EFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

Dilovası Organize San. Böl. 5.Kısım Fırat Cad. No:18 41455

Dilovası, Kocaeli / TÜRKİYE

Test TS EN ISO/IEC 17025 AB-0556-T

AB-0556-T
RFTR23045
06-23

DENEY RAPORU

TEST REPORT

Müşterinin adı/adresi *Customer name/address*	:	AKTİF MOTOR HAVALANDIRMA SİSTEMLERİ SAN. VE TİC. LTD. ŞTİ. Halkalı Merkez Mah. Şehit Yılmaz Özdemir Cad. Sanayi Sok. No:4 Küçükçekmece, İstanbul / TÜRKİYE
İstek numarası *Order No.*	:	EEA-22-001066
Numunenin adı ve tarifi *Name and identity of test item*	:	Powered Smoke and Heat Exhaust Axial Fan – **AKAP-300**
Numunenin kabul tarihi *The date of receipt of test item*	:	04.04.2023
Açıklamalar *Remarks*	:	
Deneyin yapıldığı tarih *Date of test*	:	10.04.2023
Raporun sayfa sayısı *Number of pages of the Report*	:	14 (Totally 24 pages with annexes)

Deney laboratuvarı olarak faaliyet gösteren Efectis Era Avrasya Test ve Belgelendirme A.Ş, TÜRKAK'tan AB-0556-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.

Efectis Era Avrasya Test ve Belgelendirme A.Ş. accredited by TÜRKAK under registration number AB-0556-T for EN ISO/IEC 17025:2017 as test laboratory"

Türk Akreditasyon Kurumu(TÜRKAK) deney raporlarnın tanınması konusunda Avrupa Akreditasyon Birliği(EA) ve Uluslararası Laboratuvar Akreditasyon Birliği(ILAC) ile karşılıklı tanınma antlaşmasını imzalamıştır.

The Turkish Accreditation Acency(TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation(EA) and of the International Laboratory Accreditation(ILAC) for the Mutual recognation of test reports

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metodları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir .

The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

Mühür *Seal*	**Yayımlandığı Tarih** *Date*	**Deney Sorumlusu** *Person in charge of test*	**Onaylayan** *Approval*
Efectis	19.06.2023	*e-signed* Osman AYYILDIZ	*e-signed* Ali BAYRAKTAR

1. SCOPE

Fire resistance test, in conformity with the general requirements of standards EN 1363-1:2020, with substitute or additional methods of standard EN 1363-2:1999 and with the particular requirements of standard EN 12101-3:2015 "**Smoke and heat control systems - Part 3: Specification for powered smoke and heat exhaust ventilators - Annex C: Test method for the determination of fire resistance of powered smoke and heat control ventilators**"

2. TEST LABORATORY

Name : EFECTIS ERA AVRASYA TEST VE BELGELENDİRME A.Ş.

Adress : Dilovası OSB 5. Kısım Fırat Cad. No:18 41455 Dilovası, Kocaeli / TÜRKİYE

3. TEST NUMUNESİNİN TANIMI

3.1. Genel

Product Identification : Powered Smoke and Heat Exhaust Axial Fan – **AKAP-300**

Direction of flow : Motor downstream direction

Application : Connected directly to furnace

Temperature class : F300

Manufacturer : AKTİF MOTOR HAVALANDIRMA SİSTEMLERİ SAN. VE TİC. LTD. ŞTİ.
Halkalı Merkez Mah. Şehit Yılmaz Özdemir Cad. Sanayi Sok. No:4
Küçükçekmece, İstanbul / TÜRKİYE

Sponsor of test : AKTİF MOTOR HAVALANDIRMA SİSTEMLERİ SAN. VE TİC. LTD. ŞTİ.
Halkalı Merkez Mah. Şehit Yılmaz Özdemir Cad. Sanayi Sok. No:4
Küçükçekmece, İstanbul / TÜRKİYE

3.2. Description of test sample

3.2.1. *Fan*

3.2.1.1. Carcase

Material : St 37 Galvanized steel

Dimensions :

- *Overall diameter : 364 mm*
- *Inner diameter : 300 mm*
- *Outside length : 300 mm*
- *Wall thickness : 2 mm*
- *Carcase support : 2 pcs. of St 37 galvanized plate were used for fixing the fan.*
  - *Steel plate dimensions : 250,00 x 32 x 120,00 x 2 mm (w x d x h x t)*
  - *Fixing : M10 steel screws. (4 pcs.)*

See figure 1, figure 2 and figure 7 for details.

3.2.1.2. Impeller:

Material : Special aluminium alloy (ETIAL 171)

Number of blades : 6

Nominal tip gap : 10 mm

Nominal dimensions :

- *Overall diameter : 280 mm*
- *Blade length : 80 mm*
- *Blade thickness : 4 mm*
- *Fastening : Each impeller placed inside to the hub casing and fixed with 6 pcs. nut.*

See figure 3 – figure 5 for details.

3.2.1.3. Hub:

Material : Special aluminium alloy (ETIAL 171)

Nominal dimensions : 34,07 x 25,6 mm (Ø x d) – bearing clearance

120 x 25,6 mm (Ø x d) – for hub

Fastening : Hub fixed with 6 pcs. of nut.

See figure 6 for details.

3.2.1.4. Motor

Model number	*: GAMAK-GM3ED 80M*
Rating	*: Motor Insulation H, Protection class IP55, Temperature rise class B (ΔT 80K)*
Carcase	*: 80M*
Speed	*: 1365 rpm*
Electrical information	*: 400 V, 50 Hz, 1 kW, 2,1 A, cosΦ: 0,72*
Application	*: Uninsulated, smoke and heat exhaust.*
Bearing type	*: Ball bearing-ZZ*
Class of fit	*: C4*
Arrangement	*: Not locked*
Lubricant	*: KRYTOX CORRUGATOR 226 FG-DUPONT*

- *Power cable: Halogen free silicon fire resistance cable*
  - *Cable cross section: 4 x 1,5 mm^2*

4. PRE-TEST PROCESSES

Efectis Era Avrasya Test ve Belgelendirme A.Ş. verified the used materials and parts against the supplied data and drawings during installation of the test specimen and not involved in the selection of test specimen.

Brand, type, quantity and dimension information of the components, when it is not possible to be verified by the laboratory, are given according to the sponsor's declaration. Drawings included in this report are provided by the test sponsor.

The test specimen was assembled by the manufacturer.

4.1. Tip clearances measurements

- Declared nominal value : 10 mm
- Measured mean value : 10 mm

5. TEST PROCESS

5.1. Method

The fire test was conducted according to the TS EN 12101-3:2015, Annex C.
The heating of the furnace followed as specified in the EN 12101-3:2015, Annex C.

5.2. Measurements

Following test data were measured during the test:

- Air temperatures at the intake plane of the fan (Furnace TC1 to Furnace TC4) (see figure A1).
- Ambient temperature in the laboratory (see figure A3).
- Static pressure at the intake plane of the fan (see figure A2).
- Surface temperatures on the motor carcase (See Figure B2)
- Current of the motor (see figure B3)
- Supply voltage of the motor (see figure B4)
- Electrical power of the motor (see figure B5)
- The positions of the thermocouples on motor carcase are given in figure B1.

Following equipment were used during the measurement related to test specimen:

- Static pressure of the fan: Piezometric ring connected to differential pressure transmitter
- Electrical measurement: Power analyser
- Temperature measurement on motor carcase: Fibre-glass insulated Type K Thermocouple

6. OBSERVATIONS

Table 1: Observations during test.

