



**500 mL Reactor**

Sets

Accessories

Spares

**500 mL Reactor Sets**

Reactors for the World of Chemistry

**METTLER TOLEDO**

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### Glossary of terms used

<b>RTCal™</b>	= Real Time Calorimetry	<b>PTFE GF25</b>	= Teflon® (Polytetrafluoroethylene), 25 % glass
<b>FBRM®</b>	= Focused Beam Reflectance Measurement	<b>ETFE</b>	= Ethylene-Tetrafluoroethylene
<b>PVM®</b>	= Particle Vision and Measurement	<b>FFKM</b>	= Kalrez® (Perfluoroelastomer)
<b>IR</b>	= InfraRed spectroscopy	<b>FPM</b>	= Viton® (Fluorine rubber)
<b>HC22</b>	= Hastelloy C22	<b>VALFLON® F117</b>	= Fluoropolymer
<b>PEEK</b>	= Polyetheretherketone		

# The 500 mL Reactor Platform

## Editorial

- **Glass reactor with low starting volume to save reactants and solvents**
- **Large ratio between start and end volume allows studying the work-up process too**
- **Reactor and stirrers are optimized for good mixing**
- **Mixing characteristics are provided with iControl RTCa™ software**
- **High quality material for reactor, inserts and cover suit a majority of chemistries**
- **Good analytical data are obtained due to an optimized cover design**
- **Correct probe positioning guaranteed**
- **Triple-wall reactor assures clear visibility into the reactor at any time**
- **Easy-to-setup because of the design chosen**

### Vessel Concept

The 500 mL vessel exists in two different versions. One with, the other without the RTCa™ sensors that allow measurement of any heat release online.

Both types of vessel are available as a ready-to-install set including vessel, cover, stirrer, baffle, temperature probe, calibration heater and reflux equipment.

Because the application may require a reactor setup that is different from the ready-to-install sets it also can be configured as required.

### Vessel Design

The 500 mL vessel and all its inserts are designed by experts in mixing and thus guarantee for optimal mixing conditions independent from the volume and type of reaction mass.

Thanks to the triple-wall design the visibility into the vessel is always guaranteed even at temperature conditions below 0 °C.

To make it suitable for a large temperature range and all your chemistries the material of the individual components were carefully selected.

### Cover Design

The cover offers a great flexibility. Both in terms of number and types of probes that can be installed as well as applications for which it can be applied for.

Due to the sophisticated design analytical probes, such as FBRM®, IR, PVM®, etc. are kept in a perfect position and provide high quality data.

Two different types of covers and various fittings are available to cope with the variety of probes and to suit your application.

### Mixing

One of the main focuses of the 500 mL is excellent mixing behavior as this is key for batch and semi-batch reactions.

Several stirrers in combination with baffles are provided to cope with reaction masses of different viscosities and single or multiple-phase systems.

A comprehensive mixing guideline provides valuable mixing knowledge in a descriptive manner. Besides theory and examples a large number of mixing videos demonstrate the influence of the type of stirrer, the viscosity, the volume of the reaction mass, the stirring speed etc on mixing.

The mixing guidelines are an integral part of **iControl RC1e™**, the software required to operate the 500 mL vessels.

# The 500 mL Reactor Set without RTCal™ Sensors



**51 162 344**

## AP01-0.5-3w-Set

- Dedicated for chemists in chemistry and development labs
- Starting volume as low as 70 mL allows to carry out reactions with only little amounts of solvents and reactants in the research as well as development
- Max. volume of 500 mL for quenching and work-up investigations
- Analytical probes, such as FBRM®, IR, PVM®, pH etc. can be positioned close to the bottom to obtain reproducible data in high quality
- Supports heat flow calorimetry
- Mixing details, such as 'Power Number' and videos are provided together with the vessel

### Reactor set consisting of

Order number	Product description	Quantity
51 162 348	Reactor without RTCal™ sensors, AP01-0.5-3w	1
51 162 450	Cover set for standard probes, Cov-PTFE-00-0.5-Set	1
51 162 453	Glass stirrer set, Sti-GL-0.5-PB-D-Set	1
51 162 456	Tr probe, Tr-GL-6/230	1
51 162 457	Calibration heater, Cal-GL-6/230	1

# The 500 mL Reactor Set with RTCal™ Sensors



## 51 162 401 AP01-0.5-RTC-3w-Set

- Most suitable reactor for safety labs, engineering and development labs
- Built-in RTCal™ sensors to measure heat data in real-time
- Supports the traditional and reliable heat flow calorimetry as complementary measuring technique
- Analytical probes, such as FBRM®, IR, PVM®, pH etc. can be positioned close to the bottom to obtain reproducible data in high quality
- “Power Number” and mixing videos are provided together with the vessel and help selecting the best possible conditions

### Reactor set consisting of

Order number	Product description	Quantity
51 162 400	Reactor with RTCal™ sensors, AP01-0.5-RTC-3w	1
51 162 450	Cover set for standard probes, Cov-PTFE-00-0.5-Set	1
51 162 453	Glass stirrer set, Sti-GL-0.5-PB-D-Set	1
51 162 456	Tr probe, Tr-GL-6/230	1
51 162 457	Calibration heater, Cal-GL-6/230	1

# 500 mL Reactor without RTCal™ Sensors



**51 162 348**  
**AP01-0.5-3w**

- Dedicated for chemists in chemistry and development labs
- Starting volume as low as 70 mL allows to carry out reactions with only little amounts of solvents and reactants in research as well as development
- Max. volume of 500 mL for quenching and work-up investigations
- Analytical probes, such as FBRM®, IR, PVM®, pH etc. can be positioned close to the bottom to obtain reproducible data in high quality
- Supports heat flow calorimetry
- Mixing details, such as ‘Power Number’ and videos are provided together with the vessel

<b>51 162 348</b>	<b>AP01-0.5-3w</b> 3-wall reactor without RTCal™ sensors, glass, mounting included
Nominal Volume	500 mL
Operating Volume	70 mL – 500 mL
Temperature, Tj	–73 °C to +230 °C
Pressure	0.05 bar up to ambient pressure (checked at 25 °C)
Material	Duran®-Glass, PTFE spindle, LUBRIFLON 904 valve plug, BS 29 ball joint
Inner dimensions: diameter/height	Ø 70 x 166 mm

# 500 mL Reactor with RTCal™ Sensors



## 51 162 400 AP01-0.5-RTC-3w

- Most suitable reactor for safety labs, engineering and development labs
- Built-in RTCal™ sensors to measure heat data in real-time
- Supports the traditional and reliable heat flow calorimetry as complementary measuring technique
- Design identical with AP01-0.5-3w vessel
- Analytical probes, such as FBRM®, IR, PVM®, pH etc. can be positioned close to the bottom to obtain reproducible data in high quality
- ‘Power Number’ and mixing videos are provided together with the vessel and help selecting the best possible conditions



The RTCal™ technology measures the heat flow through a large number of sensors that are embedded in a polymer matrix.

