

型号认可证数据单

TYPE VALIDATION CERTIFICATE DATA SHEET

编号/No: VTC0200E

版次/Revision: 0

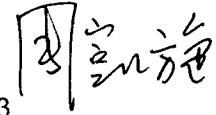
型号/Type: ARRIUS 2

衍生型 Variants

ARRIUS 2F

批准人/Approved By:

日期/Date: 2007-12-13



本数据单是型号认可证(编号: VTC 0200E)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 0200E), 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

中国民用航空总局
GENERAL ADMINISTRATION OF CIVIL AVIATION OF CHINA

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	VTC0200E、0、2007-12-13	M22, 05, Sept, 2005
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 2F
1994 年 11 月 29 日

JAA 审定日期/JAA Certification Date:

Arrius 2F
1997 年 02 月 22 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 9 dated 21/10/1994 excluding Section 4 which was deleted by NPA-E-17
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 840 –压气机/涡轮转子完整性试验/Compressor & turbine rotor integrity tests

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:

2F: P/N 0 319 00 800 0

2. 描述/Description:

ARRIUS 2F型发动机是一个自由涡轮的涡轮轴发动机, 用于单发直升机。该发动机包括环形进气道, 由单级燃气发生器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发动机前面和排气管间的减速齿轮箱。减速部件也包括由燃气发生器驱动的附件齿轮箱和完整的滑油箱。

The ARRIUS 2F is a free turbine turboshaft engine for single-engine helicopters. It is composed of an annular air intake, a single stage centrifugal compressor driven by a single stage gas generator turbine, an annular reverse flow combustor chamber, a single stage free turbine driving a reduction gearbox located in the engine front and exhaust pipe. The speed reduction module also includes the accessory gearbox driven by the gas generator and an integral oil tank.

3. 设备/Equipment:

参照安装/操作手册中规定的设备和部件/Refer to the Installation/Operating manual for specific equipment units.

起动机和发动机安装点不属于发动机定义的部件/ The starter-generator and engine mounts are not part of the engine definition.

4. 尺寸/Dimensions:

中国民用航空总局
GENERAL ADMINISTRATION OF CIVIL AVIATION OF CHINA

总长/Overall Length: 1.418m

总高/Overall height: 0.674m

总宽/Overall Width: 0.489m

5. 干重/Dry Weight:

103.5 公斤/103.5 kg.

6. 额定值/Rating:

额定值/Rating	最大持续时间/Maximum duration per period	功率/ Power(kw)	
		2F	2F (Tf39)
Take off	5 min	322	376
Maximum Continuous	无限制/Unlimited	322	335

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.

- 在海平面国际标准大气条件下 (15°C, 101.3kpa) /ISA, sea level static conditions (15°C, 101.3kpa) .
- 发动机试验台装有水刹车系统/ At the engine test bed fitted with a water brake system.
- 发动机装有校准的TURBOMECA空气进气口P/N 6 528 01 526 0/ engine fitted with calibrated TURBOMECA air intake bellmouth P/N 6 528 01 526 0.
- 发动机装有TURBOMECA排气管P/N 6 528 01 734 0/engine fitted with a TURBOMECA exhaust pipe P/N 6 528 01 734 0.
- 进气口没有压力损失, 没有气体排放/No pressure loss in the air intake, no gas exhaust.
- 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 extraction by other accessories than those necessary for normal operation of the engine.
- 燃油的最低热值/ Low heating value of fuels
 - 正常燃油, 无限制 =43136千焦/公斤/normal fuels, unrestricted =43 136 kJ/kg
 - 替代燃油, 使用受限制 =43 500千焦/公斤/Substitute fuels, restricted-use =43 500 kJ/kg
- 连续输出轴驱动转速 =6000转/分/At constant output shaft drive speed =6 000rpm

7. 燃油控制系统/Fuel Control System

带有人工备份的液压控制。/Hydromechanical control with manual mode.

