

Anexo III: Características Técnicas de Actuadores

III.I Regulador de Presión de Baja

Fuel Cell Components

Miniature two-stage diaphragm pressure regulator - PR2

The PR2 accurately reduces high-pressure inputs (up to 500 psi or 35bar) down to 0 to 20 psi or 0-1,4bar (and is especially suited to low pressure regulation such as ½ psi or 0,035bar.) with minimal drop or rise even with wide swings in inlet pressure. The PR2 two-stage diaphragm regulator is an excellent choice if the inlet pressure will decay over time such as with hydrogen storage tanks commonly used in hydrogen fuel cell applications.



PR2

PR2 Ordering details

PR2-32C3 (replace underlined letter with a code)

C (Outlet pressure range)

0 = 0-0,35bar (0-5psi) - on request

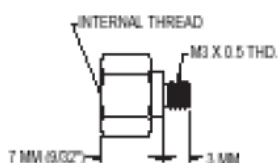
1 = 0-0,7bar (0-10psi) - standard version

2 = 0-1,4bar (0-20psi) – on request

Options:

PA-M3M53

Port adapter M3 to M5 female in stainless steel 303



Technical specifications

Inlet pressure range	up to 35 bar (500psi)
Outlet pressure range (non relieving)	Version C=0 0-0,35bar (0-5psi) Version C=1 0-0,7bar (0-10psi) Version C=2 0-1,4bar (0-20psi)
Body material	303 Stainless Steel
Weight	50g
Dimensions	DxH ca. 27x37mm
Port size	M3 (Adapter for M5 as an option)

Product Description

Product Description	Part#
Miniature two-stage diaphragm pressure regulator in stainless steel 303. Port size M3	PR2-3213
Port adapter M3 to M5 female in stainless steel 303	PA-M3M53

Specifications may change without prior notice.

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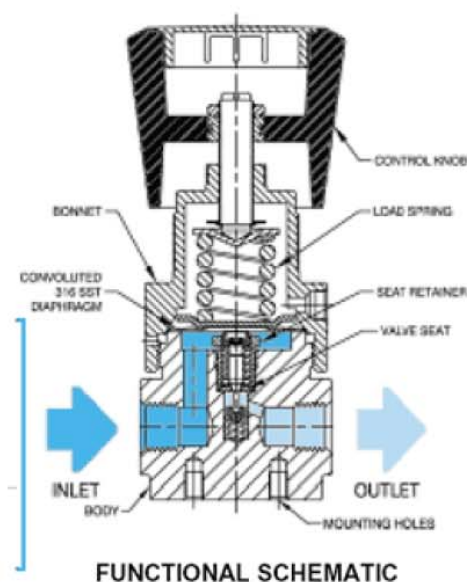
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Back Pressure Regulators



A back pressure regulator is used to control the upstream pressure in a fuel cell test system, while allowing gas flow through a diaphragm. The diaphragm operates like a sensitive adjustable relief valve so that the fuel cell system pressure can be kept constant at varied gas flow conditions. These back pressure regulators can work up to a **200 psig** environment with a control pressure of **0 to 50psig**; have a flow capacity of **0.3Cu**.

Displaying products **1 - 1 of 1** results

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EC-BPR1

Gas flow back pressure regulator; 0-50 psig
Your Price \$573.00

Qty

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III.II Regulación de Flujo Másico Manual

SC423XL Series

Catalog 4513/US

Precision Low Flow Control

Parker Hannifin Corporation's Veriflo Division presents the SC423XL. The SC423XL is a unique device which supplies a constant flow with a self correcting action to compensate for changes in downstream pressure.

The SC423XL was designed for air and analyzer sampling systems which require very low flow rates (less than 10 sccm). Connected to a vacuum cylinder, the SC423XL provides consistent flow control despite changes in the vacuum.



Features

- ▶ Rugged Design.
- ▶ Reliable Precision Flow Control as low as 1 sccm.
- ▶ Adjustable Flows.
- ▶ Hastelloy C-22® Diaphragms.
- ▶ Stable flows as vacuum pressure changes from 28 in Hg to 5 in Hg.
- ▶ Stable flows over a wide temperature band.
- ▶ Color coded orifices.
- ▶ Special CFC Free Cleaning.
- ▶ Tamper Proof.
- ▶ O₂ Cleaned.

Materials of Construction

Wetted

Body	316L Stainless Steel
Seat	Fluorocarbon
Seals	Fluorocarbon
Piston	316L Stainless Steel
Diaphragm	Hastelloy C-22®
Inlet Fitting	316 Stainless Steel
Outlet Fitting	316 Stainless Steel

Non-wetted

Cap	316L Stainless Steel
Filter	Sintered Hastelloy
Cap Nut	316 Stainless Steel
Retaining Ring	Stainless Steel
O-Ring	Fluorocarbon
Plug	Stainless Steel

Operating Conditions

Inlet pressure	Atmospheric
Outlet pressure	Vacuum
Flow	As low as 1 sccm (See Flow Curve)

Functional Performance

Design Leak Rate:	
(outboard)	1x10 ⁻⁶ scc/sec He

Temperature Range

-40°F to 200°F (-40°C to 94°C)

