major attributes of the declared product range, but does not cover all requirements. The compliance of an individual fan with the above table does not necessarily mean it is part of the approved product range. The definitive range is contained within the manufacturer's submission documents in Appendix A, particularly the Smokevent range given on Pages 19 - 35, Appendix A.

CONTENTS

1	INTRODUCTION.....	7
2	PRODUCT RANGE.....	7
	2.1 Additional Information.....	9
3	SELECTION OF TEST FANS.....	10
4	ANCILLARIES.....	14
5	CONCLUSION.....	15

APPENDICES

APPENDIX: A	MANUFACTURER'S SUBMISSION FILE.....	16
-------------	-------------------------------------	----

TABLES

Table 1	Range Summary.....	4
Table 2	Range Summary.....	7
Table 3	Source of information demonstrating compliance with Clause C.6.2. of EN12101-3.....	9
Table 4	Compliance with clauses of A.1 and A.2 of BS EN 12101-3:2015.....	10
Table 5	Test coverage of fan structure.....	12
Table 6	Test coverage of impeller range.....	13
Table 7	Tested ancillaries.....	14
Table 8	Test and Application Classes.....	15

1 INTRODUCTION

This report is the amalgamation of all the technical and test performance data for the Elta Fans product range – Smokevent axial fans, foot mount motors (Elta designation – PVR 2).

The supplier currently has CE marking of this range under the requirements of BS EN 12101-3:2015. This report extends the range of fans and ancillaries covered, and as such supersedes BSRIA reports 58394/1, dated 19 September 2014, 57613/2, dated 6 January 2014, 19170/18 Edition 3, dated 9 February 2012, 19170/18 Edition 2, dated August 2010, 19170/18, dated August 2006 and 18513B/2, dated April 2005.

2 PRODUCT RANGE

- This report contains information to support the CE marking (in accordance with BS EN 12101-3:2015, clause 3.10, defines the requirements for a powered ventilator product range, including materials, impeller, hub, and motor mounting, with variations in, overall dimensions, impeller variation as laid out in standard, and motor size.
- BS EN 12101-3:2015, clause 3.13, defines the requirements for a three phase motor family for motors of the same construction but allowing variation in, frame size, rotational speed, windings related to speed, and motor mounts, i.e. pad and foot.

Table 2, for the application classes and temperature/time classification listed.

- The data relating to the fans and motors has been reviewed and been found to form ranges as shown in BS EN 12101-3:2015, clause 3.10, defines the requirements for a powered ventilator product range, including materials, impeller, hub, and motor mounting, with variations in, overall dimensions, impeller variation as laid out in standard, and motor size.
- BS EN 12101-3:2015, clause 3.13, defines the requirements for a three phase motor family for motors of the same construction but allowing variation in, frame size, rotational speed, windings related to speed, and motor mounts, i.e. pad and foot.

Table 2, in accordance with the following requirements:

- BS EN 12101-3:2015, clause 3.10, defines the requirements for a powered ventilator product range, including materials, impeller, hub, and motor mounting, with variations in, overall dimensions, impeller variation as laid out in standard, and motor size.
- BS EN 12101-3:2015, clause 3.13, defines the requirements for a three phase motor family for motors of the same construction but allowing variation in, frame size, rotational speed, windings related to speed, and motor mounts, i.e. pad and foot.

Table 2 Range Summary

Ventilator Range Details	
Ventilator Manufacturer	Elta Fans Ltd
Ventilator Range Title	Smokevent, Foot Mount Motors
Ventilator Type	Axial
Motor Mounting	Foot
Smallest Diameter Fan	250mm
Largest Diameter Fan	2000mm
Impeller Range 1	
Impeller Range Details	Elta Smokevent Impellers
Smallest Diameter Fan	250mm
Largest Diameter Fan	2000mm
Most Highly Stressed Model	LCS080R2-A3/16/B (800mm, 2 pole, 3 blades)
Motor Range 1 Details	
Motor Manufacturer	Leroy Somer

Motor Range	LSHT Smoke Extraction Motors, 300°C/2 Hours
Smallest Frame, Largest Output	80, 1.1 kW
Largest Frame, Largest Output	160MR, 15 kW
Bearing Fit	C3
Bearing Lubricant	ENS Grease
Motor Range 2 Details	
Motor Manufacturer	Leroy Somer
Motor Range	LSHT Smoke Extraction Motors, 300°C/2 Hours
Smallest Frame, Largest Output	160L, 18.5 kW
Largest Frame, Largest Output	315SP, 75.0 kW
Bearing Fit	C3
Bearing Lubricant	Unirex N3 Grease
Motor Range 3 Details	
Motor Manufacturer	Weg
Motor Range	Smoke Extraction Motors, 300°C/2 Hours, Silicone Varnish
Smallest Frame, Largest Output	80, 1.73 kW (AOR)
Largest Frame, Largest Output	200, 63.3 kW (AOR)
Bearing Fit	C3
Bearing Lubricant	Krytox GPL 226 or Polyrex EM
Motor Range 4 Details	
<i>For current production, this specification is only used for frames from 225 to 315 - for smaller frames, see Range 3</i>	
Motor Manufacturer	Weg
Motor Range	Smoke Extraction Motors, 300°C/2 Hours, Polyester Modified
Smallest Frame, Largest Output	80, 1.73 kW (AOR)
Largest Output	315, 185 kW (AOR)
Bearing Fit	C3
Bearing Lubricant	Krytox GPL 226 or Polyrex EM
Motor Range 5 Details	
<i>Materials spec as for range 3 – included as separate range as tested at a higher voltage and frequency</i>	
Motor Manufacturer	Weg
Motor Range	Smoke Extraction Motors, 300°C/2 Hours, Silicone Varnish, 60 Hz, 460V
Smallest Frame, Largest Output	80, 2.07 kW (AOR)
Largest Frame, Largest Output	200, 58.3 kW (AOR)
Bearing Fit	C3
Bearing Lubricant	Krytox GPL 226 or Polyrex EM
Motor Range 6 Details	
Motor Manufacturer	Teco Electric and Machinery SDN. BHD
Motor Range	High Temperature Resistant Motors, 300°C/2 Hours, 2 pole
Smallest Frame, Largest Output	80, 1.1 kW
Largest Frame, Largest Output	160, 11 kW
Bearing Fit	C4
Bearing Lubricant	High temperature lubricating grease BLP 747
Motor Range 7 Details	
Motor Manufacturer	Teco Electric and Machinery SDN. BHD
Motor Range	High Temperature Resistant Motors, 300°C/2 Hours, 4 and 6 pole
Smallest Frame, Largest Output	80, 0.75 kW
Largest Frame, Largest Output	250, 75 kW
Bearing Fit	C3
Bearing Lubricant	High temperature lubricating grease BLP 747
Test and Application Classes	
BS EN 12101-3 Test Class	F200 F300 (300°C, 1Hr), Unclassified (300°C, 2Hr)
Test Temperature	300°C
Test Time (Hours)	2 Hours
Application Classes	Thermally uninsulated Smoke Reservoir and Non Smoke Reservoir Dual Purpose No Ducted Cooling Air Required Horizontal and Vertical orientation Form A and Form B operation

- NOTE: BS EN 12101-3:2015, clause 3.10, defines the requirements for a powered ventilator product range, including materials, impeller, hub, and motor mounting, with variations in, overall dimensions, impeller variation as laid out in standard, and motor size.
- BS EN 12101-3:2015, clause 3.13, defines the requirements for a three phase motor family for motors of the same construction but allowing variation in, frame size, rotational speed, windings related to speed, and motor mounts, i.e. pad and foot.
- Table 2 is a summary of the major attributes of the declared product range, but does not cover all requirements. The compliance of an individual fan with the above table does not necessarily mean it is part of the approved product range. The definitive range is contained within the manufacturer's submission documents in Appendix A, particularly the Smokevent range given on Pages 19 - 35, Appendix A.

The information required to comply with the various parts of a to q in Clause C.6.2 of BS EN 12101-3:2015 may be found as indicated in Table 3.

