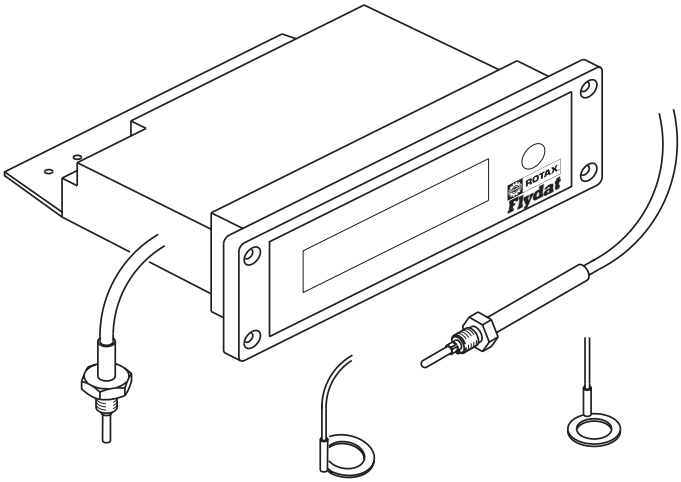
# USER´S GUIDE

*for*

# FLYdat




## ⚠ WARNING

Before starting the engine, read the Operator`s Manual. Failure to do so may result in **personal injuries including death**.
Consult the original equipment manufacturer`s handbook for additional instructions!

The manual must remain with the engine / original equipment in case of sale.

**Ausgabe: 0 vom 1997 10 01**



Recommended price: ATS 100,--
Part no.: 897 730 DM 14,--

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## 2) Preface

**Congratulations to your decision to use the *FLYdat*, specially developed for ROTAX Aircraft Engines for indicating and storing of engine operation data. Prior to taking the *FLYdat* into service, please, read the Guide carefully, as it will aquaint you with the basic knowledge of technical data, installation and the safe handling of the *FLYdat.***

**If you don't understand everything in this manual or in case of any questions arising, please, contact the nearest authorized ROTAX Distributor or Service Partner.**



***We wish you fun and satisfaction when flying the Rotax powered aircraft, supplemented by the FLYdat.***

## 3) Warning

The ***FLYdat*** has not undergone any safety and durability examination to the Standards of Civil Aviation but it does incorporate the latest technical development and has been thoroughly tested.

Despite of ***FLYdat*** being a precision instrument, false indication or misinterpretation of data could occur. By utilizing the ***FLYdat*** the user acknowledges the possible danger and responsibility for all risks.

To minimize the risks, study the Guide carefully. Before the content of the Manual is not understood completely you may not take the ***FLYdat*** into Service.

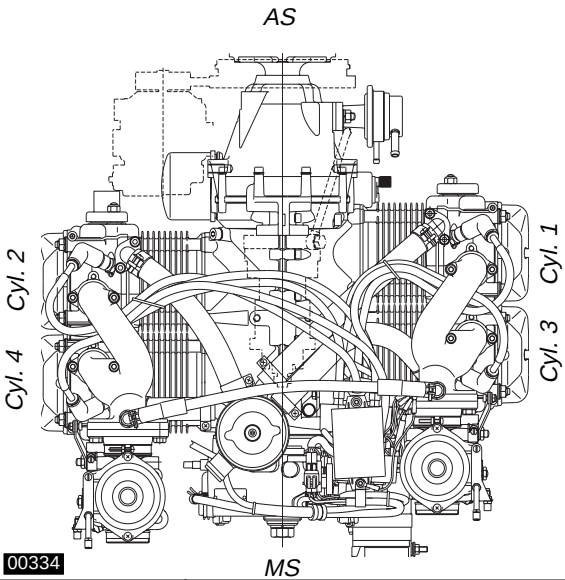
Please, pay attention to the following symbols throughout the manual emphasizing particular information.

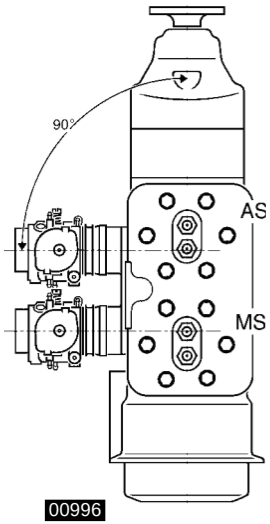
▲ **WARNING:** Identifies an instruction, which if not followed, may cause serious injury or even death.

■ **ATTENTION:** Denotes an instruction which if not followed, may severely damage the engine or other components.

◆ **NOTE:** Information useful for better handling of the ***FLYdat.***

P.T.O. stands for power take off side and M.S. for magneto side throughout Technical Documentation of Rotax, for precise destination of location.



# 4) Description of design

## 4.1) General data

The ***FLYdat*** represents an instrument especially developed for Rotax aircraft engines for indication and acquisition of engine operating data readily accessible for the pilot.

The ***FLYdat*** is furnished with 8 sensor input ports, which can be occupied variably according to engine type.

The operating data is permanently compared with the engine specific operating limit. If the signalled operating data exceeds the stored operating limit, the ***FLYdat*** will warn the pilot.

In addition all the input ports are equipped with a maximum alarm, responding when picked-up value is equal or above the stored limit.

Two or more readings will never be indicated simultaneously but in succession updated on the display. The updating of all the readings takes less than one second.

The ***FLYdat*** keeps the pilot informed on the following actual readings:

- Engine speed
- Cylinder head temperature (CHT)
- Exhaust gas temperature (EGT)
- Ambient air temperature (not on engines 912 / 914)
- Temperature of cooling water (only on engines 582 UL, 618 UL)
- Oil temperature and oil pressure (only on engines 912 / 914)

Besides the topical data, the ***FLYdat*** shows also the hours of operation.

The seperately picked up readings are issued in accordance to display allocation.

For maintenance and analyses of engine shortcomings the ***FLYdat*** picks up and stores the essential operating data. For safety's sake the programmed service date reminds you of the scheduled maintenance of engine.

The handy unit offers a number of appreciable assets compared to conventional dial gauge indication. Besides easy installation, the low weight and compact size are essential advantages of the ***FLYdat*** .

## 4.2) Possible configurations

The ***FLYdat*** is supplied by Rotax with a standard configuration.

With the standard configuration all trigger levels for warning- and alarm system are set to the **maximum of the measuring range**, i.e. no checks for exceeding of warning limits.

The ***FLYdat*** can be coordinated by the authorized Rotax Distributor with the respective engine type. With this configuration warn- and alarm limits are set for specific channels.

Configuration is available for the following engine types:

- 447 UL SCDI
- 503 UL DCDI
- 582 UL DCDI
- 618 UL DCDI
- 912 DCDI series
- 914 DCDI series
- STANDARD

By configuration of the ***FLYdat,*** the engine type, engine number, hours of operation, temperature unit and the respective engine limits are programmed.

◆ NOTE: If the ***FLYdat*** is utilized on a used engine, the existing time of operation can be taken into account.

▲ WARNING: If using the ***FLYdat*** with the standard configuration the indication will work flawless, but because warning- and alarm limits are set to a high level, therefore no warning at danger .

## 4.3) Display allocation

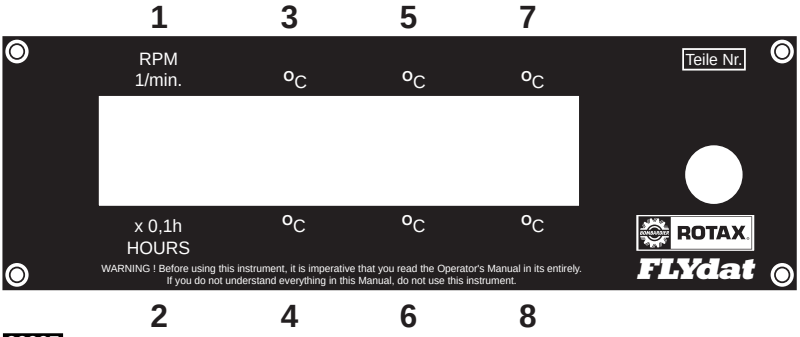
Display allocation at state of supply as per standard configuration. By programming the ***FLYdat*** it will be adapted to the respective engine type.