51 162 400	AP01-0.5-RTC-3w 3-wall reactor with RTCal™ sensors, glass, mounting included
Nominal Volume	500 mL
Operating Volume	70 mL – 400 mL
Temperature	–53 °C to +163 °C
Pressure	0.05 bar up to ambient pressure (checked at 25 °C)
Material	Duran®-Glass, PTFE spindle, LUBRIFLON 904 valve plug, BS 29 ball joint
Inner dimensions: diameter/height	Ø 70 x 166 mm

# Cover Set for Standard Probes



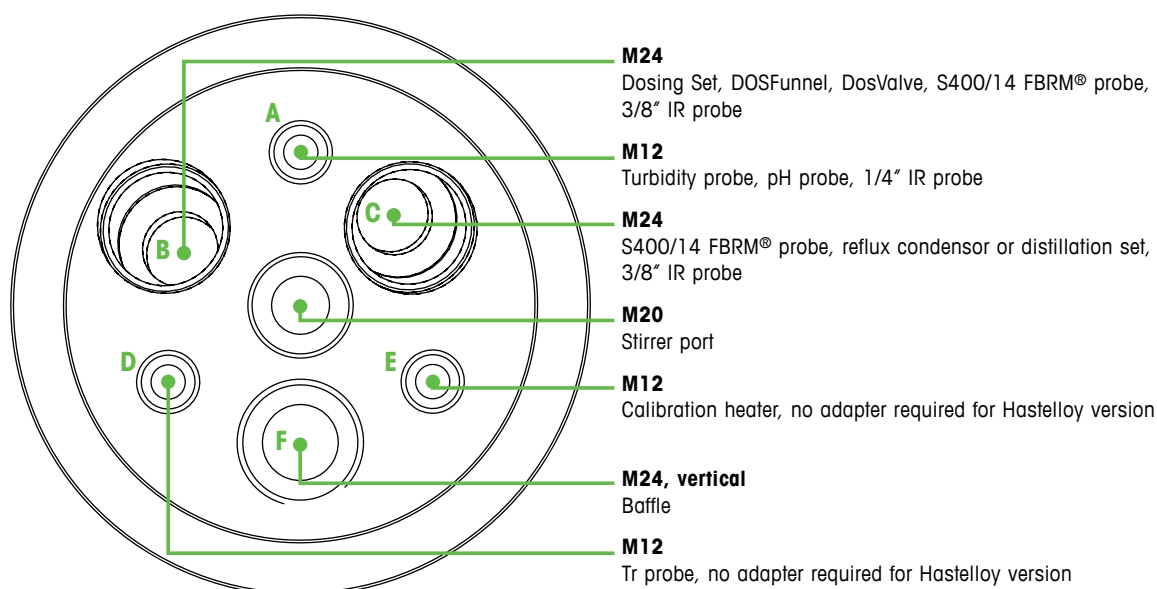
## 51 162 450 Cov-PTFE-00-0.5-Set

500 mL cover set for standard probes

The cover set for standard probes includes all parts to mount probes with a small diameter, such as an S400/14 FBRM® probe, a 1/4" or 3/8" IR probe, an InLab Semi-Micro-L pH probe, a standard temperature probe and calibration heater.

### Cover set consisting of

Order number	Product description	Quantity
51 162 311	Teflon cover, Cov-PTFE-00-0.5	1
	Retaining plate	1
51 162 421	Stirrer bearing incl. bushing and bearing screw, StB-PTFE-M20-10	1
51 162 406	PTFE adapter for 6 mm probes, Ada-PTFE-M12-6	3
51 162 407	PTFE plug, for M12 opening, Plu-PTFE-M12/6	2
51 162 408	PTFE plug, for M24 opening, Plu-PTFE-M24/14	2
51 162 410	PTFE adapters M24-ST 19/26 for reflux cooler, Ada-PTFE-M24-NS19/26	2
51 162 414	PTFE dosing adapter, Ada-PTFE-M24-2xUNF1/4G28	1
71 517	ST 19/26 glass plugs	2
51 191 204	UNF 1/4" G 28 plug, Plug-ETFE-UNF 1/4G28, 4 in a set	1
51 191 515	UNF 1/4" G 28 nuts, Plug-ETFE-UNF 1/4G28 1/8" (3.175 mm), 4 in a set	1
51 191 514	ETFE ferruls for 1/8" (3.175 mm) tubing, 4 in a set	1
51 162 384	FFKM O-ring set for standard cover, OR-FFKM-Cov-0.5-set, 8 in a set	1



<b>51 162 311</b>	<b>Cov-PTFE-00-0.5</b> Teflon cover
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 110 x 32 mm

