



THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY

BS EN 1789:2007
Certificate of Compliance

This component has satisfied all requirements of paragraph(s) **4.5.9** and **5.4** of BS EN 1789:2007 including Amendment 1 in order to achieve CEN compliance for DYNAMIC TESTING. Appropriate tests have been witnessed by the Vehicle Certification Agency and the specification of the component tested has been documented.

See VCA test report(s): ESS374596

Reason for Extension: Not applicable

1. Make (trade name of manufacturer): Mangar International Limited

2. Type and general description: Battery powered low pressure air compressor,
Mangar Airflo 24

3. Means of Identification: Product data label

4. Location of that Marking: Base of compressor enclosure

5. Category of Vehicle: Not applicable

6. Name and Address of Manufacturer:

Mangar International Limited
Presteigne
Powys
LD8 2UF
United Kingdom

7. If approved as a Separate Technical Unit, Location of that marking: Not applicable

8. Remarks: An information file containing test reports, drawings and statements is held on file at Vehicle Certification Agency

Date: 23 OCTOBER 2017

D LAWLOR
Chief Technical and Statutory Operations Officer



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Test Report: Road Ambulances – Maintain Systems and Fixations of the Equipment in the Patient’s Compartment

Legislation

British Standard BS EN 1789:2007+A2:2014; paragraphs 4.5.9 and 5.4

Test Details

Location of Test: Millbrook Proving Ground Limited, Millbrook, Bedford.
MK45 2JQ United Kingdom
Date of Test: 21 October 2016
VCA Representative(s): Peter Cullingham
Manufacturer’s Representative(s): Bill Thorne
Reason for Test Report: ~~New approval / Extension of approval /~~ Test report only

Manufacturer Details

Name and Address: Mangar International Ltd,
Presteigne,
Powys,
Wales
LD8 2UF
Type: Battery powered low pressure air compressor
Commercial Description: Mangar Airflo 24
Category: M₁ (SC)

Conclusion

The above mentioned whole component was tested in accordance with the above mentioned legislation and was found to comply in all respects. This report relates only to the items tested.

Signature:

Name: Peter Cullingham
Position: Type Approval Engineer
Date: 23 October 2017

List of Annexes

Annex	No of Pages	Subject
I	8	Mangar Information Document
II	2	Millbrook test graphs





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Worst Case Rationale

Compressor unit designed to be side wall mounted on the ambulance.
unit mass: 6.7kg

Mounting symmetrical so only 1 lateral and 1 x forward/rearward test required.
both upwards and downward vertical direction tested.

Millbrook Test No: S14377

Note: Include information on variants and versions this report covers, as applicable

Tests Required

Test of:	Yes, NA, See Report ... / Approval ... / Annex ...
Test 1 – Rear Impact:	Component: Battery powered low pressure air compressor Yes
Test 2 – Frontal Impact:	Not Applicable – See Worst Case
Test 3 – Transverse Left / Out-of-Wall (OOV) Impact: *	Yes – See Test 1
Test 4 – Transverse Right / Into Wall (ITW) Impact: *	Not Applicable – See Worst Case
Test 5 – Vertical Impact:	Yes – See Test 1

(* Delete if not applicable)

Vehicle Identification / Component Specification

Vehicle Identification Number:	Not Applicable
Component Specification:	Battery powered low pressure air compressor (Mangar Airflo 24)

Add additional lines as necessary

Manufacturer’s Documentation

Manufacturer’s documentation is complete and reflects the agreed specification for the vehicle / component(s)* tested, and covers all variants and versions / versions * agreed in the worst case rationale.

Yes

(* Delete if not applicable)

Facility and Equipment Checks

Calibration certificates checked and valid, recorded in the following table:

Yes

Equipment	Serial / Certificate No.	Calibration due*
Sled Accel	ZR30	07 December 2016

*Specify calibrated date + (interval) or calibration due date.





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Test Setup

Component configuration: (Component(s) tests – delete if not applicable)

Configuration (mounting method, etc.):

Mounted to steel cube using components own mounting locations and fixings.

Mass to Simulate Equipment: 6.7 kg

Remarks:

None

Complies Yes / NA

Test Requirements

Test 1 – Rear Impact

Test Setup

Test setup is appropriate and is as shown in the manufacturer’s document and/or as described in “Test Setup”.

