



Chapter 6

Non-Stirred Pressure Vessels

Inside this chapter you will find:

4703-4714 22-45 mL

4740-4742 25-75 mL
High Pressure

4791-4793 25-100 mL

4791HP/HT-4793HP/HT 25-100 mL
High Pressure / High Temperature

4750-4755 125-200 mL

4760-4777 100-600 mL

4760HT-4768HT 160-600 mL
High Temperature

4651-4653 250-1000 mL
High Pressure

4605-4626 600-1200 mL
High Pressure

4601-4622 1000-2000 mL

4661-4664 1 & 2 gallon

4681-4684 1000-1800 mL
High Pressure

4671-4674 1 & 1.5 gallon
High Pressure

4676-4679 2.6 & 5 gallon



Non-Stirred Pressure Vessels

Parr offers a broad selection of non-stirred pressure vessels in convenient styles, sizes and pressure ranges for many laboratory uses. Recent additions to this line have included new sizes, new temperature and pressure

combinations and new self-sealing closures, all designed to provide convenient vessels for laboratory procedures that must be performed under pressure at elevated temperatures.

Pressure Vessel Selection Procedure

The steps to be followed in selecting a non-stirred pressure vessel are similar to those used for a stirred reactor. Selection begins with the Guide to Non-Stirred Vessels, from which the user can identify the Model Number for vessels in a range of sizes with temperature and pres-

sure ratings suitable for the intended application. Detailed specifications and catalog numbers can then be found on the referenced page. After the specifications have been established, the options and accessories required to customize a complete pressure vessel system can be selected.

Guide to Parr Non-Stirred Vessels

Model Number	Vessel Style	Vessel Size	Max. Press. psi (bar)	Max. Temp. °C	See Page Number
4703-4714	Screw Cap	22-45 mL	1700 (115)	300	128
4740-4742	High Pressure	25-75 mL	8500 (575)	350	129
4791-4793	Split Ring	25-100 mL	3000 (200)	350	130
4791HP/HT-4793HP/HT	Split Ring	25-100 mL	5000 (200)	500	130
4750-4755	Split Ring	125-200 mL	3000 (200)	350	131
4760-4777	Split Ring	100-600 mL	3000 (200)	350	132-133
4760HT-4768HT	Split Ring	300-600 mL	2000 (200)	500	132-133
4651-4653	High Pressure	250-1000 mL	6000 (345)	600	136
4605-4626	High Pressure	600-1200 mL	5000 (345)	350	135
4601-4622	Split Ring	1000-2000 mL	1900 (130)	350	134
4601HP-4622HP	Split Ring	920-1850 mL	2900 (200)	350	134
4661-4666	Split Ring	1 & 2 gallon	1900 (130)	350	137
4680-4683	High Pressure	1000-1800 mL	6000 (345)	600	138
4671-4674	High Pressure	1 & 1.5 gallon	3000 (200)	600	139
4676-4679*	Split Ring	2.6 & 5 gallon	1900 (130)	350	140

*May be modified for pressures to 5000 psi & temps to 500°C.



Model 4703, 22 mL, with Rupture Disc.

Head Design

Many of the non-stirred vessels offer a basic head with a 1/8" NPT plug. These should be considered as only a starting point for custom built vessels as they *do not* include a safety relief device. Safety codes, good practice, and common sense dictate that a safety relief device should be installed on all vessels. The 1/8" NPT plug is provided for the user to install their own safety relief device.

Users who take delivery of vessels without safety relief devices installed must take responsibility for installing adequate protective devices before the vessel is placed in service.



Parr General Purpose Vessels with Volumes from 22 to 2000 mL.

Index to Non-Stirred Vessel Design Features, Options and Accessories

Primary Accessories	Reference Page
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Options	Reference Page
Gaskets and Seals	18-19
Materials of Construction	10-12
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Rupture Disc	110
Certification	9-10

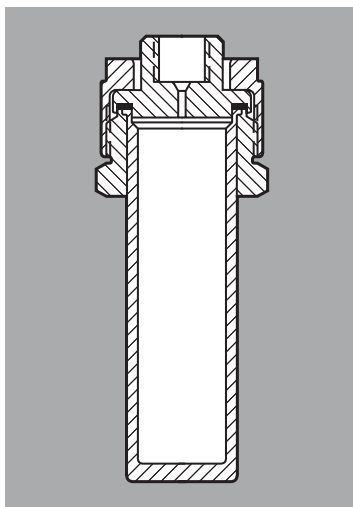
Accessories*	Reference Page
Liners	115
Pressure Hoses	118
Check Valves	117
Liquid Pipettes	114
Gas Filling Systems	112-113

* May require modifications of vessel to install



Available Accessories Include Heaters, Controllers, Valves, Gage Block Assemblies, and Gas Filling Hoses

Series 4703-4714 General Purpose Pressure Vessels: 22 & 45 mL



4714 Cross Section



Model 4704, 22 mL Vessel shown with Needle Valve.

These are the smallest of the Parr General Purpose Pressure Vessels. They have a 1 inch inside diameter and are offered in two different lengths with volumes of 22 and 45 mL.

These vessels have a flat PTFE or flexible graphite gasket that is sealed with a screw cap. Special wrenches and bench sockets are offered for tightening these closures. The screw caps and bodies are made of alloy steel for use at temperatures to 300 °C. The maximum working pressure is 1700 psi (115 bar). The standard material of construction for these small, inexpensive vessels is Type 316 Stainless Steel, but they are also available in all of the current materials of construction Parr provides.