Pay attention to the **WARNING** below the display:

**Before using this instrument it is imperative to read the Operator's Manual (User's Guide) in its entirety. If you do not understand everything in this Manual (Guide), do not use this instrument.**

Because of the similar design of some engines, the following engines can be dealt with in categories.

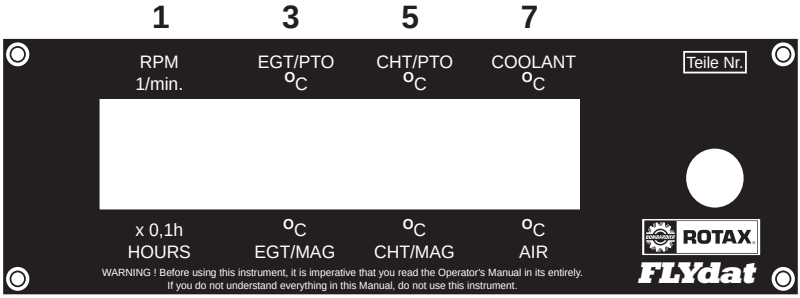
***Standard***




| Display field | Designation | Unit | Resolution |
|---|---|---|---|
| 1 | Engine speed | rpm | 1 |
| 2 | Hours of operation | h | 0,1 |
| 3 | Temperature 1 | °C | 1 |
| 4 | Temperature 2 | °C | 1 |
| 5 | Temperature 3 | °C | 1 |
| 6 | Temperature 4 | °C | 1 |
| 7 | Temperature 5 | °C | 1 |
| 8 | Temperature 6 | °C | 1 |

***Liquid cooled 2-stroke-engines***

- 582 UL
- 618 UL




| Display field | Designation | Unit | Resolution |
|---|---|---|---|
| 1 | Engine speed | rpm | 1 |
| 2 | Hours of operation | h | 0,1 |
| 3 | Exhaust gas temp. PTO | °C or °F | 1 or 10 |
| 4 | Exhaust gas temp. MS | °C or °F | 1 or 10 |
| 5 | Cylinder head temp. PTO | °C or °F | 1 |
| 6 | Cylinder head temp. MS | °C or °F | 1 |
| 7 | Coolant temperature | °C or °F | 1 |
| 8 | Ambient air temperature | °C or °F | 1 |

***Aircooled 2-stroke-engines***

- 447 UL
- 503 UL

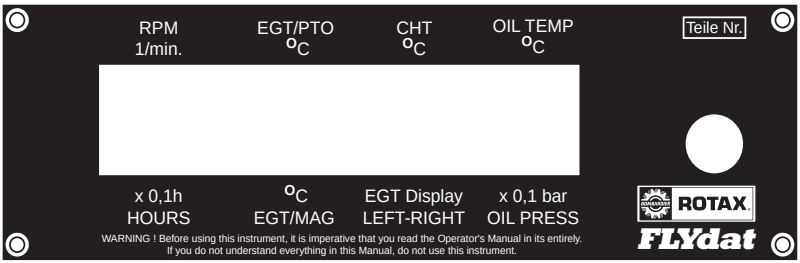

Display coverage as above, but display 7 not occupied.

**Liquid cooled 4-stroke-engines**

➪ 912 DCDI series

➪ 914 DCDI series

| Display field | Designation | Unit | Resolution |
|---|---|---|---|
| 1 | 3 | 5 | 7 |




1 ..... Engine speed ..... rpm ..... 1

2 ..... Hours of operation ..... h ..... 0,1

3 ..... Exhaust gas temp. AS . °C or °F ..... 1 or 10

4 ..... Exhaust gas temp. MS °C or °F ..... 1 or 10

5 ..... Cylinder head temp. .... °C or °F ..... 1

6 ..... x)

7 ..... Oil temperature ..... °C or °F ..... 1

8 ..... Oil pressure ..... bar ..... 0,1

x) indicating the line of cylinders from which the exhaust gas temp. is picked up

◆ NOTE: Arrow ← denotes left line of cylinders

Arrow → denotes right line of cylinders

The change over of the readings of exhaust gas temperature is every 6 to 8 seconds.

## 5) Technical data

| | |
|---|---|
| Design: | plastic injection molded housing with plexiglass front plate, easy to exchange |
| Function: | ➪ display of actual values of engine speed<br>temperatures<br>oil pressure |
| | ➪ Counting hours of operation |
| | ➪ Control of limits |
| | ➪ Alarm output |
| | ➪ Display of maintenance schedule |
| | ➪ Control of sensors |
| | ➪ Autocontrol |
| | ➪ Maximum input memory for each channel |
| | ➪ Last input memory for all channels |
| | ➪ Memory of the first exceeding of a limit on each channel |
| | ➪ Recording of the stored data in an auxiliary unit |
| | ➪ Visual and audible signals for warning- and alarm limits |
| Weight: | ca. 0,5 kg (1 lb.) |
| Display: | LCD with background illumination<br>2 x 16 digits, size of type 8 mm |
| Power supply: | 12 V DC (min. 11,8 V, max. 15 V) |
| Power consumption: | 0,5 A max. |
| Excess-voltage protection: | Short-circuiting of supply above 20 V (fuse blows). |
| Fuse: | 3 A |
| Alarm output: | 12 V DC, 0,5 A max. |
| Operating temperature: | 0°C to 60°C |

| | | |
|---|---|---|
| Storage temp.: | -20°C to +60°C | |
| Vibration limits: | amplitude: | max. 0,36 mm |
| | acceleration: | max. 5 g |
| | frequency: | 10 to 500 Hz |
| Shock limits: | acceleration: | max. 50 g |
| | duration of shock: | 11 ms |
| Permanent shock limit: | acceleration: | max. 10 g |
| | duration of shock: | 6 ms |

**Sensor inputs**:

4 x input for thermo couple NiCrNi (type K):

| | |
|---|---|
| measuring range: | -20°C to +999°C at 25°C terminal temperature |
| accuracy: | ± 5°C |
| application: | cylinder head temperature (CHT), exhaust gas temperature (EGT) |

2 x input resistance thermometer (PT 100):

| | |
|---|---|
| measuring range: | -20°C to +203°C |
| accuracy: | ± 2°C |
| application: | air-, coolant temperature (2-stroke),<br>oil-, cylinder head temperature (912 / 914) |

1 x input oil pressure pick-up:

| | |
|---|---|
| measuring range: | 0 to 10 bar |
| accuracy: | ± 0,2 bar |
| application: | oil pressure (912 / 914) |

1 x rpm input:

| | |
|---|---|
| measuring range: | 1030 to 9990 rpm |
| accuracy: | ± 10 rpm |

■ NOTE: For configuration on 912 / 914 **one** impulse per revolution, but for all other configurations **6** impulses per revolution are required for correct rev-counting.

hour meter:

| | |
|---|---|
| measuring range: | 0,0 to 3200 h |
| indicating range: | 0,0 to 999,9 h (after 999,9 h change to Zero) |
| accuracy: | ± 2 sec/h at operation without interruption |

## 5.1) Warn- and alarm limits

If the ***FLYdat*** has been configurated by a distributor, the following limits are stored.

◆ NOTE: Please, pay attention to limits as specified in the Operator's Manual for engine.

Don't run engine above these limits.