Yes

Fixtures present.

Yes

No sharp edges present.

Yes

Pulse meets requirements of BS EN 1789, Figure 10.

Yes

	Requirement	Measured	
Speed:	30 – 32	31.13	km/h
Maximum acceleration:	80 – 120	10.35	m/s ²
Duration *	> 50	50.1	ms

* Continuous period of acceleration over 80 m/s²:

Remarks

None

Test 2 – Frontal Impact

See Test 1

Test 3 – Transverse Left / Out-of-Wall (OOW) Impact

See Test 1





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Test 4 – Transverse Right / Into Wall (ITW) Impact

See Test 1

Test 5 – Vertical Impact

See Test 1

Test Results Complies
Yes / NA

Test Results

Tested item(s)* meet(s)* the requirements of BS EN 1789.
(* Delete as appropriate)

Yes

Test Results					
Tested Item(s)	Test No / Direction of Impact <i>Enter "Pass", "RA" or "-" as appropriate</i>				
	Test 1 Rear	Test 2 Frontal	Test 3 Side L / OOW	Test 4 Side R / ITW	Test 5 Vertical
Battery powered low pressure air compressor	Pass	Pass	Pass	Pass	Pass

Extend/reduce as necessary

Notes on Test Results

Notes on Test Results	
Tested Item(s)	Notes
Battery powered low pressure air compressor	None

Extend/reduce as necessary

Remarks

None

Note: VCA apply measurement uncertainty to calibrated items but not test results.



VCA Job number: ESS374596, ECE:10, type: Compressor Unit.

Manufacturers Information Document: CEN 1789 Rescue Systems: Components

Paragraph 4.5.9 & 5.4 – 10g

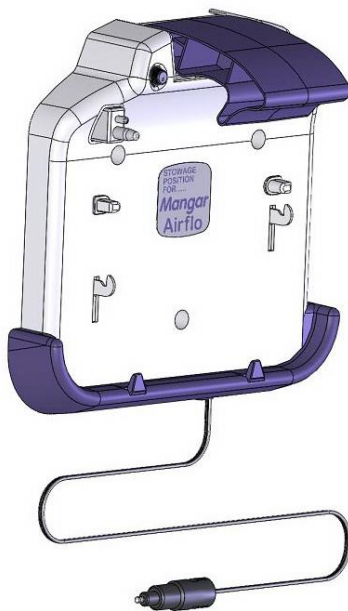
0. GENERAL

- 0.1 Make: Mangar International Ltd
- 0.2 Type: Battery powered low pressure air compressor:
- 0.2.1. Commercial Name: Mangar Airflo 24
- 0.3 Means of identification of type: Product Data Label:
- 0.3.1. Location of that marking Base of compressor enclosure:
- 0.5 Name and address of manufacturer Mangar international,
Presteigne, Powys, Wales LD8 2UF:
- 0.8 Assembly Plant: Mangar international,
Presteigne, Powys, Wales LD8 2UF

