

# ULTRA - HIGH PURITY POINT - OF - USE REGULATOR

## HPGR-400 Series

Catalog No. : H-HPGR400S  
Aug. 2006

### Features

- Single Stage
- Low Particle Entrapment
- True metal to metal body to diaphragm seal
- Long life cycle
- 10Ra or 5Ra microinch internal surface
- Free poppet type (400)
- *Tied diaphragm type (410)*
- *Internally springless & threadless (410)*
- *360 positionable captured vent bonnet & adjustable stop to limits outlet (410)*
- Maximum inlet pressure range : 3500 or 600psig (241 or 41 barg)
- Outlet pressure range : 1-30, 1-60, 1-100, 1-150, 1-250psig  
(1-2.1, 1-4.2, 1-7.0, 1-10.5 barg)

The HPGR-400 Series is a high purity gas regulator designed to provide the optimum in performance and cleanliness for high purity delivery systems in semiconductor applications.

*The HPGR-410 Series is internally threadless and springless type, and minimized particle occurrence due to low internal volume and is a high purity gas regulator designed to provide the optimum in performance and cleanliness for high purity delivery system in semiconductor applications.*

The HPGR-400 and 410 Series regulators are a Point-Of-Use regulator designed to be used with corrosive and non-corrosive gases in process gas systems for Semiconductor manufacturing facilities and is a single stage regulator operated by the load spring which interacts with a main valve to control outlet pressure.

The HPGR-400 and 410 Series regulators are metal-to-metal diaphragm to body seal provides enhanced leak integrity and *a positive sealing effect by bonnet seal and vent bonnet seal components.(410)*

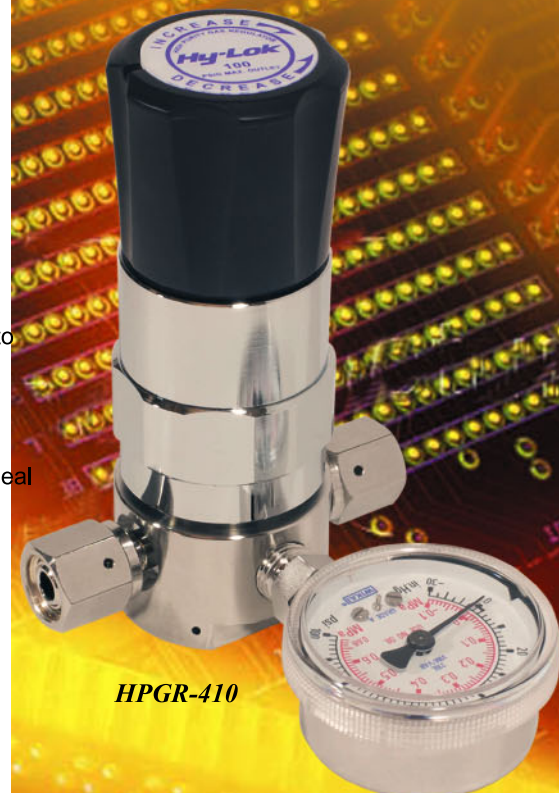
The wetted surface are finished to 10Ra or 5Ra microinch to minimize the generation of particles.

Assembly, testing and packing are performed in a class 10 cleanroom.

※ *HPGR-410 listed in italics*



HPGR-400



HPGR-410



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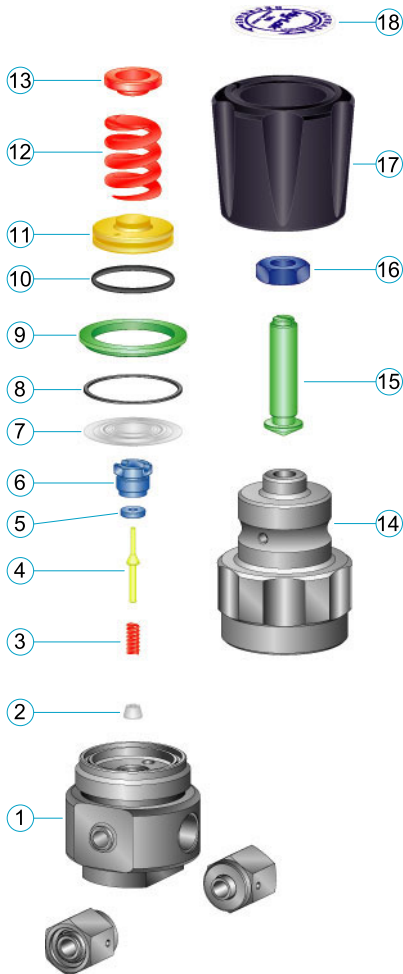
ISO 14001