-70	The fan was switched on and the motor started warming up. **See photo C1-C2.**
-10	Heating started.
0	Target temperature (300 °C) reached. Test started.
15	The fan was switched off.
17	The fan was switched on.
60	No changes were observed.
90	No changes were observed.
122	Test was terminated with approval of the sponsor. **See photo C3-C4.**

7. TEST RESULTS

7.1 Results

The results are given in Table 2 and appendices B.

7.2 Uncertainty of measurements

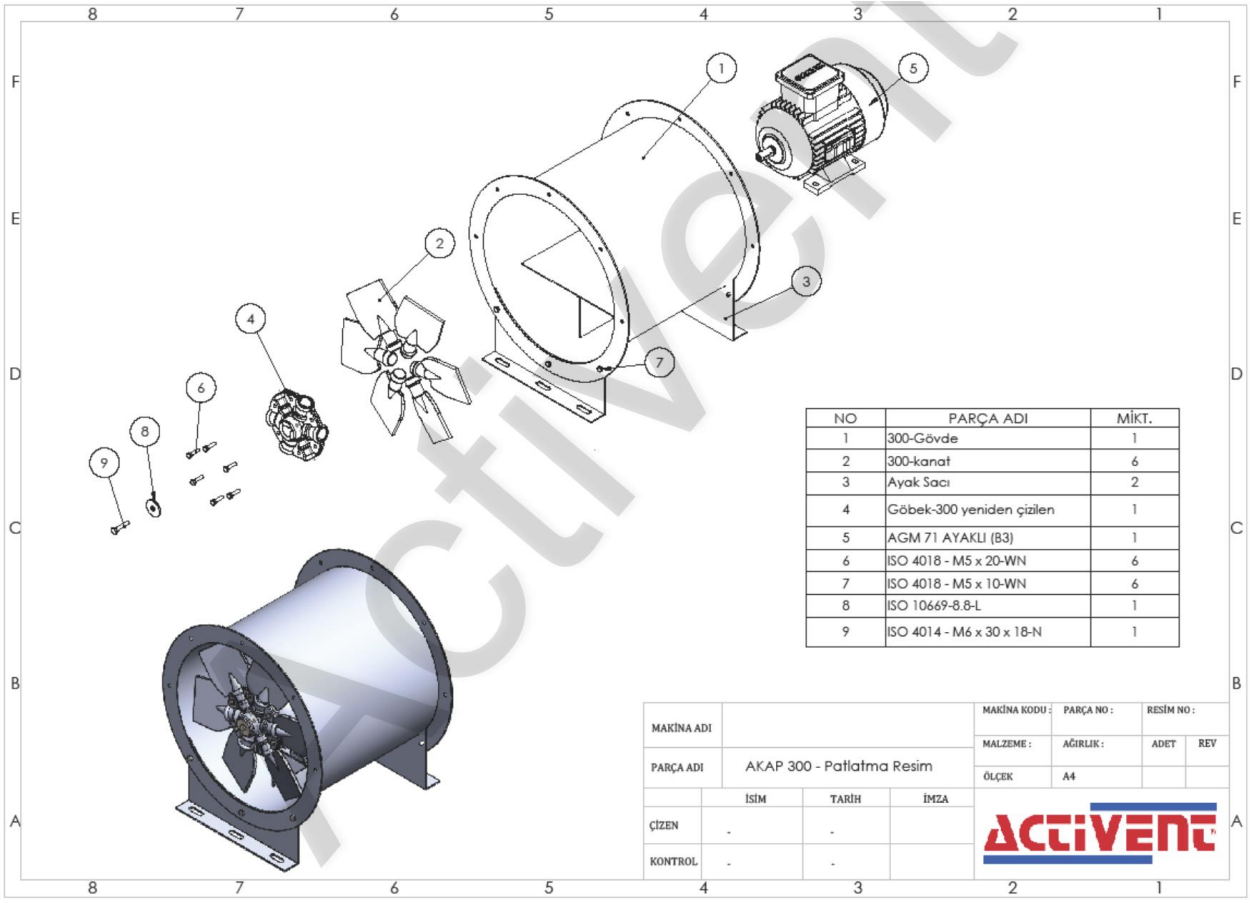
Due to the nature of fire resistance testing, in which several non-linear effects are present in both the test configuration and the test specimen, which influence each other, it is at this moment not yet possible to give a stated degree of uncertainty of measurement.

8. SUMMARY

Table 2: Summary of test results of the test specimen

Functionality, (**F**) – Static pressure – Motor	 No failure (- %4,09) No failure
Test was terminated at 122nd minute with approval of the sponsor.	

9. DRAWINGS



NO	PARÇA ADI	MİKT.
1	300-Gövde	1
2	300-kanat	6
3	Ayak Sacı	2
4	Göbek-300 yeniden çizilen	1
5	AGM 71 AYAKLI (B3)	1
6	ISO 4018 - M5 x 20-WN	6
7	ISO 4018 - M5 x 10-WN	6
8	ISO 10669-8.8-L	1
9	ISO 4014 - M6 x 30 x 18-N	1

MAKİNA ADI		MAKİNA KODU :	PARÇA NO : RESİM NO :
PARÇA ADI	AKAP 300 - Patlatma Resim	MALZEME :	AĞIRLIK : ADET REV
		ÖLÇEK	A4
	İSİM TARİH İMZA		
ÇİZEN	- -		
KONTROL	- -		