**Engine type 447 and 503 UL**

| Display | Unit | Warn limit | Alarm limit |
|---|---|---|---|
| Engine speed .... | (rpm) | 6800 | 7000 |
| Exh. gas temp. .. | (°C) | 650 | 680 |
| Cyl. head temp. . | (°C) | 250 | 275 |
| Ambient air temp. | (°C) | 40 | 50 |

**Engine type 582 UL DCDI**

| Display | Unit | Warn limit | Alarm limit |
|---|---|---|---|
| Engine speed .... | (rpm) | 6800 | 7000 |
| Exh. gas temp. .. | (°C) | 650 | 680 |
| Cyl. head temp. . | (°C) | 165 | 180 |
| Coolant temp. .... | (°C) | 85 | 95 |
| Ambient air temp. | (°C) | 40 | 50 |

**Engine type 618 UL**

| Display | Unit | Warn limit | Alarm limit |
|---|---|---|---|
| Engine speed .... | (rpm) | 7000 | 7300 |
| Exh. gas temp. .. | (°C) | 650 | 680 |
| Cyl. head temp. . | (°C) | 165 | 180 |
| Coolant temp. .... | (°C) | 85 | 95 |
| Ambient air temp. | (°C) | 40 | 50 |

**Engine type 912**

| Display | Unit | Warn limit | Alarm limit |
|---|---|---|---|
| Engine speed .... | (rpm) | 5800 | 6000 |
| Exh. gas temp. .. | (°C) | 880 | 900 |
| Cyl. head temp. . | (°C) | 150 | 160 |
| Oil temperature. | (°C) | 140 | 150 |
| Oil pressure max. | (°C) | 6,0 | 8,0 |
| Oil pressure min. | (bar) | 2,0 | 1,0 |

**Engine type 914**

| Display | Unit | Warn limit | Alarm limit |
|---|---|---|---|
| Engine speed ..... | (rpm) | 5800 | 6000 |
| Exh. gas temp. ... | (°C) | 950 | 1000 |
| Cyl. head temp. .. | (°C) | 135 | 150 |
| Oil temperature .. | (°C) | 130 | 145 |
| Oil pressure max. | (bar) | 6,0 | 8,0 |
| Oil pressure min. | (bar) | 2,0 | 1,0 |

# 6) Installation

## 6.1) General information

Prior to the installation of the ***FLYdat*** look for a suitable location in the cockpit, taking into consideration the following:

➪ protection against too high temperatures

◆ NOTE: The unit operates flawless up to the max. operating temperature of 60°C.

➪ protection against excessive vibrations and shock loads (see Technical Data for permissible values). For certain conditions it might be necessary for keeping within specifications, to install the unit vibration damped.

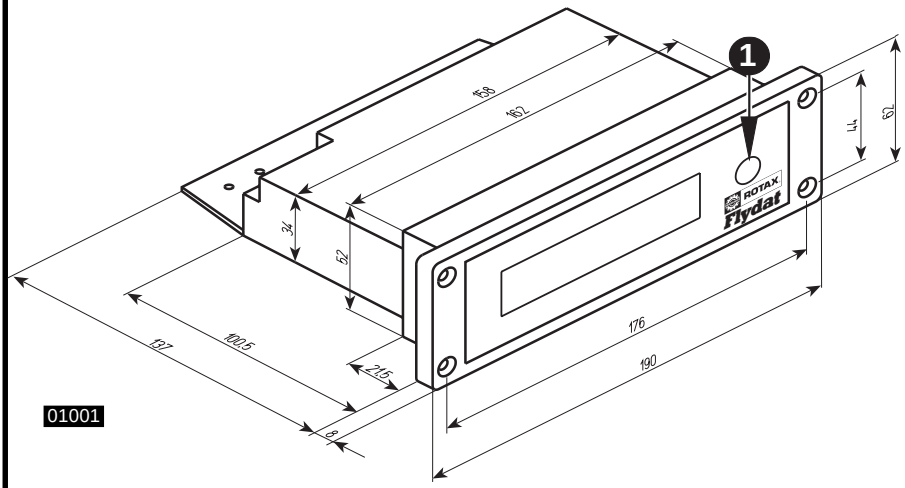
➪ Protection against dampness and any kind of gasoline and oil wetting.

➪ Ensure clear and distinct visibility, direct and without glare

➪ Easy maintenance

In consideration of reliability and durability try to meet all these conditions.

## 6.2) Outline dimensions of the Flydat




◆ NOTE: Attachment screws for the ***FLYdat*** are not in the supply scope.

## 6.3) Electric Connections

The plug receptacles with interlocking, for connection of the sensors and power supply are located on the backside. For the wiring of sensors and terminals consult the wiring diagram.

The fitted socket ❶ is used to program (datatransfer) the ***FLYdat*** for the different engine types.

This programming is performed exclusively by the Bombardier-Rotax distributor. Therefore, the socket ❶ is of no significance for the user.

■ **ATTENTION:** Manipulation on this terminal ❶ or to plug-in any connection whatsoever, is not allowed.

## 6.4) Sensor kits

3 different sensor kits, especially assembled for each engine type are offered from Bombardier-Rotax.

**Version LC** (liquid cooled 2-stroke engines)

**Version AC** (aircooled 2-stroke engines)

- ➪ 2 sensors for exhaust gas temperature (EGT)
- ➪ 2 spark plug seat sensors for cylinder head temperature (CHT)
- ➪ 2 temperature pick-ups for air and coolant temperature

**(version AC with 1 air temperature sensor only)**

- ➪ 2 sealing rings for EGT sensors
- ➪ 2 support angles for CHT sensors
- ➪ 2 cable straps
- ➪ 1 front plate alternatively with temperature display in °C of °F
- ➪ 1 sticker with wiring diagram

**Version 912 / 914**

- ➪ 4 sensors for exhaust gas temperature (EGT)
- ➪ 2 temperature pick-ups, for cylinder head and oil temperature
- ➪ 1 pick-up for oil pressure
- ➪ 4 sealing rings for EGT sensors
- ➪ 4 welding collars M8x1 for EGT sensors
- ➪ 1 front plate, alternatively with temperature display in °C or °F
- ➪ 1 sticker with wiring diagram

## 6.5) Installation of the sensors

At installation of the sensors take into consideration the following:

- ➪ Route sensor lines to be protected against excessive temperatures.
- ➪ Route sensor lines free of vibrations, but with some flexibility.
- ➪ Sensor lines to be without kinks and must not chafe.
- ➪ The threads of the EGT sensors and pick-up of coolant have to be greased with Loctite ANTI-SEIZE, to ensure troublefree removal. (see tightenig torque chart).

Shortcomings in these points can result in false readings, interruption of lines or the ruin of pick-up lines and sensors.

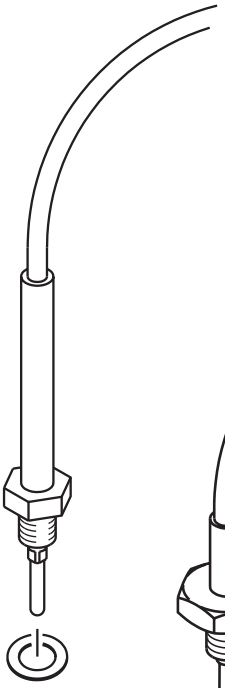
◆ NOTE: The sensors are furnished by the supplier with pick-up lines of 2 m (6' - 6") length, but can be extended to a max. length of 4 m (13').

Thermocouples NiCrNi (type K) to be extended with NiCrNi resistor cables only. Connections have to be soldered and insulated, preferably by shrink tube.

Never establish connections by clamping, danger of false reading due to higher contact resistance. NiCrNi resistor cables are available in a specialist store or from your local Bombardier-Rotax dealer.

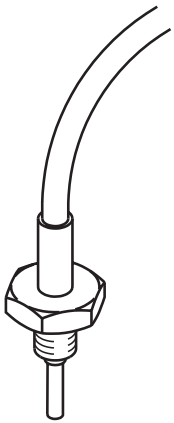
All other sensors can be extended by suitable stranded copper wire.

■ ATTENTION: Always bear in mind, you are dealing with measuring devices when you install sensors, and handle these sensitive components carefully.
For any question, please contact your local Bombardier-Rotax distributor.