Standard Configurations

1/4" NPT Female	Inlet and Outlet
-----------------------	------------------

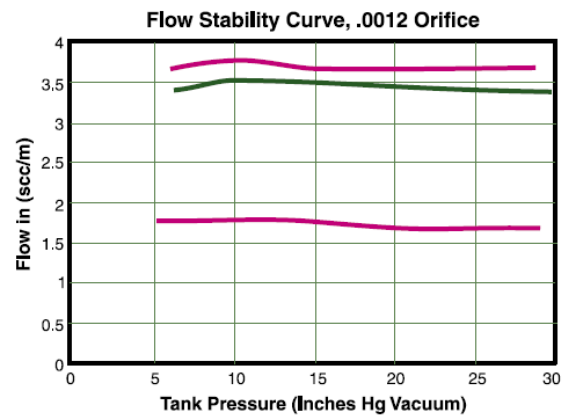
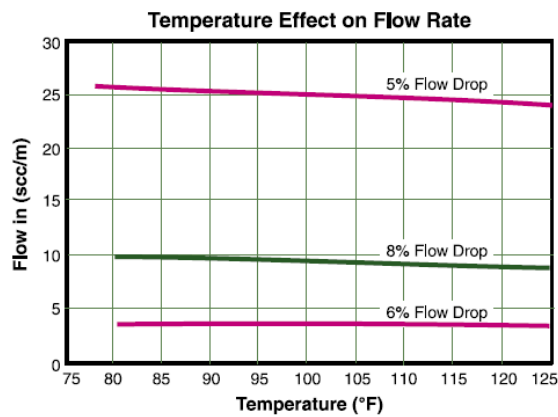
Connections

Inlet (Atmosphere)	1/4" NPT x 1/4" Compression Fitting
Outlet (Vacuum)	1/4" NPT X 1/4" Tube Adapter

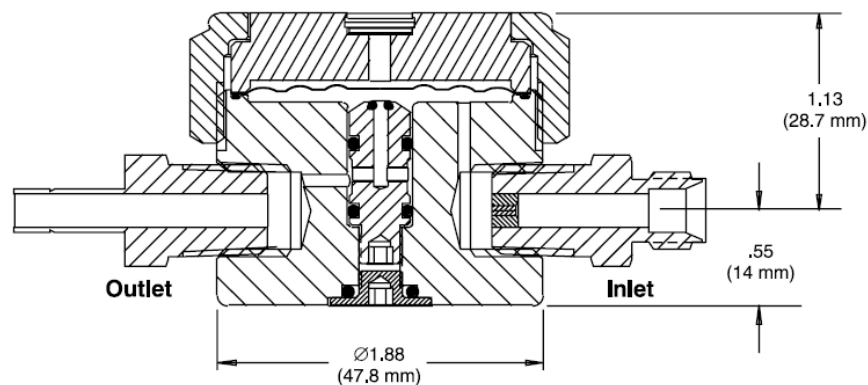
Approximate Weight

1.75 lbs. (.80 kg)

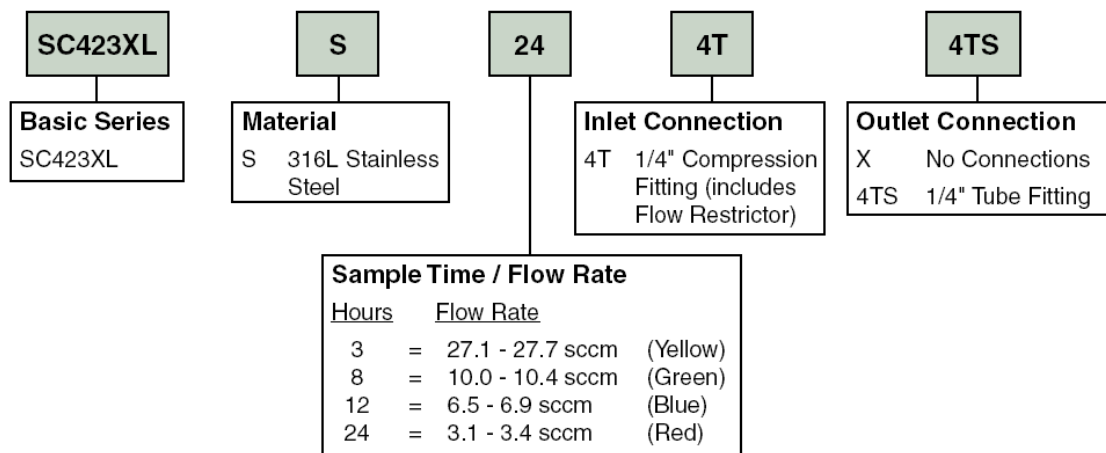
Flow Curves



Dimensional Data



Ordering Information



III.III Regulador de Presión de Alta



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- High Pressure Regulator 2-Stage

High Pressure Regulator 2-Stage



Item Number	541408
Unit Price	\$885.00

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PRODUCT OVERVIEW

High Pressure 2-Stage Regulator for compressed hydrogen gas cylinders includes **Single solenoid valve** for safety shut-off and **Connecting tube with quick-coupler**

