

Continuous Flow
Isotope Ratio MS



### Introduction

The consumables kits are complementary for 1000 or 3000 analyses. The 3000 analyses kits contain additional spare parts. Single consumables or special supplementary chemicals can be ordered through your regional Thermo Fisher Scientific office or your Thermo Fisher Scientific dealer. Each Thermo Scientific Flash elemental analyzer comes with a "Consumables and Spare Parts Catalog" in PDF format on a CD.

The pictures show spare parts and items contained in the kits. The number of items and spare parts varies depending on the number of analyses indicated in the name of the kits. The content of all kits is subject to change but valid as of January 2011.

Thermo Fisher Scientific Bremen offers special analytical kits suitable for Thermo Scientific elemental analyzers used for gas isotope ratio mass spectrometry:

- Thermo Scientific TC/EA for high temperature conversion (2H and <sup>18</sup>O isotope analysis)
- Flash 1112/2000 for IRMS (<sup>15</sup>N, <sup>13</sup>C, <sup>34</sup>S)
- Flash 1112/2000 HT (<sup>2</sup>H, <sup>18</sup>O, <sup>15</sup>N, <sup>13</sup>C, <sup>34</sup>S)
- Flash HT Plus (2H, <sup>18</sup>O, <sup>15</sup>N, <sup>13</sup>C, <sup>34</sup>S)

#### Thermo Scientific TC/EA

This High Temperature Conversion/Elemental Analyzer is the technological breakthrough bringing the benefits of continuous flow IRMS to on-line oxygen and hydrogen isotope ratio analysis on solid and liquid bulk samples.



## **Overview**

PN	Kits	Flash 2000 IRMS*	Flash 2000 HT* / HT Plus	TC/EA	Page
1157110	Sulfur Conversion Kit for Flash 2000 IRMS / HT Elemental Analyzer	Х	Х		7
1293140	Consumables for Flash 2000 IRMS / HT / <i>Plus</i> 1000 NCS-analyses	X	Х		5
1142961	Spare Parts & Consumables for Flash IRMS 3000 NC-analyses	X			4
1293150	Consumables for Flash 2000 IRMS 1000 NC-analyses	Х			4
1293160	Consumables for Flash 2000 HT / <i>Plus</i> 1000 NC-analyses		Х		5
1293170	Spare Parts & Consumables for Flash 2000 HT / <i>Plus</i> 3000 NC-analyses		Х		5
1136820	Spare Parts & Consumables for TC/EA 3000 OH-analyses			Х	6
1185471	Spare Parts & Consumables for Flash HT / <i>Plus</i> 3000 OH-analyses		х		6
1290340	Consumables for for TC / EA, Flash 2000 HT / <i>Plus</i> 1000 OH-analyses		х	Х	6

<sup>\*</sup> consumable kits are also good for previous model 1112.

#### **Thermo Scientific Flash 2000 IRMS**

Based on the Flash Dynamic Combustion method, this Elemental Analyzer produces complete combustion of a sample for nitrogen, carbon and sulfur isotope ratio analysis.



#### Thermo Scientific Flash HT 2000 / Flash HT 2000 Plus

They combine two single-furnace systems, one for Dynamic Flash Combustion and one for High Temperature Conversion, into a single analyzer.



### **Combustion**



## Consumables for Flash 2000 IRMS (1000 C and N analyses)

#### PN 1293150

The amount of consumables is designed for self-packing of oxidation and reduction reactors in a Flash 2000 IRMS. Depending on sample type and oxygen dosage, one pair of reactors can last up to 600 analyses so that the kit allows more than 1,000 analyses.

Top O-ring for 18 mm OD quartz reactor	5
Quartz wool	5 g
Chromium oxide granular	50 g
Silvered cobaltous/ic oxide	25 g
Reduced Cu	300 g
Anhydrone flask	100 g
Quartz reactor tube, 18 mm	4
Tin capsules for solids lightweight, ca. 0.05 ml	1,000



# Spare Parts & Consumables for Flash 2000 IRMS (3000 C and N analyses)

#### PN 1142961

As for 1293150, the amount of consumables is designed for self-packing of oxidation and reduction reactors in a Flash 2000 IRMS, but for 3,000 analyses. This kit includes an additional adsorption filter tube and two sorts of tin containers.