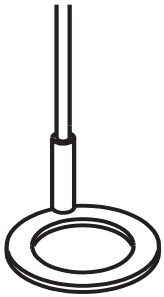
01002

*EGT Sensor*



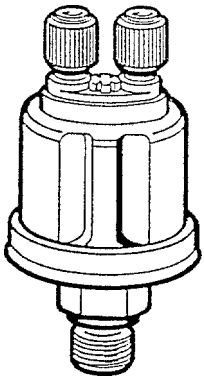
01004

air-,coolant-Sensor
CHT- Sensor (912 / 914)
oil temp.-Sensor (912 / 914)



01005

*CHT Sensor*



01007

*oil pressure pick-up*

**Tightening torques:**

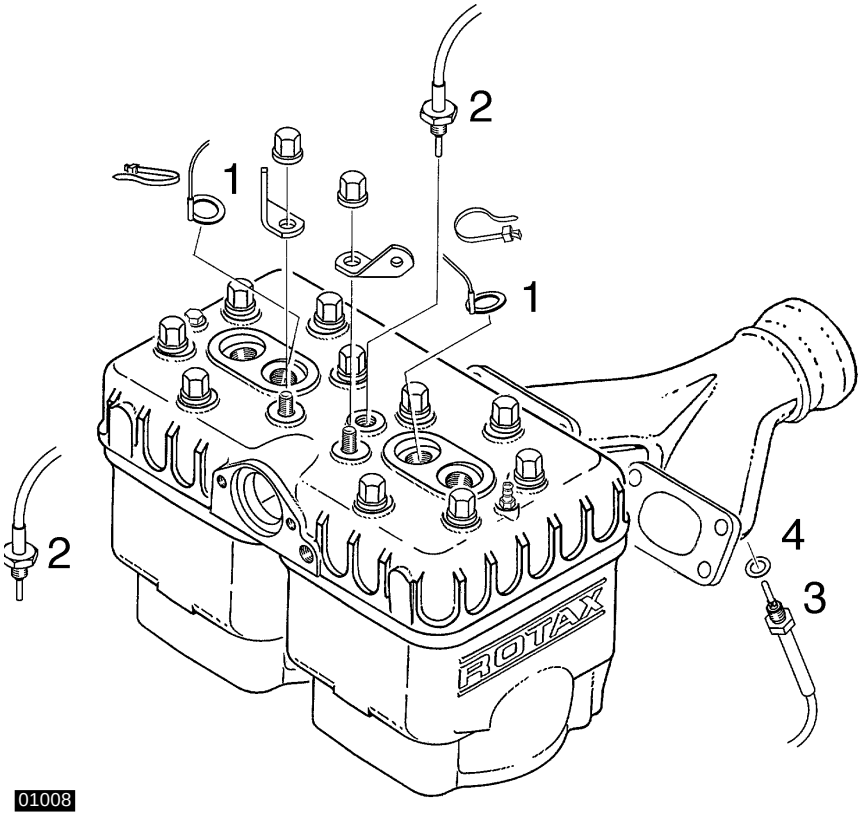
EGT- sensor ..... 20Nm 177in.lb. + LOCTITE Anti Seize
oil pressure pick-up ..... 15Nm 133in.lb. + LOCTITE 603
CHT- sensor (912 / 914) ..... 15Nm 133in.lb. + LOCTITE 221
oil temp.- sensor (912 / 914) .... 15Nm 133in.lb. + LOCTITE 603
coolant temp.- sensor ..... 6Nm 53in.lb. + LOCTITE Anti Seize
air temp.- sensor ..... 6Nm 53in.lb. + LOCTITE 221

■ ATTENTION: All components, liable to come off during operation, **have to be secured against loss**!

## 6.6) Installation plan for the individual sensor kits

**liquid cooled 2-stroke engines**

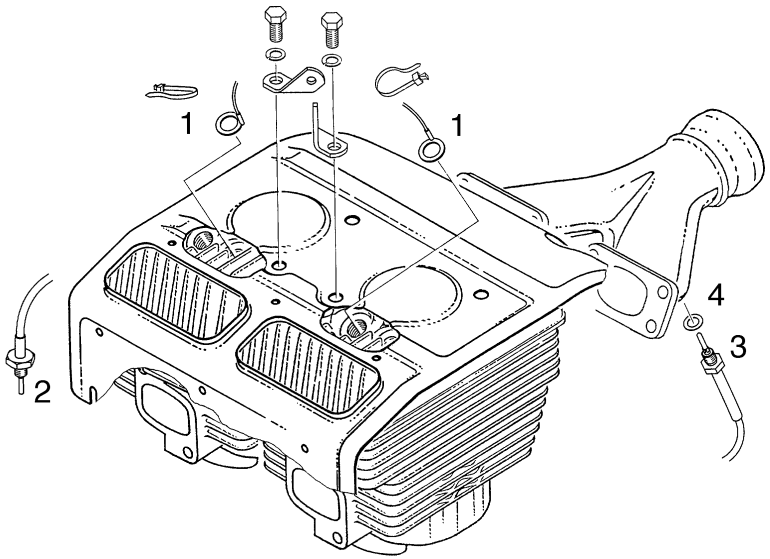
(Illustration shows engine type 582 UL)




1) Sensor at spark plug seat (CHT)
2) Air- and liquid temperature sensor
3) EGT-sensor
4) Sealing ring

**Aircooled 2-stroke engines**

(Illustration shows engine type 503 UL)




01009

1) Sensor at spark plug seat (CHT)

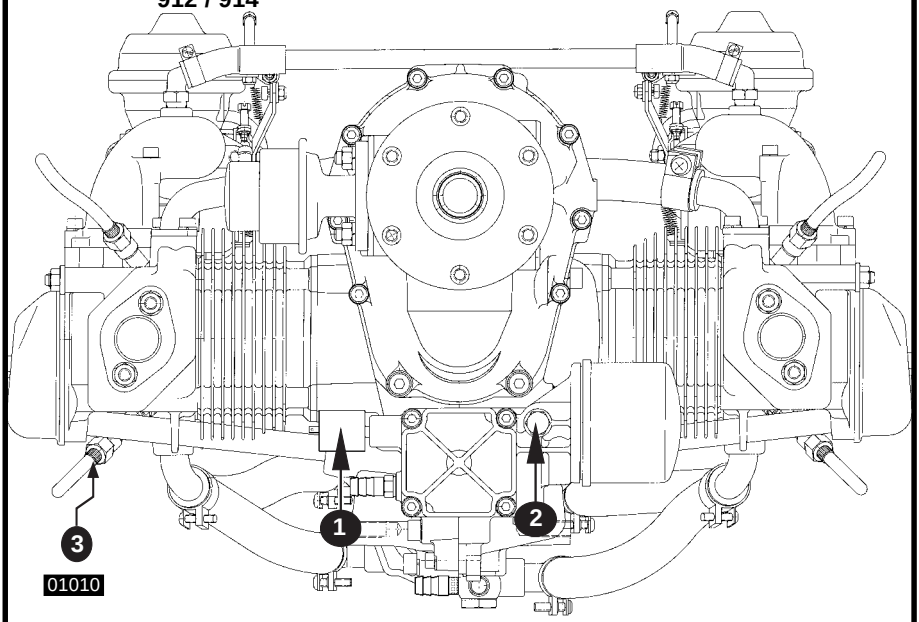
2) Air temperature sensor

3) EGT sensor

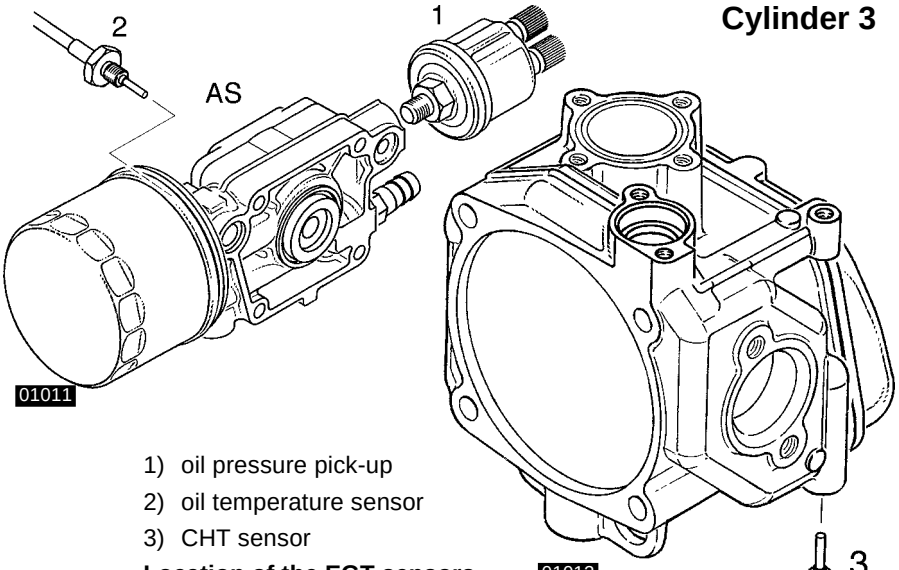
4) Sealing ring

◆ NOTE: For engine type 447 UL, 503 UL, 582 UL and 618 UL, exhaust manifolds specially prepared for installation of EGT sensors, are readily available.