8. 燃油, 滑油/Fuel, Oil:

批准的燃油: 参见安装手册。/Approved fuels: Refer to the Installation Manual.

批准的滑油: 参见安装手册。/Approved fuels: Refer to the Installation Manual.

9. 附件供应/Accessory drives provision:

名称 Nominal rpm	旋转方向 Rotation direction	最大稳态功率 Maximum steady state power (kw)	过载时最大扭矩 Maximum Torque in overload (N.m)	最大静悬吊 Maximum static overhang (N.m)	失效扭矩 Failure torque (N.m)
12 334	CW	5.7	25	25	77

—参考面对发动机传动装置驱动盘的旋转方向。

The reference for the direction of rotation is facing the engine accessories drives pad.

中国民用航空总局
GENERAL ADMINISTRATION OF CIVIL AVIATION OF CHINA

—CW: 顺时针/clockwise.

10. 引气供应/Air bleed provisions:

—供直升机使用的P2引气: /P2 air bleed extraction for helicopter use:

在国际标准海平面大气条件下最大起飞状态的最大空气流量为70克/秒/Maximum air mass flow of 70g/s at maximum take-off rating under ISA standard sea level conditions;

用于更改型Tf39, With modification Tf39, 在国际标准海平面大气条件下最大起飞状态的最大空气流量为110克/秒/maximum air mass flow of 110g/s at maximum take-off rating under ISA standard sea level conditions.

一起动时最大空气流量: /Maximum air mass flow during starting:

10克/秒/10g/s

—性能影响/Effects on performance:

参考性能手册/Refer to Performance Booklets.

III 使用限制/Operational Limitations

1. 温度限制/Temperature limits:

1.1 最大排气温度: /Maximum exhaust gas temperature (T45):

一起动: /Starting:

无限制时间: /Unlimited duration: 800°C

限制小于5秒(最大超温): / Limited to <5 s (max. overtemperatures): 870°C

—静态飞行条件: /Steady state flight: conditions:

起飞额定: /Take off rating: 870°C

最大连续额定: /Maximum continuous rating: 830°C

1.2 燃油温度: /Fuel temperature:

一起动/再起动最小值: /Minimum for starting and relight:

参见安装手册。/Refer to the Installation Manual.

—当燃油温度 $\leq 15^{\circ}\text{C}$ 时使用防冰添加剂。/Use of anti-icing additive for fuel temperature $\leq 15^{\circ}\text{C}$.

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

—最大: /Maximum:

正常燃油: /normal fuels: $+50^{\circ}\text{C}$

替代燃油: /substitute fuels: $+20^{\circ}\text{C}$

1.3 滑油温度: /Oil temperature:

一起动最低温度: -50°C (参见安装手册)。/Minimum for starting: -50°C (Refer to the Installation Manual) .

—最小功率应用时: /Minimum for power application:

-10°C with 5 cSt ($5 \cdot 10^{-6} \text{ m}^2/\text{s}$) oil.

-0°C with 3 cSt ($3 \cdot 10^{-6} \text{ m}^2/\text{s}$) oil.

—最大工作温度: /Maximum operating:

正常燃油: /normal fuels: 110°C

替代燃油: /substitute fuels:

Zp = up to 3000m: 110°C

Zp = from 3000 to 4500m: Linear decrease from 110°C to 90°C

Zp = from 4500 to 6000m: 90°C

中国民用航空总局
GENERAL ADMINISTRATION OF CIVIL AVIATION OF CHINA

2 发动机转速限制: /Engine speed limits:

2.1 燃气发生器转速/Gas generator speed (N1)

100%N1 = 54117 rpm.

额定值/Rating	最大起飞/Maximum take off	最大连续/Maximum continuous	瞬态超转/Transient overspeed
N1 (rpm)	54 658 (101%)	53 846 (99.5%)	56 065 (103.6%)

超过整个包线的最大转速: 参见安装手册/Maximum speed over the entire operating envelope: refer to the Installation Manual.