OHSAS 18001



# HPGR - 400Series

## HPGR-400

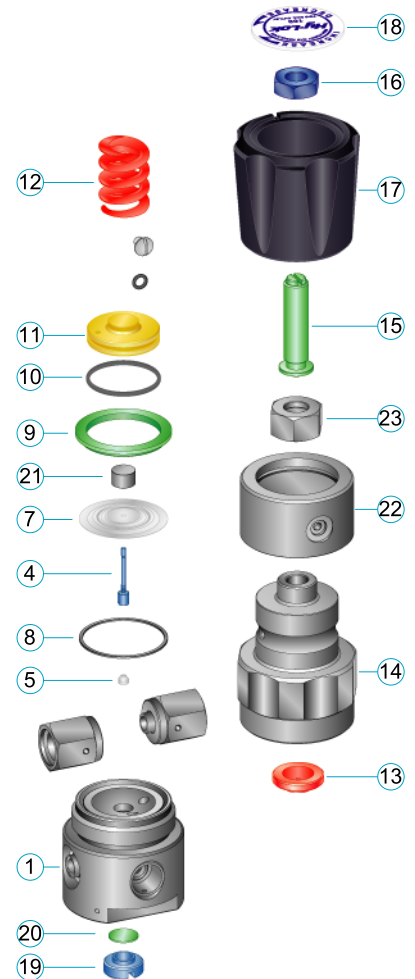


## MATERIALS OF CONSTRUCTION

No.	Description	Material / ASTM Specification
* 1	Body	Single / Double Vacuum Melt 316L / A479
* 2	Valve Bush(400)	Type 316L / A479
* 3	Valve Spring(400)	Type 316L / A479
* 4	Main Valve	Type 316L / A479
* 5	Seat	PCTFE
* 6	Seat Holder(400)	Type 316L / A479
* 7	Diaphragm	Elgiloy <sup>®</sup>
8	Bonnet Seal Gasket	PTFE
9	Bonnet Ring	Stainless Steel 304
10	O-Ring	Viton <sup>®</sup>
11	Thrust pad	Stainless Steel 304
12	Load Spring	Stainless Steel 304
13	Cone Washer	Brass / B16
14	Bonnet	Brass / B16
15	Adjust Screw	Stainless Steel 304
16	Wheel Nut	Stainless Steel 304
17	Hand Wheel	Plastic
18	Label	Plastic
19	<i>Push Bolt(410)</i>	<i>Stainless Steel 304</i>
*20	<i>Body Bottom Seal(410)</i>	<i>Type 316L / A479</i>
21	<i>Valve Nut(410)</i>	<i>Stainless Steel 304</i>
22	<i>Vent Bonnet(410)</i>	<i>Brass / B16</i>
23	<i>Bonnet Seal Nut(410)</i>	<i>Brass / B16</i>

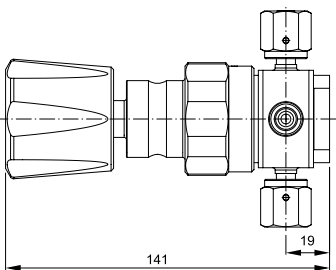
\* : Wetted Components

## HPGR-410

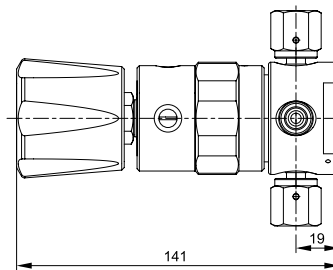


## DIMENSION

- All dimensions are in millimeters and Subject to change.