TECHNICAL SPECIFICATIONS

Cylinder pressure: 200 bar or 2940 psi
Delivery pressure: fixed

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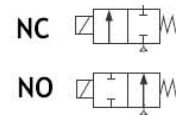
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Availability	20512	General Information	
Order Code	20512	Product Weight	1.00 lb
Catalog Page	8262_8263_2.27R3.pdf	Shipping Weight	1.09 lb
Listed in Catalog	33	Kit Number	30201
Min Operating Pressure (Air)		Operating Pressure Ratings	
Min Operating Pressure (Water)		Max Operating Pressure (Air)	160 PSI
Min Operating Pressure (Lt Oil)		Max Operating Pressure (Water)	150 PSI
		Max Operating Pressure (Lt Oil)	90 PSI
AC/DC	AC	Technical Information	
Actuation Method	Solenoid	I&M Solenoid	V6583
Approvals	UL 104R Shutoff, CSA, FM	Inlet Pipe Size (NPT)	3/8
Available Voltages	120/60,110/50	Lead Length	18.00
Body Material	Brass	Max Ambient Temperature	125 F
Coil Class	FT	Max Fluid Temperature	180 F
Coil Number	238210-032-D	Min Ambient Temperature	32 F -
Cv/Kv (Pressure Port)	0.35 Cv - 0.30 Kv	Orifice Size	1/8 in
I&M Pressure Vessel	v5256r9.pdf	Watt Rating 60 Hz	6.1 W
I&M Solenoid	V6950R5_.pdf	Watt Rating 50 Hz	8.1 W

= ASCO Today Product: Orders with a maximum quantity of 25 pieces placed by 3:00 PM EST are guaranteed to ship



Direct Acting
General Service Solenoid Valves
Brass or Stainless Steel Bodies
1/8" to 3/8" NPT



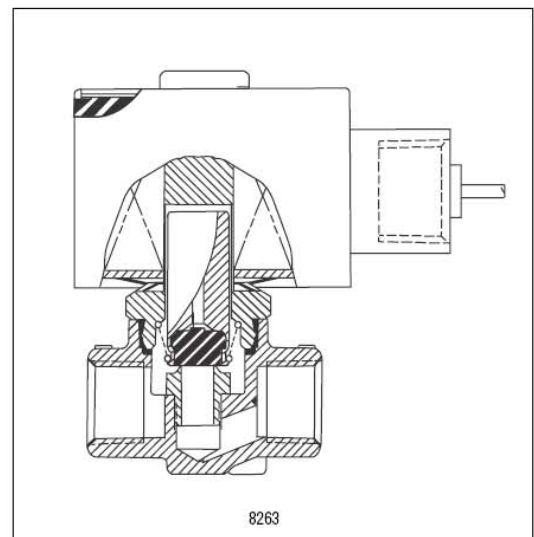
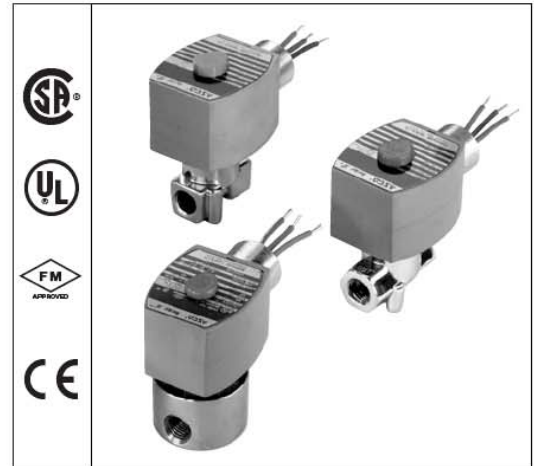
2/2
SERIES
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Features

- Reliable, proven design with high flows.
- Small poppet valves for tight shutoff.
- Wide range of elastomers for specialty service.
- Mountable in any position.
- Brass and stainless steel constructions.

Construction

Valve Parts in Contact with Fluids		
Body	Brass	303/304 Stainless Steel
Seals and Discs	NBR or Cast UR	
Core Tube	305 Stainless Steel	
Core and Plugnut	430F Stainless Steel	
Springs	302 Stainless Steel	
Shading Coil	Copper	Silver
Stem	PA (Normally Open)	
Note: All 1/8" NPT Normally Open valves contain CA. All 1/4" NPT Normally Open valves contain PA.		



Electrical

Standard Coil and Class of Insulation	Watt Rating and Power Consumption				Spare Coil Part No.			
	DC Watts	AC			General Purpose		Explosionproof	
		Watts	VA Holding	VA Inrush	AC	DC	AC	DC
F	10.6	6.1	16	30	238210	238310	238214	238314
F	11.6	10.1	25	50	238610	238710	238614	238714
F	22.6	17.1	40	70	238610	238710	238614	238714
Standard Voltages 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC. Must be specified when ordering. Other voltages available when required.								

Nominal Ambient Temperature Ranges:

AC: 32°F to 125°F (0°C to 52°C)

DC: 32°F to 104°F (0°C to 40°C)

Refer to Engineering Section for details.

Solenoid Enclosures

Standard: Watertight, Types 1, 2, 3, 3S, 4, and 4X.
Optional: Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9.
(To order, add prefix "EF" to catalog number)
See Optional Features Section for other available options.

Approvals:

CSA certified. UL listed, as indicated. Normally Closed Valves FM approved. Meets applicable CE directives.
Refer to Engineering Section for details.

