Series Number:

4650

Type:
High Pressure
High Temperature

Stand:
Bench Top

Mounting Style:
Moveable or Fixed Head

Vessel Sizes, mL:
250-1000

High Pressure MAWP Rating, psi (bar):
4200 (290)

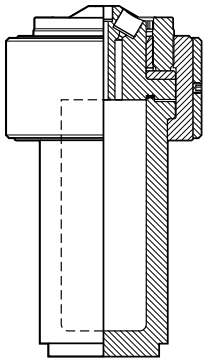
Standard Maximum Operating Temperature, °C:
500 w/ Grafoil Gasket

High Temperature MaximumOperating Temperature, °C:
600 w/ Grafoil Gasket

Series 4650 High Pressure / High Temperature Vessel Systems

4650 Series High Pressure and High Temperature Vessels are available in volumes of 250, 500, and 1000 mL. These vessels can obtain temperatures up to 600 °C and a maximum pressure of 6000 psi (410 bar). The maximum pressure at maximum temperature is 4200 psi (290 bar) at 600 °C. They come standard with a Split Ring Closure with 8 Compression bolts, and a VGR head design that includes Valve, Gage, Rupture Disc, and Thermowell. An additional valve with dip tube can be added.

The maximum allowable head openings are seven but this may be limited by the types of fittings required. These vessels are available as either a moveable or fixed head design.



4650-1000mL Cross Section

Series 4650 Pressure Vessel Specifications			
Shaded bar indicates specifications that change within series.			
Model Number	**4650**		
Approximate Volume, mL	250	500	1000
Maximum Pressure (MAWP)	5000 psi (345 bar) @ 500 °C 6000 psi (413 bar) @ 350 °C 4200 psi (289 bar) @ 600 °C		
Maximum Temperature			
with PTFE Flat Gasket	350 °C		
with Flexible Graphite Flat Gasket	500-600 °C		
Vessel Details			
Mounting Style	Moveable or Fixed Head		
Closure	Split-Ring (8 Compression Bolts)		
Head Opening Options	Ports for valve, gage, rupture disc, and thermocouple (VGR) Custom port option (Contact our technical sales department to discuss options)		
Maximum Head Openings	7 (Dependent on opening size, and required fittings)		
Valve Connections	1/4" NPT Female		
Pressure Gage, Size	4.5 inches		
Range	0-5000 psi (345 psi) or 0-7500 psi (517 bar)		
Temperature Measurement	Thermowell		
Cooling Coil (optional)	Single Loop		
Stand and Heater (optional)			
Stand Type	Bench Top Heater with base plate (moveable head only) and Bench Top Stand with Heater (fixed head)		
Heater Style	Ceramic Fiber Heater		
Heater Power, Watts	1500		
Maximum Load, amps, 115V / 230V	15 / 9		
Weights & Dimensions			
Cylinder I.D. x Depth, inches	2.5 x 3.25	2.5 x 6.63	2.5 x 13.13
Vessel Assembly w/ Moveable Head Weight, pounds**	38	45	57
Vessel Assembly w/ Fixed Head Weight, pounds**	33	40	52
Cylinder Weight, pounds	8.9	15	26
** Vessel Assembly weight varies based on head configuration choice and fitting options. Weights shown are based on vessels with valve, gage, rupture disc, thermocouple, and double valve assembly.			
Other options available. See Ordering Guide, visit www.parrinst.com, or call for more information.			

Series 4650 Ordering Guide

An example order number for a vessel in this series is: **4650-250mL-FG-SS-VGR-VD-5000**

A composite identification number to be used when ordering a 4650 Series Pressure Vessel System can be developed by combining individual symbols from the separate sections below. For more information on how to use this ordering guide, please see page 27.

A Vessel Volume	
-250mL	250 mL, 2.5" ID
-500mL	500 mL, 2.5" ID
-1000mL	1000 mL, 2.5" ID

B Head Mounting Style	
-No Symbol	Moveable Head (Standard configuration)
-FH	Fixed Head

C Gasket / Maximum Temperature	
-T	PTFE Flat Gasket, 350 °C
-FG	Flexible Graphite Flat Gasket, 350 °C

D Material of Construction	
-SS	T316 Stainless Steel
-C20	Alloy 20*
-MO	Alloy 400*
-IN600	Alloy 600
-IN625	Alloy 625
-HB	Alloy B-2 / B-3*
-HC	Alloy C-276
-NI	Nickel 200
-TI2	Titanium Grade 2*
-TI4	Titanium Grade 4*
-ZR702	Zirconium Grade 702*
-ZR705	Zirconium Grade 705*

**High temperature option not available.*
See page 10 or 24 for complete list of available alloys.

E Head Configuration	
-VGR	Valve on gage adapter, pressure gage, rupture disc assembly, & thermocouple and thermowell
-NS	Non-standard, custom head opening

F Optional Fittings & Custom Options (List all needed)	
-VD	Single Valve on head w/ dip tube (VGR Required)
-DVD	Double Valve Assembly on head w/ dip tube (VGR Required)
-CL	Cooling Loop
-BDV	Bottom Drain Valve
-CAD	Internal Catalyst Addition Device
-XCAD	External Catalyst Addition Device
-SCP	Solids Charging Port (Ball Valve)
-RC	Reflux Condenser
-RTC	Reflux/Take-Off Condenser
-WJ	Welded Jacket

G Pressure Gage	
-No Symbol	None
-10000	10000 psi / 690 bar
-7500	7500 psi / 517 bar
-5000	5000 psi / 345 bar
-3000	3000 psi / 207 bar
-2000	2000 psi / 138 bar

H Stand and Heater Options	
-No Symbol	None
-BTH	Bench Top heater with base plate
-BTS	Bench Top Stand with Heater

I Controller	
-No Symbol	None
-4838	PID Control, Ramp & Soak Programming, and Data logging with Software (RS-485 to USB cable not included). For use with one additional display module.
-4848	PID Control, Ramp & Soak Programming, and Data logging with Software. (RS-485 to USB cable not included). For use with up to three additional display modules.

See Chapter 6 for complete list of Controller options.

J Controller Options (Check all needed)	
-PDM	Pressure Display Module
-HTM	High Temperature Cut Off Module
-ETLM	External Temperature Limit Module
-SVM	Solenoid Valve Module (for cooling control)
-A1925E4	RS-485 to USB Converter (required for data logging)
-A1925E6	RS-485 to USB Converter, isolated, 30-ft
-A2208E	RS-485 Daisy Chain for Multiple Controllers (Must be used with A1925E6)
-A3504HC	SpecView Software Package

K Electrical Supply for Heater and/or Controller	
-No Symbol	None
-115	115V Heater
-230	230V Heater

L Certifications	
-No Symbol	No Certification
-ASME	ASME Documentation
-CE	CE Documentation
-P	Parr Certification

Model 4650-250mL Vessel with VGR, Thermocouple, and Single Inlet Valve (-VD)

Model 4650-500mL Removeable Head Vessel with Bench Top Heater and Base Plate