型号认可证数据单

THE VALIDATION DATA SHEET

编号/No.： VTC0356E
版次/Revision： 1
型号/Type：
VK-2500-01
VK-2500-02
VK-2500-03
VK-2500PS-03
批准人/Approved By： Yang Zhenmei

职务/Title： Director General of CAAC-AAD
日期/Date： 2022 年 5 月 7 日

本数据单是型号认可证(编号：VTC0356E)的组成部分，它规定了符合中国民用航空局的适航要求所颁发此型号认可证的产品的状态和限制。

This data sheet，which is part of Validation of Type Certificate (No: VTC0356E) ，prescribes condition and limitation under which the product for which the type certificate was issued meets the airworthiness requirements of the Chinese Civil Aviation Regulation.

型号认可证持有人/Validation of Type Certificate Holder:

JSC “UEC-Klimov”
11, Kantemirovskaya str., Saint-Petersburg, 194100

第1部分 概述

Section 1 GENERAL

1. CAAC认可数据单和型号合格证数据单/CAAC Validation Data Sheet and Type Certificate Data Sheet

	中国民用航空局认可数据单号、版次和颁发日期/CAAC Validation Data Sheet Number, Revision and issuance date	型号合格证数据单号、版次和颁发日期/ Type Certificate Data Sheet Number, Revision and issuance date
当前 Current	No.VTC0356E，版次 1，2022 年 5 月 7 日颁发 No.VTC0356E; Revision 1; Date of Issue: 2022-05-07	No.FATA-01045E，版本：01，2018 年 12 月 14 日颁发 No.FATA-01045E,issue 01, Date of Issue: 2018-12-14
历史 History	No.VTC0356E，版次 0，2019 年 3 月 21 日颁发 No.VTC0356E; Revision 0; Date of Issue: 2019-03-21	No. CT197-АМД，版本：08，2013 年 8 月 7 日颁发 No.CT197-АМД, Revision 08, Date of Issue: 2013-8-07

注：上表中出口国局方型号合格证数据单信息仅供参考/ Note：Above TCDS information of Certification Authority is only for reference.

CAAC 认可数据单修订情况说明 / CAAC VTCDS Change Record

CAAC 认可数据单版次 /CAAC VTCDS Revision	相对上一版次的修订情况/ CAAC VTCDS Change Record	备注 /Remark
版次 2/Rev 2	1.增加 VK-2500PS-03 型别/ Addition of the models VK-2500PS-03. 2 更换审定当局/ Change of Certification Authority. 3.变更持证人名称/ Change of Type Certificate Holder. 4.更新 VK-2500PS-03 的 3 号喷气燃料标准 Update No.3 Jet Fuel Standard of VK-2500PS-03	

2. 类别/Category: 航空发动机/Aviation Engine

3. 认可当局/Validation Authority: 中国民用航空局/CAAC
审定当局/Certifying Authority: 俄罗斯联邦航空运输局/FATA

4. 型号合格证持证人/Type Certificate Holder JSC “UEC-Klimov”,
11, Kantemirovskaya str., Saint-Petersburg, 194100

5. 生产商/Manufacturer JSC “UEC-Klimov”,
11, Kantemirovskaya str., Saint-Petersburg, 194100
The Russian Federation

6. ETOPS: 不适用/NA

7. CAAC专用要求/CAAC Special Requirements： 中华人民共和国国家标准“3 号喷气燃料”（GB 6537）
National Standard of the People’s Republic of China “No.3 Jet Fuel”（GB 6537）

第2部分 数据单

Section 2 DATA SHEET

1 初始审定信息
Initial certification data

IAC AR 于 2000 年 12 月 29 日颁发了编号为 No. 197-АМД 的型号合格证（包括 VK-2500-01, VK-2500-02, VK-2500-03, VK-2500PS-03 等型号）
Type Certificate (TC) No. 197-АМД issued by AR of IAC on 29.12.2000 (for the ВК-2500-01, ВК-2500-02, ВК-2500-03, ВК-2500ПС-03 models)

2 简要概述
Brief description

这是一台带有自由涡轮的涡轮轴发动机，它包含一个十二级压气机（具有可变进气导向叶片和 1、2、3、4 级导向叶片）、环形燃烧室。压气机转子通过轴流式两级涡轮驱动。自由涡轮是带有一个输出轴的轴流式两级涡轮。压气机涡轮和自由涡轮之间仅由气动连接。自动控制系统由电子和液压-机械调节器组成。
It is a turbo-shaft engine with a free turbine. It incorporates a twelve-stage compressor with inlet variable guide vanes and guide vanes of the 1, 2, 3 and 4-th stages, annular combustion chamber. The compressor rotor is put into operation by an axial-flow two-stage turbine. The free turbine is an axial-flow two-stage turbine with an output shaft. It is provided only gas-dynamic connection between the compressor turbine and the free turbine. The automatic control system consists of an electronic and hydro-mechanical governor.