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Specifications (English units)

Pipe Size (ins.)	Orifice Size (ins.)	Cv Flow Factor	Operating Pressure Differential (psi)						Max. Fluid Temp. °F		Brass Body			Stainless Steel Body			Watt Rating/ Class of Coil Insulation ②	
			Max. AC			Max. DC												
			Air-Inert Gas	Water	Lt. Oil @ 300 SSU	Air-Inert Gas	Water	Lt. Oil @ 300 SSU	AC	DC	Catalog Number	Constr. Ref. No.	UL ③ Listing	Catalog Number	Constr. Ref. No.	UL ③ Listing	AC	DC
NORMALLY CLOSED (Closed when de-energized), NBR Disc																		
1/8	3/64	.06	750	750	530	650	640	550	180	120	8262G1	1	○	8262G12	1	○	6.1/F	10.6/F
1/8	3/32	.20	275	290	130	150	140	145	180	120	8262G14	1	○	8262G15	1	○	6.1/F	10.6/F
1/8	1/8	.34	155	180	140	80	80	80	180	120	8262G2	1	○	8262G6	1	○	6.1/F	10.6/F
1/4	3/64	.06	750	750	500	500	500	500	180	120	8262G19	16	○	8262G80	11	○	6.1/F	10.6/F
1/4	3/64	.06	1500	1500	1100	475	475	450	140	140	8262G200 ①	17	●	-	-	-	10.1/F	11.6/F
1/4	3/64	.06	2200	2000	1100	-	-	-	140	140	-	-	-	8262G214 ①	12	●	10.1/F	-
1/4	3/32	.17	360	340	160	150	125	125	180	120	8262G20	16	○	8262G86	11	○	6.1/F	10.6/F
1/4	1/8	.35	140	165	90	65	60	60	180	120	8262G22	16	○	8262G7	11	○	6.1/F	10.6/F
1/4	1/8	.35	300	300	200	75	70	70	180	150	8262G232	17	○	-	-	-	10.1/F	11.6/F
1/4	5/32	.50	180	200	145	40	40	45	180	150	8262G202	4	○	8262G220	12	○	10.1/F	11.6/F
1/4	7/32	.72	90	100	100	25	25	25	180	150	8262G208	4	○	8262G226	12	○	10.1/F	11.6/F
1/4	7/32	.85	40	50	40	17	20	21	180	120	8262G13	2	○	8262G36	11	○	6.1/F	10.6/F
1/4	9/32	.88	60	75	60	18	15	18	180	150	8262G210	4	○	-	-	-	10.1/F	11.6/F
1/4	9/32	.88	90	100	90	25	20	22	180	150	8262G212	6	○	8262G230	13	○	17.1/F	22.6/F
1/4	9/32	.96	27	36	28	15	16	16	180	120	8262G90	2	○	8262G38	11	○	6.1/F	10.6/F
3/8	1/8	.35	160	150	90	65	60	60	180	120	8263G2	3	○	8263G330	3	○	6.1/F	10.6/F
3/8	5/32	.52	100	100	100	35	35	35	180	150	8263G200	5	○	8263G331	5	○	10.1/F	11.6/F
3/8	7/32	.72	100	100	100	25	25	25	180	150	8263G206	5	○	8263G332	5	○	17.1/F	11.6/F
3/8	9/32	.85	100	100	70	-	-	-	180	—	8263G210	7	○	8263G333	7	○	17.1/F	-
NORMALLY OPEN (Open when de-energized), NBR Disc (except where noted)																		
1/8	1/16	.09	500	300	225	400	250	150	180	120	8262G91	8	●	8262G92	8	●	6.1/F	10.6/F
1/8	3/32	.15	275	200	150	190	110	110	180	120	8262G93	8	●	8262G94	8	●	6.1/F	10.6/F
1/8	1/8	.21	125	100	85	80	60	50	180	120	8262G31	8	●	8262G35	8	●	6.1/F	10.6/F
1/4	3/64	.06	750	700	700	500	500	500	140	140	8262G260 ①	9	●	8262G130 ①	14	●	10.1/F	11.6/F
1/4	3/32	.17	300	250	230	200	150	125	140	140	8262G261 ①	9	●	8262G134 ①	14	●	10.1/F	11.6/F
1/4	1/8	.35	130	110	100	80	60	60	180	150	8262G262	9	●	8262G138	14	●	10.1/F	11.6/F
1/4	5/32	.49	85	75	60	45	30	30	180	150	8262G263	4	●	8262G142	14	●	10.1/F	11.6/F
1/4	7/32	.83	45	45	40	25	20	20	180	150	8262G264	4	●	8262G148	14	●	10.1/F	11.6/F
1/4	9/32	.96	30	25	20	15	15	15	180	150	8262G265	4	●	8262G152	14	●	10.1/F	11.6/F
Notes: ① Cast UR disc supplied as standard. ② On 50 hertz service, the rating for the 6.1/F solenoid is 8.1 watts. ③ ○ Safety Shutoff Valve; ● General Purpose Valve. Refer to Engineering Section (Approvals) for details.																		

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8262
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Specifications (Metric units)