There is room for a single opening on the head of these vessels. This is generally an "A" socket which will accept a 4316 Gage Block Assembly.

These heads can also be furnished with 1/8" NPT, 1/4" NPT, or a rupture disc assembly.

These vessels are normally heated in ovens, baths, or similar general purpose heating devices. Special heaters for these vessels are not available from Parr.



Model 4714, 45 mL Vessel, with 4316 Gage Block Assembly.

Series 4701-4714 Pressure Vessel Specifications				
Shaded bar indicates specifications that change within series.				
Model Number	4703	4704	4713	4714
Sizes, mL	22		45	
Maximum Pressure (MAWP)	1700 psi (115 bar)			
Maximum Temperature	300 °C		300 °C	
Closure	Screw Cap-Steel			
Gasket	Flat - PTFE			
Vessel Dimensions				
Inside Diameter, inches	1.0			
Inside Depth, inches	1.6		3.8	
Weight of Vessel, pounds	1		2	
Head Style				
Opening*	1/8" NPT w/plug	"A" Socket	1/8" NPT w/plug	"A" Socket
Thermowell	Not Available			
Heater	Not Available			
Maximum Head Openings	1			
Recommended Gage Block	NA	4316	NA	4316
Recommended Wrench	21AC4			
Recommended Bench Socket	A22AC3			
*Note: Alternative heads with 1/4" NPT or Rupture Disc Assembly are available upon request.				

*Note: Alternative heads with 1/4" NPT or Rupture Disc Assembly are available upon request.

Series 4740 HP/HT Pressure Vessels: 25 & 75 mL

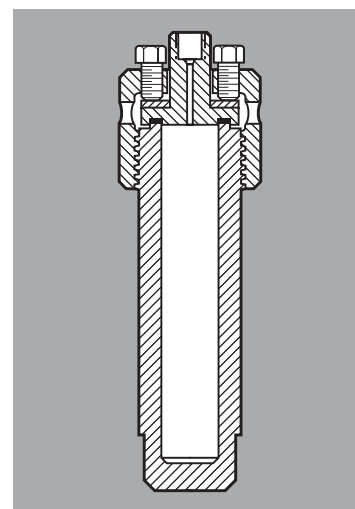


These are the smallest of Parr High Pressure, High Temperature vessels. They have a 1 inch inside diameter and offer volumes of 25 or 75 mL. These vessels are closed with an alloy steel screw cap which includes six cap screws to develop the sealing force on a flat, flexible graphite gasket. Interchangeable PTFE gaskets are also available for users who need the high pressure capabilities provided by these vessels, but who do not need to operate above 350 °C. Maximum pressure drops quickly at temperatures above 350 °C to a rating of 1850 psi (125 bar) at 540 °C. These vessels are available in all of the standard materials currently offered by Parr, although some of these materials will limit the maximum pressures and temperatures available.

Only one head opening is available for these vessels. It is designed to accept the 4316 Gage Block Assembly which can be furnished with or without a thermocouple. Parr now offers the 4921 Bench Top Ceramic Fiber heater for use with the 75 mL, 4740 vessel only.



Model 4740, 75 mL Vessel, with Gage Block Assembly.



4740 Cross Section



Model 4740, 75 mL Vessel, with Ceramic Fiber Heater.

Series 4740 Pressure Vessel Specifications

Shaded bar indicates specifications that change within series.

Model Number	4740	4742
Sizes, mL	75	25
Maximum Pressure (MAWP) @ 350 °C	8500 psi (585 bar)	
Maximum Temperature	540 °C	
Max. Pressure at Max. Temp., psi (bar)	1850 (125)	
Closure	Screw Cap (6 Cap Screws)	
Gasket	Flat - Flexible Graphite	
Vessel Dimensions		
Inside Diameter, inches	1.0	
Inside Depth, inches	5.6	1.7
Weight of Vessel, pounds	5	4
Head Style		
Opening	“A” Socket	
Thermowell	No	
Heater (Ceramic Fiber)		
Model	4921	N/A
Heater Power, Watts	700	N/A
Maximum Head Openings	1	
Recommended Gage Block	4316	

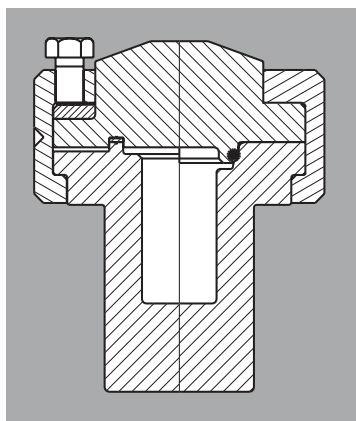
Series 4791-4793 GP and HP/HT Vessels: 25 - 100 mL



Model 4791, 25 mL General Purpose Vessel



4793HP/HT, 100 mL Fixed Head Vessel



4791 Cross Section
(Showing Flat Gasket and
O-ring Closure)

General Purpose 4790 Series Vessels come with dip tube, three valves, gage, rupture disc, and thermocouple. The HP/HT versions include two valves as standard.

Series 4791 - 4793 Pressure Vessel Specifications

Shaded bar indicates specifications that change within series.