3 型号设计
Type design

其定义由签发型号合格证之日生效的设计和维修文件或根据既定程序之后进行的修订所确定:
It has been defined by the design and maintenance documents effective at the date of issue of the Type Certificate or later revisions introduced according to the established procedure:

	型号/Models			
	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
设计说明 Specification	078006700	078006700	078006700	07C.00.0100
装配图 Assembly Drawing	078.00.6700СБ	078.00.6700СБ	078.00.6700СБ	07C.00.0100 СБ
维护手册 Maintenance Manual	078 00 5700РЭ,1 078 00 5700РЭ1,2 078 00 6700РЭ,3	078 00 5700РЭ,1 078 00 5700РЭ1,2 078 00 6700РЭ,3	078 00 5700РЭ,1 078 00 5700РЭ1,2 078 00 6700РЭ,3	07C.00.0100РЭb.1 07C.00.0100РЭb.2
维护计划 Maintenance Schedule	078006700PO	078006700PO	078006700PO	Ref.07C.00.0100 РЭ b.1
翻修手册 Overhaul Manual	078006700PKP	078006700PKP	078006700PKP	—*

备注：“—”表示“不适用于本型号”。
Note: * Here and below sign “ — “ means “not applicable to this model”

4 审定基础

Certification basis

型号/Model	审定基础/Certification basis	等效安全/List of items of the CB which equivalent compliance has been determined	专用条件/Special technical conditions
VK-2500-01, VK-2500-02, VK-2500-03	VK-2500 发动机审定基础 078.634 .007（第 1 版） Certification basis 078.634.007 (Issue 1) of the VK-2500 engine		
VK-2500PS-03	审定基础清单 078.634.007（第 1 版）及其附件 1/List of items of Certification basis No. 078.634.007 (Revision 1); Appendix 1 to the list of items of certification basis No. 078.634.007 (Revision 1)	32.33.69 a)1) 32.33.91 a)6)	32.33.28, 32.33.65, 32.33.83, 32.33.89, 33.5, 33.14, 33.15, 33.15A, 33.87 ，D33.2.1

5 主要设计特征和技术数据

Main specifications and technical data

5.1 设计特征

Specifications

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
输出轴上的发动机功率，马力/Power (power at the engine output shaft), [h.p.]:				
2.5 分钟 OEI 功率，不少于/ The 2.5-minute power (at OEI) ， no less than	2700	2700	2700	2700
30 分钟 OEI 功率，不少于/ 30-minute power (at OEI), no less than	—	—	—	2400
起飞功率，不少于/ The take-off power，no less than	2400	2200	2000	2000
连续 OEI 功率，不少于/ Continuous power (at OEI), no less than	—	—	—	1900
最大连续功率，不少于/ The maximum continuous power, no less than	1900	1700	1700	1700

备注/Note：

1．上述性能中各数值是针对以下条件规定的/The values of the above specifications are specified for the following conditions:

-海平面静态条件（H = 0，V = 0），ISA;

-static conditions at sea level (H=0, V=0) ，ISA

-无引气;

- the air bleeding does not occur

-无直升机防尘装置;

- without the helicopter dust protection device;

2. VK-2500 发动机的 02、03 型与 01 型号的区别仅在于除 2.5 分钟功率外，起飞功率和其他功率均有下降。功率通过 БАРК-78 自动控制和监控部件设定。

The VK-2500 engine models 02 and 03 differ from the model 01 only by reduced values of take-off and other powers, except for the 2.5-minute power. The power values are set by means of the БАРК-78 automatic control and monitoring unit.

3. 无功率提取

There is no power extraction from the engine to the helicopter drive units.