Pipe Size (ins.)	Orifice Size (mm)	Kv Flow Factor (m3/h)	Operating Pressure Differential (bar)						Max. Fluid Temp. °C		Brass Body			Stainless Steel Body			Watt Rating/ Class of Coil Insulation ②	
			Max. AC			Max. DC												
			Air-Inert Gas	Water	Lt. Oil @ 300 SSU	Air-Inert Gas	Water	Lt. Oil @ 300 SSU	AC	DC	Catalog Number	Constr. Ref. No.	UL ③ Listing	Catalog Number	Constr. Ref. No.	UL ③ Listing	AC	DC
NORMALLY CLOSED (Closed when de-energized), NBR Disc																		
1/8	1.2	.05	52	52	37	45	44	38	81	48	8262G1	1	○	8262G12	1	○	6.1/F	10.6/F
1/8	2.4	.17	19	20	9	10	10	10	81	48	8262G14	1	○	8262G15	1	○	6.1/F	10.6/F
1/8	3.2	.29	11	12	10	6	6	6	81	48	8262G2	1	○	8262G6	1	○	6.1/F	10.6/F
1/4	1.2	.05	52	52	34	34	34	34	81	48	8262G19	16	○	8262G80	11	○	6.1/F	10.6/F
1/4	1.2	.05	103	103	76	33	33	31	60	60	8262G200 ①	17	●	-	-	-	10.1/F	11.6/F
1/4	1.2	.05	152	138	76	-	-	-	60	60	-	-	-	8262G214 ①	12	●	10.1/F	-
1/4	2.4	.15	25	23	11	10	9	9	81	48	8262G20	16	○	8262G86	11	○	6.1/F	10.6/F
1/4	3.2	.30	10	11	6	4	4	4	81	48	8262G22	16	○	8262G7	11	○	6.1/F	10.6/F
1/4	3.2	.30	21	21	14	5	5	5	81	65	8262G232	17	○	-	-	-	10.1/F	11.6/F
1/4	4.0	.43	12	14	10	3	3	3	81	65	8262G202	4	○	8262G220	12	○	10.1/F	11.6/F
1/4	5.6	.62	6	7	7	2	2	2	81	65	8262G208	4	○	8262G226	12	○	10.1/F	11.6/F
1/4	5.6	.73	3	3	3	1	1	1	81	48	8262G13	2	○	8262G36	11	○	6.1/F	10.6/F
1/4	7.1	.75	4	5	4	1	1	1	81	65	8262G210	4	○	-	-	-	10.1/F	11.6/F
1/4	7.1	.75	6	7	6	2	1	2	81	65	8262G212	6	○	8262G230	13	○	17.1/F	22.6/F
1/4	7.1	.82	2	2	2	1	1	1	81	48	8262G90	2	○	8262G38	11	○	6.1/F	10.6/F
3/8	3.3	.30	11	10	6	4	4	4	81	48	8263G2	3	○	8263G330	3	○	6.1/F	10.6/F
3/8	4.0	.45	7	7	7	2	2	2	81	65	8263G200	5	○	8263G331	5	○	10.1/F	11.6/F
3/8	5.6	.62	7	7	7	2	2	2	81	65	8263G206	5	○	8263G332	5	○	17.1/F	11.6/F
3/8	7.1	.73	7	7	5	-	-	-	81	-	8263G210	7	○	8263G333	7	○	17.1/F	-
NORMALLY OPEN (Open when de-energized), NBR Disc (except where noted)																		
1/8	1.6	.08	34	21	16	28	17	10	81	48	8262G91	8	●	8262G92	8	●	6.1/F	10.6/F
1/8	2.4	.13	19	14	10	13	8	8	81	48	8262G93	8	●	8262G94	8	●	6.1/F	10.6/F
1/8	3.2	.18	9	7	6	6	4	3	81	48	8262G31	8	●	8262G35	8	●	6.1/F	10.6/F
1/4	1.2	.05	52	48	48	34	34	34	59	59	8262G260 ①	9	●	8262G130 ①	14	●	10.1/F	11.6/F
1/4	2.4	.15	21	17	16	14	10	9	59	59	8262G261 ①	9	●	8262G134 ①	14	●	10.1/F	11.6/F
1/4	3.2	.30	9	8	7	6	4	4	81	65	8262G262	9	●	8262G138	14	●	10.1/F	11.6/F
1/4	4.0	.42	6	5	4	3	2	2	81	65	8262G263	4	●	8262G142	14	●	10.1/F	11.6/F
1/4	5.6	.71	3	3	3	2	1	1	81	65	8262G264	4	●	8262G148	14	●	10.1/F	11.6/F
1/4	7.1	.82	2	2	1	1	1	1	81	65	8262G265	4	●	8262G152	14	●	10.1/F	11.6/F
Notes: ① Cast UR disc supplied as standard. ② On 50 Hertz service, the rating for the 6.1/F solenoid is 8.1 watts. ③ ○ Safety Shutoff Valve; ● General Purpose Valve. Refer to Engineering Section (Approvals) for details.																		

SERIES
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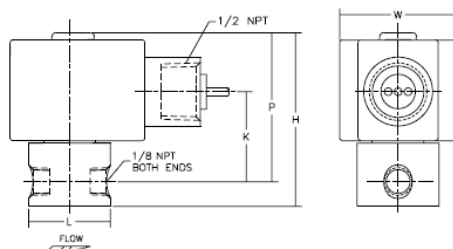
ASCO®

Dimensions: inches (mm)

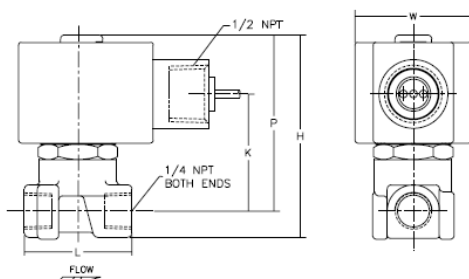
Constr. Ref. No.		H	K	L	P	W
1	ins.	2.52	1.30	1.19	2.16	1.69
	mm	64	33	30	55	43
2	ins.	2.98	1.71	1.56	2.57	1.69
	mm	76	43	40	65	43
3	ins.	3.07	1.63	1.88	2.49	1.69
	mm	78	41	48	63	43
4	ins.	3.20	1.78	1.56	2.79	1.95
	mm	81	45	40	71	50
5	ins.	3.25	1.70	2.00	2.77	1.95
	mm	83	43	51	70	50
6	ins.	3.16	1.78	1.56	2.75	1.95
	mm	80	45	40	70	50
7	ins.	3.25	1.70	2.00	2.67	1.95
	mm	83	43	51	68	50
8	ins.	3.15	1.32	1.19	2.18	1.69
	mm	80	34	30	55	43
9	ins.	3.23	1.67	1.25	2.81	1.95
	mm	82	42	32	71	50
11	ins.	2.94	1.71	1.56	2.57	1.69
	mm	75	43	40	65	43
12	ins.	3.12	1.78	1.56	2.75	1.95
	mm	79	45	40	70	50
13	ins.	3.12	1.78	1.56	2.75	1.95
	mm	79	45	40	70	50
14	ins.	3.16	1.65	1.56	2.79	1.95
	mm	80	42	40	71	50
16	ins.	3.01	1.73	1.25	2.59	1.69
	mm	76	44	32	66	43
17	ins.	3.19	1.80	1.25	2.77	1.95
	mm	81	46	32	70	50