Table 3 Source of information demonstrating compliance with Clause C.6.2. of EN12101-3

Annex C Clause 6.2	Variant	Source
a	Impeller Range 1	Appendix A, pages 18 and 19 - 35
b	Impeller Range 1	Appendix A, pages 18 and 19 - 35
c	Impeller Range 1	Appendix A, pages 19 - 35
d	Impeller Range 1	Appendix A, pages 19 – 35 and 38 (for tip clearances, "Rounded up Min T/C")
e	Impeller Range 1	Appendix A, page 36
f	Impeller Range 1	Appendix A, page 36
g	Motor Ranges 1 & 2 Motor Ranges 3,4 & 5 Motor Ranges 6 & 7	Appendix A, pages 39 and 40 Appendix A, pages 43 – 45 Appendix A, page 48
h	Motor Ranges 1 & 2 Motor Ranges 3,4 & 5 Motor Ranges 6 & 7	Appendix A, pages 39 and 40 Appendix A, pages 43 – 45 Appendix A, page 48
i	Motor Ranges 1 & 2 Motor Ranges 3,4 & 5 Motor Ranges 6 & 7	Appendix A, pages 39 and 40 Appendix A, pages 43 – 45 Appendix A, page 48
j	Motor Ranges 1 & 2 Motor Ranges 3,4 & 5 Motor Ranges 6 & 7	Appendix A, pages 41 and 42 Appendix A, page 46 and 47 Appendix A, pages 49-50
k	Motor Ranges 1 & 2 Motor Ranges 3,4 & 5 Motor Ranges 6 & 7	Appendix A, pages 41 and 42 Appendix A, page 46 and 47 Appendix A, pages 49-50
l	Motor Ranges 1 & 2 Motor Ranges 3,4 & 5 Motor Ranges 6 & 7	Appendix A, pages 41 and 42 Appendix A, page 46 and 47 Appendix A, pages 49-50
m	Ancillaries	Section 4 & Appendix A, page 51
n	N/A	N/A
o	All	Section 2.1
p	All	Section 2.1
q	All	Section 3

2.1 ADDITIONAL INFORMATION

Clauses C.6.2.o and C.6.2.p require the inclusion of the following statements:

o) Recommendation about the supplying electric cable: “the fan shall be supplied by an electric cable which is suitable for smoke exhausting application and for the relevant temperature-time and installation classes”.

p) The following statement: “The tip/running clearances can have a large influence on the aerodynamic performance”.

3 SELECTION OF TEST FANS

The test fans for the above range were selected in accordance the requirements laid out in Annex A of BS EN 12101-3:2002. These are detailed in Table 4, Table 5 and Table 6 below with reference to the relevant BSRIA reports.

Table 4 Compliance with clauses of A.1 and A.2 of BS EN 12101-3:2015

Clause A.1	BS EN requirement	Report	Fan model	Comments
Fan Structure – Foot Mount				
a	Most highly stressed impeller	See Impeller Range Below		
b	Not applicable			
c	At least two sizes at their highest rotational speed	18513/5 18852/8 53490/4 SE003-004-11	LCS040-K2-A10/21 LCS125X4-A12/26.5/B LCS080R2-A3/16/B LCS200X6-A12/37B	All sizes tested at their highest rotational speed
d	Ventilator with smallest motor frame size	18513/5	LCS040-K2-A10/21	
e	Not Applicable			
f	Stress levels by calculation - Sufficient sizes to ensure diameters of range are from 0.63 to 1.27 of those tested	See Table 5		
g	Motors downstream	18513/5 18852/8 53490/4 SE003-004-11	LCS040-K2-A10/21 LCS125X4-A12/26.5/B LCS080R2-A3/16/B LCS200X6-A12/37B	All sizes tested motors downstream
h	Motors Upstream			Approved for motor upstream use
i	Vertical and horizontal installation	18513/5 18852/8 53490/4 SE003-004-11	LCS040-K2-A10/21 LCS125X4-A12/26.5/B LCS080R2-A3/16/B LCS200X6-A12/37B	Vertical Horizontal Horizontal Horizontal
J	Jetfan – at least one example	58728/1	JFU/F4-400-2-SCI	F400 Jetfan
k	Jetfan – test completely assembled	58782/1	JFU/F4-400-2-SCI	F400 Jetfan
l	Reversible fan (symmetrical impeller), test motor downstream	18513/5 18852/8 53490/4 SE003-004-11	LCS040-K2-A10/21 LCS125X4-A12/26.5/B LCS080R2-A3/16/B LCS200X6-A12/37B	All sizes tested motors downstream
m	Electrical devices used in combination with motor			No devices present
n	Use with PWM Converter			Not approved for use with PWM converter
Impeller Range				
a	Most highly stressed impeller	53490/4	LCS080R2-A3/16/B	
b	Not applicable			
c	At least two sizes at their highest rotational speed	18513/5 18852/8 53490/4 SE003-004-11	LCS040-K2-A10/21 LCS125X4-A12/26.5/B LCS080R2-A3/16/B LCS200X6-A12/37B	All sizes tested at their highest rotational speed
d	Ventilator with smallest motor frame size	18513/5	LCS040-K2-A10/21	
e	Not Applicable			

f	Sufficient sizes to ensure diameters of range are from 0.63 to 1.27 of those tested	See Table 6		
Motor Range 1 – Leroy Somer				
A.2	Largest and smallest motor Frame size at the highest ratings	18513/5 18852/7	LCS040-K2-A10/21 LCS071-M2-A14/21/A	Smallest Motor Largest Motor
Motor Range 2 – Leroy Somer				
A.2	Largest and smallest motor Frame size at the highest ratings	18852/6 TUM Report No. 3440	LCS071/R2-A12/20/B LCS180X6-A12/28/B	Smallest Motor Largest Motor
Motor Range 3 - Weg				
A.2	Largest and smallest motor Frame size at the highest ratings	19697/4 19697/3	LCS040K2-A10/33/A LCS125X4-A12/26B	Smallest Motor Largest Motor
Motor Range 4 - Weg				
A.2	Largest and smallest motor Frame size at the highest ratings	18852/1 SE003-004-11	SCS040-K2-A10/33/A LCS200X6-A12/37B	Smallest Motor Largest Motor
Motor Range 5 - Weg				
A.2	Largest and smallest motor Frame size at the highest ratings	54439/3 54439/4	JFSR-CPA 400 2-3 LCS125-R4-A12/29/B	Smallest Motor Largest Motor
Motor Ranges 3, 4 & 5				
Table B.2	Change of Lubricant – Test of motor with highest peripheral bearing speed	53490/8	LCS071R2-A12/32°/B	Substitution of Polyrex EM for Krytox 226 GPL
Motor Range 6 - Teco				
A.2	Largest and smallest motor Frame size at the highest ratings	58128/1 Ed 2 57828/1 Ed 2	APS0402JA3/32 APS0712CA6/18	Smallest Motor Largest Motor
Motor Range 7 - Teco				
A.2	Largest and smallest motor Frame size at the highest ratings	58128/2 Ed 2 57416/2	APS0504JA6/42 APS1404FA12/25	Smallest Motor Largest Motor

Table 5 Test coverage of fan structure

Powered Ventilator Tested	Test Range		Nominal Size mm	Report Number
	Yellow		250	
			315	
			355	
400			400	18513/5
			450	
	Orange		500	
			560	
			630	
			710	
800			800	53490/4
			900	
	Blue	Green	1000	
			1120	
1250			1250	18852/8
			1400	
			1600	
			1800	
2000			2000	SE003-004-11

Table 6 Test coverage of impeller range

Powered Ventilator Tested	Test Range		Nominal Size mm	Report Number
	Yellow		250	
			315	
			355	
400			400	18513/5
			450	
	Orange		500	
			560	
			630	
			710	
800			800	53490/4
			900	
	Blue	Green	1000	
			1120	
1250			1250	18852/8
			1400	
			1600	
			1800	
2000			2000	SE003-004-11

4 ANCILLARIES

The following ancillaries have been temperature tested to the performance requirements of BS EN 12101-3: 2015 and when used in conjunction with the list of smoke extract fans detailed in Appendix A are suitable for use as Class F300 for 120 minutes.

