

型号认可证数据单

TYPE VALIDATION CERTIFICATE DATA SHEET

编号/No: VTCXXXXX
版次/Revision: 0
型号/Type: ARRIUS 2
衍生型 Variants
ARRIUS 2K1
批准人/Approved By:
日期/Date: XXXX-XX-XX

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

This data sheet, which is part of Validation of Type Certificate (No: VTC XXXX) , 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:
TURBOMECA, 64511 Bordes Cedex - France

有效页清单/List of effective pages :

页数/ Pages	1	2	3	4	5	6	7	8
版次/Revision	0	0	0	0	0	0	0	0

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编号/No: VTC0191E

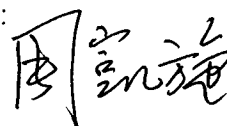
版次/Revision: 0

型号/Type: ARRIUS 2

衍生型 Variants

ARRIUS 2K1

批准人/Approved By:



日期/Date: 2007 年 7 月 3 日

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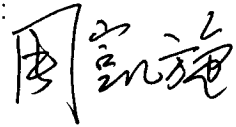
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第1部分 概述/Section 1 GENERAL

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

	中国民用航空总局认可数据单号、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	VTCXXX、0、XXXX-XX-XX	JAA/E/96-014、04、03 July, 2003
历史 History	无 NONE	不适用 NA

2. 类别/Category: 航空发动机/aviation engine

3. 认可当局/Validation Authority: 中国民用航空总局/CAAC
审定当局/Certifying Authority: 欧洲联合航空安全局/ JAA

申请 JAA 审定日期/JAA Certification Application Date:

Arrius 2K1
1997 年 4 月 14 日

JAA 审定日期/JAA Certification Date:

Arrius 2K1
2000 年 9 月 8 日

4. 型号合格证持有人/Type Certificate Holder: TURBOMECA
地址/Address: 64511 Bordes Cedex - France

5. 制造厂/Manufacturer: TURBOMECA

6. ETOPS: 不适用/NA

7. CAAC专用要求/CAAC Special Requirements:

明确中国3号喷气燃料使用条件。详见第2部分II.8. 油料（燃油/滑油/添加剂）。

Define the operation condition for the P.R.C. JET fuel No.3. See Section 2 II.8.Fluids (Fuel/Oil/Additives).

第2部分/Section 2

I 审定基础/Certification Basis

1. 适航标准/Airworthiness Standards:

JAR-E Change 8 dated 04/05/1990 except 4 Section 4, plus
Orange Paper E/91/1 dated 27 May 1991
Orange Paper E/93/1 dated 17 May 1993
Orange Paper E/96/1 dated 08 August 1996

2. 专用条件/Special Conditions (SC):

无/None

3. 豁免/Exemptions:

JAR-E 570(a)(4)(ii) and (a)(5)(ii) –滑油系统/Oil System

4. 等效安全条款/Equivalent Safety Finding:

JAR-E 740(c) –耐久试验方案/Endurance Test Schedules
JAR-E 740(f) (4) (i) –耐久试验方案/Endurance Test Schedules

5. 环境标准/Environmental Standards:

ICAO 附录16第 II 卷(1993年11月, 第2版)的燃油排放/Fuel Venting Provision of ICAO Annex 16 Vol. II (ed.2, dated 11/1993).

6. CAAC 认可审定基础 / CAAC Validation Basis

CAAC接受EASA的审定基础为认可审定基础
CAAC accept EASA certification basis as validation basis

II 技术特性/Technical Characteristics

1. 型号设计定型/Type Design Definition:

2K1: P/N 0 319 00 610 0

2. 描述/Description:

ARRIUS 2k1型发动机是功率为500kw级的涡轮轴发动机, 主要目的是驱动双发直升机。该发动机包括环形进气道, 由单级涡轮驱动的一级离心式压气机, 环形倒转流燃烧室, 和一个单级自由动力涡轮, 该单级自由动力涡轮驱动位于前面的减速齿轮箱。该减速齿轮单元也包括由燃气发生器驱动的附件齿轮箱和滑油箱。燃油控制系统通过一个具有人工备份的单通道电子发动机控制组件(EECU)来保证。

The Arrius 2k1 engine type is a 500kw class turboshaft engine, primarily intended for powering twin-engine helicopters. The engine consists of an annular air intake, a centrifugal compressor driven by a single stage turbine, an annular reverse flow combustor, and a single stage free power turbine with through shaft driving a reduction gearbox located in front. The reduction gear unit also includes the accessory gear box driven by the gas generator and an oil tank. The fuel control system is ensured by a single channel Electronic Engine Control Unit (EECU) with manual back-up.

3. 设备/Equipment:

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以下设备由飞机制造厂提供/To be supplied by the aircraft manufacturer:

- 起动发电机/ Starter-generator
- 滑油冷却器/ Oil cooler
- 前安装点/ Front mounts

发动机设备包含在型号设计定义中。 /The engine equipments are included in the engine Type Design Definition.