Figure 1: Exploded picture of the specimen

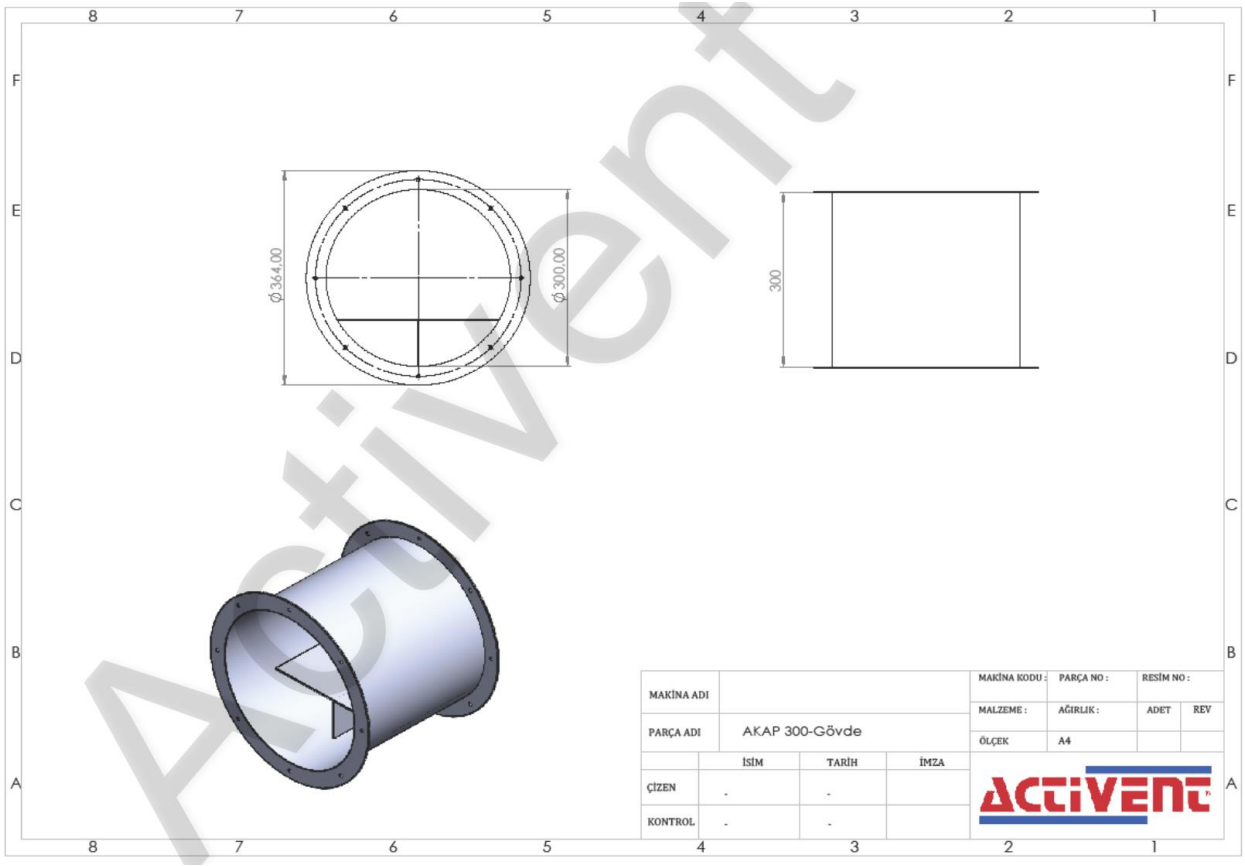


Figure 2: Fan carcase details

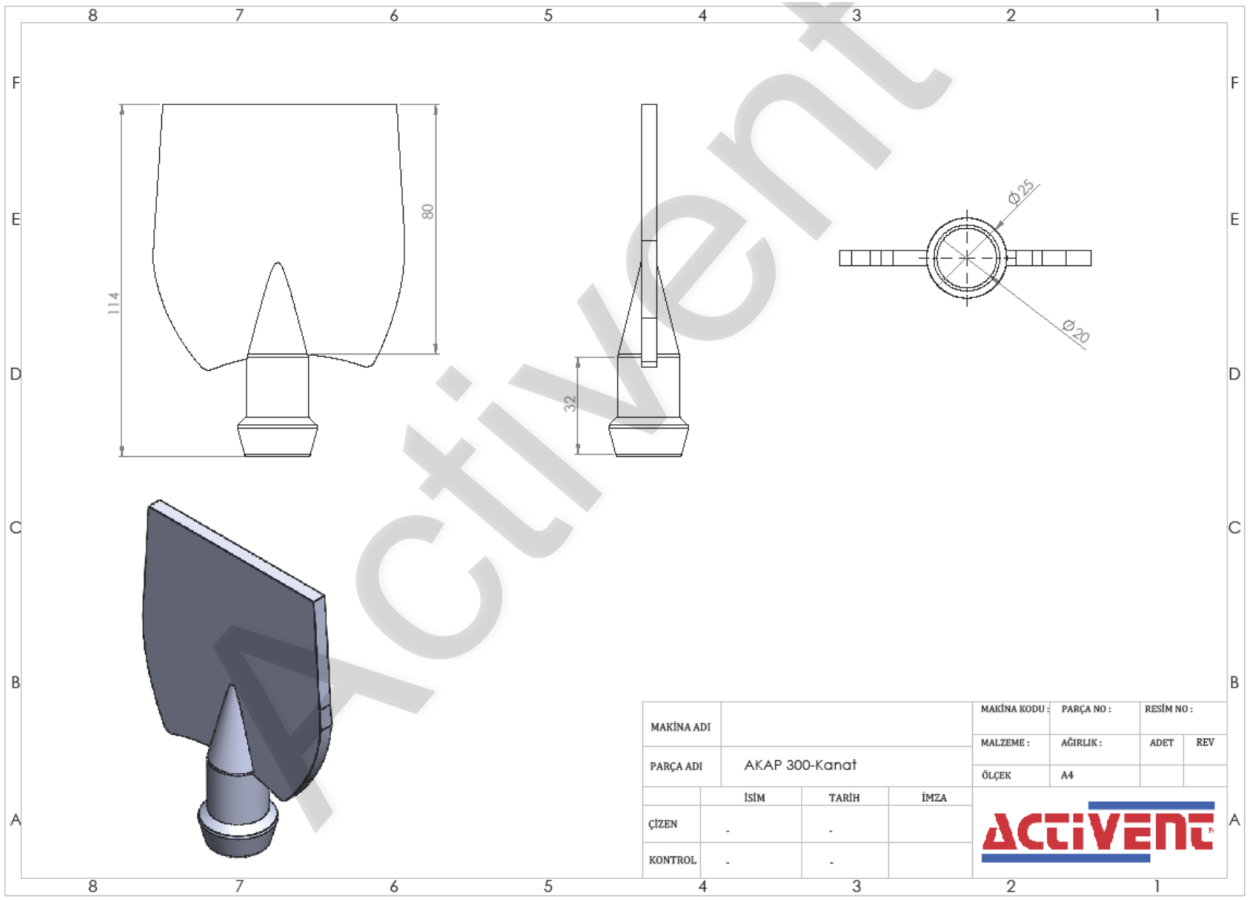


Figure 3: Impeller details.