Table 7 Tested ancillaries

Description	Compliance	Report number
Mounting Feet	Yes	18513/1
Spring anti-vibration mounting	Yes	18513/5
Rubber anti-vibration mounting	Yes	18513/5
Matching Flange	Yes	18513/5
Flexible collar high temp SC250	Yes	18513/5
Flexible collar banding SC250	Yes	18513/5
Flexible Collar high temp SC250M	Yes	18852/1
Flexible collar banding SC250M	Yes	18852/1
Silencer	Yes	18513/5
Bell mouth inlet	Yes	18513/7
Motor side guard	Yes	18513/7
Impeller side guard	Yes	18513/7
Non return Damper (Horizontal and Vertical)	Yes	18513/5
Non return Damper (Vertical, Counterbalanced)	Yes	18852/1
Guide Vane	Yes	18852/5
Access Door	Yes	19170/8
Electrical Isolator – Craig & Derricott, 158-RSA0720	Yes	19170/10
Caice Silencer	Yes	57300/1
Venco Silencer	Yes	56612/1
Craig & Derricott Isolator FSDMR0206	Yes	56612/1
Gave Isolator AB55621F4	Yes	56612/1
Bolted Guide Vane	Yes	54439/3
Terminal Box - 160-ISO-01-TYPE	Yes	58782/1
Mounting Foot - 060-JF-SIZE	Yes	58727/1
Mounting Bracket - 260-JF-SIZE	Yes	58727/1

5 CONCLUSION

The Elta Fans product range – Smokevent axial fans, foot mount motors (Elta designation – PVR 2), has passed the required performance tests for the application classes and temperature/time classification listed in Table 8, carried out in accordance with BS EN 12101-3:2015 to cover the range shown in Appendix A.

Table 8 Test and Application Classes

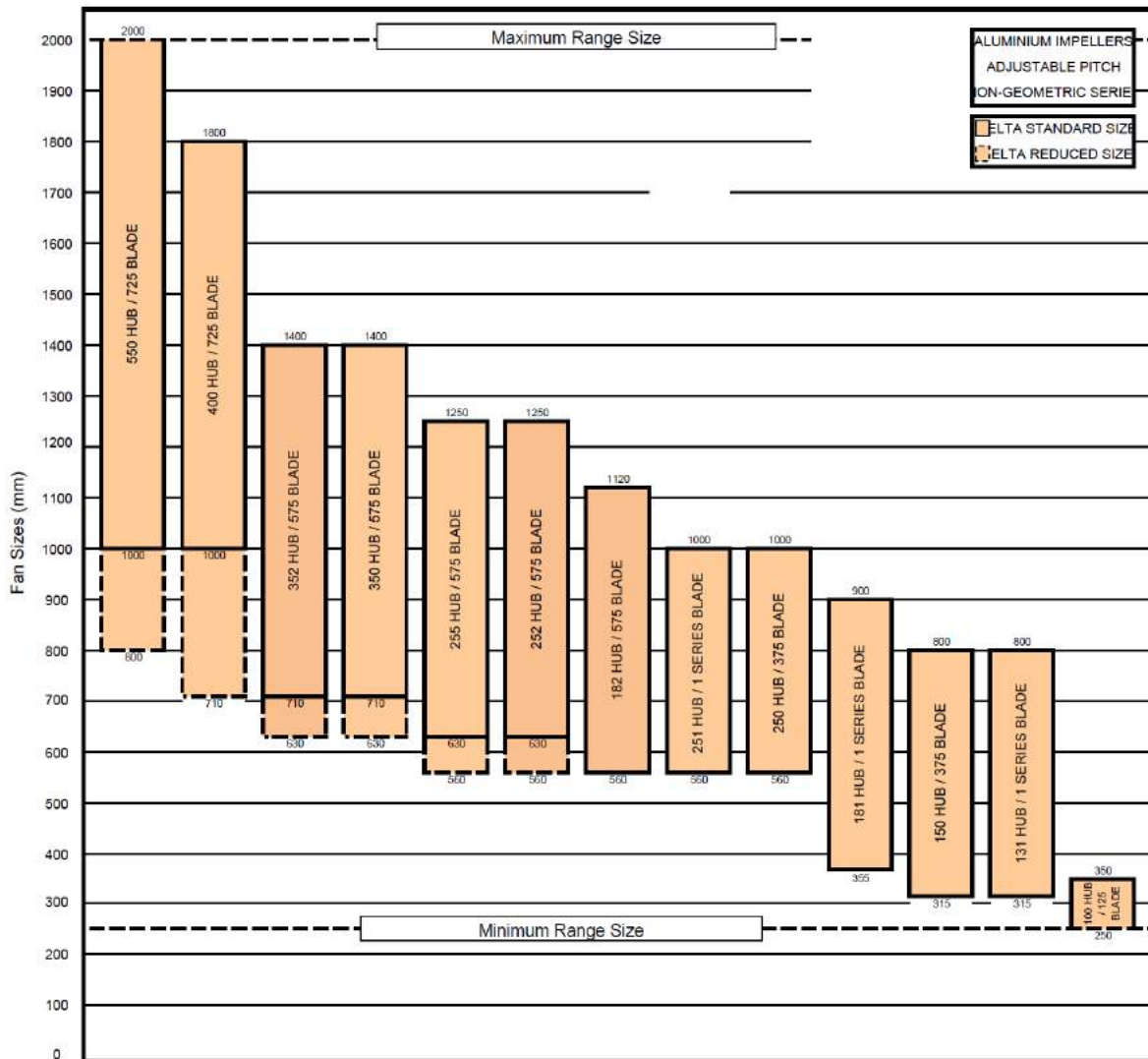
BS EN 12101-3 Test Class	F200 F300 (300°C, 1Hr), Unclassified (300°C, 2Hr)
Test Temperature	300
Test Time (Hours)	2 Hours
Application Classes	Thermally uninsulated Smoke Reservoir and Non Smoke Reservoir Dual Purpose No Ducted Cooling Air Required Horizontal and Vertical orientation Form A and Form B operation

APPENDIX: A MANUFACTURER'S SUBMISSION FILE

This appendix consists of technical data submitted by the manufacturer. It details the specification of the fan range and its components, the test selection criteria, as well as providing details of the individual models available.

EN 12101-3

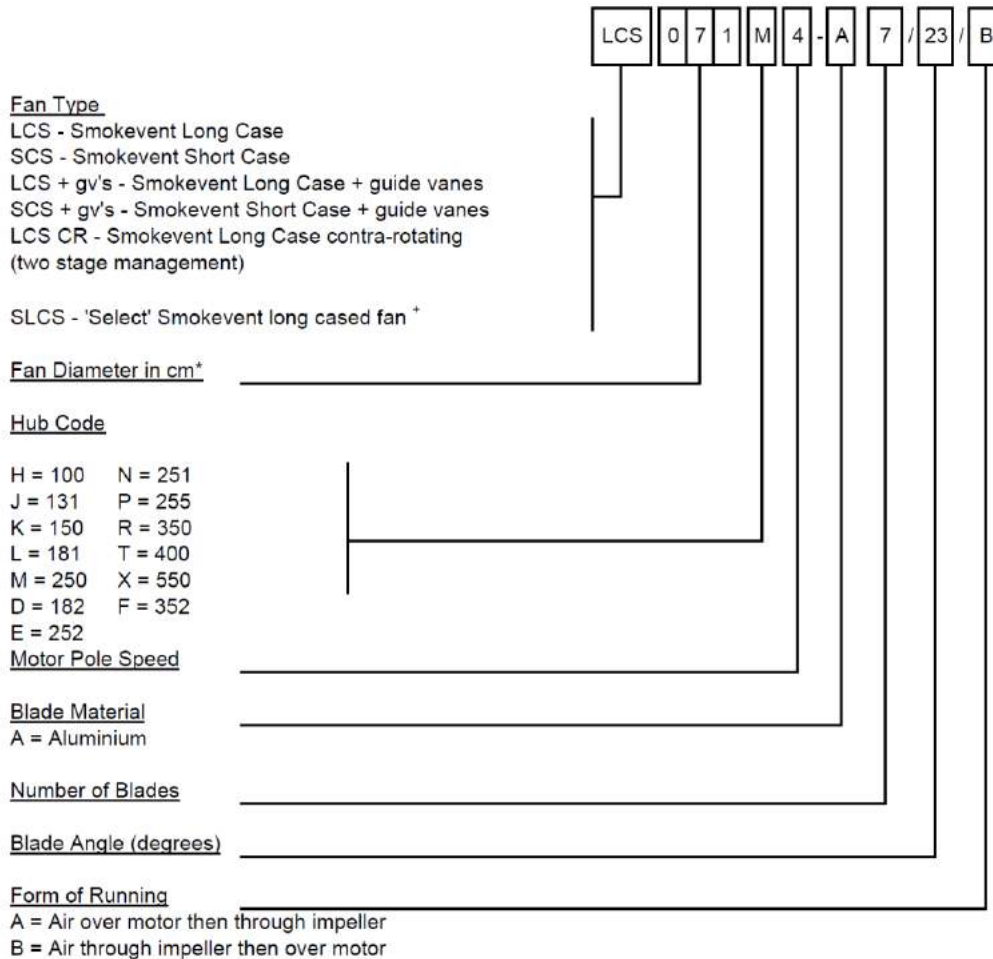
ELTA SMOKEVENT AXIAL FAN RANGE
FOR 300°C & LESS APPLICATIONS