General Purpose Vessels

Model Number	4791*	4792*	4793*
Sizes, mL	25	50	100
Maximum Pressure (MAWP)	3000 psi (200 bar)		
Maximum Temperature			
with FKM O-Ring	225 °C		
with FFKM O-Ring	275 °C		
with PTFE - Flat Gasket	350 °C		
Valve Connections	3 – 1/8" NPT Male		
Pressure Gage Size / Range	3.5 inches / 0-3000 psi (200 bar)		
Heater			
Catalog Number	A2236HC	A2236HC	A2237HC
Heater Power Watts	400	400	350
Heater Style	Clamp-on	Clamp-on	Mantle

High Temperature / High Pressure Vessels

Model Number	4791HP/HT*	4792HP/HT*	4793HP/HT*
Sizes, mL	25	50	100
Maximum Pressure (MAWP)	5000 psi (350 bar)		
Maximum Temperature			
with Grafoil - Flat Gasket	500 °C		
Valve Connections	2 – 1/4" NPT (F)		
Pressure Gage Size / Range	3.5 inches / 0-5000 psi (350 bar)		
Heater (Ceramic Fiber)			
Model	4991		
Heater Power, Watts	700		

Common to these General Purpose and High Temperature / High Pressure Models

Vessel Style	Moveable, or Fixed Head on Bench Top		
Closure	Split-Ring (6 Cap Screws)		
Temperature Measurement	Fixed Thermocouple		
Additional Fittings	Dip Tube and Rupture Disc		
Vessel Dimensions			
Inside Diameter, inches	1.0	1.3	1.3
Inside Depth, inches	2.0	2.3	4.6
Weight of Vessel, pounds	7	7	8

* Add the following suffixes to these model numbers to specify vessels with the described features:

No suffix: Moveable Head

Q: Add the suffix Q to specify vessels with an O-Ring seal and a split ring pair without cap screws

FH: Add the suffix FH to specify a Fixed Head design.

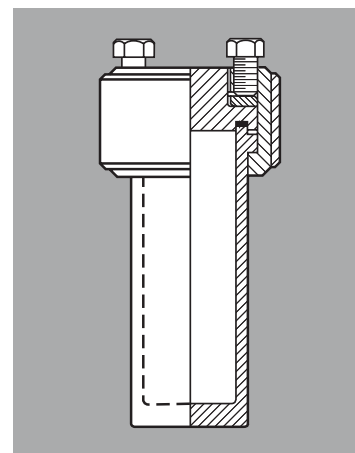
Series 4750 General Purpose Pressure Vessels: 125 & 200 mL



Model 4753, 200 mL Vessel, with 4316 Gage Block Assembly.



Model 4751, 125 mL Vessel, with 4316 Gage Block Assembly.

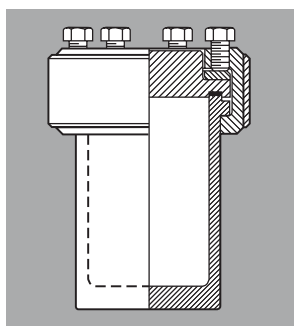


Cross Section 4750

Series 4750 Pressure Vessel Specifications						
Shaded bar indicates specifications that change within series.						
Model Number	4750	4751	4754	4752	4753	4755
Sizes, mL	125			200		
Maximum Pressure (MAWP)	3000 psi (200 bar)					
Maximum Temperature	350 °C					
Closure	Split-Ring (6 Cap Screws)					
Gasket	Flat - PTFE					
Vessel Dimensions						
Inside Diameter, inches	1.5					
Inside Depth, inches	4.5			7.0		
Weight of Vessel, pounds	4			5		
Head Style						
Opening	1/8" NPT w/plug	"A" Socket	"A" Socket	1/8" NPT w/plug	"A" Socket	"A" Socket
Thermocouple	No	No	Yes	No	No	Yes
Heater (Ceramic Fiber)	Model 4921, 125 / 200					
Maximum Head Openings	2					
Recommended Gage Block	4316					

Series 4760-4777 General Purpose Vessels: 100 - 600 mL

Series 4760-4768 High Temperature Vessels: 300 - 600 mL



Cross Section 4760



4760 with plug and rupture disc assembly installed.



Model 4761, 300 mL Vessel with A281HC Adapter and A146VB Needle Valve.

Series 4760 - 4767 Pressure Vessel Specifications

Shaded bar indicates specifications that change within series.

General Purpose Vessels

Model Number	4760*	4761*	4766*	4762*	4763*	4767*
Sizes, mL	300			450		
Maximum Pressure (MAWP)	3000 psi (200 bar)					
Maximum Temperature						
with FKM O-Ring	225 °C					
with PTFE - Flat Gasket	350 °C					

Heater (Mantle)

Model / Wattage	A2230HC / 510	A2230HC2 / 590
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High Temperature Vessels

Model Number	4760HT*	4761HT*	4766HT*	4762HT*	4763HT*	4767HT*
Sizes, mL	300			450		
Maximum Pressure (MAWP)	2000 psi (137 bar)					
Maximum Temperature	500 °C with Grafoil Gasket					
Heater (Ceramic Fiber)						
Model / Wattage	4961 / 800					

Common to these General Purpose and High Temperature Models

Closure	Split-Ring (6 Cap Screws)					
Head Style						
Opening	1/8" NPT w/plug	"A" Socket	VGR & Thermowell	1/8" NPT w/plug	"A" Socket	VGR & Thermowell
Thermowell	No	No	Yes	No	No	Yes
Vessel Style	Moveable, or Fixed Head on Bench Top					
Maximum Head Openings	5					
Recommended Fittings	Valve, Gage, and Rupture Disc (VGR), Thermocouple					
Vessel Dimensions						
Inside Diameter, inches	2.5					
Inside Depth, inches	4.0			6.0		
Weight of Vessel, pounds	9			10		

* Add the following suffixes to these model numbers to specify vessels with the described features:

No suffix: Moveable Head

Q: Add the suffix Q to specify vessels with an O-Ring seal and a split ring pair without cap screws (Not available on HT Vessels)

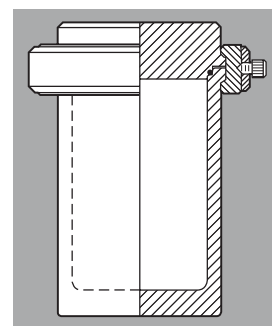
FH: Add the suffix FH to specify a Fixed Head design.