(HPGR-400)



(HPGR-410)

※ *HPGR-410 listed in italics*



# HPGR - 400Series

## SPECIFICATION

**FLUID MEDIA** : All gases corrosive or non-corrosive for high purity system.  
When using other media , Please Contact us.

**PRESSURE RATING** : Per criteria of ANSI/ASME B31.3

Maximum rated inlet pressure ----- 3500 or 600psig (241 or 41 barg)  
Outlet pressure range ----- 1-30, 1-60, 1-100, 1-150,1-250 psig  
(1-2.1, 1-4.2, 1-7.0, 1-10.5, 1-17.5 barg)

**DESIGN PROOF PRESSURE** : 150% maximum operating pressure

**MATERIALS IN CONTACT WITH MEDIA** :

Body ----- 316L SS VOD / AOD / VIM (BA),  
316L SS VIM / VAR (EP)  
Valve seat ----- 600 to 1000psig - PCTFE, 3500psig - Vespel®  
Diaphragm ----- Hastelloy C-22 / Elgiloy  
Main valve,Bush,Spring,Seat holder----- 316L SS

**OTHER PARAMETERS** :

Flow capacity ----- Cv = 0.06(3500 psig), Cv = 0.15(600 psig)  
Certified maximum inboard leak rate -----  $1 \times 10^{-9}$  atm cc / sec He  
Internal surface finish----- 10Ra or 5Ra microinch (0.25 or 0.13 $\mu$ m)

**OPERATING TEMPERATURE** :

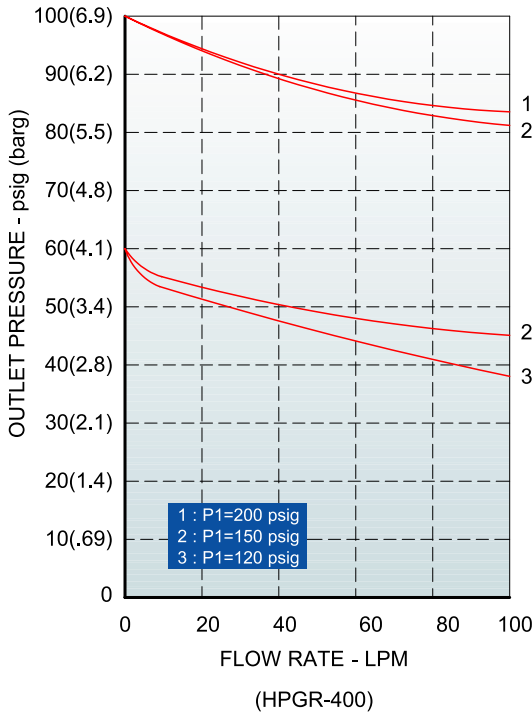
PCTFE Seat ----- -40°F to +140°F (-40°C to +60°C)  
Vespel® Seat ----- -40°F to +350°F (-40°C to +177°C)

**WEIGHT** : 2.0lbs (0.9Kg)

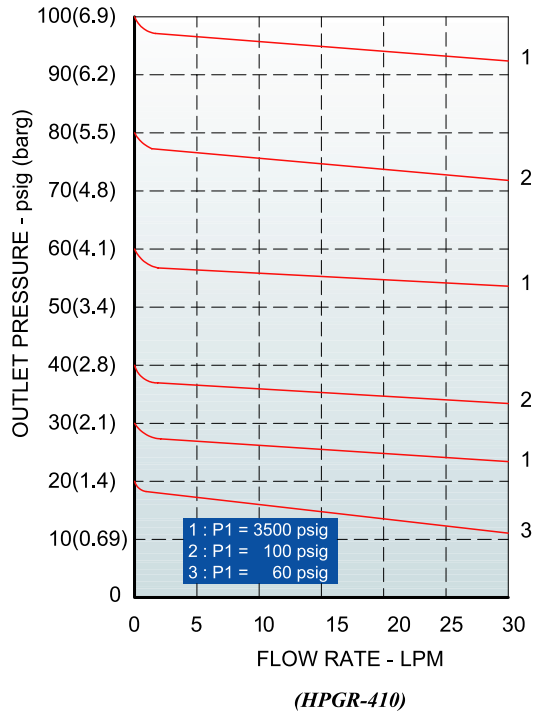
### FLOW CHART

#### REGULATOR DISCHARGE CHARACTERISTICS CURVES

P1 : Inlet Pressure



This characteristics curve chart shows the change or drop in two Different pressure as the flow rate Increases and the inlet pressure Decreases.