IMPORTANT: Valves may be mounted in any position.

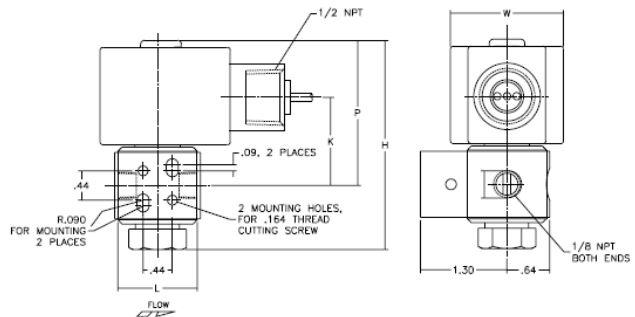
Constr. Refs. 1



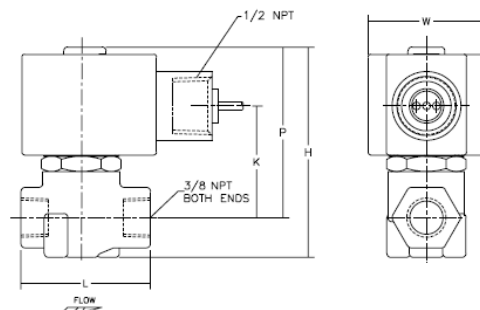
Constr. Refs. 2, 4, 6, 9



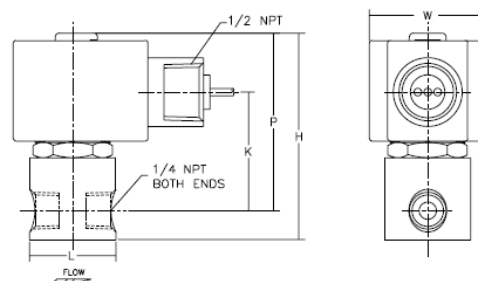
Constr. Refs. 8



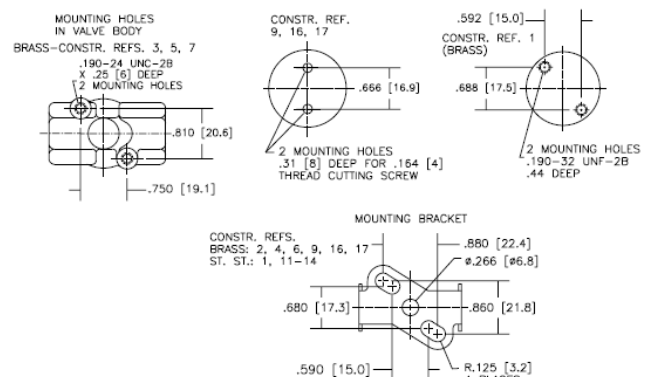
Constr. Refs. 3, 5, 7



Constr. Refs. 11-14, 16, 17



Mounting Details



III.V Celdas Peltier



Búsqueda

peltier

Descripción

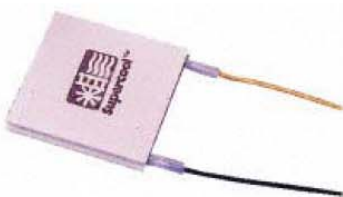
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Sealed thermoelectric module, 82.2W 8.4A

Volver a: [Electronic Components, Power & Connectors](#) » [Semiconductors & Optoelectronics](#) » [Discretes](#) » [Thermoelectric Modules](#) » [Peltier Effect](#) » [Peltier Effect Heat Pumps](#)


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Código RS

490-1525

Disponibilidad:

En stock

Estado RoHS

✓ RoHS
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Fabricante

[Supercool](#)

Referencia del Fabricante PF-127-14-11-S

[Comparar](#)

Cantidad Precio:

1+ 41,22 €

25+ 33,96 €

100+ 28,30 €

Cantidad

1

Pedido



Ver todos los productos

[Thermo Electric Modules Effect](#)

[Peltier Effect Heat Pumps](#)

Descripción

Heat exchanger, Peltier effect heat pumps, thermoelectric module, high temp, sealed, 80.5V 14-11-S



Data Sheet

Páginas

Ta

[SuperCool Peltier Element Modules](#)

12

[TE MODULE SEALED Drawing](#)

1

Nota: Si encuentra algún problema descargando los archivos PDF, deshabilite la casilla 'Descargar Página a Página' que figura a continuación.