**912 / 914**

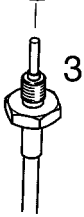



**Cylinder 3**




1) oil pressure pick-up
2) oil temperature sensor
3) CHT sensor

**Location of the EGT sensors:** 01012




The sensors have to be installed in the exhaust manifold at a distance of 100 mm (4") from the exhaust valve.

Welding collars are included in the sensor kit.

## 6.7) Signalling device

The ***FLYdat*** is furnished with an alarm output, which acts as the positive (+) terminal of 12V output.

◆ NOTE: A short-circuit on this output will blow the fuse of the unit.

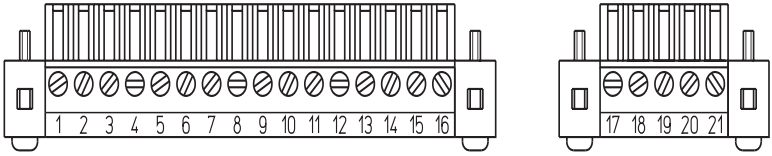
If need be, a lamp and/or some signalling device, acoustic or visual, may be connected.

■ ATTENTION: The maximum load must not exceed 0,5 A.

At installation, the same considerations as for the Flydat unit should be taken!

## 6.8) Wiring diagram for different engine types:

**plug receptacles**

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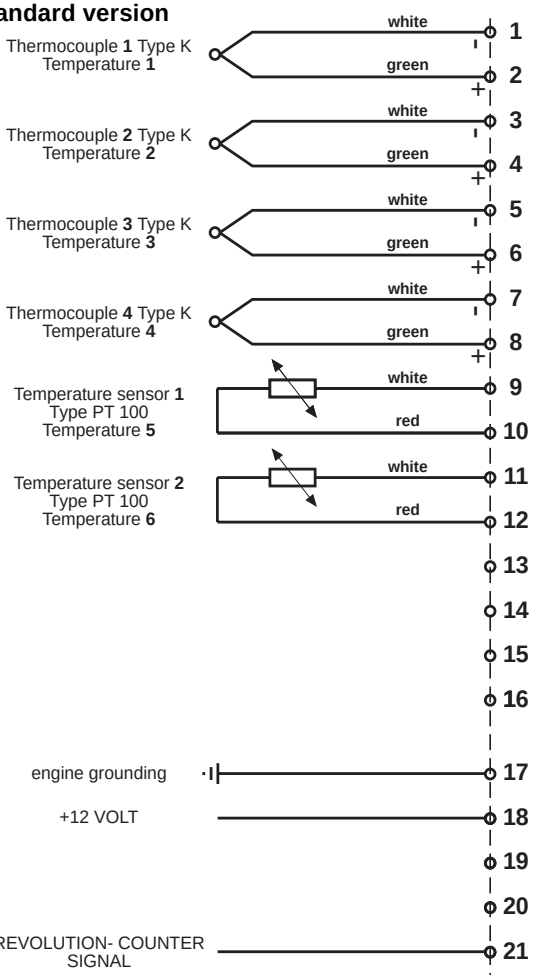
Legend: EGT Exhaust gas temperature