## Adapter compatibility list

Order number	Product description	Compatible adapters and available ports					
<b>51 162 425</b>	Glass baffle, Baf-GL-10/205-3B		<b>F ● 1)</b>				
<b>51 162 420</b>	Hastelloy baffle, Baf-HC22-10/205-3B		<b>F ● 1)</b>				
<b>51 162 456</b>	Glass Tr probe, Tr-GL-6/230	<b>D ● 2)</b>					
<b>51 162 457</b>	Glass calibration heater, Cal-GL-6/230-5	<b>E ● 2)</b>					
<b>51 162 530</b>	Reflux condenser, Ref-GL-50/215-NS19/26			<b>C ● 2)</b>			
<b>51 162 541</b>	Dosing starter set ProMinent St19				<b>B ● 2)</b>	<b>A, D, E ● 3)</b>	
<b>51 161 152</b>	DOSFunnel, automatic dosing funnel, 100 mL				<b>B ● 2)</b>		
<b>51 162 621</b>	Dosing valve				<b>B ● 2)</b>	<b>A, D, E ● 3)</b>	
<b>51 343 161</b>	Inlab Semi-Micro-L pH probe	<b>A ● 2)</b>					
<b>51 191 327</b>	Turbidity probe, OFS-6H-205HO	<b>A ● 2)</b>					
	IR 3/8" probe		<b>B, C ● 4)</b>				
	IR 1/4" probe	<b>A ● 2)</b>					
	Lasentec® FBRM® S400/14 probe, position above stirrer (upwards)						<b>B ● 4)</b>
	Lasentec® FBRM® S400/14 probe, position beside stirrer (downwards)						<b>C ● 4)</b>
		<b>51 162 406</b> Add-PTFE-M12-6	<b>51 162 381</b> Add-PTFE-M24-10-kpl	<b>51 162 410</b> Add-PTFE-M24-NS19/26	<b>51 162 414</b> Add-PTFE-M24-2xUNF1/4G28	<b>51 162 492</b> Add-PTFE-M12-2xUNF1/4"	<b>51 162 411</b> Add-PTFE-M24-S400-14

1) the adapter is part of the glass stirrer set, Sti-GL-0.5-Set (No. 51 162 453) and of the Hastelloy stirrer set, Sti-HC22-0.5-Set (No. 51 162 452)

2) the adapter is part of the standard cover set, Cov-PTFE-00-0.5-Set

3) the adapter is part of the cover set for large probes, Cov-PTFE-00-0.5-19-5/8"-Set (No. 51 162 445)

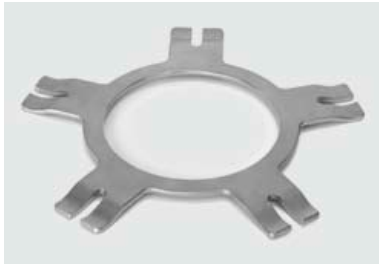
4) the adapter is **not** part of the standard cover set, please order separately

## Cover Accessoires

for the 500 mL Cover Set for Standard Probes

- Adapters
- Plugs

- UNF plugs
- Stirrer bearings



	<b>Retaining plate</b>
Material	Stainless steel
Quantity	1



<b>51 162 421</b>	<b>StB-PTFE-M20-10</b> Stirrer bearing incl. bushing and bearing screw
Material	PTFE GF25, VALFLON® F117
Temperature	-200 °C to +260 °C
Size	Ø 25 x 170 mm
Quantity	1



<b>51 162 406</b>	<b>Ada-PTFE-M12-6</b> PTFE adapter for 6 mm and 1/4" probes
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 15 x 45 mm
Quantity	1



<b>51 162 407</b>	<b>Piu-PTFE-M12/6</b> PTFE plug, M12-6 mm
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 15 x 50 mm
Quantity	1



<b>51 162 408</b>	<b>Piu-PTFE-M24/14</b> PTFE plug, M24-14 mm
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 24 x 50 mm
Quantity	1



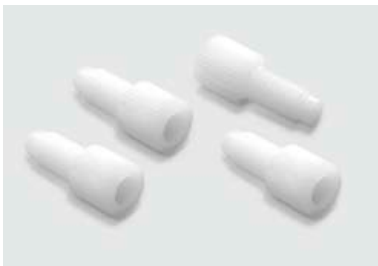
<b>51 162 410</b>	<b>Ada-PTFE-M24-NS19/26</b> PTFE adapter, M24-ST 19/26
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 26 x 60 mm
Quantity	1



<b>51 162 414</b>	<b>Ada-PTFE-M24-2xUNF 1/4G28</b> PTFE dosing adapter, M24
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 24 x 40 mm
Quantity	1



<b>71 517</b>	<b>Glass Plug NS 19/26</b> ST 19/26 glass plug
Material	borosilicate glass
Size	Ø 26 x 47 mm
Quantity	1



<b>51 191 204</b>	<b>Plug-ETFE-UNF 1/4G28</b> UNF 1/4 G 28 plugs
Material	ETFE
Temperature	-100 °C to +150 °C
Size	Ø 9 x 22 mm
Quantity	4 in a set



<b>51 191 515</b>	<b>Locking plug-ETFE-UNF 1/4G28 1/8"</b> UNF 1/4 G 28 locking plugs, flangeless
Material	ETFE
Temperature	-100 °C to +150 °C
Size	Ø 9 x 22 mm
Quantity	4 in a set



<b>51 191 514</b>	<b>ETFE Ferruls</b> for 1/8" (3.175 mm) tubing, flangeless
Material	ETFE, color may vary
Temperature	-100 °C to +150 °C
Size	Ø 5 x 5 mm
Quantity	4 in a set

## Cover Accessoires

for the 500 mL Cover Set for Standard Probes

### ■ O-rings



<b>51 162 384</b>	<b>OR-FFKM-Cov-0.5-set</b> O-ring set for standard cover, Kalrez®
Material	FFKM
Set parts	1 O-ring for cover, Ø 81.92 x 5.34 mm; 1 O-ring for stirrer bearing, Ø 14 x 1.78 mm; 3 O-rings for adapter, Ø 6.07 x 1.78 mm; 3 O-rings for adapter, Ø 13.95 x 2.62 mm
Quantity	8 in a set



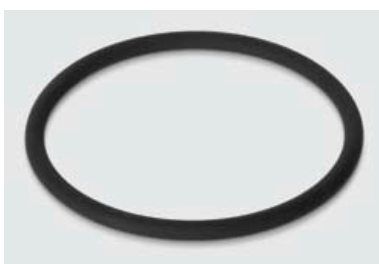
<b>51 191 851</b>	<b>O-Ring for stirrer bearing</b>
Material	FFKM
Size	Ø 14 x 1.78 mm
Quantity	1



<b>51 191 852</b>	<b>O-Ring for adapter</b>
Material	FFKM
Size	Ø 6.07 x 1.78 mm
Quantity	1

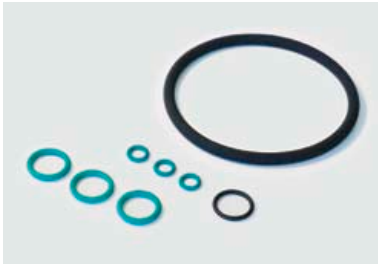


<b>51 191 857</b>	<b>O-Ring for adapter</b>
Material	FFKM
Size	Ø 13.95 x 2.62 mm
Quantity	1