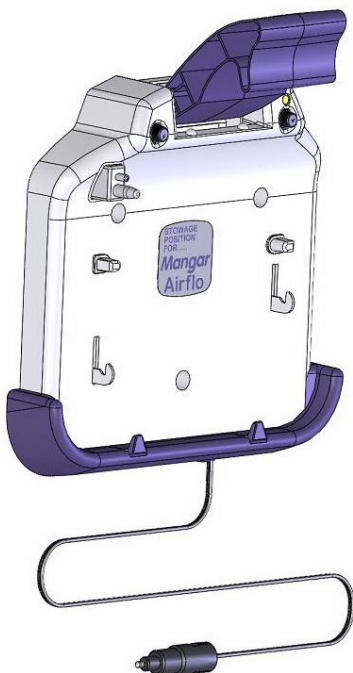
1. GENERAL CONSTRUCTION AND CHARACTERISTICS OF THE COMPONENT

1.1 Photographs and/or drawings of a representative component:

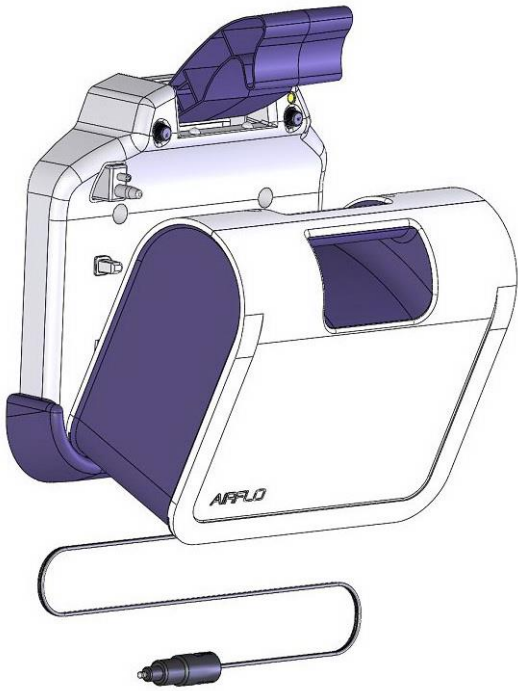
Overview



Stowage Board fitted to Passenger compartment wall



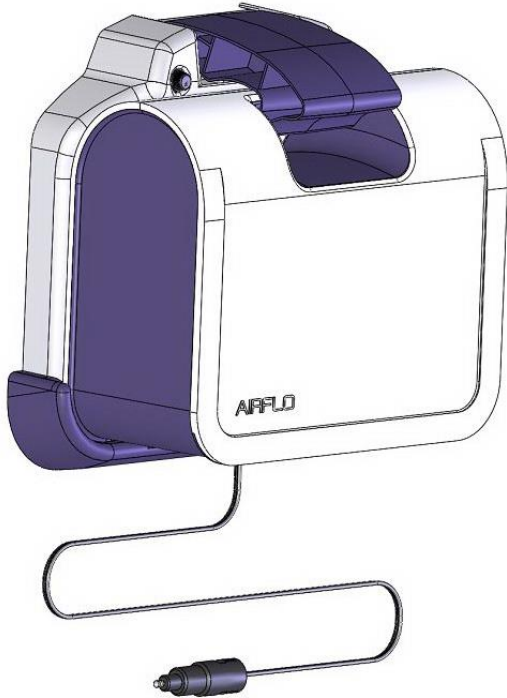
Locking latch lifted



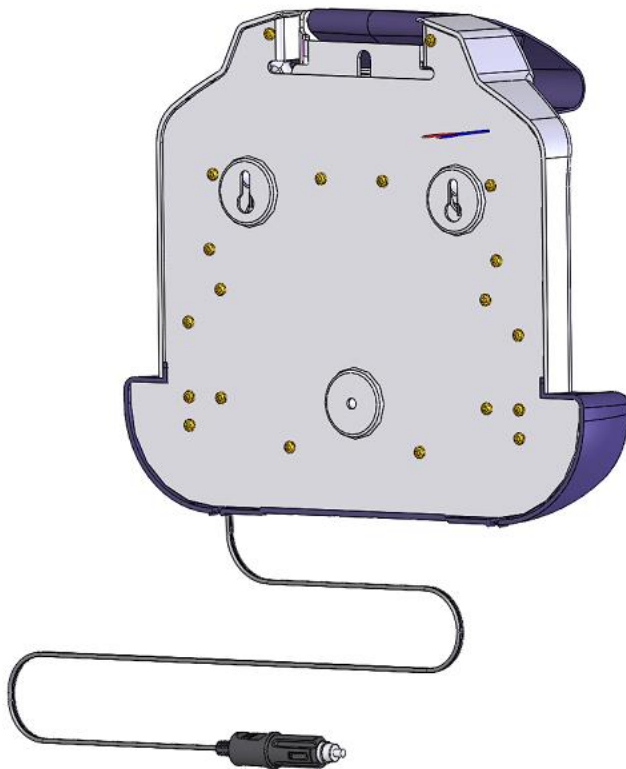
Airflo 24 loading into Stowage board



Loaded but not locked in position



Airflo 24 locked into travelling position



Bulkhead mounting positions



THIRD ANGLE		DO NOT SCALE	DRAWING NUMBER CD0102-01	SHEET 1 OF 1	ISSUE 01
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	CD0154	Airflo 24 In-Vehicle Stowage - Common Sub- Assembly	1