4. 尺寸/Dimensions:

总长/Overall Length: 0.973m

总高/Overall height: 0.638m

总宽/Overall Width: 0.538m

5. 干重/Dry Weight:

112.8 公斤, 包括安装/操作手册中定义的基本的发动机设备和EECU。有关增加的具体设备参考安装/操作手册。

112.8 kg, this includes the baseline engine equipments and the EECU as defined in the Installation/Operating Manual. For additional specific equipments refer to the Installation/Operating manual.

6. 额定值/Rating:

额定值/Rating	最大持续时间/Maximum duration per period	功率Power(kw)
		考虑了机械功率限制/Mechanical power limits taken into account
OEI-2 1/2 min	2.5 min	504
OEI Continuous	无限制/Unlimited	504
Take off	5 min	504
Maximum Continuous	无限制/Unlimited	432

下列条件定义了上述相应的性能参数最小值/The performance values specified above correspond to minimum values defined under the following conditions.

- 试车台在海平面国际标准大气温度条件下/ISA conditions at sea level, on test bed,
- 发动机装有试验台排气管和试验台进气道/ engine equipped with a test bed exhaust pipe and test bed air intake,
- 没有进气或排气损失/ no intake or exhaust losses,
- 没有安装损失/ no installation loss,
- 没有引气/ no air bleed,
- 除了发动机正常运转必须的没有任何附件的功率提取/ no power drawn by any accessories other than those required for engine operation,
- 输出轴旋转速度/output shaft rotation speed: 6360rpm (106%)常量/ constant
- 燃油的最低热值/fuel Low Heat Value: 43136 kJ/kg

7. 控制系统/Control System

控制系统是带有人工备份的单通道电子发动机控制元件。/The control system is a single channel electronic engine control unit with manual backup.

软件标准在发动机型号设计定义中规定。/Software standard is specified in the engine Type Design Definition.

8. 油料（燃油/滑油/添加剂）/Fluids (Fuel/Oil/Additives):

参见安装/操作手册的最新版本: X 319 N1 0042

Refer to latest edition of Installation/Operating Manual ref: X 319 N1 0042

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9. 航空器附件驱动/Aircraft Accessory Drives:

名称 designation	旋转方向 Rotation direction	旋转速度 Rotation speed (rpm)	过载时最大扭矩 Maximum Torque in overload (N.m)	最大静悬吊 Maximum static overhang (N.m)	剪切轴破坏扭矩 Shear shaft breaking torque (N.m)
启动发电机 Starter generator	CW	12334	25	7	77
备用驱动 Spare Drive	CW	4632	15	7	45

—从外侧看动力传动装置所指示的旋转方向

The rotation direction of the power drives for the accessories is indicated considering the power drive seen from the outside.

—CW: 顺时针/clockwise.

10. 最大允许的引气/Maximum Permissible Air Bleed Extraction

供飞机使用的最大允许引气：发动机进气流的5.48%

Maximum permissible air bleed for aircraft use: 5.48% of engine inlet air mass flow.

III 使用限制/Operational Limitations

1. 运行/启动/再起动车包线/Operating/Starting/Relight/Envelope: 参考安装/操作手册/ Refer to Installation/Operating Manual.

2. 温度限制/Temperature limits:

2.1 标准的燃气发生器排气温度/Measured Gas temperature (T45)

启动中/during starting:

	标准的燃气温度/ Measured Gas temperature (T45)
无限制时间 unlimited duration	810°C
超温overtemperature (<5 s)	895°C

飞行中/during flight:

	标准的燃气温度/Measured Gas temperature (T45)
OEI 2 1/2-min	957°C
OEI continuous	905°C
Take off	905°C
Max continuous	866°C

2.2 燃油温度/Fuel temperature

最小: 参见安装/操作手册为启动/再起动车。/Minimum: See Installation/Operating Manual for starting and relight.

当燃油温度 $\leq 4^{\circ}\text{C}$ 时使用防冰添加剂。/Use of anti-icing additive for fuel temperature $\leq 4^{\circ}\text{C}$.

参考安装/操作手册获得推荐的添加剂。/Refer to Installation/Operating Manual for recommended additives.

最大: 参见安装/操作手册/ Maximum: Refer to Installation/Operating Manual

2.3 滑油温度/Oil temperature

发动机启动/再起动车时最低滑油温度/Minimum oil temperature for engine starting/relight:

-30°C for oil with a kinematic viscosity of $5.10^{-6}\text{m}^2/\text{s}$ and $3.9 \times 10^{-6}\text{m}^2/\text{s}$

-50°C for oil with a kinematic viscosity of $3 \times 10^{-6}\text{m}^2/\text{s}$

加速时的最低滑油温度 Minimum oil temperature for power-up:

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10°C for oil with a kinematic viscosity of $5 \times 10^{-6} \text{ m}^2/\text{s}$ and $3.9 \times 10^{-6} \text{ m}^2/\text{s}$

0°C for oil with a kinematic viscosity of $3 \times 10^{-6} \text{ m}^2/\text{s}$