<b>51 191 900</b>	<b>O-ring for cover</b>
Material	FFKM
Size	Ø 81.92 x 5.34 mm
Quantity	1

- **Alternative O-rings**
- **Additional compatible adapters**



<b>51 162 382</b>	<b>OR-FPM-Cov-0.5-set</b> O-ring set for standard cover, Viton®
Material	FPM, color may vary
Set parts	1 O-ring for cover, Ø 81.92 x 5.34 mm; 1 O-ring for stirrer bearing, Ø 14 x 1.78 mm; 3 O-rings for adapter, Ø 6.07 x 1.78 mm; 3 O-rings for adapter, Ø 13.95 x 2.62 mm
Quantity	8 in a set



<b>51 162 381</b>	<b>Ada-PTFE-M24-10-kpl</b> PTFE adapter
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 24 x 50 mm
Quantity	1

# Cover Set for Large Probes



**51 162 445**

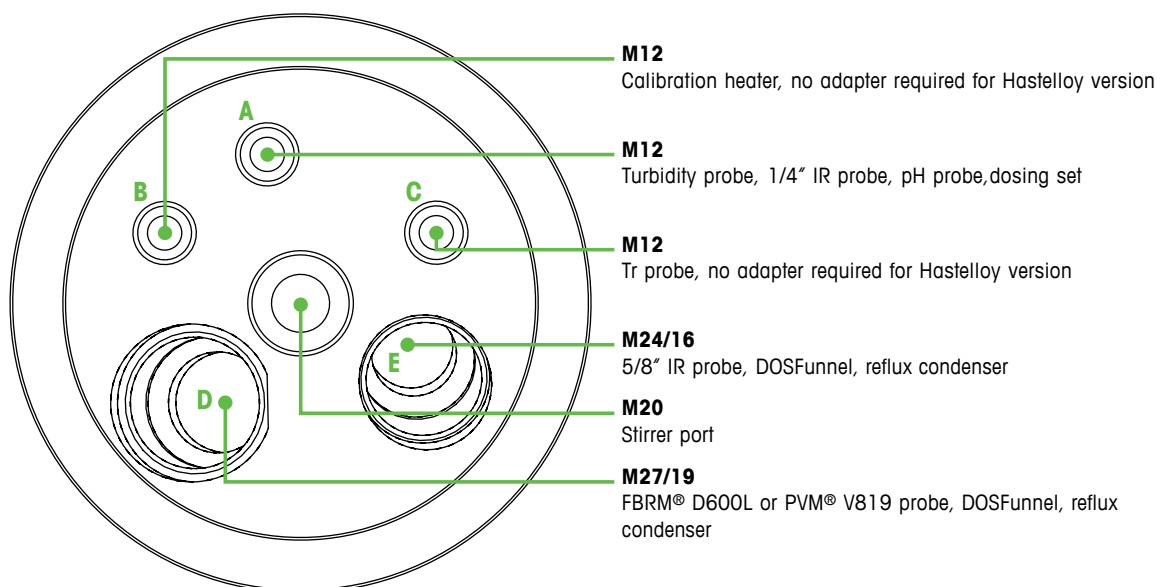
**Cov-PTFE-00-0.5-19-5/8"-set**

500 mL cover set for large probes

- The cover set for large probes is designed for applications where probes with a large diameter, such as the D600L FBRM® probe, the 3/8" IR probe, or PVM® V819 are used besides the standard probes.

## Cover set consisting of

Order number	Product description	Quantity
<b>51 162 444</b>	Teflon cover, Cov-PTFE-00-0.5-19-5/8"	1
	Retaining plate	1
<b>51 162 421</b>	Stirrer bearing incl. bushing and bearing screw, StB-PTFE-M20-10	1
<b>51 162 406</b>	PTFE adapter for 6 mm probes, Ada-PTFE-M12-6	3
<b>51 162 407</b>	PTFE plug, for M12 opening, Plu-PTFE-M12/6	2
<b>51 162 446</b>	PTFE plug, Plu-PTFE-M24/16	1
<b>51 162 448</b>	PTFE adapter, Ada-PTFE-M24-5/8"	1
<b>51 162 447</b>	PTFE plug, Plu-PTFE-M27/19	1
<b>51 162 449</b>	PTFE adapter, Ada-PTFE-M27-19	1
<b>51 162 492</b>	PTFE dosing adapter, Ada-PTFE-M12-2xUNF1/4G28	1
<b>51 162 535</b>	PTFE adapter, Ada-PTFE-M24/16-NS19/26	1
<b>51 162 536</b>	PTFE adapter, Ada-PTFE-M27/19-NS19/26	1
<b>71 517</b>	ST 19/26 glass plugs	1
<b>51 191 204</b>	UNF 1/4 G 28 plug, Plug-ETFE-UNF 1/4G28, 4 in a set	1
<b>51 191 515</b>	UNF 1/4 G 28 nuts, Plug-ETFE-UNF 1/4G28 1/8" (3.175 mm), 4 in a set	1
<b>51 191 514</b>	ETFE ferruls for 1/8" (3.175 mm) tubing, 4 in a set	1
<b>51 162 385</b>	FFKM O-ring set for standard cover, OR-FFKM-Cov-0.5-19-set, 8 in a set	1



<b>51 162 444</b>	<b>Cov-PTFE-00-0.5-19-5/8"</b> Teflon cover
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 110 x 32 mm

### Adapter compatibility list

Order number	Product description	Compatible adapters and available ports						
<b>51 162 456</b>	Glass Tr probe, Tr-GL-6/230	C ● 1)						
<b>51 162 457</b>	Glass calibration heater, Cal-GL-6/230	B ● 1)						
<b>51 162 530</b>	Reflux condenser, Ref-GL-50/215-NS19/26		E ● 1)	D ● 1)				
<b>51 162 541</b>	Dosing starter set ProMinent SI19				A ● 1)			
<b>51 104 220</b>	DOSFunnel, automatic dosing funnel, 250 mL		E ● 1)	D ● 1)				
<b>51 161 152</b>	DOSFunnel, automatic dosing funnel, 100 mL		E ● 1)	D ● 1)				
<b>51 162 621</b>	Dosing valve				A ● 1)			
<b>51 343 161</b>	pH probe Inlab-Semi Micro L	A ● 1)						
<b>51 191 327</b>	Turbidity probe, OFS-6H-205HO	A ● 1)						
	IR 1/4" probe	A ● 1)						
	IR 5/8" probe					E ● 1)		
	Lasentec® FBRM® D600 L probe							D ● 1)
	Lasentec® PVM® V819 probe							D ● 1)