发动机主配套件/Main vendor items of the engine

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
自动控制和监控部件 automatic control and monitoring unit	БАРК-78[1] 版本/version	БАРК-78[1] 版本/version	БАРК-78[1] 版本/version	БАРК-6В-7С[2] 版本/version
	ПО-1.1（2） 或/or ПО-1.2 或/or ПО-1.3 或/or ПО-1.4	ПО-1.1（2） 或/or ПО-1.2 或/or ПО-1.3 或/or ПО-1.4	ПО-1.1（2） 或/or ПО-1.2 或/or ПО-1.3 或/or ПО-1.4	software version -1.0(0)
燃油流量控制部件 fuel flow control unit	HP-3BMA HP-3BMA-T HP-3BM-T	HP-3BMA HP-3BMA-T HP-3BM-T	HP-3BMA HP-3BMA-T HP-3BM-T	HP-2500
工作时间计数器 operating time counter	CHK -78-1	CHK -78-1	CHK -78-1	—

Note:

1) БАРК-78 自动控制和监控部件的验收证书编号为 СГКИ-072-74-БАРК-78。

The БАРК-78 automatic control and monitoring unit has acceptance certificate No. СГКИ-072-74-БАРК-78.

2) БАРК-6В-7С 电子单元的型号证书 编号为 No. ФАВТ-СГКИ-БАРК-6В-7С-01

The БАРК-6В-7С electronic unit has Type certificate No. ФАВТ-СГКИ-БАРК-6В-7С-01

5.2.主要尺寸，毫米

The main dimensions, mm:

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
长/length	2055	2055	2055	2055
高/height	728	728	728	731
宽/width	660	660	660	660

5.3．干重

The dry weight

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
干重/The dry weight	300	300	300	300

6 使用和安装限制/The operating and installation limitations

6.1 最大允许转速，%.Maximum permissible rotational speeds, %:

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
2.5 分钟 OEI 功率时燃气发生器转子的最大转速 maximum speed of the gas generator rotor at 2.5-minute power(with OEI)	103.5	103.5	103.5	103.5
30 分钟 OEI 功率时燃气发生器转子的最大转速 gas generator rotor at the 30-minute power (with OEI)	—	—	—	102.5
起飞功率时燃气发生器转子的最大转速 maximum speed of the gas generator rotor at take-off power	102.5	102.5	102.5	102.5
连续OEI功率时燃气发生器转子的最大转速 gas generator rotor at continuous power (at OEI)	—	—	—	99.5
直升机带动力下滑时动力涡轮转子转速短时间内（最多 20 秒）最大可增加至 maximum permissible short-term (up to 20 s) increase of the power turbine rotor	108.0*	108.0*	108.0*	108.0*

speed at the helicopter power-on glide				

备注/Note:

1) 在《维护手册》中规定了当转速增加到 108.0%时的几种情况限制。

* - limitation of the number of cases of the rotational speed increase up to 108.0 % is specified in the MM.

2) 100%转速情况下/100 % compliance:

-燃气涡轮转子 19,537.48rpm/ the gas generator rotor 19,537.48 r.p.m.;

- 动力涡轮转子 15000rpm/the free turbine rotor 15,000 r.p.m..

6.2 下列功率状态下，发动机可连续工作的最长时间，分钟

Maximum time of continuous operation at main powers, min.:

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
2.5 分钟 OEI 功率状态 at 2.5-minute power: (at OEI)	2.5*	2.5*	2.5*	2.5*
30 分钟 OEI 功率状态 at the 30-min power (at OEI)	—	—	—	30
连续 OEI 功率状态 at the continuous power (at OEI)	—	—	—	60
起飞功率状态 at the take-off power**:	5.0**	5.0**	5.0**	5.0**

备注/Note:

*：《维护手册》中规定了使用 2.5 分钟功率后对发动机应采取适当措施进行维护。

* - appropriate actions on the engine maintenance after application of the 2.5-minute power are specified in the Maintenance Manual

**：可以连续使用起飞工况不超过 30min，首翻寿命（TBO）内允许这样使用 2 次。

** - it is permitted to apply the takeoff mode continuously within 30min twice within the service life before the first overhaul (TBO)。

6.3 温度，ºC/Temperatures, ºC

6.3.1 压气机涡轮后的最大允许燃气温度

maximum permissible gas temperatures after the compressor turbine

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
2.5 分 OEI 钟功率 at the 2.5-minute	735	735	735	735

power(at OEI)				
30 分钟 OEI 功率状态 at the 30-min power (at OEI)	—	—	—	705
连续 OEI 功率状态 at the continuous power (at OEI)	—	—	—	670
起飞功率 at the take-off power	705	705	705	705

6.3.2 发动机出口处的滑油温度

temperature of oil at the engine outlet

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
最大 maximum	150	150	150	150
慢车以上功率状态时的最低温度 minimum to set the engine at the above idle powers	30	30	30	30
巡航及以上功率状态时的最低温度 minimum to operate the engine continuously at powers not below the cruising ones	70	70	70	70
发动机起动时的最低温度 minimum to start the engine	-40	-40	-40	-40