2	CD0262	Retaining Plate, Latch Hook	1
3	CA0199	Cable Assembly, vehicle power, DIN ISO 4165 Plug	1
4	6mmX30mm	Screw 6x20 Pan Posi Steel PlasTech 30 ZP	4
5	FQ0073	Screw Plastech 4 dia x20 lg BZP Pan T-Drive	18
6	GA0057	Non Threaded Spacer - , White, 20.0 mm	1
7	BP0152	Poly Bag - Bathing Cushion - 430 x 660 x 125mm	1
8	CD0272	Label packaging Stowage board DIN	1
9	CD0205	Latch hook Sub assembly	1
10	MI0356	Airflo Stowage - catch fitting instructions	1
11	MI0363	Airflo Stowage - catch fitting instructions	1
12	CD0158	CD0158 - Stowage	1
13	CD0162	Backplate	1
14	CD0236	Spring retainer plate	1

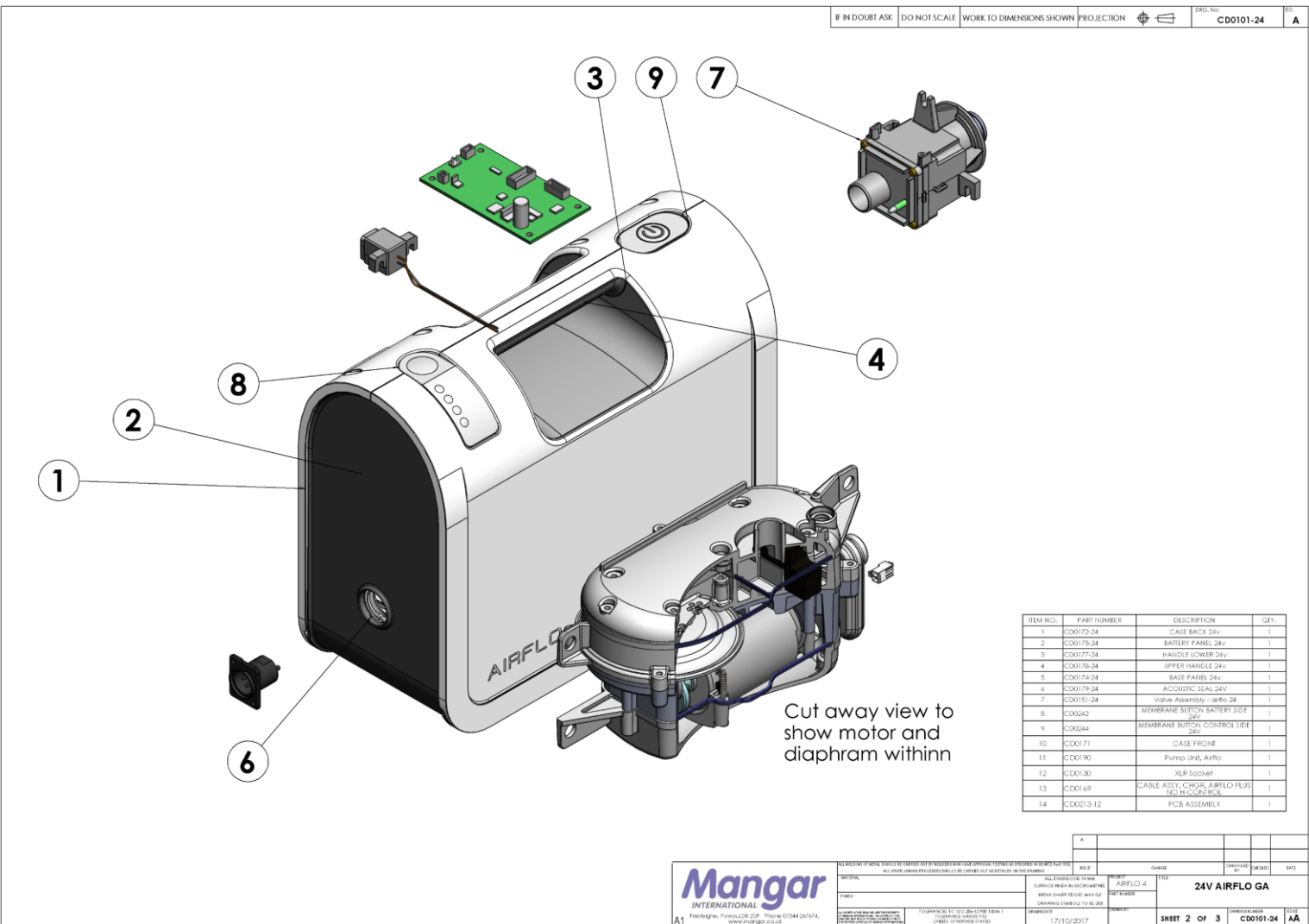
01	RELEASED TO PRODUCTION	WJT	GA	14/03/2017
ISSUE	CHANGE	CHANGED BY	CHECKED	DATE