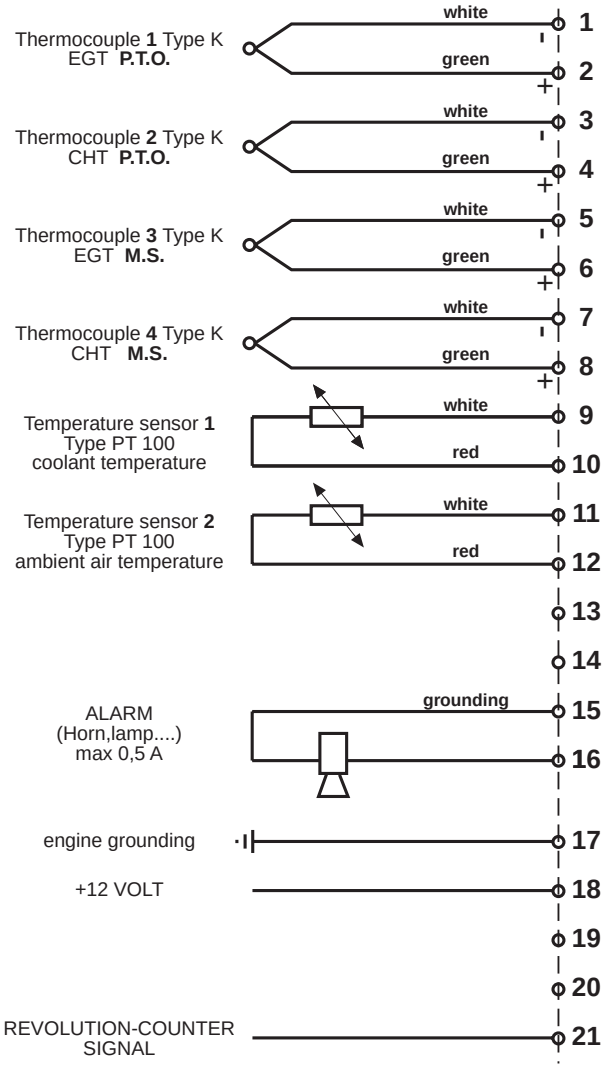
CHT Cylinder head temperature

**Standard version**



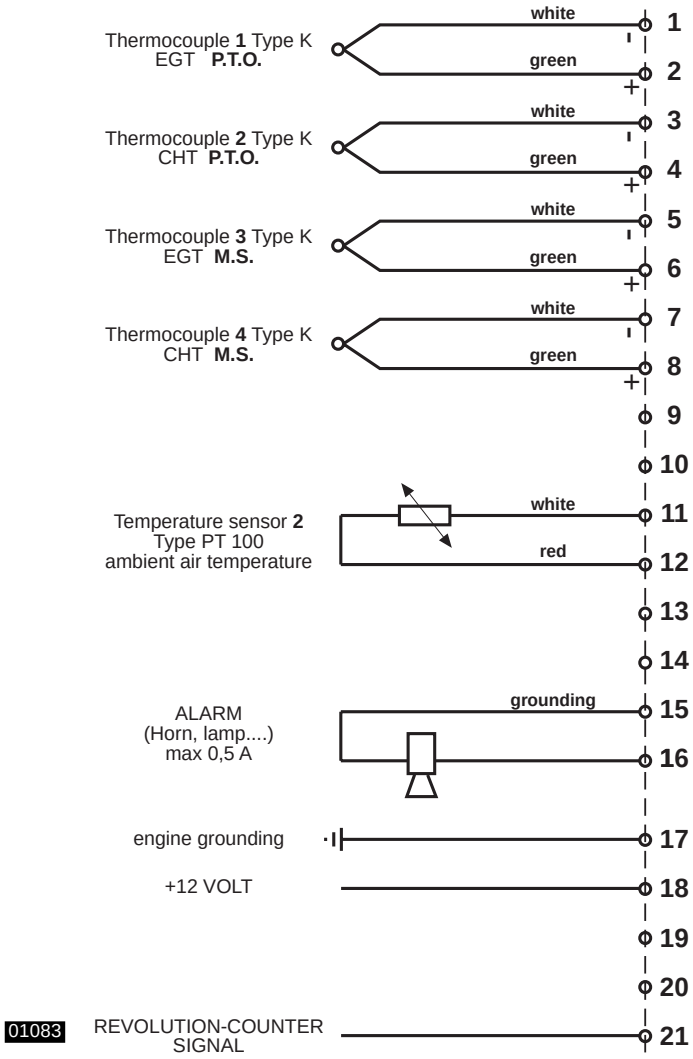

01081

## Engine type 582 UL, 618 UL

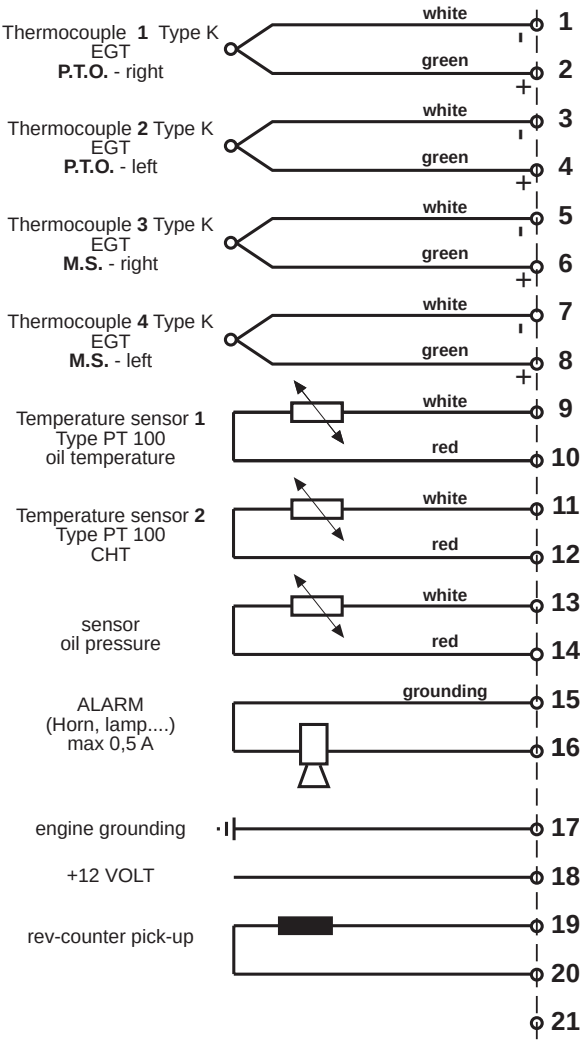



01082

**Engine type 447 UL, 503 UL**



## Engine type 912 / 914




01084

◆ NOTE: Included in the sensor kit are stickers with the relevant wiring diagram. The sticker may be glued to the Flydat case, to facilitate the connecting of the particular sensors.

# 7) Operation

## 7.1) Initial start-up

Prior of putting the ***FLYdat*** into operation make sure that all the sensor lines and the supply cable are connected correctly.

Consult wiring diagram and the chapter electric connections for the particular engines.

Not until all the connections are checked, supply the ***FLYdat*** with voltage.

■ ATTENTION: The wrong polarity of the supply will blow the fuse.

With adequate voltage and correctly connected supply, the

- ➪ background illumination must glow, and
- ➪ readings are indicated on the ***FLYdat*** .

If the particular sensor lines are not connected properly the ***FLYdat*** will show false or blinking readings.

If the ***FLYdat*** won't operate flawless, follow up tips regarding supply, faulty sensor lines and various error indications.

## 7.2) Reaction at start

After connecting the unit on power it will perform an autotest. With no errors detected, the version of software applied and the programmed temperature unit (°C or °F) will be indicated.

The display might read as follows:

„**V1.22 °C**“ or **V1.22 °F**“

**NOTE:** This message will remain for 6 sec. on the display.

Afterwards call for a maintenance, possibly due, might appear for 30 sec., triggered by exceeding the period of operation or a limit. With other words, if one or more limits have been exceeded or the TBO specified is shorter than operation time since the last TBO service, then the maintenance request will appear.

The call for maintenance appears as follows:

**„Service!“**

◆ NOTE: But no indication for which engine type the ***FLYdat*** was programmed will appear on the display.

All the messages appear in 8 digits on the top line and are in English only.

After the various messages, the alarm output will be activated for 1 sec. And finally, the***FLYdat*** starts the reading operation with the actual values appearing on the display.

■ ATTENTION: If the call for "**Service**" appears after switching on the unit, contact the next Bombardier-Rotax dealer without delay. He will find out the reason for the maintenance request.

## 7.3) Possible display

### Indication of engine speed

The r.p.m. reading is in 4 digits and appears from 1030 r.p.m. onwards on the display. Recording of the speed down to 768 r.p.m. ending with last input memory.

◆ NOTE: I.e. even with 0000 on the display (actual speed 1030÷ 768 r.p.m.) a storage allocation is feasible with 0000 in the last input memory.

### Indication of operating time

The number of operating hours is 4 digits with the resolution of 0,1 hour on the display.

As only 4 digits are at disposal, time of operation is indicated up to 999,9 hours followed by starting at 0,0 hours again.

The recording of the time of operation is at engine speed down to 768 r.p.m. on the condition of a previous engine speed above 1030 r.p.m.

◆ NOTE: The ***FLYdat*** is capable to pick-up operating periods up to 3276,7 h at correct overflow registration and can record a total running time of up to 9999,9 hours.

Time between overhaul must not be longer than 3000 h, leaving a safety margin of 276,7 hours.

**Temperature indication** (Exhaust gas-, cylinder head-, oil- and air temperature)

The temperature display is in 3 digits with a resolution to 1°C or 1°F or 10°F.

◆ NOTE: As stated previously at configuration, the temperature indication is either in °C or in °F. As only 3 digits are at disposal, the indication of the exhaust gas temperature in °F shows only 1/10 of its actual value on the display, i.e. indication °F x 10 = actual exhaust gas temperature in °F.

On engine type 912/914 the indication of the exhaust gas temperature is alternatively from one line of cylinders to the other cylinder line (see display allocation). But the control of the limits is for all 4 EGT's simultaniously.

**Indication of oil pressure** (on engine 912 / 914 only)

Display of the oil pressure in 3 digits with a resolution of 0,1 bar. The oil pressure gauge is furnished besides the generally fitted max. limit control, additionally with a minimum pressure control.

The control of the minimum oil pressure is linked to the circuit 5 sec. after (for physical reasons) reaching an engine speed of at least 1030 r.p.m.

Control of the max. oil pressure without time-delay.

◆ NOTE: If during the period of storing, the limits of both, the max. and min. oil pressure are exceeded, only the value of the oil pressure minimum is stored in the memory of 1st exceeding of limit, as only one memory cell is at disposal.

## 7.4) Control of readings

The ***FLYdat*** can be programmed by the authorized dealer for different warn- and alarm limits, depending on engine type.

Distinguish between three ranges of readings control:

- **green range** (standard operation).

  All readings are below or above (min. oil pressure) the warn limits programmed.

- **yellow range** (exceeding of warn limits)

  If one or more readings exceed the programmed warn limit, then the reading appears flashing on the display, and simultaniously the alarm output is periodically (0,25 sec.) switched on and off, until no reading exceeds warn limit.

- **red range** (exceeding of alarm limits)

  If one or more readings exceed the programmed alarm limit, then the readings appear flashing on the display and simultaniously the alarm output is permanently activated until no reading exceeds the warn limit.

■ WARNING: Disregard of the warn- and alarm signals might result in injuries or endanger the life of operator or third party.

◆ NOTE: The reading operation of the ***FLYdat*** remains active, even when exceeding limits, as long as it is supplied with the required voltage.

The control of limits responds if picked-up readings are on or above or below (oil pressure) the programmed limits.

## 7.5) Data recording in operation

**Maximum input memory**

The ***FLYdat*** stores the highest reading of each channel.

**Last input memory**

The***FLYdat*** forms from each sort of readings (from max. 8 channels) the maximum, and with each 0,1 h (6 min) step of the hour-counter the maximum is stored in a ring-type puffer. At an engine stop the maximum values are stored too and marked for identification.

With this identification mark you can distinguish between regular 6 minutes intervals and engine stop.

Criteria for identification of an engine stop:

- ➪ Engine speed below 768 r.p.m.
- ➪ Breakdown of voltage supply

The size of the ring-type puffer caters for the storage of 20 maximum input records on 8 channel each, plus time of operation.