☒ Descargar página a página

Atributos

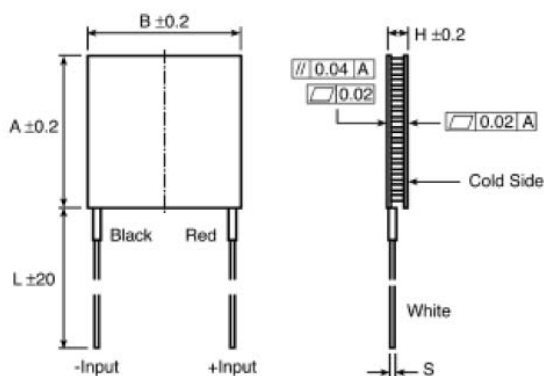
Tipo de Producto	Thermo Electric Modules - Peltier Effect
DeltaT (Max)	71°C
Dimensions (L x W x H)	40x40x3.8
Maximum Current	8.4A
Maximum Power	82.2W
Maximum Temperature	150°C
Maximum Voltage	15.7
Number Of Couples N	14

Detalles

Peltier Effect Heat Pumps

- Can be used to **cool or heat**, when supplied with a suitable power source
- Large sizes suitable for cooling sub-assemblies
- Small sizes can be used for cooling ICs, infrared detector chips etc. or for control temperature of oscillators circuits, amplifiers etc.

- Centre hole types can be used for cooling lasers and microscope slides when light be passed through the TEC
- Types include single stage, 2-stage (2 SC), multistage (PE-190/192), high tempe (PF-XXX), centre hole and miniature (PE-011)
- All PE-XXX modules are UL1569 approved except PE-011 (miniature)
- High temperature modules (PF-XXX) have Teflon (PTFE) wire insulation and posit wire is yellow not red
- All types can be bonded using heat sink bonder



[Ampliar Imagen](#)

Descripción de la gama

Peltier Effect

A range of semiconductor thermoelectric devices working on the Peltier effect. When supplied with a suitable electric current, they can either **cool** or **heat**.

When subject to an externally applied temperature gradient these devices will generate amount of electrical power.

The larger devices can be used for cooling or controlling the temperature of sub assemblies. The small size of the mini module makes it ideally suited for cooling miniature electronic components such as infra-red detector chips, microwave IC's, fiber-optic lasers and detectors.

Alternatively, it may be used to minimise the effects of temperature coefficients on oscillator stability, reference voltages, amplifier offsets etc. by providing temperature control.

- Solid state long term stability
- Generates no acoustic noise



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Amidata S.A.
Avenida de Europa, 19, 28224 - Pozuelo de Alarcón - Madrid
Barra Comte Borrell, 115 - 08015 Barcelona

Custom design – finding a solution quickly

Although we provide more than 120 standard modules, we're fully aware that a standard solution will not always meet your needs. That's why we pride ourselves on being able to customize solutions quickly and cost-efficiently. All you have to do is ask.

Making sure you get the best

We'll help you conduct thermal studies to define your demands. Supercool's design engineers will then work closely with your personnel to implement the solution. Our flexible production process enables us to meet your requirements – without you having to invest a fortune in either prototypes or large-volume production.

Modules alone won't do the job

We provide not only modules, but also wire harnesses, packaging such as epoxy bonding to heat sinks and much more. To make the most of the market's finest TEMs, be sure to challenge our designers. And if your project calls for it, we can test-run systems in our climatic chamber. Naturally, we also offer complete thermoelectric solutions, including assemblies, temperature controllers and power supplies.

A Supercool product has to work all over the world

Today it's widely accepted that thermoelectrics enjoy virtually limitless potential. That's why our solutions see action all over the world. They withstand shocks and vibrations. They manage thermal cycling and provide absolute accuracy. Yet they never lose their cool.

Typical applications:

- | | |
|--------------------------|-------------------------------|
| • CCDs | • Liquid chillers |
| • Lasers | • Thermal cycling |
| • Sensors | • Point-of-sale refrigerators |
| • Analytical instruments | • Automotive applications. |

Supercool in reality...

Though we have operations in Sweden and the United States, it's only through our international network of partners and representatives that we can offer you a global service. Their

commitment to quality, service and integrity has established Supercool as a global supplier of thermoelectric solutions. You're never far from Supercool – wherever you are.

...and in virtual reality

www.supercool.com is much more than simply a shopwindow for us. This is where you go for the latest news as well as tips and advice on how to best manage your thermal challenges.

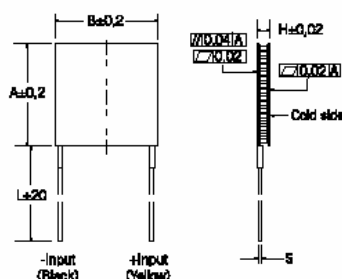
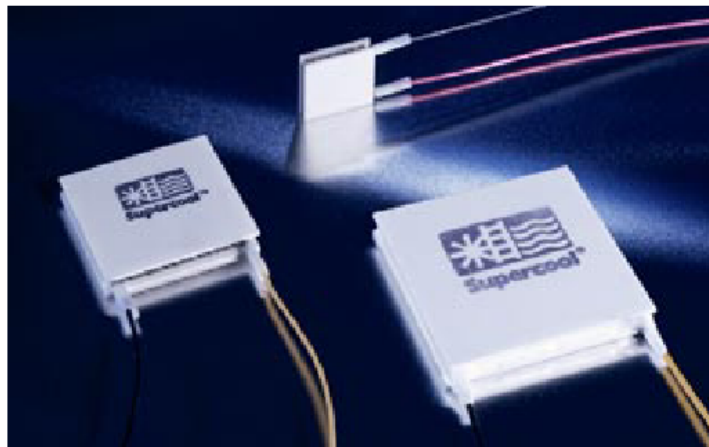
Cool by nature

Environmental legislation is getting ever tougher. But once you opt for thermoelectrics you need never worry that you've chosen a cooling system that has a negative impact on the environment. That's because electricity triggers the cooling process; there are no CFCs and no need for refills.