EN 12101-3

SMOKEVENT AXIAL FAN CODES

Note: *These fan range codes are incorporated within an extensive fan coding system utilised by Elta Fans Ltd for its Axial Fan units*



* Elta's standard fan Sizes / Diameters are as follows :-
 250, 315, 400, 500, 560, 630, 710, 800, 900,
 1000, 1120, 1250, 1400, 1600, 1800 & 2000

Intermediate sizes can be manufactured to special order.
 A reduced range of Stock Smokevent fan unit are available within the extensive 'Select' product portfolio

Issue 4

L:/R&D/PHIL/SMOKE/Smokevent Axial Fan Codes ISS4

15/01/2018

Alternative product coding for Elta Fans Malaysia:

Product Type	Elta Fans	Elta Fans Malaysia
Long Case Smoke	LCS	APS
Short Case Smoke	SCS	SCS
Long Case Smoke GV	LCSGV	LCSGV
Short Case Smoke GV	SCSGV	SCSGV
Contra rotating Smoke	LCSCR	APSCR

50 Hz Range

EN Stress Calculator F300 2.1

Available Uni-Directional 50Hz



Table with 15 columns: Fan Model, Speed (rpm), Voltage (V), Power (W), Airflow (m³/s), Static Pressure (Pa), Sound Power Level (dB), Sound Pressure Level (dB), Weight (kg), Dimensions (mm), etc. Rows include various fan models like 181 50Hz, 182 50Hz, 250 50Hz, and 260 50Hz.

I:\R&D\DATA\Smokevent\Smoke Equation Sheets\EN12101 Smokeevent\EN Stress Calculator F300 2.1

15/12/2017

50 Hz Range

EN Stress Calculator F300 2.1

Available Uni-Directional 50Hz



Table with columns for fan speed (Hz), voltage (V), current (A), power (W), and efficiency (%). Rows include various fan models like Aerofol 575, Aerofol 725, and Aerofol 855 across different specifications.

I:\R&D\DATA\Smokevent\Smoke Equation Sheets\EN12101 Smokevent\EN Stress Calculator F300 2.1

15/12/2017

60 Hz Range

EN Stress Calculator F300 2.1

Available Uni-Directional 60Hz



Table with columns for pressure (Pa), velocity (m/s), and various performance metrics for different fan models and configurations.

I:\R&D\DATA\Smokevent\Smoke Equation Sheets\EN12101 Smokevent\EN Stress Calculator F300 2.1

22/08/2013

60 Hz Range

EN Stress Calculator F300 2.1

Available Uni-Directional 60Hz



Table with columns for speed (560-1250), frequency (252-255 60Hz), number of poles (4, 6, 8), fan type (Aerofol 575), and various performance metrics (181.0, 155, 2844.7, etc.).

I:\R&D\DATA\Smokevent\Smoke Equation Sheets\EN12101 Smokevent\EN Stress Calculator F300 2.1

22/08/2013

EN Stress Calculator

Cross Sectional Areas



Hub and Blade Cross Sectional Area								
Hub	Fan Size	Hub CSA	Blade CSA		Hub	Fan Size	Hub CSA	Blade CSA
131	250	427	564.4		252	500	724.5	1041.0
	315		533.1			560		1005.7
	400		498.8			630		967.6
	450		480.8			710		927.7
	500		464.0			800		887.0
	560		445.6			900		846.5
	630		426.4			1000		810.1
	710		406.8			1120		770.7
	762		395.1			1250		732.7
	800		387.0					
150	315	257	447.9		255	560	526	1008.5
	400		416.3			630		970.2
	450		402.0			710		930.1
	500		389.1			762		905.9
	560		375.4			800		889.2
	630		362.6			900		848.4
	710		351.9			1000		811.8
	762		346.0			1120		772.2
	800		341.9			1250		734.0
	900		334.7					
181	315	416	556.6		350	630	579.9	1023.0
	355		518.3			710		978.2
	400		498.8			762		951.2
	450		480.8			800		932.5
	500		460.9			900		887.0
	560		439.9			1000		846.5
	630		418.7			1120		803.2
	710		406.3			1250		761.4
	762		397.7			1400		720.1
	800		377.2					
182	500	888.1	1000.0		352	630	729.4	1023.0
	560		967.6			710		978.2
	630		932.5			762		951.2
	710		895.7			800		932.5
	762		858.2			900		887.0
	800		820.6			1000		846.5
	900		786.6			1120		803.2
	1000		749.5			1250		761.4
250	500	267	409.5		400	710	804	2743.8
	560		392.6			762		2691.3
	630		375.3			800		2656.3
	710		359.2			900		2572.5
	762		351.2			1000		2496.0
	800		346.3			1120		2410.1
	900		335.2			1250		2324.2
	1000		327.9			1400		2234.9
251	500	432	503.4		550	1600	712	2129.2
	560		481.3			1800		2031.0
	630		457.9			800		2813.5
	710		434.1			900		2702.9
	762		420.3			1000		2613.2
	800		410.9			1120		2518.4
	900		388.3			1250		2424.0
	1000		368.9			1400		2324.2
				1600	2207.3			
				1800	2104.1			
				2000	2008.4			

EN 12101-3 : 2002

Consideration of Axial Fan Tip Clearances - 300°C

Fan Ø (mm)	Min T/C at 20°C (mm)	Max Imp. Ø (mm)	Imp. Expansion for Δt = 280°C (mm)	Impeller Δ T/C (mm)	Reservoir Installation (α = 280°C) *			
					Reservoir Installation			
					Casing circumference increase (mm)	Resultant Casing Expansion (mm)	Casing + Impeller	
Change in T/C (mm)	Resultant T/C (mm)							
250	4.5	241.0	1.350	-0.675	2.639	0.840	-0.255	4.245
315	4.5	306.0	1.714	-0.857	3.325	1.058	-0.328	4.172
400	5.0	390.0	2.184	-1.092	4.222	1.344	-0.420	4.580
500	5.0	490.0	2.744	-1.372	5.278	1.680	-0.532	4.468
560	5.0	550.0	3.080	-1.540	5.911	1.882	-0.599	4.401
630	5.0	620.0	3.472	-1.736	6.650	2.117	-0.678	4.322
710	5.0	700.0	3.920	-1.960	7.495	2.386	-0.767	4.233
800	5.5	789.0	4.418	-2.209	8.445	2.688	-0.865	4.635
900	6.0	888.0	4.973	-2.486	9.500	3.024	-0.974	5.026
1000	7.0	986.0	5.522	-2.761	10.556	3.360	-1.081	5.919
1120	7.5	1105.0	6.188	-3.094	11.822	3.763	-1.212	6.288
1250	8.5	1233.0	6.905	-3.452	13.195	4.200	-1.352	7.148
1400	9.5	1381.0	7.734	-3.867	14.778	4.704	-1.515	7.985
1600	10.5	1579.0	8.842	-4.421	16.889	5.376	-1.733	8.767
1800	11.5	1777.0	9.951	-4.976	19.000	6.048	-1.952	9.548
2000	12.5	1975.0	11.060	-5.530	21.112	6.720	-2.170	10.330

