PIKE TECHNOLOGIES
Spectroscopic Creativity

Installation and User Guide

Falcon™ Heated Transmission Accessory

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Introduction

The PIKE Technologies Falcon NIR Transmission Accessory is an excellent choice for quantitative and qualitative analysis of liquid samples in the NIR spectral region. 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. The Peltier element provides for reproducible ramping and for reaching target temperatures quickly and reliably. The system is driven by a Digital Temperature Controller – directly, or via PC.

Individual sample holders are designed to accommodate standard 5 mm, 8 mm and 12 mm glass vials and 1 cm cuvettes. The vials and cuvette size are selected specifically to optimize the transmission performance in the Near Infrared. Holders are interchangeable and pin positioned to ensure maximum reproducibility.

This accessory can be used with FTIR models configured with NIR optics. Optical specification is not dependent on FTIR main body type, but the NIR capability is realized using an FTIR with NIR optics only. The Falcon mounts directly in the sample compartment of the FTIR.

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 NIR Manual

PN 350-110600

Quantity 1

Falcon NIR Base

PN 110-60XX

Quantity 1

Digital Temperature Controller

PN 076-1230 or 076-1430

Quantity 1

Falcon External Cable

Quantity 1

Optional Holder (for NIR-IR)

Optional Holder (for UV-Vis)

Purge Tubing Kit

Quantity 1

Liquid Circulator Tubing

Quantity 1

Installation

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

The Temperature Control Module must be installed before mounting Falcon NIR Transmission Cell Accessory.

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 instruction 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. The baseplate is fixed in place without requiring access to the inside of the accessory.

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

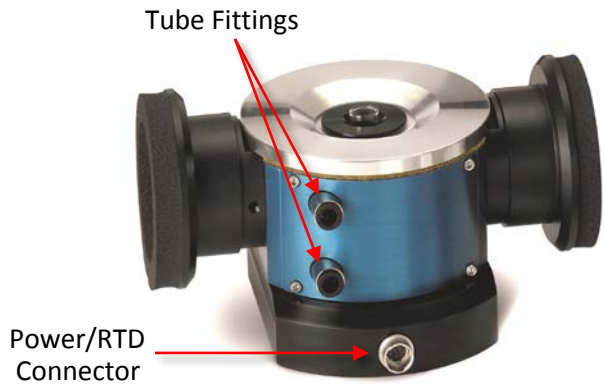

Figure 1. Falcon front view

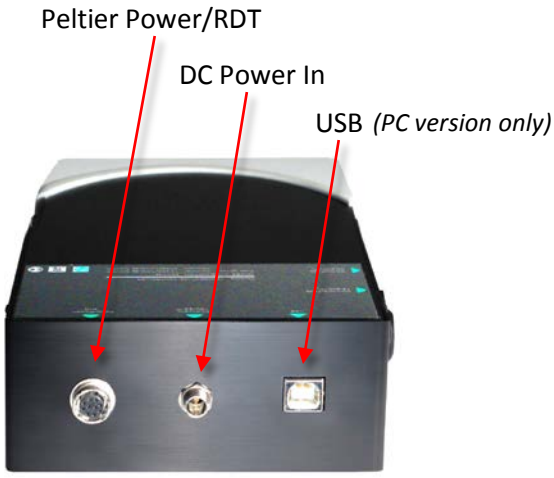

Figure 2. Controller back view

Preparing the Accessory

1. Place the sample holder into the Falcon base. The holder is keyed to assure proper placement. When inserted properly the holder lip should be flush against the Falcon base.

2. Temperature of this accessory is controlled by the PIKE Temperature Control Module. Refer to the Temperature Controller Instruction Manual for its operation.

Aligning the Accessory

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

Sampling Procedures

Sample Preparation

Choose the appropriate vial or cuvette size that corresponds to the sample holder. Sample holders are available for 5, 8, 12 mm diameter vials or a 1 cm cuvette. Insert the vial or cuvette in the sample holder at the center of this accessory. When volatile sample is analyzed, the test tube should be capped with proper material such as Parafilm.

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 NIR Transmission Accessory and the Temperature Controller displays temperature at the position, not temperature of the sample. Actual sample temperature depends on its physical characteristics. To know the sample temperature, place a sensor directly into the sample tube.

Precautions

Cautions for Measurement of Samples in a Container

This accessory scans samples in glass vials or quartz cuvettes. The spectrum of the vial or cuvette superimposes the sample spectrum. When you use other glass containers for analysis, you have to investigate influences that the containers may give to the spectra and result before starting the analysis.

SAFETY Precaution

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 NIR accessory:

Part Number	Description
110-60XX	Falcon NIR Base
Temperature Controllers	
076-1230	Digital Temperature Control Module
076-1430	Digital Temperature Control Module PC Control
Sample Holders	
111-3610	5 mm Vial Holder
111-3620	8 mm Vial Holder
111-3630	12 mm Vial Holder
111-3640	1 cm Cuvette Holder
Other Useful Options	
162-0205	5 mm Disposable Glass Vials, 6 mm x 50 mm (200/pk)
162-0208	8 mm Glass Vials (200/pk)
162-0212	12 mm Glass Vials (200/pk)
162-0255	Falcon 1 cm Quartz Cuvette

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