最大滑油温度/Maximum oil temperature: 110°C

3 最大/最小转速/Maximum / Minimum Speeds:

3.1 燃气发生器转速/Gas generator speed (N1)

最小稳定转速/Minimum stabilized speed: 35176rpm/65%

额定值/Rating	最大燃气发生器转速/Maximum gas generator Speed N1 rpm (%)
Transient(5s)	56823 (105)
OEI 2 1/2 min	56113 (103.7)
OEI continuous	54706 (101.1)
Take off	54706 (101.1)
Max Continuous	53406 (98.7)
Reference speed	54117 (100)

3.2 功率涡轮转速/Power turbine speed (N2)

100% N2 =44 009 rpm

除起动和慢车限制值 (FLIGHT 模式) /Limit values authorized other than during starting and idle (FLIGHT mode):

无限制时间/for an unlimited duration

最大/Maximum: 46650 rpm/106%

最小/minimum: 39608 rpm/90%

瞬态情况/in transient conditions:

最大/Maximum (20s) : 49290 rpm/112%

最小/Minimum (20 s): 37408 rpm/85%

4. 扭矩限制/Torque limits(m.daN):

额定值/Rating	扭矩/torque (N.m)
OEI 2 1/2- min	830
OEI continuous	760
Take off	760
Max Continuous	680
Transient(20s)	961

5 压力限制/Pressure Limits:

5.1 燃油压力/Oil pressure

最小起动/再起动/Minimum starting/relight : 30 kPa (相对压力/relative pressure)

飞行/Flight: 参见安装/操作手册/see Installation/Operating Manual

最大起动/飞行/Maximum starting/flight : 150 kPa (相对压力/relative pressure)

5.2 燃油压力/Fuel pressure

飞行中/In Flight: 参见安装/操作手册/see Installation/Operating Manual

最大起动/Maximum starting: 10000 kPa

起动中瞬态/Transient during starting (2 min) : 1500kPa

6 安装保证/Installation Assumptions:见安装/操作手册/ see Installation/Operating Manual

7 派遣限制 Dispatch Limitation:

除非经批准的 MMEL 许可，派遣时不允许 EECU 或任何发动机设备失效。

Despatch is not permitted with faults in the EECU or any engine equipments unless it is included in an approved MMEL.

IV 操作和服务说明/Operational and Service Instructions

安装/操作手册/Installation/Operating Manual	X 319 N1 0042
维护手册/Maintenance Manual	X 319 N1 3002
大修手册/Overhaul Manual	X 292 N1 5002
服务信件和服务通报 /Service letters and Service Bulletins	按需/as required

V 注释/Notes

注 1: Arrius 2K1 发动机的使用限于应用于多发旋翼航空器。

Note 1: The operation of the Arrius 2K1 engine is restricted to multi-engine helicopter applications.

注 2: 发动机被批准安装在能抵抗外物[JAR-E 790 (c) and JAR-E 800 中有定义] 吸入发动机的旋翼航空器上。

Note 2: The engine is approved to be fitted to rotorcraft only where the installation precludes ingestion of foreign objects [as defined in JAR-E 790 (c) and JAR-E 800] from entering the engine inlet.

注 3: Arrius 2k1 发动机（没有飞机进气）满足 JAR 关于在 JAR 29 附录 C 定义的包线内的结冰条件下运行的要求。

Note 3: Arrius 2k1 engine (without the aircraft air inlet) meets the JAR requirement for operation in icing conditions within the envelope defined in JAR 29 Appendix C.

注 4: 对于机组在发动机失效情况的训练，电子控制系统提供了“训练”功能，这一功能的特性参考安装/操作手册。

Note 4: The electronic control system provides a "TRAINING" function for training crew in an engine failure condition, Refer to the Installation/Operating Manual for the characteristics of this function.

注 5: 电子控制单元不能被安装在指定火区，安装条件规定在安装/操作手册中。

Note 5: The electronic control unit must not be installed in a dedicated fire zone. The installation conditions are defined in the Installation/Operating Manual.

注 6: EECU 软件已经依据 RTCA DO 178A 飞行鉴定类别（1 级）的规定进行发展和测试。

Note 6: The software of the EECU has been developed and tested in according with the provisions of Flight Critical category (level 1) of RTCA DO 178A.

组 7: 在安装/操作手册中规定了闪电防护要求和电磁干扰。

Note 7: Lightning protection requirements and electromagnetic interference are specified in the Installation/Operating Manual.

注 8: 发动机必须在大修手册出版前由 Turbomeca 进行大修。

Note 8: The engine must be overhauled by Turbomeca until the Overhaul Manual is published.

注 9: 时寿限制件列在维护手册的适航限制章节里。

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Note 9: The life Time Limitations are published in the Airworthiness Limitations Chapter of the Maintenance Manual.

注 10: 接受的限制在最新版的接受试验程序 N. 0.319.00.962.0 中有定义。

Note 10: The acceptance limitations are defined in the Acceptance Test Procedure N. 0.319.00.962.0 at the latest issue.

----完/END----