1) the adapter is part of the cover set for large probes, Cov-PTFE-00-0.5-19-5/8"-Set (No. 51 162 445)  
 2) the adapter is **not** part of the cover set, please order separately

<b>51 162 406</b> Ada-PTFE-M12-6	<b>51 162 535</b> Ada-PTFE-M24/16-NS19/26	<b>51 162 536</b> Ada-PTFE-M27/19-NS19/26	<b>51 162 492</b> Ada-PTFE-M12-2x1/4G28	<b>51 162 448</b> Ada-PTFE-M24-5/8"	<b>551 162 411</b> Ada-PTFE-M24-S400-14	<b>51 162 449</b> Ada-PTFE-M27-19
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## Cover Accessoires

for the 500 mL Cover Set for Large Probes

- Adapters
- Plugs
- Stirrer bearings



	<b>Retaining plate</b>
Material	Stainless steel
Quantity	1



<b>51 162 421</b>	<b>StB-PTFE-M20-10</b> Stirrer bearing incl. bushing and bearing screw
Material	PTFE GF25, VALFLON® F117
Temperature	-200 °C to +260 °C
Size	Ø 25 x 170 mm
Quantity	1



<b>51 162 406</b>	<b>Ada-PTFE-M12-6</b> PTFE adapter for 6 mm and 1/4" probes
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 15 x 45 mm
Quantity	1



<b>51 162 407</b>	<b>Piu-PTFE-M12/6</b> PTFE plug, M12-6 mm
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 15 x 50 mm
Quantity	1



<b>51 162 446</b>	<b>Piu-PTFE-M24/16</b> PTFE plug, M24-16 mm
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 24 x 50 mm
Quantity	1



<b>51 162 448</b>	<b>Ada-PTFE-M24-5/8"</b> PTFE adapter, M24-5/8"
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 24 x 40 mm
Quantity	1



<b>51 162 447</b>	<b>Plu-PTFE-M27/19</b> PTFE plug, M27-19 mm
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 27 x 50 mm
Quantity	1



<b>51 162 449</b>	<b>Ada-PTFE-M27-19</b> PTFE adapter, M27-19 mm
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 27 x 40 mm
Quantity	1



<b>51 162 492</b>	<b>Ada-PTFE-M12-2xUNF1/4G28</b> PTFE dosing adapter, M12
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 18 x 55 mm
Quantity	1



<b>51 162 535</b>	<b>Ada-PTFE-M24/16-NS19/26</b> PTFE adapter, M24/16 mm - NS19
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 24 x 60 mm
Quantity	1



<b>51 162 536</b>	<b>Ada-PTFE-M27/19-NS19/26</b> PTFE adapter, M27/19 mm - NS19
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 27 x 60 mm
Quantity	1

## Cover Accessoires

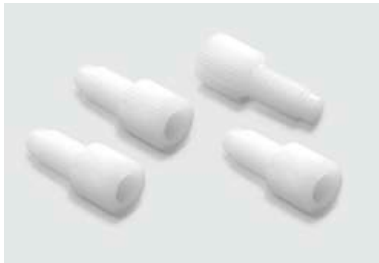
for the 500 mL Cover Set for Large Probes

- Glass stoppers
- Plugs

- UNF plugs
- O-rings



<b>71 517</b>	<b>Glass Plug NS 19/26</b> ST 19/26 glass plug
Material	borosilicate glass
Size	Ø 26 x 47 mm
Quantity	1



<b>51 191 204</b>	<b>Plug-ETFE-UNF 1/4G28</b> UNF 1/4 G 28 plugs
Material	ETFE
Temperature	-100 °C to +150 °C
Size	Ø 9 x 22 mm
Quantity	4 in a set



<b>51 191 515</b>	<b>Locking plug-ETFE-UNF 1/4G28 1/8"</b> UNF 1/4 G 28 locking plugs, flangeless
Material	ETFE
Temperature	-100 °C to +150 °C
Size	Ø 9 x 22 mm
Quantity	4 in a set



<b>51 191 514</b>	<b>ETFE Ferruls</b> for 1/8" (3.175 mm) tubing, flangeless
Material	ETFE, color may vary
Temperature	-100 °C to +150 °C
Size	Ø 5 x 5 mm
Quantity	4 in a set



<b>51 162 385</b>	<b>OR-FFKM-Cov-0.5-19-set</b> O-ring set for cover for large probes, Kalrez®
Material	FFKM
Set parts	1 O-ring for cover, Ø 81.92 x 5.34 mm; 1 O-ring for stirrer bearing, Ø 14 x 1.78 mm; 3 O-rings for adapter, Ø 6.07 x 1.78 mm; 1 O-rings for adapter, Ø 15.54 x 2.62 mm; 1 O-rings for adapter, Ø 18.72 x 2.62 mm
Quantity	7 in a set



<b>51 191 851</b>	<b>O-Ring for stirrer bearing</b>
Material	FFKM
Size	Ø 14 x 1.78 mm
Quantity	1



<b>51 191 852</b>	<b>O-Ring for adapter</b>
Material	FFKM
Size	Ø 6.07 x 1.78 mm
Quantity	1



<b>51 191 858</b>	<b>O-Ring for adapter</b>
Material	FFKM
Size	Ø 15.54 x 2.62 mm
Quantity	1



<b>51 191 859</b>	<b>O-Ring for adapter</b>
Material	FFKM
Size	Ø 18.72 x 2.62 mm
Quantity	1



<b>51 191 900</b>	<b>O-ring for cover</b>
Material	FFKM
Size	Ø 81.92 x 5.34 mm
Quantity	1

### Alternative O-rings



<b>51 162 383</b>	<b>OR-FPM-Cov-0.5-19-set</b> O-ring set for cover for large probes, Viton®
Material	FPM, color may vary
Set parts	1 O-ring for cover, Ø 81.92 x 5.34 mm; 1 O-ring for stirrer bearing, Ø 14 x 1.78 mm; 3 O-rings for adapter, Ø 6.07 x 1.78 mm; 1 O-rings for adapter, Ø 15.54 x 2.62 mm; 1 O-rings for adapter, Ø 18.72 x 2.62 mm
Quantity	7 in a set