	ALL WELDING OF METAL SHOULD BE CARRIED OUT BY WELDERS WHO HAVE APPROVAL TESTING AS SPECIFIED IN BS 4872 Part 1:1982 ALL OTHER JOINING PROCESSES SHOULD BE CARRIED OUT AS DETAILED ON THE DRAWING	ALL DIMENSIONS IN MM SURFACE FINISH IN MICROMETRES BREAK SHARP EDGES MAX 0.5 DRAWING SYMBOLS TO BS 308	PROJECT AIRFLO 4	TITLE Airflo 24 Vehicle Mounting and recharging point - with DIN ISO 4165 connector
	SEE BILL OF MATERIALS	TOLERANCES TO ISO 284-1:2010 Table 1 TOLERANCE GRADE IT12 UNLESS OTHERWISE STATED	DRAWN DATE 14/03/2017	DRAWN BY WJT

A3	Presteigne, Powys, LD8 2UF Phone 01544 267674, www.mangar.co.uk	SHEET 1 OF 1	DRAWING NUMBER CD0102-01	ISSUE 01
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23-06-17



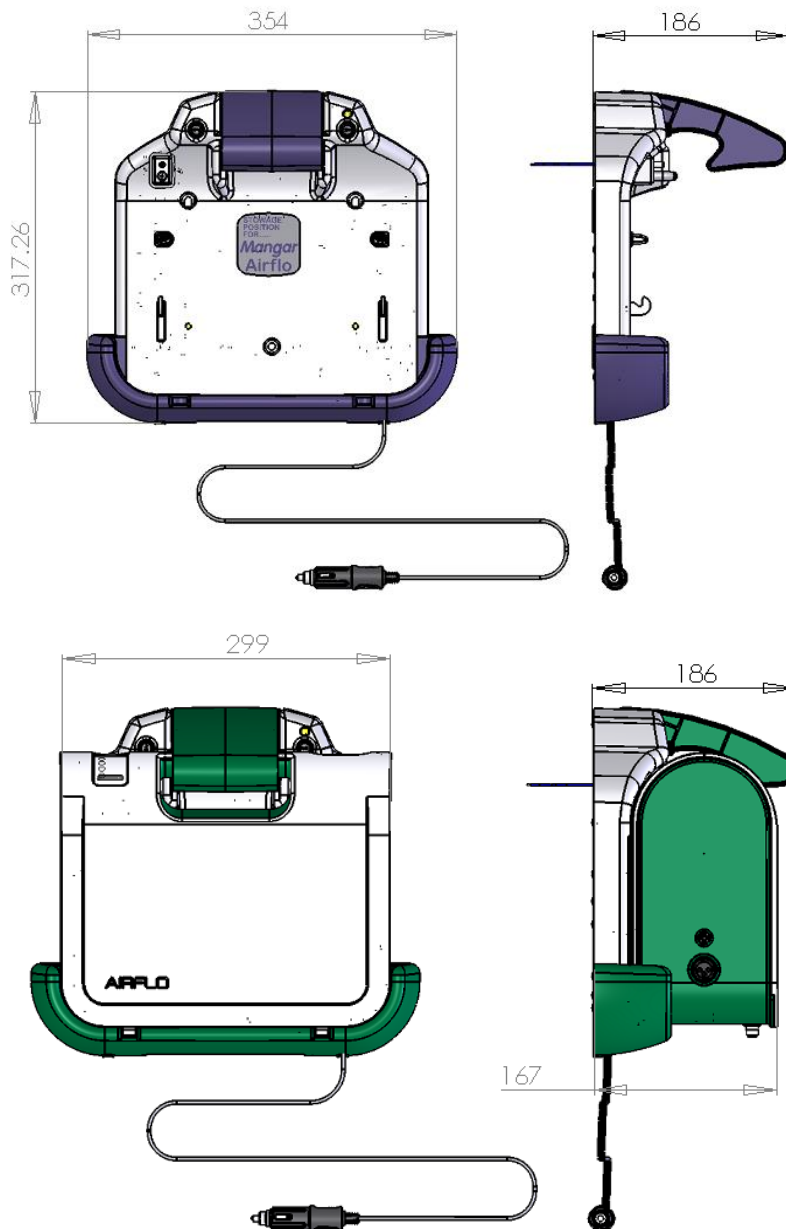
Mangar
 INTERNATIONAL
 Presteigne, Powys LD8 2UF Phone 01544 267674
 www.mangar.co.uk