6.4 压力，公斤力/平方厘米

Pressures, kgf/cm^2

6.4.1 发动机增压泵入口处的燃油压力

Fuel pressure at inlet to the engine booster pump

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
起动时燃油压力 excessive, at starting	0.4--1.2	0.4--1.2	0.4--1.2	0.4--1.2
最大燃油压力 maximum excessive fuel pressure				
-发动机工作时	2.8	2.8	2.8	2.8

when operating the engine				
-发动机地面工作时 when operating the engine on the ground	2.8	2.8	2.8	2.8

备注：《维护手册》中规定了发动机增压泵入口处的燃油最小压力值的变化与高度之间的关系。
Note: The change in the value of the fuel minimum pressure at inlet to the booster pump depending on the height is specified in the Maintenance Manual.

6.4.2 滑油/Oils

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
最小/minimum	2.0	2.0	2.0	2.0
最大/maximum	4.0	4.0	4.0	4.0

6.5 最大引气量，% /Maximum air bleeds, %

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
空调系统最大引气量 for air-conditioning system	2.3	2.3	2.3	*
备注/Note:《维护手册》中规定了空调系统引气量的变化与环境温度之间的关系 The change in the value of the air bleed for the air-conditioning system depending on the ambient temperature is specified in the Maintenance Manual.				
下列功率状态下防尘装置上的防冰系统最大引气量 for the dust protection device anti-icing system at the following powers				
-起飞功率 -at take-off power	1.5	1.5	1.5	*
-慢车功率 -at idling power	2.2	2.2	2.2	*
防尘装置喷射器的最大引气量 for the ejector of the dust protection device	0.4	0.4	0.4	*
无防尘装置时发动机进气道防冰系统的最大引气量 for the anti-icing system of the helicopter air intake in the absence of the dust protection device				
-起飞功率 -at take-off power	1.0	1.0	1.0	*
-慢车功率 -at idling power	1.5	1.5	1.5	*

备注/Note:
* -对于 VK-2500PS-03 直升机系统引气值在所有动力设置下不超过发动机进口空气流量的 4%。
* - for the ВК-2500ПС-03 models the value of the air bleeding for helicopter systems at all power settings is no more than 4% of the air flow at the engine inlet.

6.6 批准的燃油牌号和添加剂等级/Approved grades of fuel and additives

独联体国家生产	符合《维修手册》要求
produced in the CIS countries	In accordance with the Maintenance Manual
国外生产	符合《维修手册》要求
produced in foreign countries	In accordance with the Maintenance Manual
燃油防冻剂	符合《维修手册》要求
Anti-crystallization additives to fuels	In accordance with the Maintenance Manual

6.7 批准的滑油牌号/Approved grades of oils

独联体国家生产	符合《维修手册》要求
produced in the CIS countries	In accordance with the Maintenance Manual
国外生产	符合《维修手册》要求
produced in foreign countries	In accordance with the Maintenance Manual

6.8 发动机使用寿命，小时/循环

The engine service life time, hour/cycle

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
首翻寿命 life before the first overhaul	2000/2000	2000/2000	2000/2000	2000/530
翻修间隔 TBO	2000/2000	2000/2000	2000/2000	—
总寿命 assigned life	6000/6000	6000/6000	6000/6000	2000/530

6.9 发动机主部件的循环寿命

The assigned lives of the engine main parts in cycles

	VK-2500-01	VK-2500-02	VK-2500-03	VK-2500PS-03
压气机/Compressor				
- 转鼓，图号.0780139140-1(1-12 级压气机盘) -Drum, drg.0780139140-1 (the compressor discs of the 1-12 stages)	8200	8200	8200	8200
涡轮/Turbine				
-1 级涡轮盘，图号 0780410506 -disc 1, drg.0780410506	7500	7500	7500	7500
-2 级涡轮盘，图号 0780410502 -disc 2, drg.0780410502	7500	7500	7500	7500
-3 级涡轮盘，图号 0780420293 -disc 3, drg.0780420293	8000	8000	8000	8000
-4 级涡轮盘，图号 0780429023 -disc 4, drg.0780429023	8000	8000	8000	8000
-1 号覆盖盘，图号. 0780410503 -cover plate 1, drg.0780410503	6500	6500	6500	6500

-2 号覆盖盘，图号.0780410504 -cover plate 2, drg.0780410504	2000	2000	2000	2000
-3 号覆盖盘，图号.0780410505 -cover plate 3, drg.0780410505	2000	2000	2000	2000
- 4 号覆盖盘，图号.0780410452 -cover plate 4, drg. 0780410452	8500	8500	8500	8500

结束

….END….