# Stirrer Sets

- Glass stirrer set for the standard 500 mL cover
- Hastelloy stirrer set for the standard 500 mL cover
- Glass stirrer for the cover for large probes
- Hastelloy stirrer for the cover for large probes

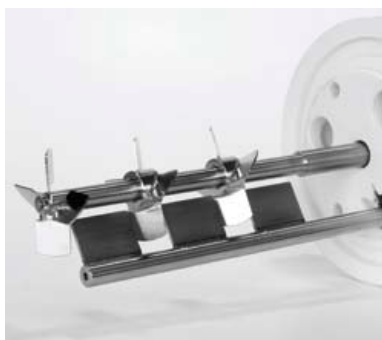


## 51 162 453 Sti-GL-0.5-Set

Glass stirrer set for the standard 500 mL cover – for low viscosity only.

Set consisting of

Order number	Product description	Quantity
51 162 423	Sti-GL-38/400-PB-D, glass stirrer (downward)	1
51 162 425	Baf-GL-10/205-3B, glass baffle	1
51 162 381	Ada-PTFE-M24-10-kpl, PTFE adapter	1



## 51 162 452 Sti-HC22-0.5-Set

Hastelloy stirrer set for the standard 500 mL cover.

Set consisting of

Order number	Product description	Quantity
51 162 432	Sti-HC22-38/400-3PB-D, Hastelloy stirrer (downward)	1
51 162 420	Baf-HC22-10/205-3B, Hastelloy baffle	1
51 162 381	Ada-PTFE-M24-10-kpl, PTFE adaptor	1



## For cover Cov-PTFE-00-0.5-19-5/8"

Glass and Hastelloy stirrers for the cover for large probes

Order number	Product description	Quantity
51 162 423	Sti-GL-38/400-PB-D, glass stirrer (downward)	1

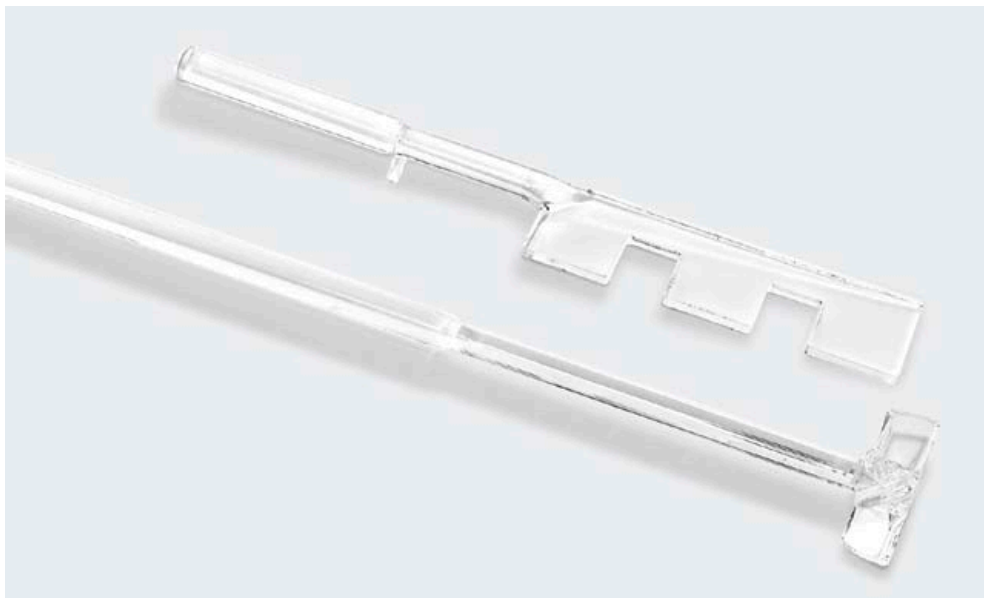
Order number	Product description	Quantity
51 162 424	Sti-GL-38/400-PB-U, glass stirrer (upward)	1

Order number	Product description	Quantity
51 162 431	Sti-HC22-38/400-PB-D, Hastelloy stirrer shaft with pitch blade (downward)	1

Order number	Product description	Quantity
51 162 442	PBE-HC22-38/M3-U, Hastelloy lower pitch blade element (upward)	1

# Glass Stirrer Set

## for the Standard 500 mL Cover



### 51 162 453 Sti-GL-0.5-Set

for low viscosity only

- Depending on the type of reaction mass or the type of probe a different design or material of stirrer or baffle might be required.
- For this reason, stirrer sets made of glass or Hastelloy with various baffles are available.

<b>51 162 423</b>	<b>Sti-GL-38/400-PB-D</b> Glass stirrer, 4 blades at 45° (downward)
Material	Borosilicate glass
Size	Ø 38/10 x 400 mm
Quantity	1

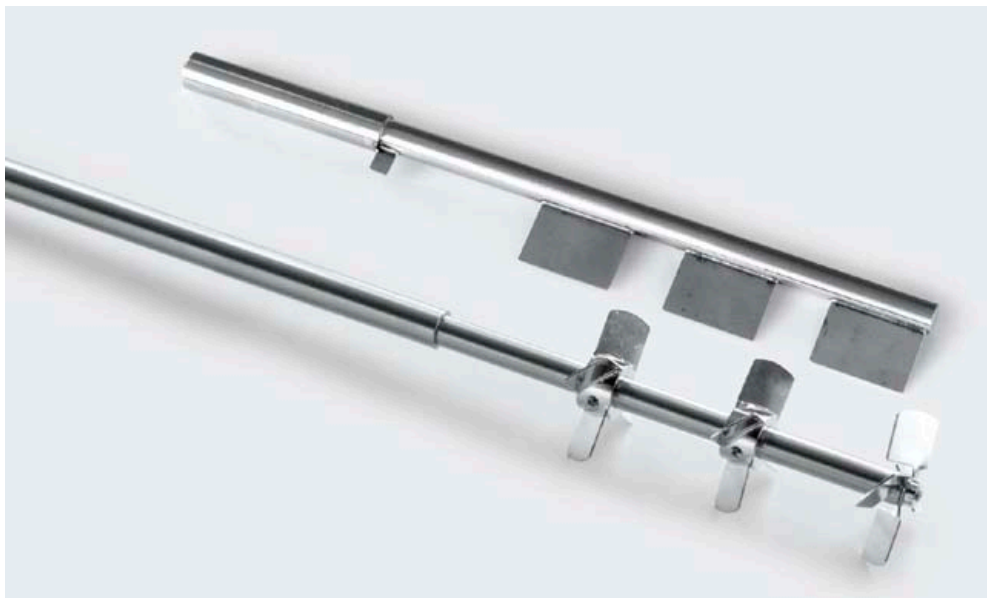
<b>51 162 425</b>	<b>Baf-GL-10/205-3B</b> Glass baffle
Material	Borosilicate glass
Size	Ø 10 x 205 mm
Quantity	1