T/C Tip Clearances

* Mean temperature of the casing wall ;

Under Reservoir Installation - Both the inside and outside of the casing is at 300°C

Under Non Reservoir Installation - The inside of the casing is at 300°C and outside of the casing is at 20°C

* T/C quoted to nearest larger 0.5mm step, which equates to Impeller Ø of 1mm size steps

Material	Coefficient of Expansions, α (10 ⁻⁶)
Mild Steel	12
Cast Al.	20

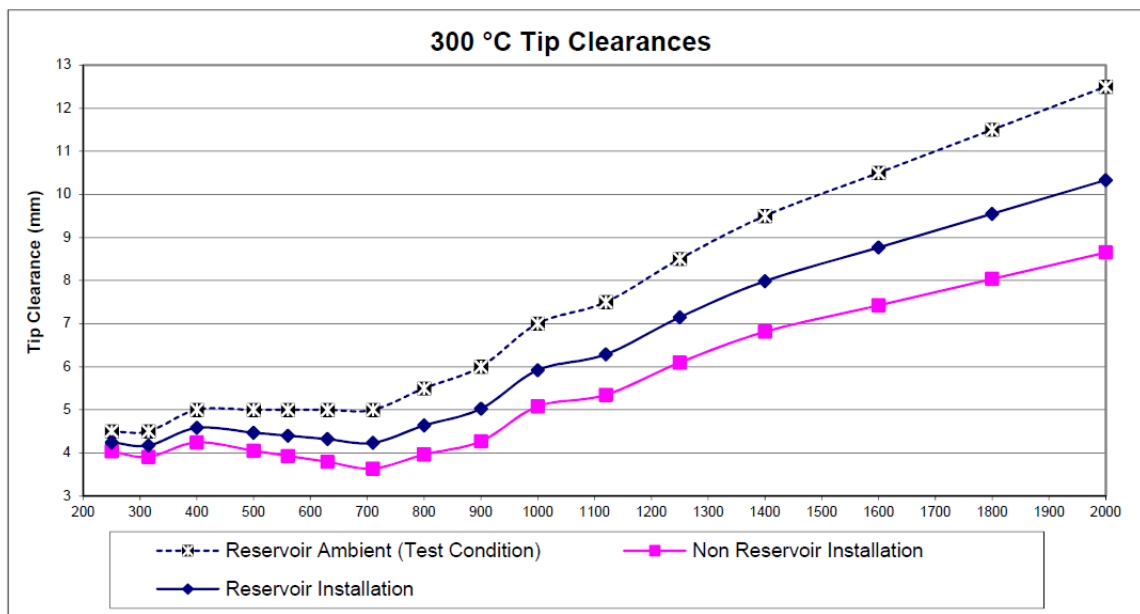
Material Coefficient of Expansion used in this

Material Expansion (mm) = α . ΔT . 1000 . α

Where ; Ø - Diameter (mm)
 ΔT - Temperature Difference (°C)
 α - Coefficient of Expansion

Non Reservoir Installation ($\Delta T = 140^{\circ}\text{C}$) *			
Non Reservoir Installation			
Casing circumference increase (mm)	Resultant Casing Expansion (mm)	Casing + Impeller	
		Change in T/C (mm)	Resultant T/C (mm)
1.319	0.420	-0.465	4.035
1.663	0.529	-0.592	3.908
2.111	0.672	-0.756	4.244
2.639	0.840	-0.952	4.048
2.956	0.941	-1.070	3.930
3.325	1.058	-1.207	3.793
3.747	1.193	-1.364	3.636
4.222	1.344	-1.537	3.963
4.750	1.512	-1.730	4.270
5.278	1.680	-1.921	5.079
5.911	1.882	-2.153	5.347
6.597	2.100	-2.402	6.098
7.389	2.352	-2.691	6.809
8.445	2.688	-3.077	7.423
9.500	3.024	-3.464	8.036
10.556	3.360	-3.850	8.650

Reservoir to Non Reservoir Installation		
T/C Difference (mm)	Required min T/C for fan use in either category (mm)	Rounded-Up Min T/C (mm) ⁺
0.210	4.710	5.0
0.265	4.765	5.0
0.336	5.336	5.5
0.420	5.420	5.5
0.470	5.470	5.5
0.529	5.529	6.0
0.596	5.596	6.0
0.672	6.172	6.5
0.756	6.756	7.0
0.840	7.840	8.0
0.941	8.441	8.5
1.050	9.550	10.0
1.176	10.676	11.0
1.344	11.844	12.0
1.512	13.012	13.5
1.680	14.180	14.5



Issue 1 L:\R&D\DATA\MISC\NASH'S\Consideration of Axial Fan Tip Clearances (300°C).xls2 12/08/2014


EN 12101-3:2002

Leroy Somer Smoke Motor Ranges – 300 °C**Salient Points.**

- Motor ranges have been independently tested to EN 12101-3 AnnexD by CTICM, which included tests at 50 Hz, 60Hz & with Inverter use.
- All motors are for dual use, i.e. Normal and emergency use.
- Motor build standard is 300°C for 2 hours.
- Aluminium frames with Cast Iron end-shields for 300°C and below and total Cast Iron build for 400°C.
- All are foot mounted.
- Option of flying leads or motor terminal box.

Single Speed Motor – Maximum Outputs (kW)

Frame size	Manufacturing works	2Pole	4Pole	6Pole
80	GP	1.1	0.75	0.55
90	GP	2.2	1.5	1.1
100	GP	3.0	3.0	1.5
112	GP	4.0	4.0	2.2
132	GP	7.5	7.5	5.5
160	GP	15	11.0	-
160	M	18.5	15.0	11.0
180	M	22.0	22.0	15.0
200	M	37.0	30.0	22.0
225	M	45.0	45.0	30.0
250	M	55.0	55.0	37.0
280	M	-	-	55.0
315	M	-	-	75.0

 Tested Motors

Note: -

- Quoted powers are the highest available from that frame size, sometimes utilising long core design.
- Leroy GP is manufactured at their Gond Pontouvre works while Leroy M motors are from their Mansle works

Issue 2

12/04/2006

- 2/4 pole - Dahlander winding
- 4/6 pole - Pam wound for GP supply, Dual wound M supply
- 4/8 pole - Dahlander winding

Note: -

- Quoted powers are the highest available from that frame size, sometimes utilising long core design.
- Leroy GP is manufactured at their Gond Pontouvre works while Leroy M motors are from their Mansle works

Issue 2

22/05/2006

EN 12101-3:2002**Leroy Somer Smoke Motor Ranges – 300 °C****Salient Points.**

- Motor ranges have been independently tested to EN 12101-3 Annex D by CTICM, which included tests at 50 Hz, 60Hz & with Inverter use.
- All motors are for dual use. i.e. Normal and emergency use.
- Motor build standard is 300°C for 2 hours.
- Aluminium frames with Cast Iron end-shields for 300°C and below, total Cast Iron build for 400°C.
- All are foot mounted.
- Option of flying leads or motor terminal box.