**Memory of the first exceeding of a limit**

In case of exceeding an alarm limit, the reading and time of operation to go with, is stored of each channel, but at the first time of exceeding only.

◆ NOTE: The sorting and printing of memory contents is possibly only by **RDAT** and **CADAT.**

## 7.6) Report of errors

### EEProm Test

At start of operation of the ***FLYdat*** , the data composition of the integrated EE-Prom is checked first. If the check proves negative, the error will be indicated on the display for c. 30 sec.

"**E2 Error**"

Then the ***FLYdat*** is not in working order and has to be newly programmed at a service place. The successive display of temperature unit (°C of °F) is of no significance in this case.

◆ NOTE: With the EE-Prom faulty, a service request might follow.

### Call for Service

In the following cases a call for engine maintenance will appear on the display:

- ➪ one or more alarm limits have been exceeded,
- ➪ the reading on the meter of the operating hours has surpassed the programmed TBO.

The maintenance message reads as follows:

**"Service!"**

This message will be on the display for c. 30 sec.. An engine maintenance has to be carried out at a service place.

**Defective sensor lines**

An interruption or short-circuit of a sensor line won't activate the alarm output, but will point out incorrect reading on the display as follows:

| Indication of the specific reading on the LC Display with sensor line **interrupted** | | | |
|---|---|---|---|
| sensor line | Engine type | | |
| | 912 , 914 | 447, 503 UL | 582 , 618 UL |
| **RPM** | **0** | **0** | **0** |
| **EGT** | **blinking** | **blinking** | **blinking** |
| **CHT** | **blinking** | **blinking** | **blinking** |
| **AIR** | | **blinking** | **blinking** |
| **WATER** | | | **blinking** |
| **Oil Temp** | **blinking** | | |
| **Oil Press** | **blinking** | | |

01098

The value of the reading indicated blinking, is not correct

| Indication of the specific reading on the LC Display with **short circuit** in sensor line | | | |
|---|---|---|---|
| sensor line | Engine type | | |
| | 912 , 914 | 447 , 503 UL | 582 , 618 UL |
| **RPM** | **0** | **0** | **0** |
| **EGT** | **Terminal temp.** | **Terminal temp.** | **Terminal temp.** |
| **CHT** | **blinking** | **Terminal temp.** | **Terminal temp.** |
| **AIR** | | **blinking** | **blinking** |
| **WATER** | | | **blinking** |
| **Oil Temp** | **blinking** | | |
| **Oil Temp** | **blinking** | | |

01098

The value of the indicated blinking is not correct.

◆ NOTE: **Terminal Temperature** is the temperature of the plug receptacles and corresponds with ambient air temperature.

◆ NOTE: Definite defects of sensors won't activate maintenance request.

An intermittent sensor defect can lead to falsified readings, exceeding of warn- and alarm limits, activating of alarm output and triggering of maintenance request.

## 7.7) Fuse of unit

**Type of fuse**: Automotive, 3 A current rating (violet identification colour). The fuse is located on the backside of ***FLYdat***.

The fuse fitted can blow with the:

- ➪ Supply voltage too high
- ➪ Wrong polarity of supply voltage
- ➪ Current at alarm output in excess of 500 mA

Easy renewal of a blown fuse by withdrawal and exchange.

■ WARNING: At exchange, use only fuse of same size and current rating.

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P.O. Box 2474, Cresta, 2118
Tel.: (011) 318 - 2346, Fax: (011) 318 - 1821
Contact person: Trevor Davies

**SERVICE-CENTER of AVIATION in ZIMBABWE:**

***ULTRALIGHT AVIATION***
P.O. Box 187, Norton, Zimbabwe
Tel.: (09263) 622 036, Fax: (09263) 622 411
Contact person: Mike Moroney

# 5) ASIA

## CHINA / HONG KONG / MACAO:

➤ ***DUEN MU CO.***
Unit 10, 10/F, Metro Centro II
21 Lam Hing Street, Kowloon Bay
Kowloon, HONG KONG
Tel.: 2756 5725, Fax: 2754 4774
E-mail: cali@tfhtech.com
Contact person: W. C. Choi

## CIS:

➤ ***AVIAGAMMA JSCo.***
P.O. Box 51, 125 057 MOSCOW
Tel.: 095 / 158 31 23, Fax: 095 / 158 65 73
Contact person: Vladimir Andriytschuk
General Director

**SERVICE-CENTERS of AVIAGAMMA:**

***"Aviakecht" JSCo.***
443022 Zavodskoe shosse 18
SAMARA, Russia
Tel.: 846 2 51-89-53, Fax: 846 2 34-76-55
Contact person: Ewgony Shistorow

**for REPUBLIC BELARUS:**

***MINIAVIA***
Minskaja ATB MVL PANH
220065 Aerodromnaja 4, MINSK/BELARUS
Tel./Fax: 0172/255-937
Contact person: Liach Alexander

## INDIA:

➤ ***GREAVES LIMITED***
22-A, Janpath
NEW DELHI - 110 001
Tel.: 11/338 50 61/338 26 53 (Dir.), Fax:11/37 82 553 Tlx.: 031-62663
Contact person: Wg Cdr S.N. Chhabra
Divisional Manager

**SERVICE-CENTERS of GREAVES LTD., New Delhi:**

***GREAVES LTD***
16/3 Ali Asker Road, P.B. No. 113
BANGALORE 560 052
Tel.: 080/22 65 873/22 68 773, Fax: 080/225 3472, Tlx.: 0845-2365
Contact person: Wg Cdr B. Chandran
Dy. Gen. Manager

***GREAVES LTD***
10-B Madan Mohan, Malviya Marg
LUCKNOW 226 001
Tel.: 0522/283 410/283 406, Fax: 0522/283 067,
Tlx.: 0535-321
Contact person: R.N. Singh
Deputy General Manager

***GREAVES LTD***
1, Dr V.B. Gandhi Marg, P.B. No. 91
BOMBAY 400 023
Tel.: 022/267 44 07/267 15 24, Fax: 022/267 7850,
Tlx.: 011-82517
Contact person: H.L. Shah
Marketing Manager
Marine Systems Grp.

***GREAVES LTD***
Thapar House, 25 Brabourne Road, P.B. No. 702
CALCUTTA 700 001
Tel.: 033/24 21 459/24 23 805, Fax: 033/24 24 325, Tlx.: 021-5055/5130
Contact person: K. K. BARKAR

## INDONESIA / MALAYSIA / SINGAPORE:

➤ ***P.T. ESACON TRADA***
Jl. Wolter Monginsidi 91
JAKARTA 12180
Tel.: (021) 724 5906 / 739 8109
Fax: (021) 725 1301, E-mail:
IR.Nyono@global.net.id

## IRAN:

➤ ***TASHAR CO. LTD.***
54 Khaled Eslamboli Ave., TEHERAN 15117
Tel.: 21 / 871 4787 / 872 3222, Fax: 21 / 872 2260
Contact persons: Morthesar Sadjat
Jusufi Nejadan

## ISRAEL:

➤ ***CONDOR-AVIATION INDUSTRIES LTD.***
34 Arlozorov St., IL-52481 RAMAT - GAN
Tel.: 03 / 672 484 / 050-290 189
Fax: 03 / 6 723 753
E-mail: condor@netvision.net.il
Contact person: David Viernik

## J A P A N :

➤ ***JUA, LTD.***
1793 Fukazawa, Gotemba City
SHIZUOKA PREF 412
Tel.: 550 / 83 8860, Fax: 550 / 83 8224
Contact person: Yoshihiko Tajika, President

## KOREA:

➤ ***HWA YOUNG MEDICAL & SCIENCE CO.***
401 KeumKang Building
1439-1, Seocho 1 dong, seocho-ku, SEOUL 137-071
Tel.: 02 / 3472-0271-5,
Fax: 02 / 3472-0276 (02/3471-4753)
Contact person: John Lee, President

## PAPUA NEW GUINEA:

➤ ***BERT FLOOD IMPORTS PTY. LTD.***
P.O. Box 61, LILYDALE, VICTORIA 3140
AUSTRALIA
Tel.: 03 / 9735 5655, Fax: 03 / 9735 5699,
Contact person: Bert Flood