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REF: AIRFLO 4 TITLE: 24V AIRFLO GA
 DATE: 17/10/2017 SHEET 2 OF 3 DRAWN BY: CD0101-24 CHECKED BY: AA

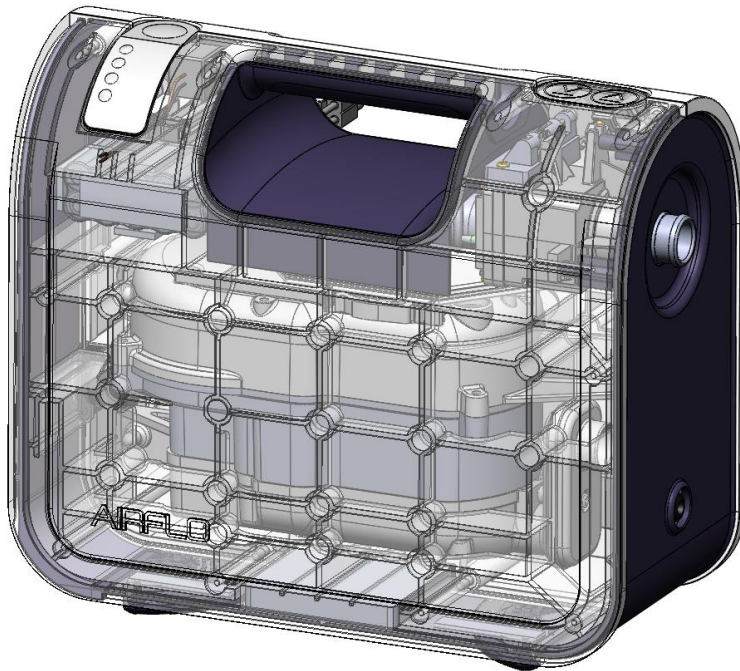
2 MASS AND DIMENSIONS (in kg and mm)