<b>51 162 381</b>	<b>Ada-PTFE-M24-10-kpl</b> PTFE adapter
Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 24 x 50 mm
Quantity	1

# Hastelloy Stirrer Set

## for the Standard 500 mL Cover



### 51 162 452 Sti-HC22-0.5-Set

for low and high viscosity

- For experiment setups where glass is not the perfect solution you may choose to install a Hastelloy version of stirrer and baffle.
- It is mechanically more stable and offers also better chemical resistance in some cases.

### 51 162 432

#### Sti-HC22-38/400-PB-3D

Hastelloy stirrer, 3 elements each with 4 blades at 45° (downward)

Material	Hastelloy 22
Size	Ø 38/10 x 400 mm
Quantity	1

### 51 162 420

#### Baf-HC22-10/205-3B

Hastelloy baffle

Material	Hastelloy 22
Size	Ø 10 x 205 mm
Quantity	1



### 51 162 381

#### Ada-PTFE-M24-10-kpl

PTFE adapter

Material	PTFE GF25
Temperature	-200 °C to +260 °C
Size	Ø 24 x 50 mm
Quantity	1

# Glass and Hastelloy Stirrers for the Cover for Large Probes



## 51 162 423 Sti-GL-38/400-PB-D

for low viscosity only

- The single blade stirrer made of glass offers the right solution.

<b>51 162 423</b>	<b>Sti-GL-38/400-PB-D</b> Glass stirrer, 4 blades at 45° (downward)
Material	Borosilicate glass
Size	Ø 38/10 x 400 mm
Quantity	1

<b>51 162 424</b>	<b>Sti-GL-38/400-PB-U</b> Glass stirrer, 4 blades at 45° (upward)
Material	Borosilicate glass
Size	Ø 38/10 x 400 mm
Quantity	1

## 51 162 431 Sti-HC22-38/400-PB-D

for low and high viscosity

- Applying large probes, such as the D600 L or PVM® V819 require to install a respective stirrer.
- The single blade stirrer made of Hastelloy offers the right solution.

<b>51 162 431</b>	<b>Sti-HC22-38/400-PB-D</b> Hastelloy stirrer shaft with pitch blade elements, 4 blades at 45° (downward)
Material	Hastelloy 22
Size	Shaft 400 mm, pitch blade Ø 38 x 10 mm
Quantity	1

<b>51 162 442</b>	<b>PBE-HC22-38/M3-U</b> Hastelloy lower pitch blade element, 4 blades at 45° (upward)
Material	Hastelloy 22
Size	Ø 38 x 10 mm, M3
Quantity	1

# Probes

## for the 500 mL Reactor Platform

- Temperature
- Turbidity
- Mid-IR
- Particle size characterization
- pH

### Versatile Probes

The concept of the 500 mL is such that a large variety of probes can be employed to satisfy the needs of your applications.

Whether you simply measure temperature or pH or the more complex measurement of concentration or particle size distribution is required there is always a solution to apply the respective probe. There is a distinct solution for the standard probes, i.e. temperature, pH, calibration heater, IR, FBRM®, PVM® or turbidity independent whether they are made of glass or Hastelloy.

Due to the sophisticated design of the vessel, cover and stirrer probes, such as FBRM®, IR, PVM® etc. are kept in a perfect position and, thus provide high quality data.

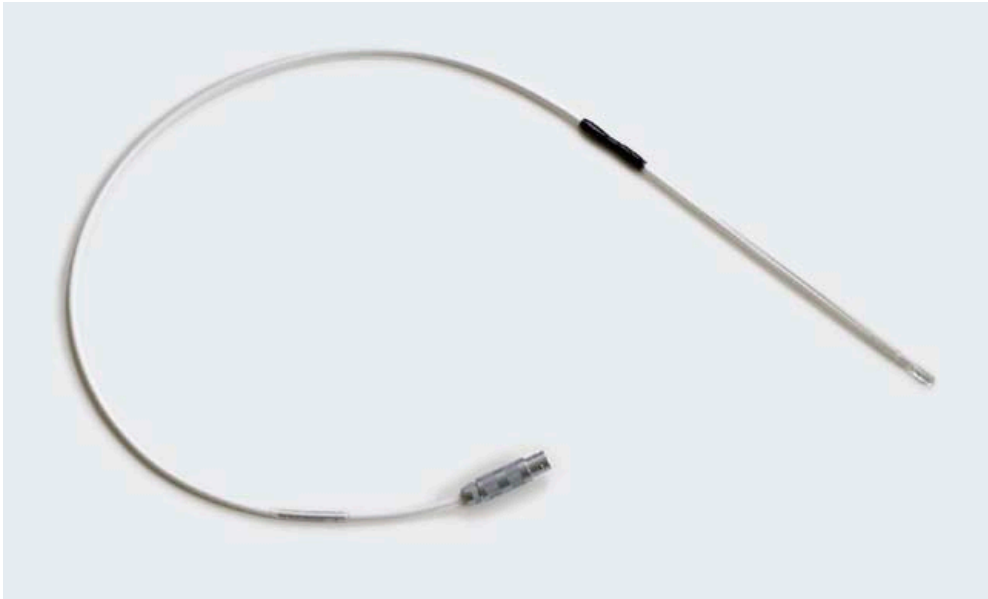
### Positioning the Probes

The probes are mounted in defined openings that allow keeping them well-positioned. This is important especially for crystallization applications in which FBRM® or IR probes are employed.

Perfectly oriented and mechanically stable probe positions help also to protect your equipment against mechanical damage or even breakage.