Model 4766, VGR with PTFE Flat Gasket and optional second valve.



Model 4768Q, with VGR, Thermocouple, O-ring seal, and optional second valve.



Cross Section 4760Q

Series 4764 - 4774 Pressure Vessel Specifications

Shaded bar indicates specifications that change within series.

General Purpose Vessels

Model Number	4764*	4765*	4768*	4772*	4773*	4774*	4775*	4776*	4777*
Sizes, mL	600			160			100		
Maximum Pressure (MAWP)	3000 psi (200 bar)								
Maximum Temperature									
with FKM O-Ring	225 °C								
with PTFE - Flat Gasket	350 °C								

Heater

Model / Wattage / Style	A2230HC3 / 780 / Mantle	A2235HC / 500 / Clamp-on	A2235HC / 500 / Clamp-on
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High Temperature Vessels

Model Number	4764HT*	4765HT*	4768HT*	NA	NA
Sizes, mL	300			NA	NA
Maximum Pressure (MAWP)	2000 psi (137 bar)			NA	NA
Maximum Temperature					
with Grafoil Gasket	500 °C			NA	NA

Heater (Ceramic Fiber)

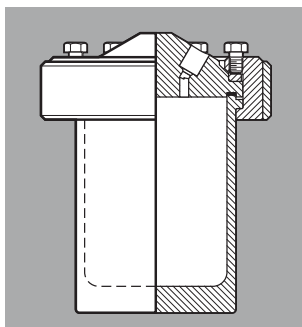
Model / Wattage	4963 / 1100	NA	NA
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Common to these General Purpose and High Temperature Models

Closure	Split-Ring (6 Cap Screws)								
Head Style									
Opening	1/8" NPT w/plug	"A" Socket	VGR & Thermowell	1/8" NPT w/plug	"A" Socket	VGR & Thermowell	1/8" NPT w/plug	"A" Socket	VGR & Thermowell
Thermowell	No	No	Yes	No	No	Yes	No	No	Yes
Vessel Style	Moveable, or Fixed Head on Bench Top								
Maximum Head Openings	5								
Recommended Fittings	Valve, Gage, and Rupture Disc (VGR), Thermocouple								
Vessel Dimensions									
Inside Diameter, inches	2.5								
Inside Depth, inches	8.0			2.0			2.0		
Weight of Vessel, pounds	11			7			2.0		

* Add the following suffixes to these model numbers to specify vessels with the described features:
 No suffix: Moveable Head
 Q: Add the suffix Q to specify vessels with an O-Ring seal and a split ring pair without cap screws (Not available on HT Vessels)
 FH: Add the suffix FH to specify a Fixed Head design.

Series 4600-4620 GP & HP Vessels: 1 & 2 Liters



4621 Cross Section

These vessels are available from Parr as either a General Purpose or High Pressure Vessel. Please note that in the high pressure version the maximum temperature decreases with the higher pressure.



Series 4600 - 4620 Pressure Vessel Specifications

Shaded bar indicates specifications that change within series.

General Purpose Vessels

Model Number	4601*	4611*	4621*	4602*	4612*	4622*
Sizes, mL	1000			2000		
Maximum Pressure (MAWP)	1900 psi (130 bar)					
Maximum Temperature						
with FKM O-Ring	225 °C					
with PTFE - Flat Gasket	350 °C					
Vessel Dimensions						
Inside Diameter, inches	4.0					

High Pressure Vessels

Model Number	4601HP*	4611HP*	4621HP*	4602HP*	4612HP*	4622HP*
Sizes, mL	970			1900		
Maximum Temperature / Maximum Pressure (MAWP)						
with PTFE - Flat Gasket	350 °C / 2900 psi (200 bar)					
with PTFE - Flat Gasket	300 °C / 3000 psi (200 bar)					
Vessel Dimensions						
Inside Diameter, inches	3.75					

Common to these General Purpose and High Pressure Models

Closure	Split-Ring (No Cap Screws*) or Split-ring (6 Cap Screws)					
Head Style						
Opening	1/8" NPT w/plug	VGR & Thermowell		1/8" NPT w/plug	VGR & Thermowell	
Thermowell	No	No	Yes	No	No	Yes
Vessel Style	Moveable, or Fixed Head on Bench Top					
Maximum Head Openings	6-10					
Heater (Calrod)						
For Moveable Head: Model / Wattage	4914 / 1000			4913 / 1500		
For Fixed Head: Model / Wattage	4941 / 1000			4942 / 1500		
Vessel Dimensions						
Inside Depth, inches	5.32			10.44		
Weight of Vessel, pounds	19			27		

* Add the following suffixes to these model numbers to specify vessels with the described features:

No suffix: Moveable Head

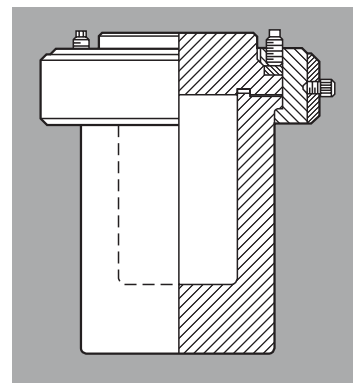
Q: Add the suffix Q to specify vessels with an O-Ring seal and a split ring pair without cap screws (Not available on HP Vessels)

FH: Add the suffix FH to specify a Fixed Head design.