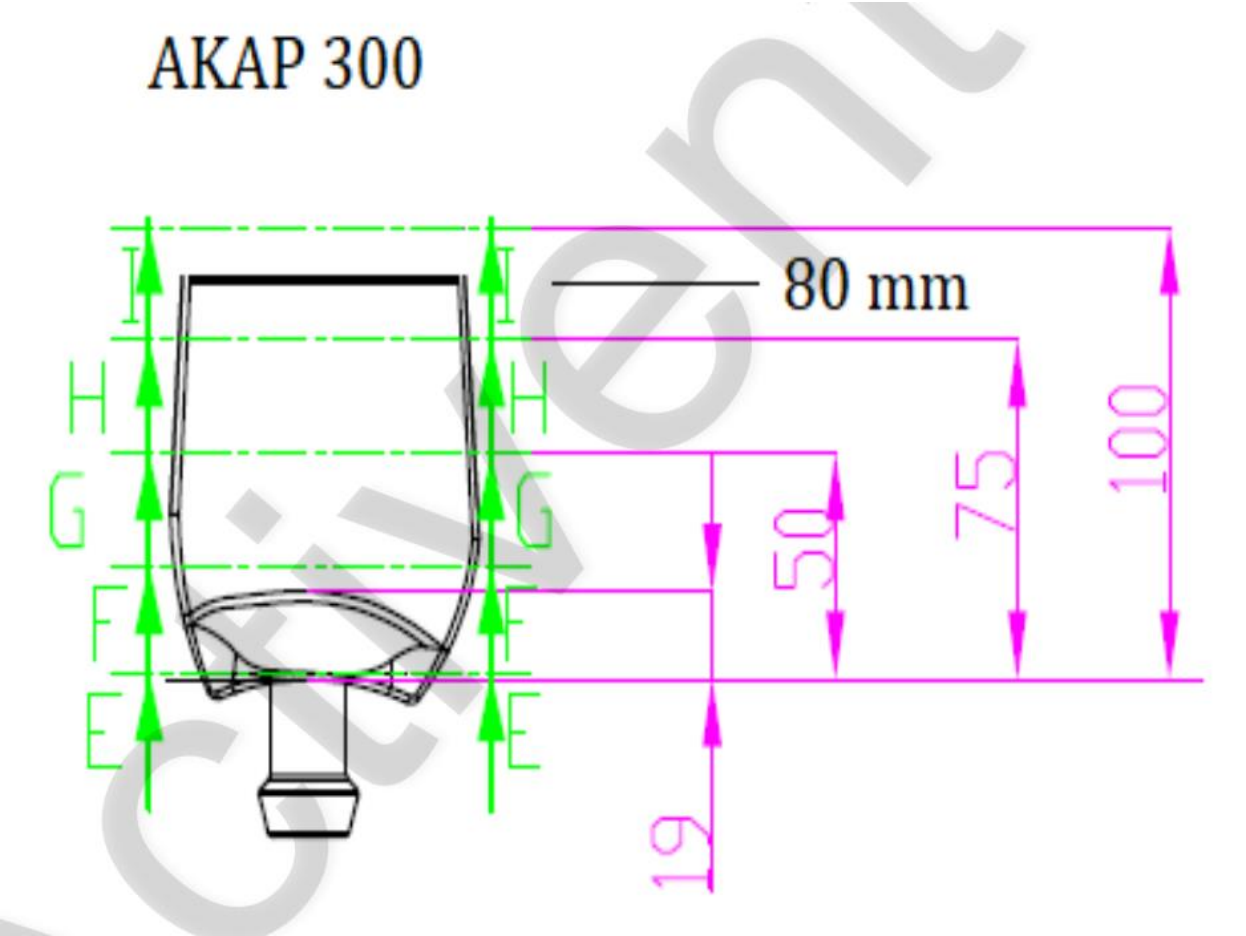


Figure 4: Impeller dimension details.

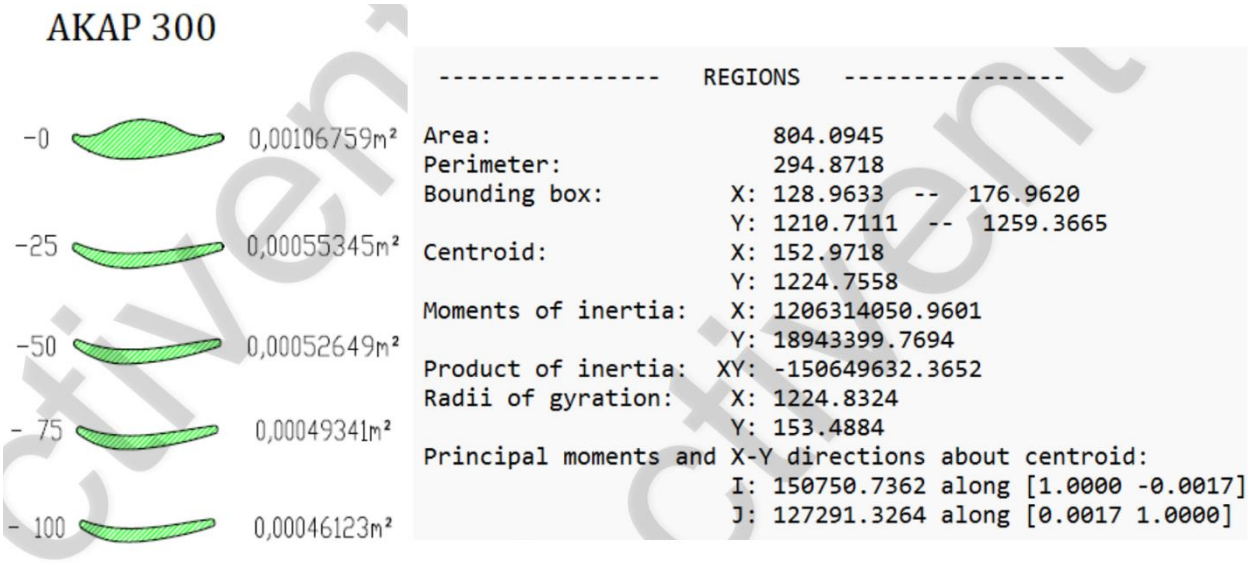


Figure 5: Blade section area details.

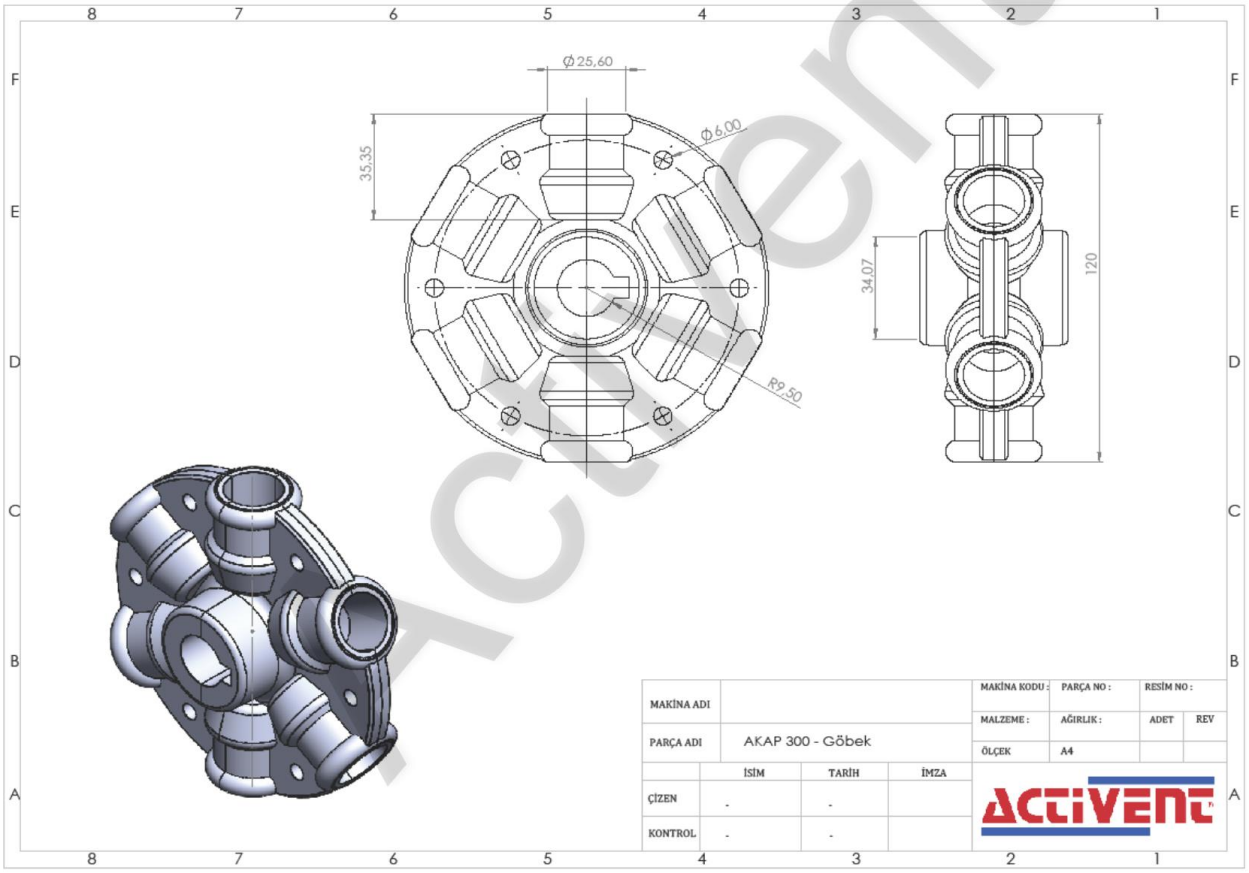


Figure 6: Hub dimension details.