Two Speed Motor – Maximum Outputs (kW)

Frame size	Manufacturing works	2/4 Pole	4/6 Pole	4/8 Pole
80	GP	0.75/0.17	-	0.75/0.15
90	GP	1.5/0.35	1.1/0.37	1.5/0.25
100	GP	3.0/0.6	2.2/0.75	3.0/0.55
112	GP	4.0/0.8	3/1.1	4/0.75
132	GP	7.5/1.5	5.5/1.8	7.5/1.5
160	GP	9.0/2.5	7.5/2.5	-
160	M	19/4.5	15/5	15/3.8
180	M	24/8.0	22/7.5	22/5.3
200	M	40/14	30/9	30/7
225	M	50/17	34/11	45/11
250	M	-	52/19	55/14
280MD	M	-	-	-
315SP	M	-	-	-

Winding designs

- 2/4 pole - Dahlander winding
- 4/6 pole - Pam wound for GP supply, Dual wound M supply
- 4/8 pole - Dahlander winding

Note: -

- Quoted powers are the highest available from that frame size, sometimes utilising long core design.
- Leroy GP is manufactured at their Gond Pontouvre works while Leroy M motors are from their Mansle works

Issue 2

22/05/2006



HIGH TEMPERATURE MOTORS FOR SMOKE EXTRACT

MOTOR SPECIFICATION 300° 2HRS

Frame size = < 160

GENERIC

Motor type: LSHT manufactured according to EN 60034-1

Voltage: 400 +/- 10% 50hz 3 phase

Continuous operation for Normal Ambient temperature.

One off Emergency Operation at up to 300°C for 2 hours.

ITEM	SPECIFICATION
Carcase and End shields	Aluminium + Cast Iron endshields
Cooling Fan	None or aluminium where used
Coil Insulation	NOMEX
Slot Insulation	NOMEX
SLOT edge insulation	NOMEX + KAPTON + NOMEX
WIRE Insulation	G2 Polyimide enamel
Winding impregnation	Class H varnish
Lead insulation	Silicone impregnated glass lappings + Silicone coated mineral fibre braid
Terminal Block	None or ceramic where used
Insulation class	Class HC (EN 60034-1)
Temperature rise	Class B (EN 60034-1)
Bearing Type	ZZ (see table (a))
Bearing arrangement	DE location
Class of fit	C3
Lubricant	ENS grease

Manufacturing sites:

GOND PONTouvre

Z.I.No3

16015 ANGOULEME – France



HIGH TEMPERATURE MOTORS FOR SMOKE EXTRACT

MOTOR SPECIFICATION 300° 2HRS as per EN 12101-3 (Approval N° 03-H-377)

Frame size 160 M to 280 MD included

GENERIC

Motor type: LSHT manufactured according to EN 60034-1

Voltage: 400 +/- 10% 50hz 3 phase

Continuous operation for Normal Ambient temperature.

One off Emergency Operation at up to 300°C for 2 hours.

ITEM	SPECIFICATION
Carcass and End shields	Aluminium + Cast Iron endshields
Cooling Fan and cover	None or aluminium where used
Coil Insulation	NOMEX
Slot Insulation	NOMEX
SLOT edge Insulation	NOMEX + MYLAR + NOMEX
WIRE Insulation	G2 Polyimide enamel
Winding impregnation	Class H varnish
Lead insulation	Silicone impregnated glass lappings + Silicone coated mineral fibre braid
Terminal Block	None or ceramic where used
Insulation class	Class HC (EN 60034-1)
Temperature rise	Class B (EN 60034-1)
Bearing Type	Regreasable (see table (a))
Bearing arrangement	Locked at DE location
Class of fit	C3
Lubricant	Unirex N3 grease

Manufacturing sites:
MANSLE
St GROUX
16230 MANSLE – France

EN 12101-3:2002**380 to 420 voltage range****50Hz****Single & Two Speed Motors****Weg Smoke Motor Ranges – F300 Classification (Tested for 120 minutes)****Salient Points**

1. Motors are within a certified range having been tested to the requirements on EN 12101-3
2. All motors are dual use, i.e. Normal & Emergency use.
3. Airstream rated higher outputs (AOM) as well as IEC standard outputs are available.
4. Motors to the classification F300, but tested for 120 minutes.
5. Option of pad or foot designs for frames 80 to 315. (Currently pad is the standard build)
6. Single & Two speed variants available as shown.
7. Option of flying leads (standard) or terminal box for motors.
8. AOM ratings quoted below apply only to IE1 (EFF2) motors, and not to IE2

Single Speed Motor – Maximum Outputs (kW)

Frame Size	2 Pole		4 Pole		6 Pole	
	IEC	AOM	IEC	AOM	IEC	AOM
80	1.50	1.73	1.10	1.27	0.55	0.66
90	3.00	3.30	2.20	2.53	1.10	1.32
100	4.00	4.60	4.00	4.40	1.50	1.60
112	7.50	8.25	5.50	6.05	3.00	3.45
132	11.00	12.70	11.00	12.10	5.50	6.60
160	22.00	27.00	22.00	27.00	11.00	13.20
180	30.00	37.00	30.00	33.00	15.00	18.00
200	37.00	44.40	45.00	49.50	22.00	26.40
225	55.00	63.20	55.00	63.30	30.00	36.00
250	n/a	n/a	n/a	n/a	45.00	51.80
280	n/a	n/a	n/a	n/a	132.00	147 (152)
315	n/a	n/a	n/a	n/a	160.00	185 (192)

Reduced AOM ref TST
Test SE003-004

Two Speed Motor – Maximum Outputs (kW)

Frame Size	2/4 Pole		4/6 Pole		4/8 Pole	
	IEC	AOM	IEC	AOM	IEC	AOM
80	1.1/0.25	1.27/0.29	0.75/0.25	0.86/0.29	0.8/0.2	0.92/0.23
90	2.2/0.5	2.58/0.58	1.5/0.37	1.7/0.43	1.6/0.4	1.84/0.46
100	3.1/0.8	3.57/0.92	2.2/0.7	2.53/0.8	2.8/0.7	3.22/0.8
112	4.4/1.1	5.06/1.27	3.0/1.0	3.45/1.15	3.8/1.0	4.37/1.15
132	8.0/2.0	9.2/3.2	6.0/2.2	6.9/2.53	7.2/1.8	8.28/2.07
160	16.0/4.0	18.4/4.6	14.0/4.5	16.1/5.18	14.0/3.5	16.1/4.03
180	25.0/6.3	28.8/7.27	20.0/8.5	23.0/9.78	20.0/5.0	23.0/5.75
200	33.0/8.5	38.0/9.78	26/9.0	29.9/10.4	35.0/8.0	38.5/8.8
225	46.0/12.0	52.9/13.8	50.0/18.0	57.5/20.7	44.0/11.0	50.6/12.7
250	n/a	n/a	n/a	n/a	55.0/14.7	63.6/16.9
280	n/a	n/a	n/a	n/a	n/a	n/a
315	n/a	n/a	n/a	n/a	n/a	n/a

Winding Designs

2/4 Pole	Dahlander Winding
4/6 Pole	Two Windings
4/8 Pole	Dahlander Winding

Note Quoted outputs are the highest available from the stated frames sometimes utilising long core designs.

 Tested Frames/ Outputs

EN 12101-3:2002**380 to 460 voltage range****60Hz****Single Speed Motors****Weg Smoke Motor Ranges – F300 Classification (Tested for 120 minutes)****Salient Points**

1. Motors are within a certified range having been tested to the requirements on EN 12101-3
2. All motors are dual use. i.e. Normal & Emergency use.
3. Airstream rated higher outputs (AOM) as well as IEC standard outputs are available.
4. Motors to the classification F300, but tested for 120 minutes.
5. Option of pad or foot designs for frames 80 to 200. (Currently pad is the standard build)
6. Single & Two speed variants available as shown.
7. Option of flying leads (standard) or terminal box for motors.
8. AOM ratings quoted below apply only to IE1 (EFF2) motors, and not to IE2

380 Volts - Single Speed Motor – Maximum Outputs (kW)

Frame Size	2 Pole		4 Pole		6 Pole	
	IEC	AOM	IEC	AOM	IEC	AOM
80	1.50	1.80	1.10	1.32	0.55	0.66
90	3.00	3.60	2.20	2.64	1.10	1.32
100	3.70	4.44	3.70	4.44	2.20	2.64
112	5.50	6.60	5.50	6.60	3.00	3.60
132	11.00	13.20	11.00	13.20	7.50	9.00
160	22.00	26.40	18.50	24.00	15.00	18.00
180	30.00	37.00	22.00	31.00	18.50	22.20
200	45.00	51.80	45.00	51.80	30.00	36.00

460 Volts - Single Speed Motor – Maximum Outputs (kW)

Frame Size	2/4 Pole		4/6 Pole		4/8 Pole	
	IEC	AOM	IEC	AOM	IEC	AOM
80	1.50	2.07	1.10	1.50	0.55	0.74
90	3.00	3.96	2.20	2.99	1.10	1.56
100	4.00	5.52	4.00	5.28	1.50	2.16
112	7.50	9.35	5.50	6.93	3.00	4.14
132	11.00	14.40	11.00	13.20	5.50	7.56
160	22.00	27.50	18.50	23.10	11.00	15.00
180	30.00	39.60	30.00	39.60	15.00	20.40
200	37.00	50.40	45.00	58.30	22.00	30.00

Note Quoted outputs are the highest available from the stated frames sometimes utilising long core designs.