Top O-ring for 18 mm OD quartz reactor	20
Quartz wool	15 g
Chromium oxide granular	100 g
Silvered cobaltous/ic oxide	100 g
Reduced Cu	800 g
Anhydrone flask	200 g
Quartz reactor tube, 18 mm	10
Adsorption filter tube with connectors	1
Silicon seal, 12x6mm	8
Al olive, 2 mm	10
Al olive, 1/16 "	10
Nut SS MB 6	10
Tin capsules for solids lightweight, ca. 0.05 ml	2,500
Tin capsules for solids lightweight, ca. 0.02 ml	500



## Consumables for Flash 2000 IRMS / HT / Plus (1000 C, N and S analyses)

#### PN 1293140

This kit contains prepacked reactors and is useful for triple analysis of N, C and S isotopes as in the Flash HT Plus, but also for S isotope analysis in modified Flash 2000 IRMS and Flash 2000 HT. For modification, the sulfur conversion kit PN 1157110 is required. It is less useful for exclusive N and C isotope analysis, because the reactor packing does not trap  $SO_2$  from S containing samples in cobaltous/cobaltic oxide.

Reactor prepacked CHNS	5
Tin capsules for solids lightweight, ca 0.05 ml	1,000
Vanadium pentoxide	3 g
Quartz wool	5 g
Anhydrone flask	100 g



# Consumables for Flash 2000 HT / *Plus* (1000 C and N analyses)

#### PN 1293160

This kit allows for 1,000 analyses of N and C isotopes in a single reactor setup, as is used in the Flash 2000 HT or alternatively in a Flash HT *Plus*. The consumables require self-packing of the reactor.

Top O-ring for 18 mm OD quartz reactor	5
Quartz wool	5 g
Chromium oxide granular	75 g
Silvered cobaltous/ic oxide	75 g
Reduced Cu	300 g
Anhydrone flask	100 g
Quartz reactor tube, 18 mm	6
Tin capsules for solids lightweight, ca. 0.05 ml	1,000



# Spare Parts & Consumables for Flash 2000 HT / *Plus* (3000 C and N analyses)

#### PN 1293170

Consumables and spare parts allow for 3,000 analyses in a single reactor setup, as is used in the Flash 2000 HT or alternatively in a Flash HT *Plus*. This kit includes an additional adsorption trap and two sorts of tin containers.

Top O-ring for 18 mm OD quartz reactor	20
Quartz wool	15 g
Chromium oxide granular	175 g
Silvered cobaltous/ic oxide	175 g
Reduced Cu	800 g
Anhydrone flask	200 g
Quartz reactor tube, 18 mm	16
Adsorption filter tube with connectors	1
Silicon seal, 12x6mm	8
Al olive, 2 mm	10
Al olive, 1/16"	10
Nut SS MB 6	10
Tin capsules for solids lightweight, ca. 0.05 ml	2,500
Tin capsules for solids lightweight, ca. 0.02 ml	500

### **High-Temperature Conversion**



# Consumables for TC/EA, Flash 2000 HT / *Plus* (1000 O and H analyses)

#### PN 1290340

This kit allows for 1,000 analyses of H and O isotopes in a high temperature conversion furnace of a TC/EA, Flash 2000 HT or Flash HT *Plus*. The consumables require self-packing of the reactor. The high-temperature conversion reactor does not require comprehensive replacement of consumables, making this kit reasonably priced.