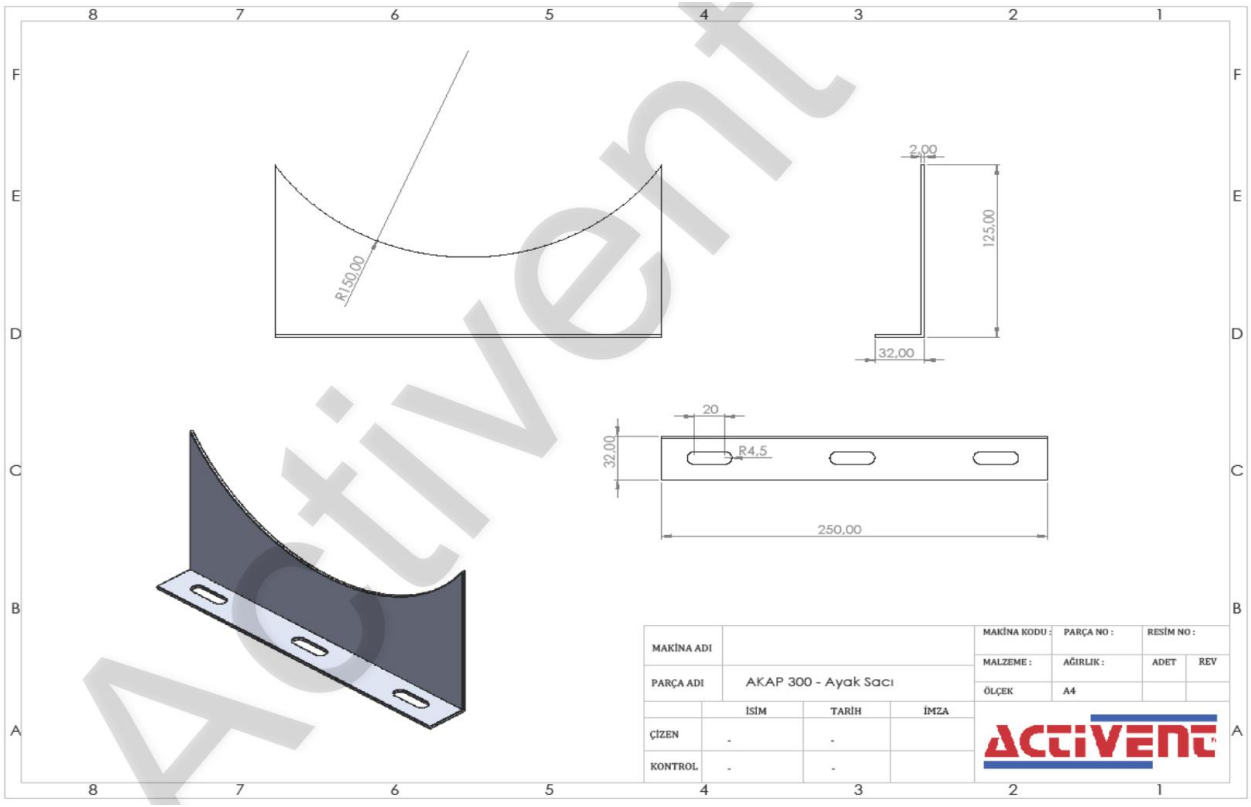


Figure 7: Fan carcase support details.

APPENDICES:

Appendix A: Furnace and laboratory conditions

Appendix B: Test results

Appendix C: Photos

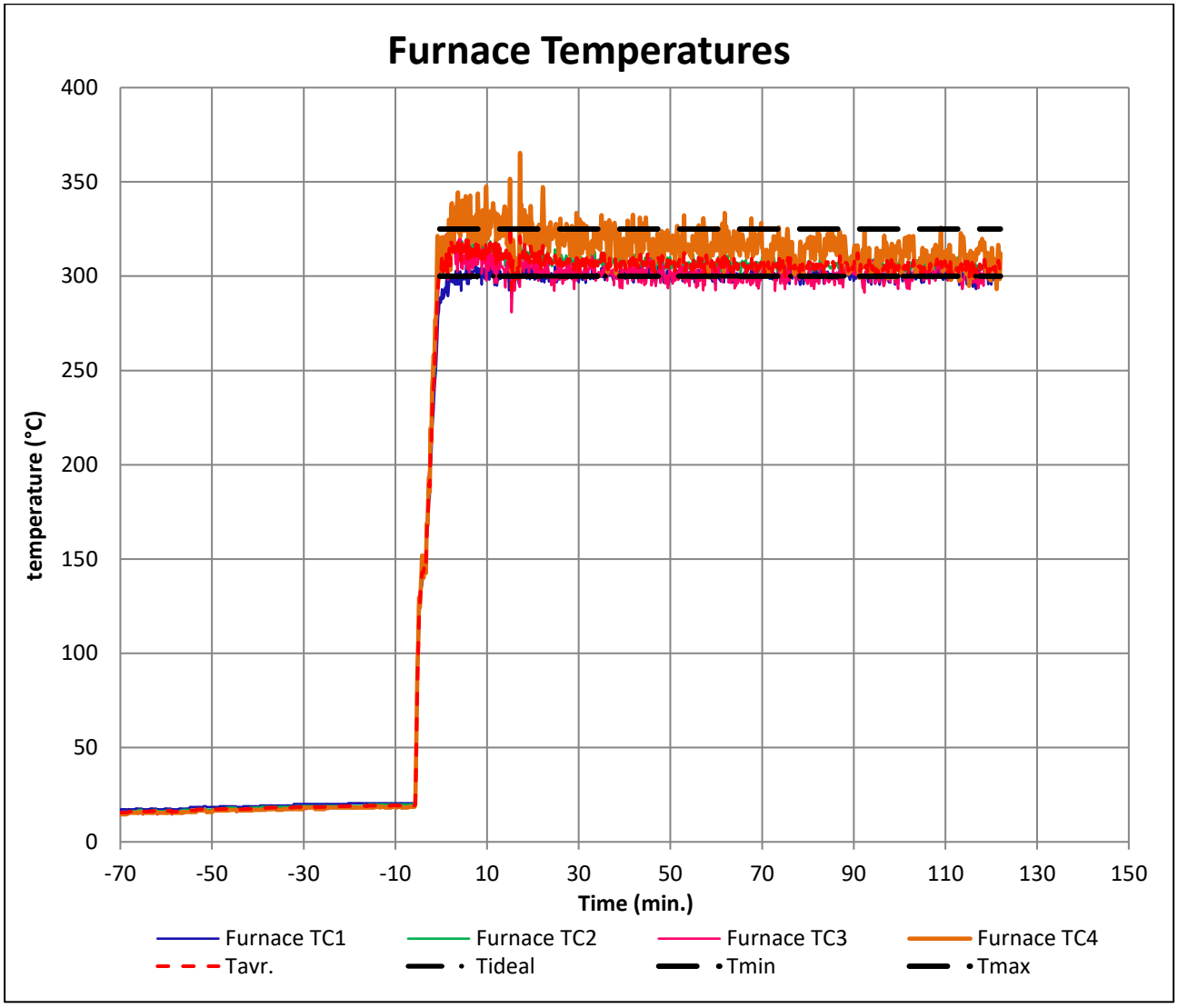


Figure A1: Furnace temperatures

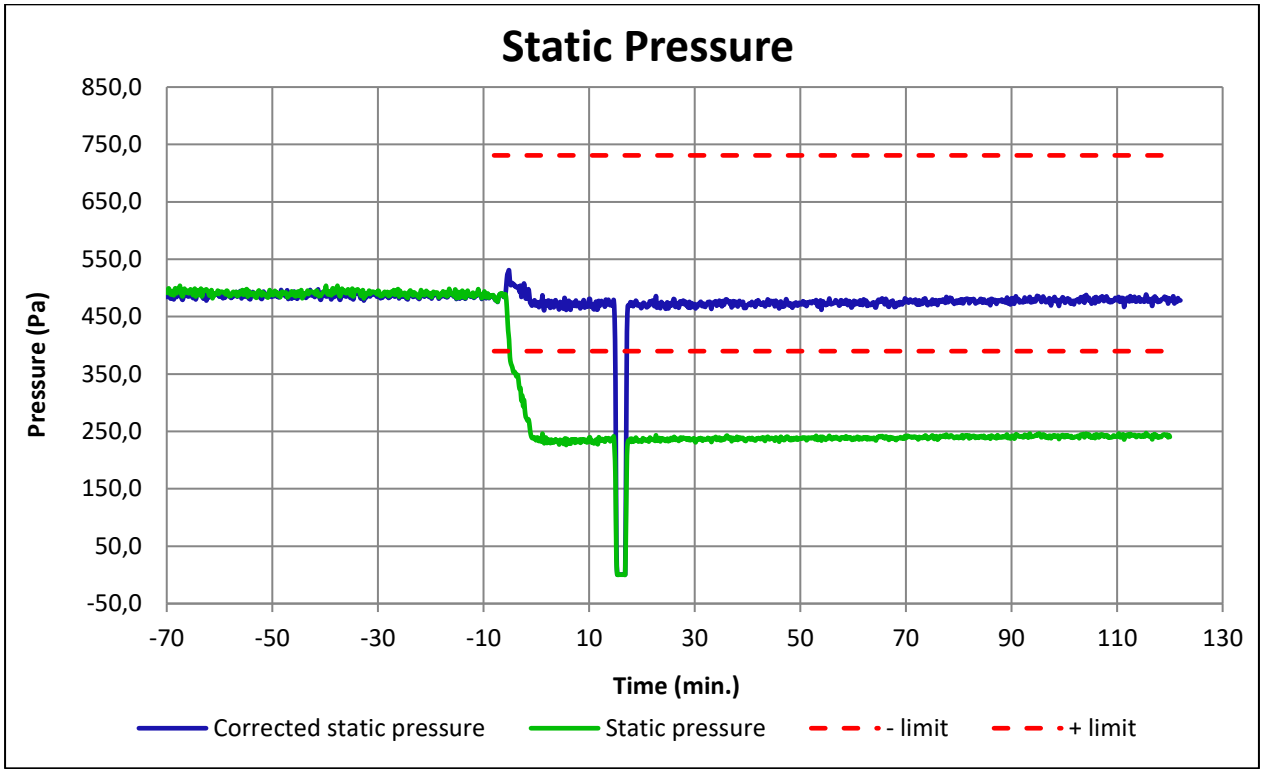


Figure A2: Static pressure of fan