 Tested Frames/ Outputs

EN 12101-3:2002**380 to 460 voltage range****60Hz****Two Speed Motors****Weg Smoke Motor Ranges – F300 Classification (Tested for 120 minutes)****Salient Points**

1. Motors are within a certified range having been tested to the requirements on EN 12101-3
2. All motors are dual use. i.e. Normal & Emergency use.
3. Airstream rated higher outputs (AOM) as well as IEC standard outputs are available.
4. Motors to the classification F300, but tested for 120 minutes.
5. Option of pad or foot designs for frames 80 to 200. (Currently pad is the standard build)
6. Single & Two speed variants available as shown.
7. Option of flying leads (standard) or terminal box for motors.
8. AOM ratings quoted below apply only to IE1 (EFF2) motors, and not to IE2

380 Volts - Single Speed Motor – Maximum Outputs (kW)

Frame Size	2/4 Pole		4/6 Pole		4/8 Pole	
	IEC	AOM	IEC	AOM	IEC	AOM
80	1.3/0.29	1.5/0.34	0.88/0.29	1.0/0.33	0.94/0.23	1.1/0.26
90	2.6/0.67	2.9/0.67	1.75/0.93	2.0/0.49	1.9/0.47	2.1/0.54
100	3.6/0.93	4.2/1.1	2.6/0.82	3.0/0.94	3.3/0.82	3.8/0.94
112	5.2/1.3	5.9/1.5	3.5/1.2	4.0/1.3	4.4/1.2	5.1/1.3
132	9.4/2.3	10.8/2.7	7.1/2.6	8.2/3.0	8.4/2.1	9.7/2.4
160	18.7/4.7	21.5/5.4	16.4/5.3	18/5.8	16.3/4.1	18.7/4.7
180	29.2/7.4	33.6/8.5	23.4/9.9	26.9/11.4	23.4/5.8	26.9/6.7
200	38.6/9.9	44.4/11.4	30.4/10.5	35.0/12.0	41/9.3	45/10.2

460 Volts - Single Speed Motor – Maximum Outputs (kW)

Frame Size	2/4 Pole		4/6 Pole		4/8 Pole	
	IEC	AOM	IEC	AOM	IEC	AOM
80	1.3/0.29	1.5/0.34	0.88/0.29	1.0/0.33	0.94/0.23	1.1/0.26
90	2.6/0.58	2.9/0.67	1.75/0.43	2/0.49	1.9/0.47	2.1/0.54
100	3.6/0.93	4.2/1.1	2.6/0.82	3/0.94	3.3/0.82	3.8/0.94
112	5.2/1.3	5.9/1.5	3.5/1.2	4/1.30	4.4/1.2	5.1/1.3
132	9.4/2.3	10.8/2.7	7.1/2.6	8.2/3	8.4/2.1	9.7/2.4
160	18.7/4.7	21.5/5.4	16.4/5.3	18/5.8	16.3/4.1	18.7/4.7
180	29.2/7.4	33.6/8.5	23.4/9.9	26.9/11.4	23.4/5.8	26.9/6.7
200	38.6/9.9	44.4/11.4	30.4/10.5	35.0/12.0	41.0/9.3	45/10.2

Winding Designs

2/4 Pole	Dahlander Winding
4/6 Pole	Two Windings
4/8 Pole	Dahlander Winding

Note

Quoted outputs are the highest available from the stated frames sometimes utilising long core designs.



WEG Motor Specification - 300 °C / 120 mins.

380-420V 50Hz 3ph.

Continuous Operation for Normal Ambient Temperature.

Once Off Emergency Extract at up to 300 °C for 120 Minutes.

The information issued in this report defines the generic Motor Specification of the WEG SMOKE EXTRACTION motors used in axial flow fans operating at normal ambient temperature conditions with once off emergency extract at temperatures of up to 300°C for 120minutes.

Item	Specification
Carcase and End Covers	Cast Iron
Cooling Fan	none
Coil Insulation	Nomex – Insulation Class H
Slot Insulation	Nomex – Insulation Class H
Wire Insulation	Polyesterimide + Polyamideimide Overcoat
Winding Impregnation	Silicone Varnish for frames 80-200 inclusive Polyester Modified for frames 225 and above
Lead Insulation	Silicone Rubber braided with fiberglass
Terminal Block (where fitted)	Special Resin
Insulation Class	Class H
Temperature Rise	Class F
Bearing Type	Metal, Cage
Bearing Arrangement	D.E.(Fixed) – N.D.E.(Floating)
Class of Fit	C3
Lubricant	Krytox GPL 226

Sites of manufacture:

Jaraguá do Sul, Brazil

Maia, Portugal

Mexico City, Mexico

Engineering Department - WMO

Reference: 3002HRA – Dec 07th, 2005



WEG Motor Specification - 300 °C / 120 mins.

380-480V 50/60Hz 3ph.

Continuous Operation for Normal Ambient Temperature.

Once Off Emergency Extract at up to 300 °C for 120 Minutes.

The information issued in this report defines the generic Motor Specification of the WEG SMOKE EXTRACTION motors used in axial flow fans operating at normal ambient temperature conditions with once off emergency extract at temperatures of up to 300°C for 120minutes.

Item	Specification
Carcase and End Covers	<i>Cast Iron</i>
Cooling Fan	<i>none</i>
Coil Insulation	<i>Nomex – Insulation Class H</i>
Slot Insulation	<i>Nomex – Insulation Class H</i>
Wire Insulation	<i>Polyesterimide + Polyamideimide Overcoat</i>
Winding Impregnation	<i>Silicone Varnish for frames 80-200 inclusive Polyester Modified for frames 225 and above</i>
Lead Insulation	<i>Silicone Rubber braided with fiberglass</i>
Terminal Block (where fitted)	<i>Special Resin</i>
Insulation Class	<i>Class H</i>
Temperature Rise	<i>Class F</i>
Bearing Type	<i>Metal, Cage</i>
Bearing Arrangement	<i>D.E.(Fixed) – N.D.E.(Floating)</i>
Class of Fit	<i>C3</i>
Lubricant	<i>Polyrex EM</i>

NB – The above specification is valid only for motors utilised on the Elta Fans Group UK Limited range of Car Park Jet Fans and Smoke-vent Fan Units.

Note: Update 19/4/2010 to detail the inclusion of use of 60Hz motors

Sites of manufacture:

Jaraguá do Sul, Brazil

Maia, Portugal

Mexico City, Mexico

Engineering Department - WMO

Reference: 3002H-ELTA-RD-April 19th, 2010

EN 12101-3**380 to 420 voltage range****50Hz****Single & Two Speed Motors****TECO Smoke Motor Ranges – F300 Classification (Tested for 120 minutes)****Salient Points**

1. Motors are within a certified range having been tested to the requirements on EN 12101-3
2. All motors are dual use. i.e. Normal& Emergency use.
3. Motors to the classification F300, but tested for 120 minutes.
4. Foot Mounted
5. Single & Two speed variants available as shown.
6. Option of flying leads (standard) or terminal box for motors.