Series 4605-4626 High Pressure Vessels: 600 & 1200 mL



Model 4625, 600 mL Vessel



Cross Section 4605

Series 4605 - 4626 Pressure Vessel Specifications

Shaded bar indicates specifications that change within series.

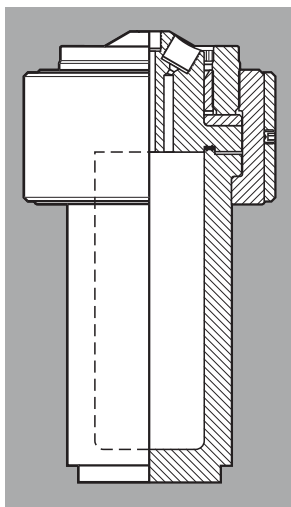
Model Number	4605*	4615*	4625*	4606*	4616*	4626*
Sizes, mL	600			1200		
Maximum Pressure	5000 psi (350 bar)					
Maximum Temperature	350 °C					
Closure	Split-Ring (8 Cap Screws)					
Gasket	Flat - PTFE					
Vessel Dimensions						
Inside Diameter, inches	3.25					
Inside Depth, inches	4.7			9.8		
Weight of Vessel, pounds	45			60		
Head Style						
Opening	1/8" NPT w/plug	VGR & Thermowell		1/8" NPT w/plug	VGR & Thermowell	
Thermowell	No	No	Yes	No	No	Yes
Heater (Calrod)						
For Moveable Head: Model / Wattage	4914 / 1000			4913 / 1500		
For Fixed Head: Model / Wattage	4941 / 1000			4942 / 1500		
Vessel Style	Moveable, or Fixed Head on Bench Top					
Maximum Head Openings	5-7					

* Add the following suffixes to these model numbers to specify vessels with the described features:

No suffix: Moveable Head

FH: Add the suffix FH to specify a Fixed Head design.

Series 4650 High Pressure / High Temp. Vessels: 250 – 1000 mL



4652 Cross Section



Model 4651, 250 mL Vessel with VGR and Thermocouple.



4652 Vessel with 4923 Heater.

Series 4650 Pressure Vessel Specifications			
Shaded bar indicates specifications that change within series.			
Model Number	4651*	4652*	4653
Sizes, mL	250	500	1000
Maximum Pressure @ 350 °C	6000 psi (410 bar)		
Maximum Temperature	600 °C		
Max. Pressure at Max. Temperature	4200 (290)		
Closure	Split-Ring (8 Cap Screws)		
Gasket	Flat - FG		
Vessel Dimensions			
Inside Diameter, inches	2.5		
Inside Depth, inches	3.25	6.63	13.13
Weight of Vessel, pounds	30	36	48
Head Style			
Openings	Valve, Gage, and Rupture Disc (VGR), Thermocouple		
Options	Optional Valve and Dip Tube available		
Heater (Ceramic)			
For Moveable Head: Model / Wattage	4923 / 1500	4923 / 1500	4926
For Fixed Head: Model / Wattage	4951 / 1500	4951 / 1500	NA
Mounting	Moveable, or Fixed Head on Bench Top		Bench Top
Maximum Head Openings	6		
* Add the following suffixes to these model numbers to specify vessels with the described features: No suffix: Moveable Head FH: Add the suffix FH to specify a Fixed Head design.			

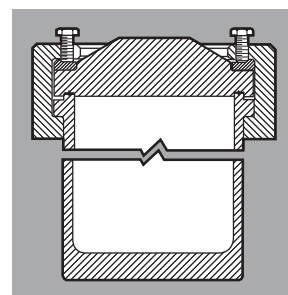
Series 4660 General Purpose Vessels: 1 & 2 Gallon



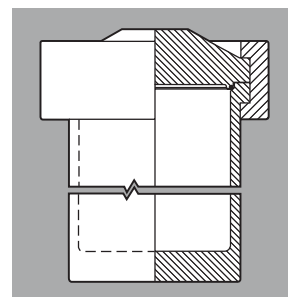
Model 4662, 1 Gallon Vessel, in 4929 Heater with 4848 Process Controller.



Model 4666, 2 Gallon Vessel, Fixed Head Floor Stand, with a Welded Jacket.



4661-4666 Cross Section



4661Q-4666Q Cross Section

Series 4660 Pressure Vessel Specifications

Shaded bar indicates specifications that change within series.