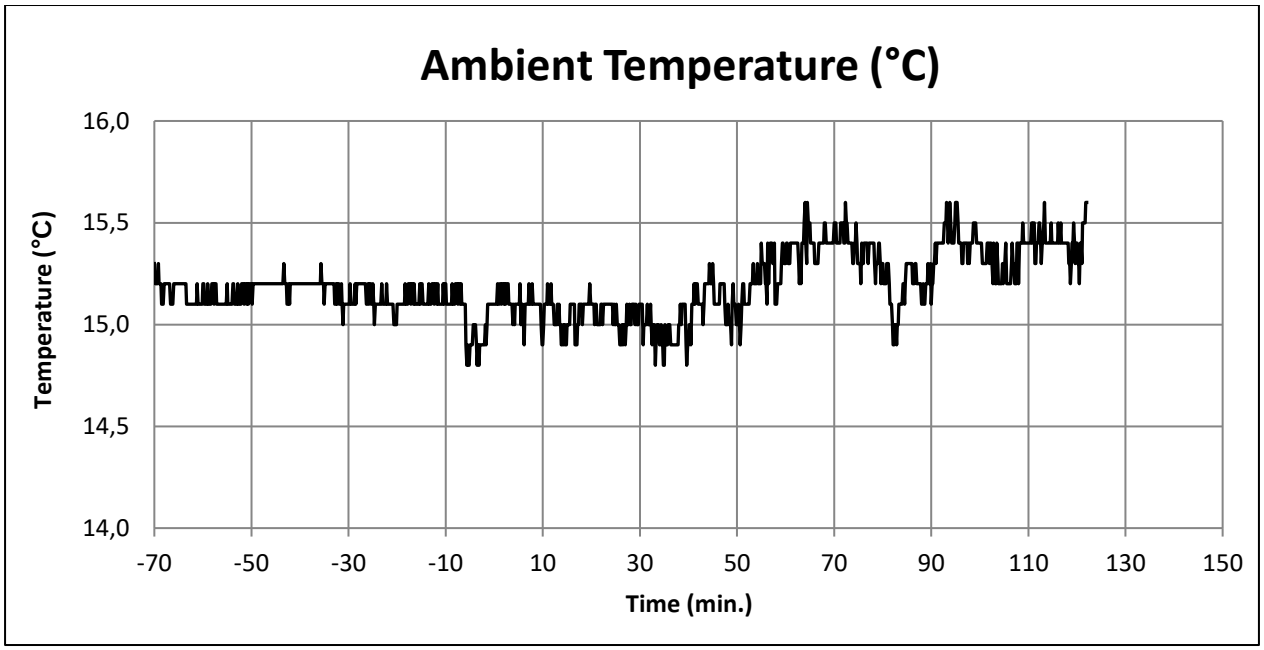


Figure A3: Ambient temperature at laboratory

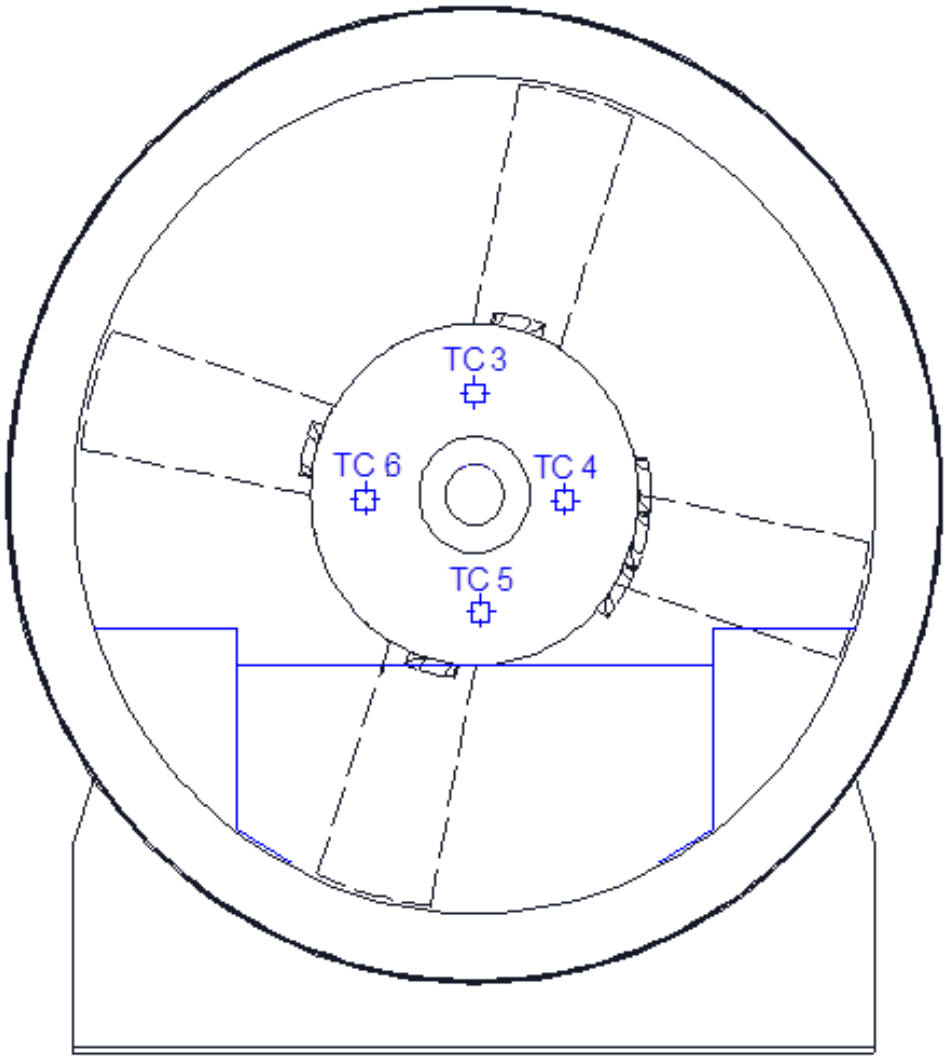


Figure B1: Locations of thermocouples on the motor carcase

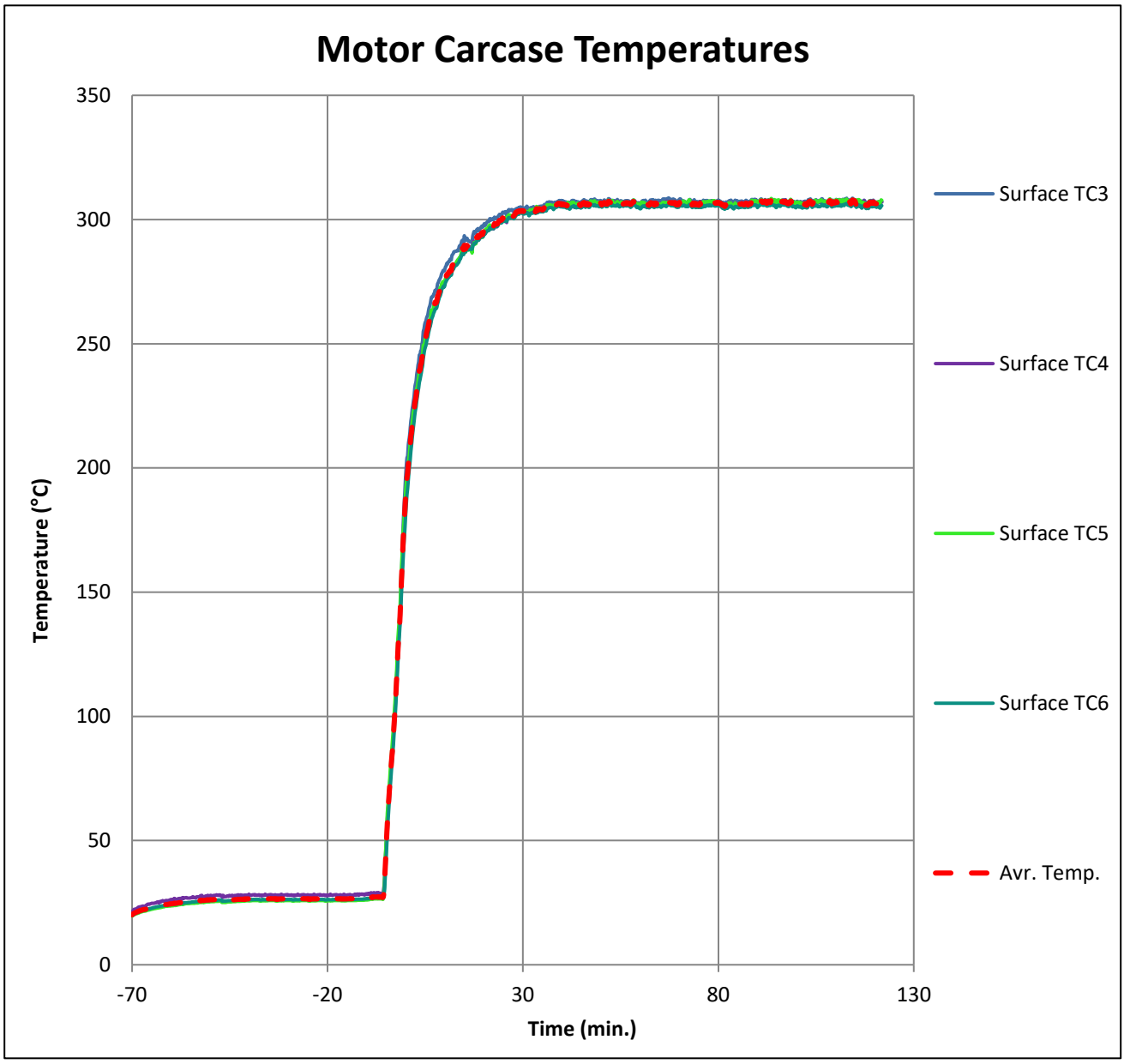


Figure B2: Surface temperatures on motor carcase.