Single Speed Motor – Maximum Outputs (kW)

Frame Size	2 Pole		4 Pole		6 Pole	
	IEC	AOM	IEC	AOM	IEC	AOM
80	1.10		0.75		0.55	
90	2.20		1.50		1.10	
100	3.00		3.00		1.50	
112	3.70		3.70		2.20	
132	7.50		7.50		5.50	
160	11.00		15.00		11.00	
180			22.00		15.00	
200			30.00		22.00	
225			45.00		30.00	
250			75.00		45.00	

Two Speed Motor – Maximum Outputs (kW)

Frame Size	2/4 Pole		4/6 Pole		4/8 Pole	
	IEC	AOM	IEC	AOM	IEC	AOM
80	0.95					
90			0.75		0.75	
100			1.50		2.25	
112			2.25		3.00	
132			5.63		7.50	
160			12.00		11.25	
180			18.75		18.75	
200			30.00		26.25	
225			41.25		41.25	
250			75.00		67.50	

Note Quoted outputs are the highest available from the stated frames



Tested Frames/ Outputs

TECO TECO ELECTRIC & MACHINERY SDN. BHD.

(373361-P)

Mr Nyo Wee Ann
No 147, Jalan TUDM,
Kampung Baru Subang, 40150
Shah Alam, Selangor, Malaysia.
Tel : +603 78460340
Fax : +603 78421132

12, January 2014.

Dear Sir,

RE : Applicable for TECO supplied High Temperature Resistant motors to Elta Fan Group .

All motors as per catalogue details three phase squirrel cage classes of performance to BS 7346

Part 2 : 1990, specification for powered smoke and heat exhaust ventilators with confirm the

Emergency rating to 300 °C for 120 minutes.

380~415V/3Ph/50Hz Material Chart of Class H :

	<u>Items</u>	<u>Material description</u>
1	Insulating material	Copper Wire : Polyesterimide Overcoat with Polyamideimide. Enamelled Round Copper Wire Lead Wire : Heat Proof Lead Wire (white silicon compound) Insulation Papers : Nomex Insulation Paper by DUPONT Wire connector seat : Special Resin
2	Varnish	Silicone Varnish KR-282
3	Bearings Fit	SKF Bearing ZC3 or equivalent * See Appendix 1.
4	Bearings lubricant	High Temperature Lubricating Grease BLP 747

Temperature rise : SF. 1.0 80 °C By Resistance Method

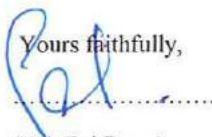
The above motor with its cast iron enclosure type TENV, range 0.75 To 75Kw frame size F80 ~ F250;

Motor performance have been designed, manufactured and tested to meet latest European Standard

Accordance with IEC60034-1, and IEC dimension.

Should you have any query, please don't hesitate to contact us.

Yours faithfully,



(Teh Fui Boon)

TECO ELECTRIC & MACHINERY SDN. BHD.
OEM Manager (373361-P)

Page : 1

□ **Head Office** : PLO 52 (No. 26), Jalan Firma 2/1, Kawasan Perindustrian Tebrau 1, 81100 Johor Bahru, Johor, Malaysia. Tel : 607-354 8008 Fax : 607-354 5017, 607-354 6107
□ **Branch Office** : No. 10, Jalan BP 4/4, Bandar Bukit Puchong, 47120 Puchong, Selangor, Malaysia Tel : 603-8062 2299 Fax : 603-8060 8869

APPENDIX 1.

Those 2 Pole motor bearing will use clearance C4, due to:

- 1.) Greater RPM will create more friction if compare to 4 Pole
- 2.) More clearance for expansion
- 3.) Larger clearance classes of C4 or C5 are used in applications requiring a heavy interference fit or experience high operating temperatures.


TECO ELECTRIC & MACHINERY SDN. BHD.
(373361-P)

Page : 2

EN 12101-3

ACCESSORY RANGE TESTED FOR USE AT 300°C - 2 HOURS DURATION

DESCRIPTION	PRODUCT CODE	ELTA TEST NO	COMMENTS / CONDITIONS
MOUNTING FEET	060-SIZE	TESTS 1,5,6,7,9,13,14,16,17,34,35	
SPRING ANTI-VIBRATION MOUNTING	062-ES CODE	TEST 5	
RUBBER ANTI-VIBRATION MOUNTING	062-TYPE	TEST 5	For use in Non - Reservoir Conditions only due to material temperature limitation
MATCHING FLANGE	061-SIZE	TEST 5,6,9	
FLEXIBLE COLLAR - HIGH TEMP	063-SIZE-SC250	TEST 5 & 6	Test 6 at 400°C for 2 hrs
FLEXIBLE COLLAR BANDING	S25- BANDING/MS	TEST 5 & 6	
FLEXIBLE COLLAR - HIGH TEMP	063-SIZE-SC250M	TEST 9	
FLEXIBLE COLLAR BANDING	SUPPLIED WITH SC250M-ITEM	TEST 9	
SILENCER	068-SIZE-TYPE	TEST 5	
SILENCER	068-SIZE-TYPE-V	TEST 55	Tested at 400°C for 2 hrs
SILENCER	068-SIZE-TYPE-C	TEST 69	Tested at 400°C for 2 hrs
SILENCER	068-C-SIZE-TYPE	TEST 58	Tested at 300°C for 2 hrs
BELL-MOUTH INLET	241-SIZE-BELL	TEST 6	Tested at 400°C for 2 hrs
MOTOR SIDE GUARD	070-SIZE	TEST 6	Tested at 400°C for 2 hrs
IMPELLER SIDE GUARD	078-SIZE	TEST 6	Tested at 400°C for 2 hrs
NON-RETURN DAMPER (FOR HORIZONTAL & VERTICAL AD USE)	019-SIZE-STD	TEST 5	Standard Type
NON-RETURN DAMPER (FOR ALL VERTICAL USE)	019-SIZE-CB	TEST 9	Counterbalanced Type
GUIDE VANE	254-SIZE-TYPE	TEST 14	
BOLTED GUIDE VANE	280-SIZE-TYPE-B	TEST 47 A	Tested at 300°C for 2 hrs
ACCESS DOOR	065-TYPE	TEST 29	Tested at 400°C for 2 hrs
ELECTRICAL ISOLATOR	158-RSA0720	TEST 15&27	Tested at 300°C & 400°C for 2 hrs
ELECTRICAL ISOLATOR	FSDMR0206	TEST 55	Tested at 400°C for 2 hrs
ELECTRICAL ISOLATOR	AB55621F4	TEST 55	Tested at 400°C for 2 hrs
TERMINAL BOX	160-ISO-01-TYPE	TEST 69	Tested at 400°C for 2 hrs
MOUNTING FOOT	060-JF-SIZE	TEST 69	Tested at 400°C for 2 hrs
MOUNTING BRACKET	260-JF-SIZE	TEST 69	Tested at 400°C for 2 hrs

<u>TEST NUMBER</u>	<u>BSRIA Report No:</u>	<u>TEST NUMBER</u>	<u>BSRIA Report No:</u>	<u>TEST NUMBER</u>	<u>BSRIA Report No:</u>
ELTA TEST NO. 1	18513/1	ELTA TEST NO. 15	19114/1 Edition 2	ELTA TEST NO 35	3440
ELTA TEST NO. 5	18513/5	ELTA TEST NO. 16	18852/6	ELTA TEST NO. 47A	54439/3
ELTA TEST NO. 6	18513/7	ELTA TEST NO. 17	18852/8	ELTA TEST 55	56612/1
ELTA TEST NO. 7	18513/8	ELTA TEST NO. 27	19170/10	ELTA TEST 58	57300/1
ELTA TEST NO. 9	18852/1	ELTA TEST NO. 29	19170/8	ELTA TEST 69	58782-1
ELTA TEST NO. 13	18852/5		<u>TU MUNCHEN</u>		
ELTA TEST NO. 14	18852/5	ELTA TEST NO 34	3440		

TYPE / CODE - Indicates specific item ref.

SIZE - Indicates fan size in cms.

All products tested at 300 °C for 2 hours unless specifically stated.