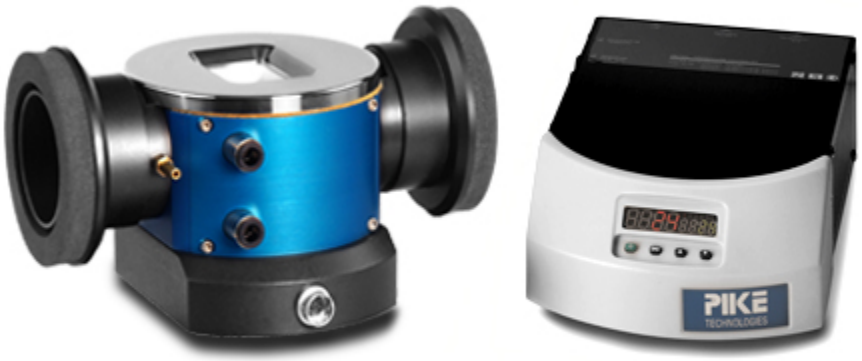
PIKE TECHNOLOGIES
Spectroscopic Creativity

Installation and User Guide



Falcon™ Heated Transmission Accessory

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Introduction

The PIKE Technologies mid-IR Falcon accessory is recommended for qualitative and quantitative analysis of liquids where it is necessary to control the temperature of the sample. Temperature range of the accessory is 5 °C to 130 °C with +/- 0.5% accuracy. Heating and cooling is controlled by a built-in Peltier device providing reproducible ramping and for reaching target temperatures quickly and reliably. The system is driven by a Digital Temperature Controller – directly, or via PC. A wide variety of window types and spacer pathlengths are available for this product. Windows offered cover mid-IR, NIR, and far-IR spectral regions and sample compositions from organic to aqueous. A complete heatable transmission cell set-up for use with the mid-IR Falcon accessory consists of two 32 mm x 3 mm size windows (drilled and undrilled), a spacer, the needle plate with Luer-Lok fittings, two gaskets and a proprietary cell mount. The full Falcon configuration requires the accessory base with cell holder, user selected windows, and one of the available temperature controllers. The Falcon accessory is compatible with most brands of FTIR spectrometers.

Specifications

Temperature Control	Peltier (cooling and heating)
Temperature Range	5 °C to 130 °C
Accuracy	+/- 0.5%
Sensor Type	3 wire Pt RTD (low drift, high stability)
Temperature Controllers	
Digital	+/- 0.5% of set point
Digital PC	+/- 0.5% of set point, graphical setup, up to 10 ramps, USB interface
Input Voltage	90-264 V, auto setting, external power supply
Output Voltage	Variable 3-15 VDC/50 W max.
Dimensions	width 120 mm, depth 175 mm, height 90 mm (without FTIR baseplate and mount)

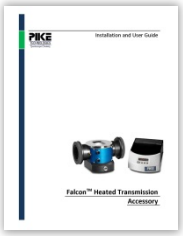
Note: Peltier device must be water cooled for proper operation. This is achieved by running cold tap water through the water jacket integrated into the accessory shell, or by the use of an external liquid circulator.

Unpacking Your Accessory

In order for you to quickly verify receipt of your accessory, we have included a packing list. Please inspect the package carefully.

Packing List

Falcon Mid-IR Manual
PN 350-111400
Quantity 1



Falcon Mid-IR Base
PN 111-40XX
Quantity 1

Digital Temperature Controller
PN 076-1230 or 076-1430
Quantity 1

Falcon External Cable
Quantity 1

Purge Kit
Quantity 1

Liquid Circulator Tubing
Quantity 10 feet

Demountable Liquid Cell
162-1600
Quantity 1

(Windows ordered separately)

Hex Wrench Set
Quantity 1

Spacer Kit and Gaskets
Quantity 1

Installation

Before installation, make sure the spectrometer is working properly without the Falcon Heated Transmission Cell Accessory. This should be performed by following the FTIR User's Manual.

The Temperature Control Module must be installed before mounting Falcon Transmission Cell Accessory into the spectrometer.

1. Connect the RTD sensor cable to the front of the Falcon accessory and to the back of the low profile temperature controller.

2. If using a PC version temperature controller, install PIKE TempPRO™ software following the instructions provided with the TempPRO documentation. Connect the USB cable to the back of the temperature controller and to a PC USB slot. Step 2 applies only to PC controllers.

3. Connect the power cord to DC Power In outlet located at the back of the low profile temperature controller.

4. Connect the 1/4 inch OD external tubing for liquid circulating fluid to the front of the Falcon Accessory. These are quick-disconnect fittings. Push the tubing into the fitting to secure. To release push the black ring around the fitting and pull the tubing. Test the seal of the quick disconnect prior to putting the accessory in the bench by circulating the fluid using an external circulator or by connecting the tubing to a running water tap.