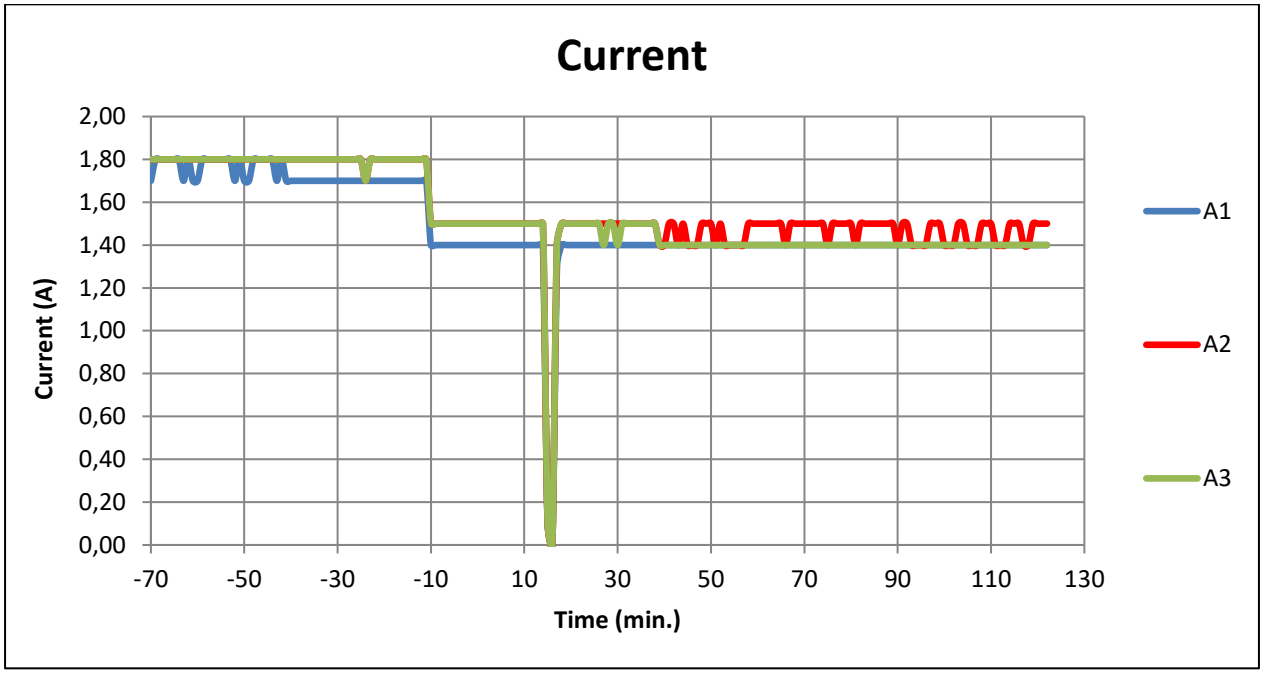


Figure B3: Motor current reading during test.

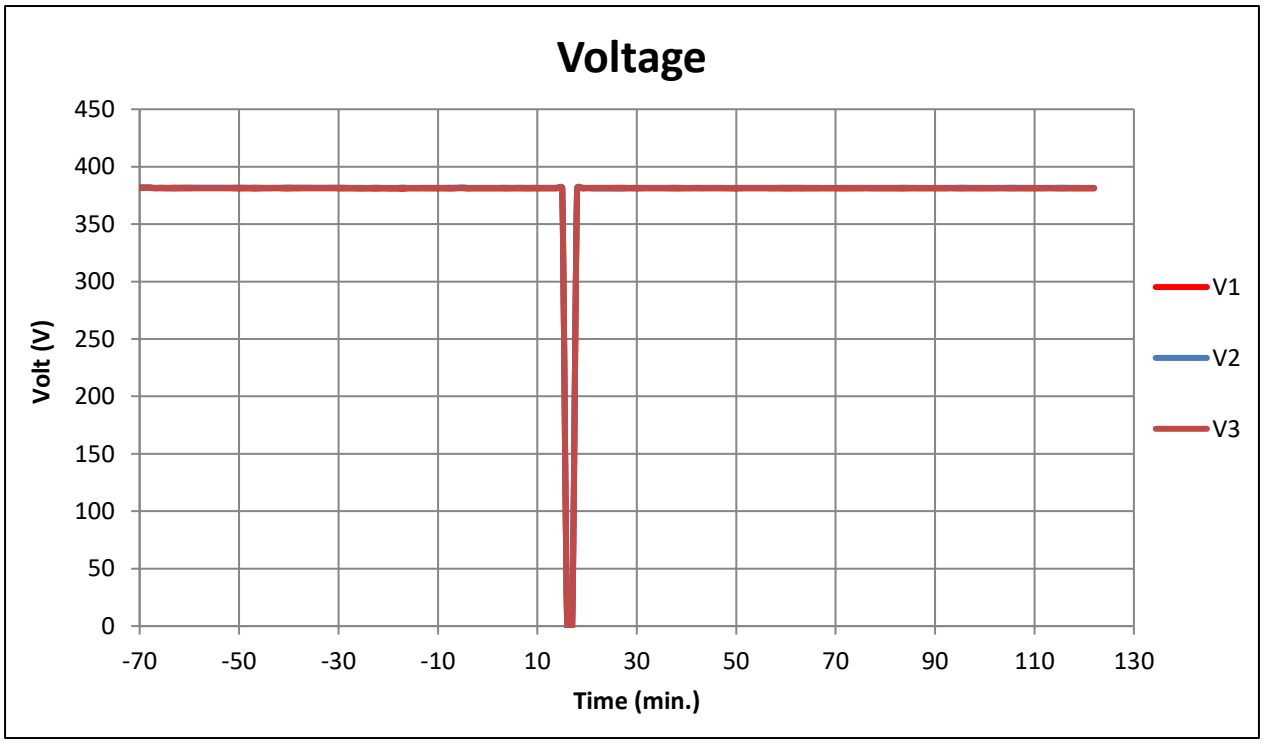


Figure B4: Motor voltage reading during test.

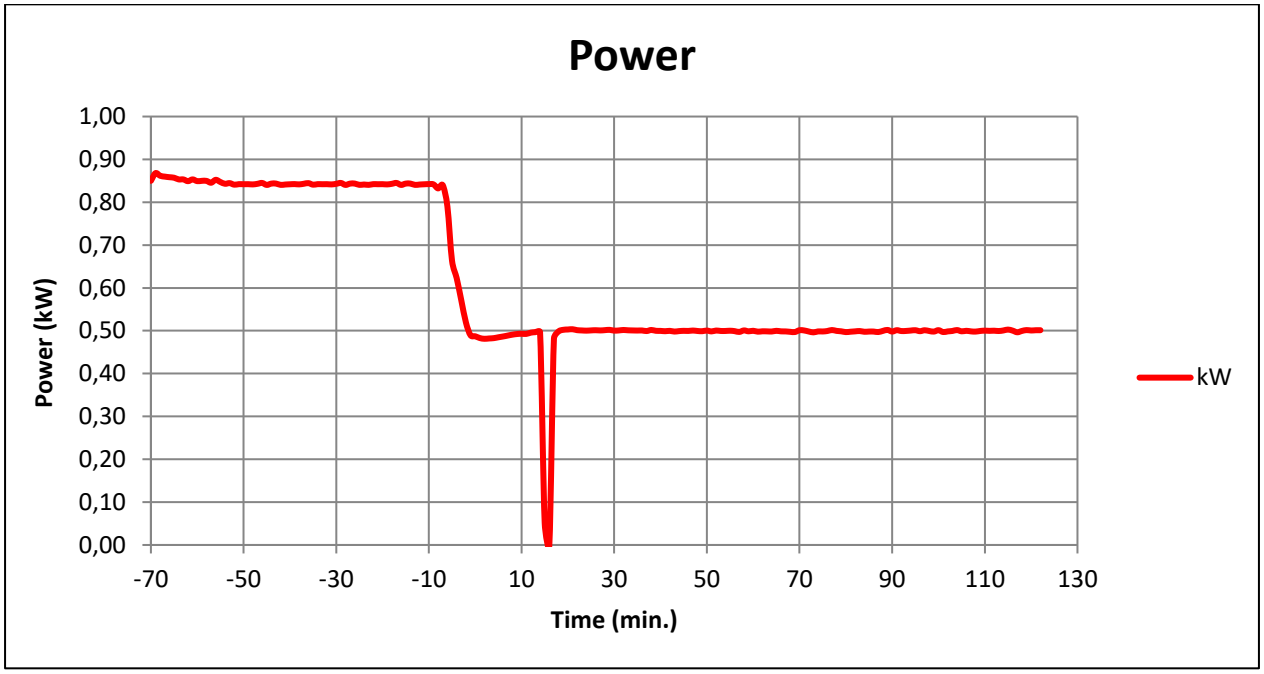


Figure B5: Motor power reading during test.

Photo C1: Front view of the specimen before the test.

Photo C2: Side view of the specimen before the test.

Photo C3: Side view of the specimen after the test.

Photo C4: Front view of the specimen after the test.