Model Number	4661*	4662*	4665*	4666 *
Sizes, Gallon (Liter)	1 (3.75)		2 (7.5)	
Maximum Pressure	1900 psi (130 bar)			
Maximum Temperature				
with FKM O-Ring	225 °C			
with PTFE Flat Gasket	350 °C			
Closure	Split-Ring (10 Cap Screws)			
Gasket	Flat - PTFE			
Vessel Dimensions				
Inside Diameter, inches	6.0			
Inside Depth, inches	8.6		17.2	
Weight of Vessel, pounds	75	80	85	90
Head Style				
Opening	Rupture Disc Only	VGR	Rupture Disc Only	VGR
Thermowell	No	Yes	No	Yes
Heater (Calrod)				
For Moveable Head: Model / Wattage	4928 / 2250		4929 / 2750	
For Fixed Head: Model / Wattage	4971 / 2250		4972 / 2750	
Mounting	Moveable Floor Stand or Fixed Head Stand			
Maximum Head Openings	12			

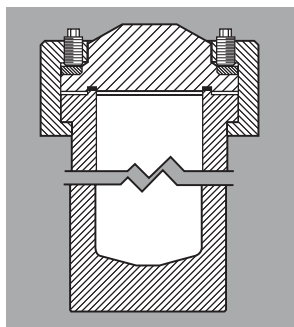
* Add the following suffixes to these model numbers to specify vessels with the described features:

No suffix: Moveable Head

Q: Add the suffix Q to specify vessels with an O-Ring seal and a split ring pair without cap screws (Not available on HP Vessels)

FH: Add the suffix FH to specify a Fixed Head design.

Series 4680 High Pressure /High Temp. Vessels: 1 & 1.8 Liters



Cross Section 4680-4683



4683 Fixed Head, 1.8 L Vessel, double valve w/ dip tube, gas release valve, gage, rupture disc, and thermowell.



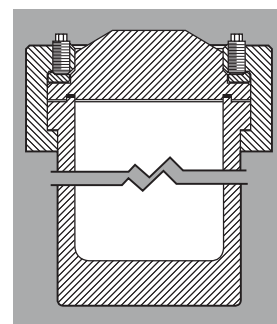
4683 Fixed Head, 1.8 L Vessel shown with Split Rings open and vessel down using a pneumatic lift.

Series 4680 Pressure Vessel Specifications

Shaded bar indicates specifications that change within series.

Model Number	4680*	4681*	4682*	4683*
Sizes, mL	1000		1800	
Maximum Pressure @ 350 °C	6000 psi (410 bar)			
Maximum Temperature	600 °C			
Max. Pressure at Max. Temperature	4200 (290)			
Closure	Split-Ring (12 Cap Screws)			
Gasket	Flat - FG			
Vessel Dimensions				
Inside Diameter, inches	3.75			
Inside Depth, inches	6.12		10.5	
Weight of Vessel, pounds	0		90	
Head Style				
Opening	Rupture disc Only	VGR	Rupture disc Only	VGR
Thermowell	No	Yes	No	Yes
Heater (Ceramic Fiber)				
For Moveable Head: Model / Wattage	4931 / 2300		4932 / 2500	
For Fixed Head: Model / Wattage	4981 / 2300		4982 / 2500	
Vessel Style	Moveable (Floor Stand) or Fixed Head (Stand)			
Maximum Head Openings	8			
* Add the following suffixes to these model numbers to specify vessels with the described features: No suffix: Moveable Head FH: Add the suffix FH to specify a Fixed Head design.				

Series 4670 High Pressure/High Temp. Vessels: 1 & 1.5 Gallon



Cross Section 4671-4674

Model 4674, 5800 mL Vessel in 4934 Heater,
with 4848 Controller on Moveable Floor Stand.

Series 4670 Pressure Vessel Specifications

Shaded bar indicates specifications that change within series.

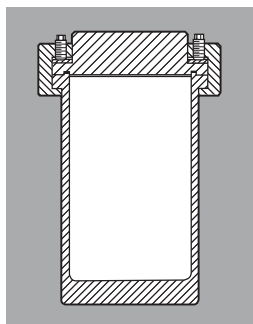
Model Number	4671*	4672*	4673*	4674*
Sizes, Gallon (Liter)	1 (3.75)		1.5 (5.8)	
Maximum Pressure	3000 psi (200 bar)			
Maximum Temperature	600 °C			
Max. Pressure at Max. Temperature	2200 (150)			
Closure	Split-Ring (16 Cap Screws)			
Gasket	Flat - FG			
Vessel Dimensions				
Inside Diameter, inches	5.5			
Inside Depth, inches	9.75		15.0	
Weight of Vessel, pounds	100		120	
Head Style				
Opening	Rupture disc Only	VGR	Rupture disc Only	VGR
Thermowell	No	Yes	No	Yes
Heater (Ceramic)				
For Moveable Head: Model / Wattage	4933 / 2800		4934 / 2800	
For Fixed Head: Model / Wattage	4973 / 2800		4974 / 2800	
Vessel Style	Moveable (Floor Stand) or Fixed Head (Stand)			
Maximum Head Openings	12			

* Add the following suffixes to these model numbers to specify vessels with the described features:

No suffix: Moveable Head

FH: Add the suffix FH to specify a Fixed Head design.

Series 4676 - 4679 General Purpose Vessels: 2.6 & 5 Gallons



Cross Section 4676-4679



Model 4677, 18.5 L Vessel, with valves, gage, and thermowell.



Model 4677, 18.5 L Vessel with heater, and 4838 Temperature Controller.