# HPGR - 400Series

## GAUGE PORT OPTIONS

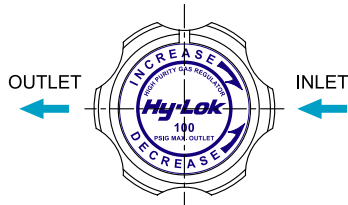


Fig.1(NO GAUGE)

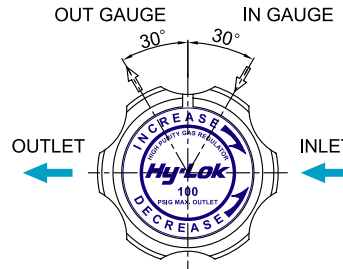


Fig.3(2 GAUGE)

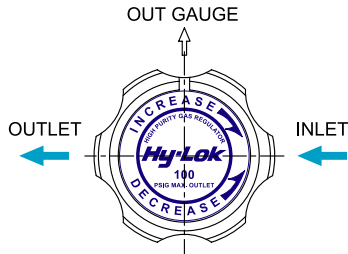


Fig.2(1 GAUGE)

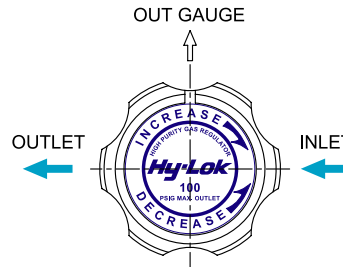


Fig.4 (2 GAUGES)

## ORDERING INFORMATION

HPGR - 400 2 2 P ZF B - H - VV6L	
<b>SERIES</b>	<b>BODY MATERIAL</b>
HPGR-400 HPGR-410	SM6L : Single melting 316L SS(VOD/AOD) VV6L : Double melting 316L SS(VIM-VAR)
<b>INLET PRESSURE</b>	<b>GRADE</b>
1 : 600 psig 2 : 3500 psig	B : BA (Bright Annealing) H : EP (Electropolish) S : Super Electropolish
<b>OUTLET PRESSURE</b>	<b>GAUGE PORT OPTION</b>
0 : 1-30 psig (1-2.1barg) 1 : 1-60 psig (1-4.1barg) 2 : 1-100 psig (1-6.9 barg) 3 : 1-150 psig (1-10.5 barg) 4 : 1-250 psig (1-17.3 barg)	A : None No gauge port (Fig.1) B : Internal Face Seal 1 Gauge (Fig.2) C : Internal Face Seal 2 Gauges (Fig.3) D : Internal Face Seal 2 Gauges (Fig.4) E : ZCR male 1 Gauge (Fig.2) F : ZCR male 2 Gauges (Fig.3) G : ZCR male 2 Gauges (Fig.4) H : ZCR Female 1 Gauge (Fig.2) I : ZCR Female 2 Gauges (Fig.3) J : ZCR Female 2 Gauges (Fig.4) K : Fixed male 1 Gauge (Fig.2) L : Fixed male 2 Gauges (Fig.3) M : Fixed male 2 Gauges (Fig.4) N : Female NPT thread 1 Gauge (Fig.2) O : Female NPT thread 2 Gauges (Fig.3) P : Female NPT thread 2 Gauges (Fig.4)
<b>SEAL MATERIAL</b>	
P : PCTFE V : Vespel®	
<b>INLET &amp; OUTLET PORT</b>	
NF : Female NPT thread TW : Tube Weld ZM : ZCR male ZF : ZCR female HL : Hy-Lok FM : Fixed male	