## PHILIPPINES:

➤ ***WESTERN PACIFIC AVIATION COMPANY***
RPMCI Hangar Manila Domestic Airport
P.O. Box 7633 Airport Airmail
Exchange Office, Domestic Road Pasay City
Metro Manila
Tel.: 2/832-3375, Fax: 2/833-0605
Contact person: Rolando P. Moscardon

## TAIWAN:

➤ ***TAIWAN MAXIEM INDUSTRIES***
7/1 Tung Feng Street, TAIPEI, 10 651
Tel.: 2 / 704 6163, Fax: 2 / 702 84 85
Contact person: Lester Lin

## THAILAND:

➤ ***JONES COMPANY LIMITED***
942/20-21 Rama 4th Road
P.O. Box 686
BANGKOK
Tel.: 2 / 233 9088 / 233 3628, Fax: 2 / 238 5079
Contact person: Kit Chong

## UNITED ARAB. EMIRATES:

➤ ***AL MOALLA***
P.O. Box 7787
ABU DHABI
Tel.: 2 / 723 248, Fax: 2 / 788 073
Contact person: Hussain Al Moalla

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## 9) Conditions of warranty valid for the *FLYdat* at use on non-certified Rotax aircraft engines.

### 9.1) Period of warranty

BOMBARDIER-ROTAX as manufacturer, warrants through their authorized BOMBARDIER-ROTAXdistributors FROM THE DATE OF SALE TO THE FIRST CONSUMER, every ***FLYdat***, sold as NEW AND UNUSED, and delivered by an authorized BOMBARDIER-ROTAX distributor for a period of not more than:

- 9 consecutive months for private use owners
- or 12 consecutive month from date of shipment of the manufacturer
- or the first 150 operation hours.

### 9.2) Tasks performed by an authorized BOMBARDIER-ROTAX distributor

The authorized BOMBARDIER-ROTAX distributor will, at its option, repair and/or replace components defective in material and/or workmanship under normal use and service, with a genuine BOMBARDIER-ROTAX component without charge for parts or labour, during said warranty period. All parts replaced under warranty become the property of BOMBARDIER-ROTAX.

### 9.3) Condition to have warranty work performed

You must present to an authorized BOMBARDIER-ROTAX service-center, the hard copy of the BOMBARDIER-ROTAX warranty registration card and/or proof of purchase delivered to the customer from the selling dealer at time of purchase.

## 9.4) Exclusion - not covered by warranty:

- Normal wear on all items
- Replacement parts and/or accessories which are not genuine BOMBARDIER-ROTAX parts and/or accessories.
- Damage resulting from the installation of parts other than genuine BOMBARDIER-ROTAX parts
- Damage caused by failure to provide proper maintenance as detailed in the User's Guide. The labour, parts costs of all maintenances services and adjustment will be charged to the owner.
- If ***FLYdat*** used in aircraft designed and/or used for racing or commercial purposes.
- All optional accessories installed on the aircraft engine and ***FLYdat***.. (The normal warranty policy for parts and accessories, if any, applies).
- Damage to the ***FLYdat*** resulting from running the aircraft engine without propeller.
- Damage to the ***FLYdat*** resulting from modification to the aircraft engine not approved in writing by BOMBARDIER-ROTAX.
- Damage caused by electrolysis.
- Use of a gear reduction not designed by BOMBARDIER-ROTAX.
- Use of propellers which exceed the inertia and balance limits as specified by BOMBARDIER-ROTAX.
- If sensors recommended by BOMBARDIER-ROTAX have not been installed.
- Losses incurred by the ***FLYdat*** owner other than the parts and labour, such as, but not limited to, mounting and dismounting of the ***FLYdat*** from the aircraft, loss of use, transportation, towing, telephone calls, taxis, or any other incidental or consequential damage.
- Damage resulting from accident, fire or other casualty, misuse, abuse or neglect.
- Damage/rust/corrosion/premature wear to the ***FLYdat*** caused by water ingestion.
- Damage resulting from sand/stones infiltration.
- Damage resulting from any foreign material ingestion.
- Damage resulting from service by an unqualified mechanic.

## 9.5) Expressed or implied warranties:

This warranty gives you specific rights, and you may also have other legal rights which may vary from state to state, or province to province. Where applicable this warranty is expressly in lieu of all other expressed or implied warranties of BOMBARDIER-ROTAX, its distributors and the selling distributor, including any warranty of merchantability or fitness for any particular purpose; otherwise the implied warranty is limited to the duration of this warranty. However, some states or provinces do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply.

Neither the distributor, nor any other person has been authorized to make any affirmation, representation or warranty other than those contained in this warranty, and if made, such affirmation, representation or warranty shall not be enforceable against BOMBARDIER-ROTAX or any other person.

BOMBARDIER-ROTAX reserves the right to modify its warranty policy at any time, being understood that such modification will not alter the warranty conditions applicable to ***FLYdat*** sold while the above warranty is in effect.

## 9.6) Consumer assistance procedure:

If a servicing problem or other difficulty occurs, please, contact:

- authorized BOMBARDIER-ROTAX service-center or
- authorized BOMBARDIER-ROTAX distributor.

## 9.7) Warranty claims

Warranty will only be valid if the end user completes this registration card as soon as the ***FLYdat*** goes into service, and returns it to the national authorized BOMBARDIER-ROTAX distributor (marked with "➤" in section 5) of the area in which the ***FLYdat*** is firstly operated.

This warranty will be effective for all ***FLYdat*** delivered by BOMBARDIER-ROTAX as of Jan. 1st, 1994.

## 9.9) Caution

**⚠ DANGER!**

Prior to taking FLY dat into operation, read the User´s Guide in its entirely, as it contains important safety information.

Before the content of the manual is not understood completely you may not take the Fly dat into service.

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## 7) Warranty registration card

**Warranty registration card** Issue 94 10 01

1. To be eligible for warranty, this registration card must be returned completed and signed by the end user to the authorized ROTAX distribution partner (marked with "➢" in section 8) of the area of the permanent residence of the end user and/or in which the ***FLYdat*** is firstly operated, within 30 days as of date of purchase.
2. No other warranties and/or guarantees than defined in the actual warranty conditions are made.
3. ***FLYdat*** -type: ❑ **AC** ❑ **LC** ❑ **912** ❑ **Standard** ❑ **914**

***FLYdat*** -no.:

Engine type.: ..... Engine no.: .....

Gearbox: ..... Reduction i = .....

Invoice-no.: ..... date of purchase: .....

Warranty expires: .....

Buyer: .....

Seller: .....

I have read and understood the User's Guide in its entirety and carefully follow all given advices.

Date: ..... Signature: .....

00455

## ▲DANGER!

**Prior to taking FLYdat into operation, read the User's Guide in its entirety, as it contains important safety information.**

**Before the content of the Manual is not understood completely you may not take the FLYdat into Service.**

Absender:
Expéditeur:

Postleitzahl - Code postal

**Postkarte**
**Carte postale**

Marke
Timbre

Postleitzahl - Code postal

Bestimmungsort - Lieu de destination

Bestimmungsland - Pays de destination

**Warranty registration card** Issue 97 01 01

1. To be eligible for warranty, this registration card must be returned completed and signed by the end user to the authorized ROTAX distribution partner (marked with "➤" in section 8) of the area of the permanent residence of the end user and/or in which the *FLYdat* is firstly operated, within 30 days as of date of purchase.
2. No other warranties and/or guarantees than defined in the actual warranty conditions are made.
3. ***FLYdat*** -type: ❑ **AC** ❑ **LC** ❑ **912** ❑ **Standard** ❑ **914**

***FLYdat*** -no.: .....

Engine type.: ..... Engine no.: .....

Gearbox: ..... Reduction i = .....

Invoice-no.: ..... date of purchase: .....

Warranty expires: .....

Buyer: .....

Seller: .....

I have read and understood the User's Guide in its entirety and carefully follow all given advices

Customer's copy, keep for your record

Date: ..... Signature: .....