For most of the probes we will provide an appropriate adapter or fitting. These are made of the same material as the cover itself (please refer to the respective section of the catalog).

# Glass Temperature Probe



## 51 162 456 Tr-GL-6/230

- High quality, dual temperature probe Tr/Trs
- Redundant temperature measurement for safety verifications
- Accurate, stable and reproducible temperature measurement thanks to DIN class A Pt100 sensors
- Resistant to most of the chemistries

51 162 456

Tr-GL-6/230

Glass temperature sensor

Material	Borosilicate glass
Size	Ø 6 x 230 mm
Quantity	1

# Hastelloy Temperature Probe



## 51 162 458 Tr-HC22-6/170

- High quality, dual temperature probe Tr/Trs
- Redundant temperature measurement for safety verifications
- Accurate, stable and reproducible temperature measurement thanks to DIN class A Pt100 sensors
- HC-22 probe which fits the requirements of the pharmaceutical industry
- Excellent alternative where glass is not the material of your choice

51 162 458

Tr-HC22-6/170

Hastelloy temperature sensor

Material

Hastelloy 22

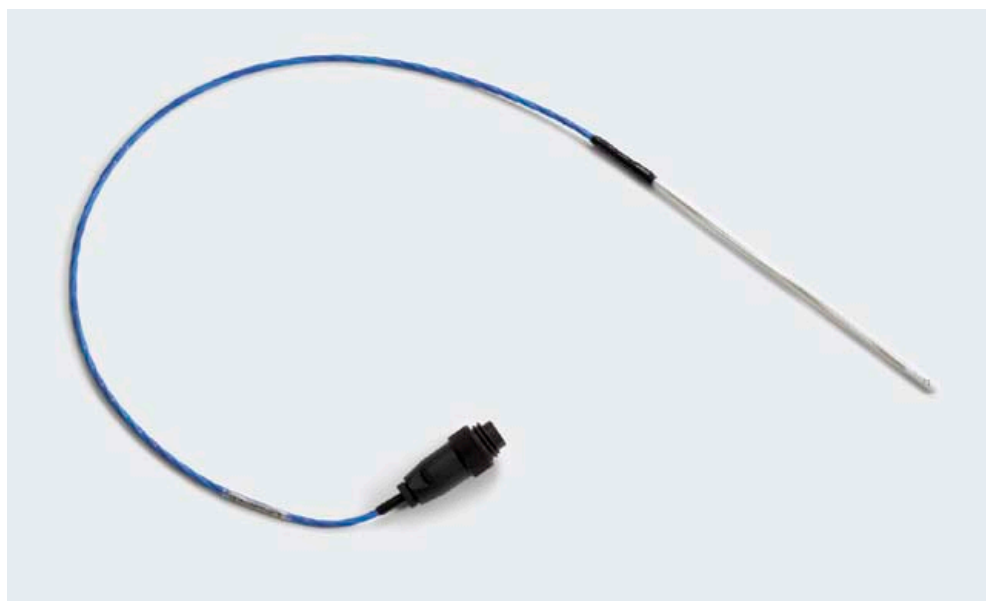
Size

Ø 6 x 170 mm

Quantity

1

# Glass Calibration Heater



## 51 162 457 Cal-GL-6/230-5

- 5 W calibration heater
- Resistant to most of the chemistries

51 162 457

**Cal-GL-6/230-5**

Glass calibration heater

Material	Borosilicate glass
Power	5 W
Size	Ø 6 x 230 mm
Quantity	1

# Hastelloy Calibration Heater



## 51 162 459 Cal-HC22-6/170-5

- 5 W calibration heater
- HC-22 probe which fits the requirements of the pharmaceutical industry
- Excellent alternative where glass is not the material of your choice

51 162 459

Cal-HC22-6/170-5

Hastelloy calibration heater

Material

Hastelloy 22

Power

5 W

Size

Ø 6 x 170 mm

Quantity

1

# Reflux Condensator

- Reaction under reflux conditions
- Safety investigations
- Remove heat of reaction



## 51 162 530 Ref-GL-50/215-NS19/26

### Reaction under Reflux and Distillation Conditions

Often reactions are carried out under reflux conditions to increase the reaction rate, to increase the conversion for a higher yield, to remove heat of reaction or simply to work at the highest possible temperature conditions for a given solvent. A simple reflux condenser can be employed.

51 162 530	Ref-GL-50/215-NS19/26 Reflux Condensator
Material	Borosilicate glass
Quantity	1

# DOSFunnel

## Automatic Dropping Funnel

- The dosing rate can be set and controlled by the output signal to the valve
- DOSFunnel is suitable for all reactors that are operated at ambient pressure



### 51 161 152 DOSFunnel

The automatic dropping funnel «DOSFunnel» enables liquids to be metered into an RC1<sup>e</sup>™ reactor automatically and software controlled. Its principal application is in the controlled addition of the liquid in the funnel to the reactor at a defined point in time.

The quantity of reagent specified in a recipe can therefore be automatically added to the reactor at the right moment.

51 161 152	DOSFunnel
	Automatic dropping funnel, 2/2-way straight valve, normally closed
Material	Borosilicate glass, PTFE plug with solenoid valve
Temperature range for the liquids dosed	+10 to 50 °C
Max. flow rate	approx. 100 ml/min (depending on level in funnel and viscosity of liquid)
Valve control voltage	24 V DC
Power consumption	4 W
Quantity	1



# How to Obtain an Update of the "ALR Product Catalog"

**This catalog represents the actual status at the date indicated below.**

There may be an update available from the METTLER TOLEDO AutoChem Community site.

We will provide two types of product Catalog files:

- One that can be installed for the use in combination with iControl RC1<sup>e</sup>™. It is an executable WinZip® file
- One that is a standard PDF

To access the AutoChem Community site you will need a personal login. If you don't yet have an account, please register first to obtain your personal login details. You may register at:

<https://community.autochem.mt.com/>

## **METTLER TOLEDO AutoChem Community Site**

The AutoChem Community site offers a wealth of information from which you can greatly benefit. A large number of application notes, user conference papers, training material as well as supporting documentation are ready for download.

Watch our web-based on-demand seminars created by industry experts and our own application specialists providing application, and technology know-how.

Last but not least, actual updates and service releases of the iC Software Suite are available from the AutoChem Community site too.

Make sure you have your personal login credentials and benefit from the information provided.

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