2.2 自由涡轮转速/Free turbine speed (N2)

100% N2 = 44 009 rpm.

除起动和慢车外最大允许转速值: /Maximum permissible speed values, exclusive of starting and idle ratings:

稳态, 无限制时间: /Steady state, unlimited duration:

最大: /Maximum: 45 769 rpm (104%)

最小: /Minimum: 40 488 rpm (92%)

瞬态, 限制到20秒: /Transient, limited to 20 s:

最大: /Maximum: 48 410 rpm (100%)

最小: /Minimum: 39 608 rpm (90%)

与其它工作模式(慢车, 起动)联合限制参见安装手册。/Refer to the Installation Manual for the limits associated with the other operating modes (idle, starting) .

3. 扭矩限制: /Torque limits:

输出轴最大扭矩: /Maximum torque on output shaft:

—最大扭矩, 最大连续额定值: /Maximum torque, max. continuous rating: 600 N.m

—最大扭矩, 最大起飞额定值: /Maximum torque, max. take-off rating: 650 N.m

—瞬态超扭(20秒): /Transient overtorque (20s): 752 N.m

4. 压力限制: /Pressure Limits:

4.1 滑油压力: /Oil pressure:

最小滑油压力: /Minimum oil pressure: 170 kPa

最大滑油压力: /Maximum oil pressure: 1 500 kPa

4.2 燃油压力: /Fuel pressure:

最小燃油压力: /Minimum fuel pressure: 参见安装手册。/Refer to the Installation Manual.

最大燃油压力: /Maximum fuel pressure: 参见安装手册。/Refer to the Installation Manual.

5. 安装保证: /Installation Assumptions:

参见安装手册中关于安装设定(见 JAR E30)。/Refer to the Installation Manual for the installation assumptions (see JAR E30).

6. 某一系统或部件失效时发动机的运转: /Engine operation with certain systems or components inoperative:

在直升机起飞前所有发动机系统和部件必须正常工作, 禁止起飞时部件或控制系统失效。/All the engine systems and components must be operative before helicopter take-off. Take-off with a component or control system failure is prohibited.

IV 操作和维护说明/Operating and Maintenance Instructions

安装手册/Installation Manual

X 319 L6 001 2

中国民用航空总局
GENERAL ADMINISTRATION OF CIVIL AVIATION OF CHINA

性能手册/Performance Booklets	
正常燃油/Normal fuels	X 319 L6 002 9
替代燃油/Substitute fuels	X 319 L6 004 9
正常燃油/Normal fuels	X 319 L6 005 9
替代燃油/Substitute fuels w/ mod. Tf39	X 319 L6 006 9
维护手册/Maintenance Manual	X 319 L6 301 2
大修手册/Overhaul Manual	X 319 L6 500 2
服务通告/Service Bulletins	
服务通告和服务信函/Service Bulletins & Service letters	参见相关索引/Refer to the relevant index

V 注释/Notes

注 1: 将振动仪安装在发动机机匣上测量振动: 参见安装手册。

Note 1: Vibration is measured by accelerometers fitted on the engine casing: refer to the Installation Manual.

注 2: 备用。

Note 2: Spare.

注 3: 环境温度、高度和燃油牌号的不同限制 N1 性能: 参见安装手册。

Note 3: N1 performance is limited as a function of the ambient temperature, the altitude and the type of fuel: refer to the Installation Manual.

注 4: 发动机的时寿限制件列在维护手册第 5 章中。

Note 4: The life-Limited engine are list in Chapter 5 of the Maintenance Manual.

注 5: Tf39 没有大变化, 主要更改是增加最大 FCU 燃油流量的设定值, 以防止由于流量限制系统造成发动机功率限制。

Note 5: Tf39 is non-significant, major modification consisting in increasing the setting value of the maximum FCU fuel flow limit to prevent engine power limitation by the flow limitation system.