5. Place the Falcon Accessory in the sample compartment of the spectrometer. The accessory plate assures the alignment of the accessory relative to the beam coming from the spectrometer. Screw down the accessory.

6. Plug the AC power cord into a wall outlet.

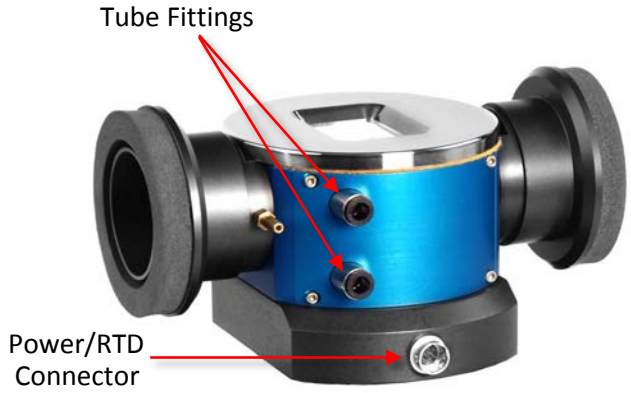


Figure 1: Falcon front view

Figure 2: Controller back view

Aligning Your Accessory

The accessory has been pre-aligned at the manufacturing facility.

Demountable Cell Holder Assembly

The demountable liquid cell contains the following components: Luer-Lok fittings, two stoppers, two Viton gaskets, and complete set of pathlength spacers. IR windows, one plain and one drilled, must be ordered separately.

Assembly Procedure

1. Place the cell holder flat on the table, with the retaining well facing upwards.

2. Position one Teflon (white) gasket at the bottom of the well.

3. Place the first IR window (plain) on top of the gasket.

4. Place the pathlength spacer on the window.

5. Position the second (drilled) window on top of this.

6. Position the second Teflon (white) gasket on top of the drilled window, followed by a Viton (black) gasket. Make sure the gasket holes match drilled holes in the window.

7. Place back plate on top of this assembly and tighten six hex screws, with the back plate filling holes aligned with the window and gasket filling holes. Make sure that parts for the assembly do not shift during this process and filling holes stay aligned. Also do not over-tighten as parts may expand during heating which may crack the windows.

8. To protect the cell and prevent leakage, it is recommended that vacuum, instead of pressure, is used for sample introduction. This can be simply done by employing two syringes for cell filling. Attached a sample-filled syringe and an empty syringe to the Luer Lock fittings. To fill the cell, pull on the empty syringe which will pull the sample through.

Important Notes

The Falcon requires a circulating fluid to regulate the heat sink temperature of the Peltier device. Do not operate the Peltier without liquid flowing as this will damage the Peltier element. 1/4 inch OD tubing supplied with the accessory or user provided 1/4 inch OD tubing may be used.

The RTD sensor is embedded in the Peltier block of the Falcon Transmission Accessory and the Temperature Controller displays temperature at the position, not temperature of the sample.

Precautions

SAFETY

The maximum temperature of the accessory can reach 130 °C. Please allow enough time for the metal parts to cool down before working with the Falcon components or removing it from the spectrometer. Remove heated sample vials or cuvettes by using tweezers. Do not to touch heated vial or cuvette sample holders.

Replacement Parts and Options

The following parts and options may be ordered for the Falcon accessory.

Temperature Controllers

Part Number	***Description***
076-1230	Digital Temperature Control Module
076-1430	Digital Temperature Control Module PC Control

Sample Holders

Part Number	***Description***
162-1600	Demountable Liquid Cell for Falcon Mid-IR

Demountable Liquid Cell Windows

Part Number		***Description***
PLAIN	*DRILLED*	
160-1147	160-1146	BaF_2
160-1143	160-1142	CaF_2
160-1137	160-1136	Ge
160-1132	160-1131	KBr
160-1126	160-1125	KRS-5
160-1122	160-1121	NaCl
160-1159	160-1158	Si
160-1113	160-1112	ZnSe

Demountable Liquid Cell Spacers (Optional)

Part Number	***Description***
162-1210	0.015 mm
162-1220	0.025 mm
162-1230	0.050 mm
162-1240	0.100 mm
162-1250	0.200 mm
162-1260	0.500 mm
162-1270	1.000 mm
162-1290	Assortment

Note: Spacer pathlength packages above include 12 spacers. The assortment package includes 2 each of the different pathlengths.

Demountable Liquid Cell Replacement Parts

Part Number	***Description***
162-1600	Demountable Liquid Cell for the mid-IR Falcon Accessory
162-1104	Demountable Liquid Cell Needle Plate
162-1300	Teflon Stoppers for Needle Plate (12 each)
162-1310	Teflon Gaskets (12 each)
161-0520	Glass Syringe, 1 mL
161-0521	Glass Syringe, 2 mL
161-0522	Glass Syringe, 5 mL

Note: For other options for the Demountable Liquid Cell, please contact PIKE Technologies.

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