Series 4676-4679 Pressure Vessel Specifications				
Shaded bar indicates specifications that change within series.				
Model Number	4676*	4677*	4678*	4679*
Sizes, Gallon (Liter)	5 (18.5)		2.6 (10)	
Maximum Pressure	1900 psi (130 bar)			
Maximum Temperature	350 °C			
Closure	Split-Ring (12 Cap Screws)		Split-Ring (10 Cap Screws)	
Gasket	Flat - PTFE			
Vessel Dimensions				
Inside Diameter, inches	9.5		7.5	
Inside Depth, inches	16.6		12.2	
Weight of Vessel, pounds	250		90	
Head Style				
Opening	1/4" or 3/8" NPT w/plug	VGR* (two valves)	1/4" or 3/8" NPT w/plug	VGR* (two valves)
Thermowell	No	Yes	No	Yes
Heater for Moveable Vessels (Flexible Mantle)				
Model / Wattage	4976 / 2500		4975 / 2500	
Heater for Fixed Head Vessels (Clamp-On Band)				
Model / Wattage	4978 / 6000		4977 / 3600	
Vessel Style	Floor Stand or Fixed Head Stand with Pneumatic Lift			
Maximum Head Openings	18		14	
* Add the following suffixes to these model numbers to specify vessels with the described features: No suffix: Moveable Head FH: Add the suffix FH to specify a Fixed Head design.				

Gage Block Assemblies



Parr gage block assemblies combine the function of an:

- Inlet / Outlet Valve
- Pressure Gage
- Safety Rupture Disc

into a compact assembly which can be attached to the head of any small vessel with limited head space using a connecting tube. There is a threaded socket in the block for a gas connection with a pressure hose or tubing using a type "A" coned pressure fitting. Coned fittings are also used on the thick-walled tube which connects the block to the pressure vessel. The valve in this assembly controls the gas flow into the vessel and the gage shows the pressure in the vessel when the valve is closed. A rupture disc with a burst rating matched to the gage is installed in the block.

Two Sizes

These gage block assemblies are made in two styles which differ only in the size of the pressure gage and the size of the tube connection to the pressure vessel. The smaller

4316 Gage Block Assembly is usually furnished with a 3-1/2 inch diameter pressure gage and includes a 3 inch long connecting tube with type "A" coned fitting. This assembly is normally installed on pressure vessels up to 600 mL.

The 4317 Gage Block Assembly has a 4-1/2 inch diameter gage and type "B" coned fitting on a 3 inch long connecting tube. This assembly is normally installed on vessels of 1000 mL and larger.

The gage block, connecting tube and pressure gage on all of these assemblies are normally made of type 316 Stainless Steel, but they can also be made of Alloy 400 on special order. Longer tubes can be furnished on special order.

Ordering Information

Part No.	Description
4316	with Type "A" Connector
4317	with Type "B" Connector



4316 Gage Block Assembly



4317 Gage Block Assembly

Available Gages

Any of the gages shown in this table can be installed on these gage block assemblies.

Gages for Parr Pressure Vessels

Pressure Range		4-1/2" Diameter	3-1/2" Diameter
psi	bar	Gage Number	Gage Number
0-100	0-7	56HCPA	593HCP1AD
0-200	0-14	56HCPB	593HCP2AD
0-600	0-40	56HCPC	593HCP6AD
0-1000	0-70	56HCPD	593HCPD
0-2000	0-140	56HCPF	593HCPF
0-3000	0-210	56HCPG	593HCPG
0-5000	0-350	56HCPH	593HCP50AD
0-7500	0-517	56HCP75AD	NA
0-10000	0-700	56HCPK	NA

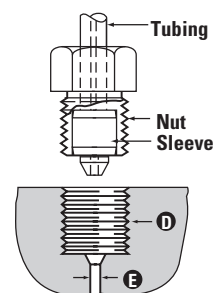
When ordering, specify the catalog number, pressure gage diameter and range.

Coned Pressure Fittings

Gage Blocks, pressure hoses and other parts that are frequently removed from a pressure vessel are attached with a coned, socket type connector. The male segment of a coned fitting consists of a sleeve with a left-hand thread screwed onto a thick-walled tube, plus a compression nut to complete the assembly. When screwed into a mating socket these parts produce a rigid joint which will remain tight over a wide temperature and pressure range, yet the

joint can be made and broken repeatedly without destroying the sealing faces. No gasket or sealing tape is required. These fittings have the added advantage of behaving like union fitting, allowing the gage block, connecting tube or hose to remain stationary while the nut is tightened.

Parr coned pressure fittings are made in two sizes, identified as types "A" and "B", for 1/4 inch and 3/8 inch tubing, respectively.



Coned Pressure Fittings

Type	A	B
Tube Size	1/4"	3/8"
Thread (D)	9/16 -18	3/4 -16
Bore (E)	3/32"	1/8"
Nut No.	35HC	326HC
Sleeve No.	40HC	366HC

Vessel Heaters



4766 General Purpose Vessel with stand, heater, and 4838 Temperature Controller.

Electric heaters and automatic temperature controllers are available for most all Parr non-stirred vessels. Some small vessels are generally heated in an oven, bath, furnace or similar general purpose heater. The heaters furnished for non-stirred vessels are the same as those furnished for the stirred versions of the same size vessels. A full description of the different types of heaters is found on page 102. The catalog number of the standard heater designed for each of the non-stirred vessels is listed in the specifications for each vessel.

Custom heaters are also available for these vessels when it is necessary to meet explosion proof requirements, to accommodate installed windows or fittings, or to convert to a welded jacket for steam or oil heating.

Temperature Controller

The Series 4838 Temperature Controller illustrated and described in Chapter 4 of this catalog are recommended for use with any of the non-stirred heaters. Special load handling circuitry must be included with the 4676-4679 vessels to handle their high power loads. Unless otherwise specified, these controllers are designed for use with Type J (iron-constantan) thermocouples.