2.4 Range of component dimensions:



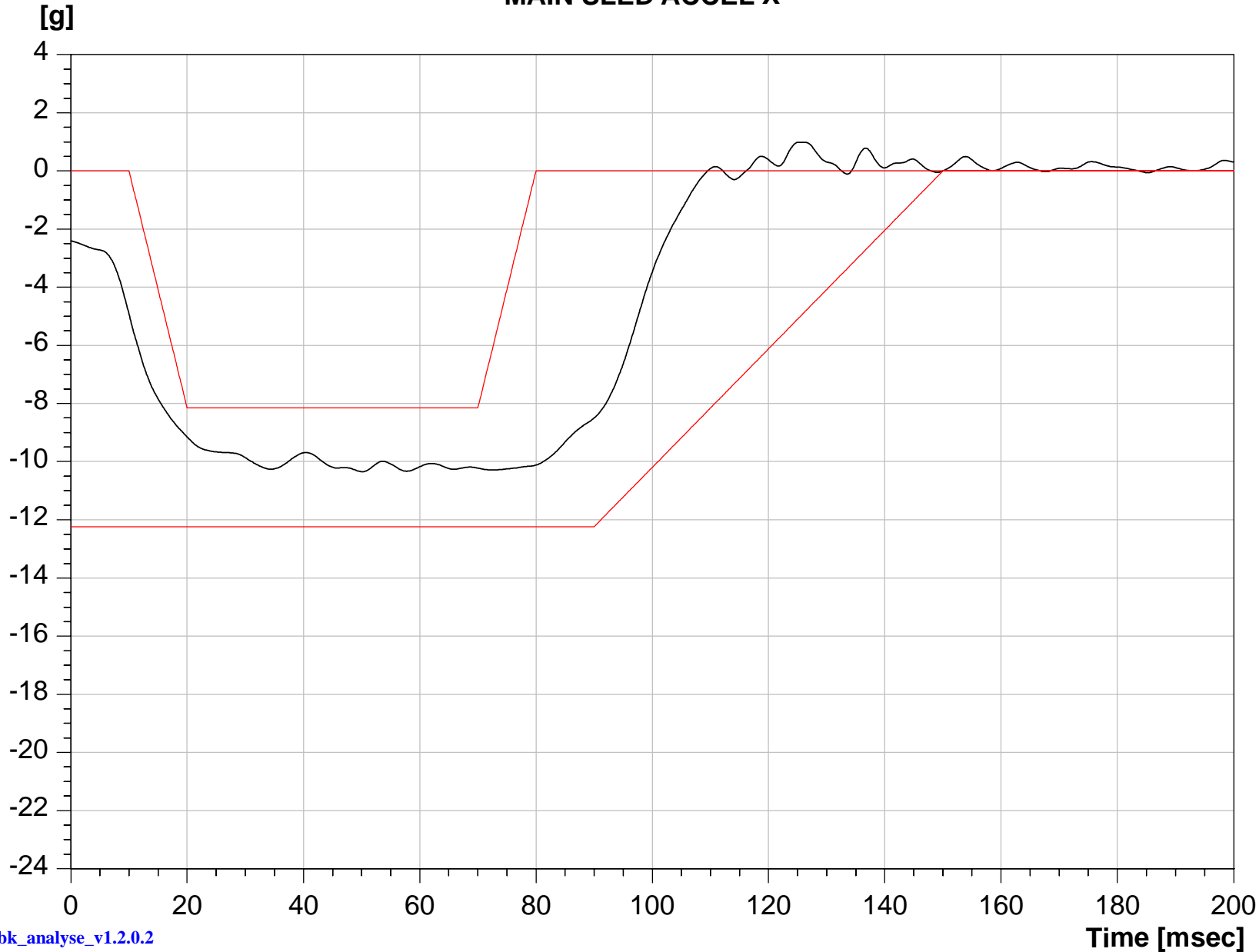
9. BODY STRUCTURE

9.1. Type of body structure: Injection moulded Plastic components





MAIN SLED ACCEL X



Test No. : S14377
Test Date : 21 Oct 2016
Customer : Mangar Int.
Test Type : BS EN 1789
: 10g/30kmh
Test Items : Airflow Pump
Orientation : Frontal
: Lateral
: Vert. Down
: Vert. Up
Mangar Int. : B. Thorne
MPG Eng. : B. Appleyard
VCA Witness : P. Cullingham

Max Test Velocity = 31.13 [km/h]