Granulate gassy carbon	50 g
Quartz wool	10 g
Silver capsules, ca. 0.03 ml	1,000
Top O-ring for 18 mm OD quartz reactor	5
Al olive, 1/16 "	10
Nut SS MB 6	10
Silver wool	2g
Graphite crucible	2

## Spare Parts & Consumables for TC/EA (3000 O and H analyses)

PN 1136820



# Spare Parts & Consumables for Flash 2000 HT / *Plus* (3000 O and H analyses)

PN 1185471



Both kits contain the same amount of consumables for 3,000 analyses in a TC/EA and Flash 2000 HT or Flash HT *Plus*, respectively. 'The only difference between the two kits is the length of the ceramic tube of the reactor: 450 mm for TC/EA and 470 mm for Flash HT and Flash HT *Plus*.

Reactor tubes (set of 3: ceramic, glassy carbon, graphite)	1*
Granulate glassy carbon	50 g
Quartz wool	10 g
Silver capsules, ca. 0.03 ml	3,000
Top O-ring for 18 mm OD quartz reactor	10
Al olive, 1/16"	10
Nut SS MB 6	10
Capillary SS, 1/16"x 0.8 mm	2 m
Silver wool	6 g
Graphite crucible	4

The pictures show spare parts and items contained in the kits. The number of items and spare parts varies depending on the number of analyses indicated in the name of the kits. The content of all kits is subject to change but valid as of January 2011.

### **Sulfur**



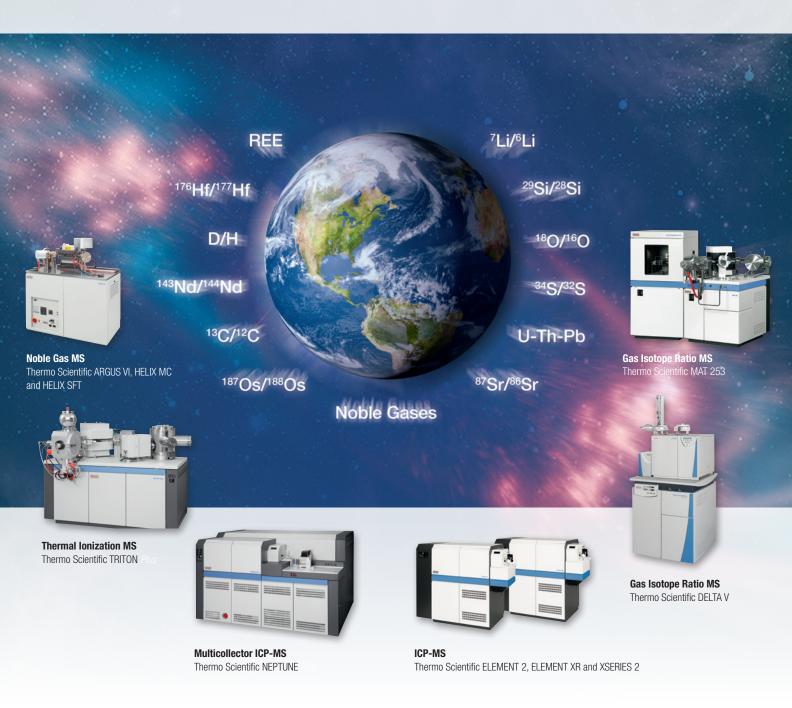
## Sulfur Conversion Kit for Flash 2000 IRMS / HT Elemental Analyzer PN 1157110

This start-up kit contains all essential items to modify the Flash 2000 IRMS and Flash 2000 HT for S isotope analysis. It comes with two prepacked reactors and 100 tin capsules. For routine, high-throughput analysis of sulfur isotopes, it is recommended to order PN 1293140 "Consumables for Flash 2000 IRMS / HT / Plus", kit for ca. 1000 C and N and S analyses. See page 5 for description.

Reactor prepacked CHNS	2
Sulfanilamide	2 g
Separation column PTFE	0.8 m
Al olive, 2 mm	10
Al olive, 1/16"	10
Nut SS MB 6	10
Teflon tubing	5 m
Tin capsules for solids lightweight, ca. 0.05 ml	100
Straight connector	2
Capillary SS, 1/16"x 0.8 mm	0.05 m
Brass Swagelok tube fitting, bulkhead, 1/16" tube OD	1
Vanadium pentoxide	1 g
Adsorption filter tube with connectors	1

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MENTS

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