4928 Floor Stand Heater with 4848 Process Controller

Furnished also with Other Heaters as:

4929 for 2 Gallon, 4666 Vessel

4930 for Series 4601-30 Vessels

4931-32 for Series 4680 Vessels

4933-34 for Series 4670 Vessels



4838 Temperature Controller



Heater No.	Use with Vessel	Volts	Watts	Heater Style	Heater Mounting
A2230HCEB / A2230HCEE	4760, 4761, 4766	115 / 230	510	Rigid Mantle	Bench Top
A2230HC2EB / A2230HC2EE	4762, 4763, 4767	115 / 230	590	Rigid Mantle	Bench Top
A2230HC3EB / A2230HC3EE	4764, 4765, 4768	115 / 230	780	Rigid Mantle	Bench Top
A2235HCEB / A2235HCEE	4772 thru 4777	115 / 230	500	Clamp-On Band Heater	Bench Top
4961EB / 4961EE	4760(FH), 4761(FH), 4766(FH)	115 / 230	510	Rigid Mantle	Bench Top
4962EB / 4962EE	4762(FH), 4763(FH), 4767(FH)	115 / 230	590	Rigid Mantle	Bench Top
4963EB / 4963EE	4764(FH), 4765(FH), 4768(FH)	115 / 230	780	Rigid Mantle	Bench Top
4961HTEB / 4961HTEE	4760HT(FH), 4761HT(FH), 4766HT(FH)	115 / 230	800	Ceramic Fiber	Bench Top
4962HTEB / 4962HTEE	4762HT(FH), 4763HT(FH), 4767HT(FH)	115 / 230	800	Ceramic Fiber	Bench Top
4963HTEB / 4963HTEE	4764HT(FH), 4765HT(FH), 4768HT(FH)	115 / 230	1100	Ceramic Fiber	Bench Top
A2235HCEB / A2235HCEE	4772 thru 4777	115 / 230	500	Clamp-On Band Heater	Bench Top
A2236HCEB / A2236HCEE	4791 thru 4792	115 / 230	700	Clamp-On Band Heater	Bench Top
A2237HCEB / A2237HCEE	4793	115 / 230	350	Rigid Mantle	Bench Top
4991EB / 4991EE	4791HT/HP(FH), 4792HT/HP(FH)	115 / 230	700	Ceramic Fiber	Bench Top
4992EB / 4992EE	4793HT/HP(FH)	115 / 230	700	Ceramic Fiber	Bench Top
4914EB / 4914EE	4600 Series (600 mL/1000 mL)	115 / 230	1000	Calrod	Bench Top
4913EB / 4913EE	4600 Series (1200 mL/2000 mL)	115 / 230	1500	Calrod	Bench Top
4930EB	4601 thru 4626 (600 mL/1000 mL/1200 mL/2000 mL)	115	1000	Calrod	Floor Stand / Cart
4930EE	4601 thru 4626 (600 mL/1000 mL/1200 mL/2000 mL)	230	1500	Calrod	Floor Stand / Cart
4941EB / 4941EE	4600 Series (FH) (600 mL/1000 mL)	115 / 230	1000	Calrod	Bench Top
4942EB / 4942EE	4600 Series (FH) (1200 mL/2000 mL)	115 / 230	1500	Calrod	Bench Top
4943EB / 4943EE	4600 Series (FH) (600 mL/1000 mL)	115 / 230	1000	Calrod	Floor Stand
4944EB / 4944EE	4600 Series (FH) (1200 mL/2000 mL)	115 / 230	1500	Calrod	Floor Stand
4945EB / 4945EE	4600 Series (FH) (1200 mL)	115 / 230	1500	Calrod	Floor Stand w/Lift
4923EB / 4923EE	4651, 4652	115 / 230	1500	Ceramic	Bench Top
4926EE	4653	230	2800	Ceramic	Bench Top
4951EB / 4951EE	4651(FH), 4652(FH)	115 / 230	1500	Ceramic	Bench Top
4928EE	4661, 4662	230	2250	Calrod	Floor Stand / Cart
4929EE	4665, 4666	230	2750	Calrod	Floor Stand / Cart
4971EE	4661(FH), 4662(FH)	230	2250	Calrod	Floor Stand w/Lift
4972EE	4665(FH), 4666(FH)	230	2700	Calrod	Floor Stand w/Lift
4975EE	4678, 4679	230	2500	Flexible Mantle	Floor Stand w/Hoist
4976EE	4676, 4677	230	2500	Flexible Mantle	Floor Stand w/Hoist
4977EE	4678(FH), 4679(FH)	230	3600	Flexible Mantle	Floor Stand w/Hoist
4978EE	4676(FH), 4677(FH)	230	6000	Flexible Mantle	Floor Stand w/Hoist
4933EE	4671, 4672	230	2800	Ceramic	Cart
4934EE	4673, 4674	230	2800	Ceramic	Cart
4973EE	4671(FH), 4672(FH)	230	2800	Ceramic	Floor Stand w/Lift
4974EE	4673(FH), 4674(FH)	230	2800	Ceramic	Floor Stand w/Lift
4931EE	4680, 4681	230	2300	Ceramic	Cart
4932EE	4682, 4683	230	2300	Ceramic	Cart
4981EE	4680(FH), 4681(FH)	230	2300	Ceramic	Cart
4982EE	4682(FH), 4683(FH)	230	2300	Ceramic	Cart

Alternate Fixed Head Stands/Heater are available on request.