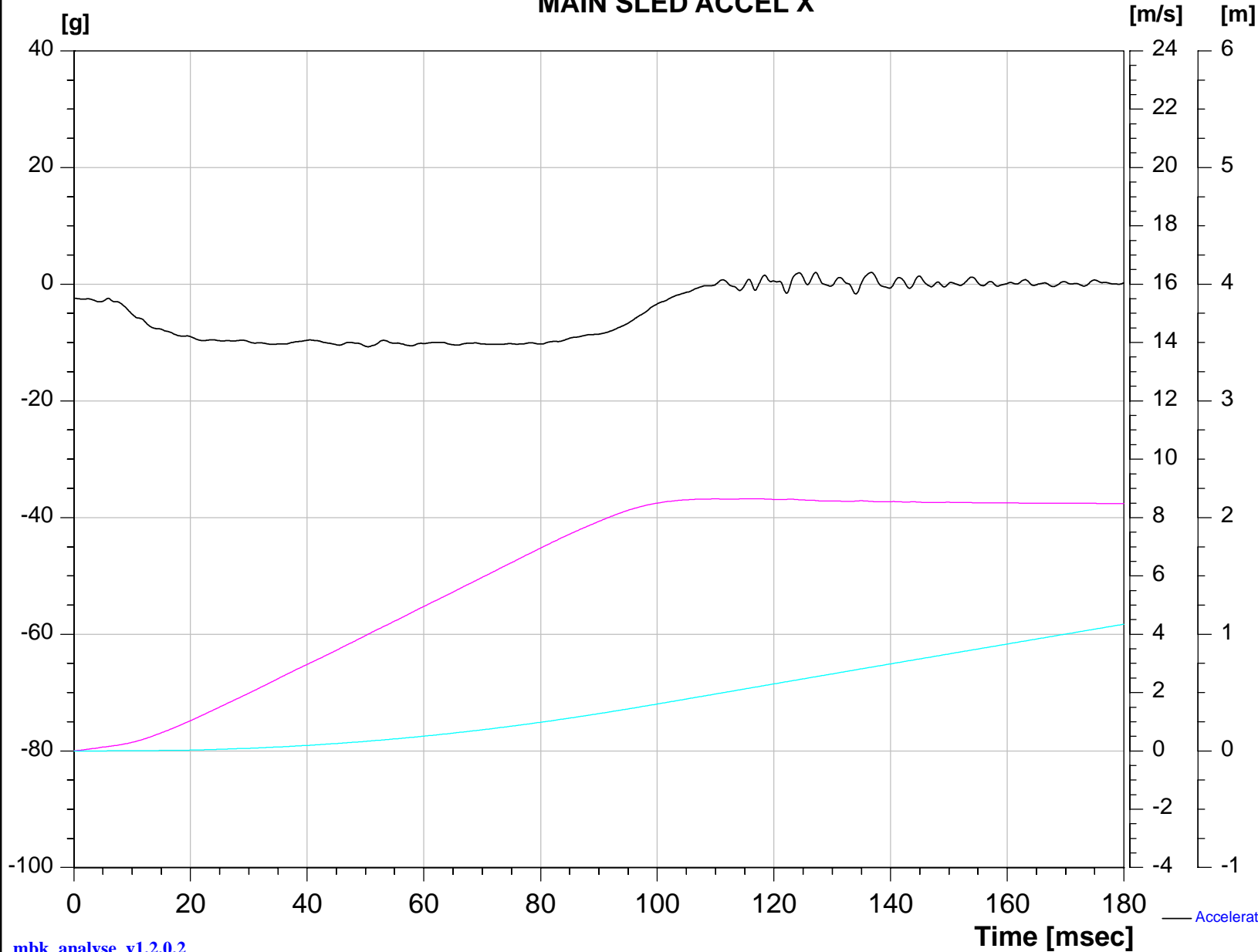
Filter : CFC 60 (SAE J211)
CAC : 200.00 [g]
Sensor ID : ZR30
Max Value : 0.99 g [125.3 msec]
Min Value : -10.35 g [50.1 msec]
Plot Date : 21/10/2016 at 11:03:55



23-Oct-17



MAIN SLED ACCEL X



Test No. : S14377
 Test Date : 21 Oct 2016
 Customer : Mangar Int.
 Test Type : BS EN 1789
 : 10g/30kmh
 Test Items : Airflow Pump
 Orientation : Frontal
 : Lateral
 : Vert. Down
 : Vert. Up
 Mangar Int. : B. Thorne
 MPG Eng. : B. Appleyard
 VCA Witness : P. Cullingham

Filter : CFC 180 (SAE J211)
 CAC : 200.00 [g]
 Sensor ID : ZR30

Acceleration

Max Value : 2.03 g [127.2 msec]
 Min Value : -10.71 g [50.4 msec]

Velocity

Max Value : 8.65 m/s [117.4 msec]
 Min Value : 0.00 m/s [0.1 msec]

Displacement

Max Value : 6.94 m [1000.0 msec]
 Min Value : 0.00 m [0.1 msec]

Plot Date : 21/10/2016 at 11:04:16