High temperature modules

Supercool's high temperature modules deliver not only long-term operation up to 150°C, but also outstanding cooling performance (Max. $\Delta T = 73^\circ\text{C}$ at $T_{\text{hot}} = 25^\circ\text{C}$).

Although we boast a modest standard range, we can, in principle, supply all modules as high temperature modules should your application call for high volumes.



- High temperature modules feature Teflon (PTFE) insulated lead wires.
- R_{AC} tolerance = $\pm 10\%$
- Tolerance of I_{max} , U_{max} , Q_{max} = $\pm 5\%$

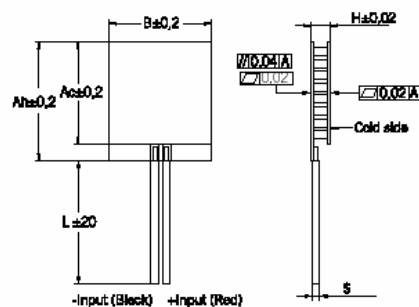
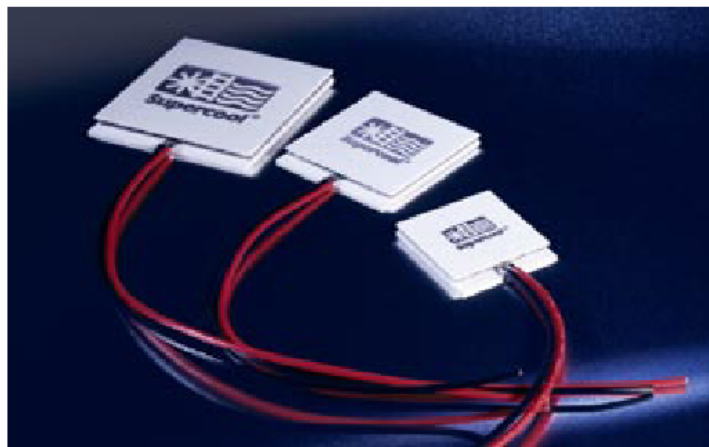
Product No.	I _{max} (A)	U _{max} (V)	P _{cmax} (W)	ΔT _{max} (°C)	R _{ac} (ohm)	(mm)			S mm ²	
						A	B	H		L
High temperature modules										
PF-031-10-13	3.9	3.8	8.0	73	0.91	15	15	3.6	200	0.20
PF-071-10-13	3.9	8.8	20.9	73	1.97	20	20	3.6	200	0.20
PF-071-14-15	6	8.8	32.8	73	1.32	30	30	3.9	200	0.35
PF-127-10-13	3.9	15.7	37.4	73	3.47	30	30	3.6	200	0.20
PF-127-10-20	2.6	15.7	24.9	74	5.7	30	30	4.3	200	0.20
PF-127-14-11	8.5	15.7	81.0	71	1.52	40	40	3.8	300	0.50
PF-127-14-15	6	15.7	58.6	73	2.19	40	40	3.9	300	0.35
PF-127-14-25	3.9	15.7	38.1	74	3.42	40	40	4.8	350	0.35
PF-127-14-11-S ¹⁾	8.5	15.7	77.6	69	1.52	40	40	3.8	300	0.50
PF-127-14-15-S ¹⁾	6	15.7	56.1	71	2.19	40	40	3.9	300	0.35
PF-127-14-25-S ¹⁾	3.9	15.7	36.6	72	3.42	40	40	4.8	350	0.35

¹⁾ S = Silicon sealed versions.

Power modules

Power modules are for applications where you need to pump a great amount of heat onto a small surface. We offer power density of up to 14 W/cm². These TEMs also provide outstanding thermal cycling properties and can be used for applications such as lasers, PCR cycling and thermal testing of micro-processors.

By powering the TEMs to around half of U_{max} you can use these modules to achieve exceptionally high efficiency (COP). The porch style offers a strong lead attachment. Operating temperature is max. 120°C.



- Power modules feature Teflon (PTFE) insulated lead wires.
- R_{AC} tolerance = $\pm 10\%$
- Tolerance of I_{max} , U_{max} , Q_{max} = $\pm 5\%$

Product No.	I _{max} (A)	U _{max} (V)	P _{c max} (W)	ΔT _{max} (°C)	R _{ac} (ohm)	(mm)					S mm ²
						Ac	Ah	B	H	L	
Power modules											
PC-128-10-05	9	15.8	88.2	68	1.38	30	34	30	2.5	200	0.50
PC-072-14-06	15.4	8.9	85.1	68	0.45	30	34	30	3.3	200	0.75
PC-128-14-06	15.4	15.8	151.4	68	0.82	40	44	40	3.3	300	0.75
PC-128-20-08	24	15.8	235.5	70	0.55	55	59	55	4.0	200	0.75
PC-200-14-06	15.4	25.0	236.5	68	1.28	40	44	40	3.3	200	0.75
PC-200-14-11	8.5	24.9	127.5	71	2.36	40	44	40	3.8	200	0.50
PC-288-10-05	9	35.8	198.4	68	3.11	40	44	40	2.5	200	0.50
PC-288-10-08	6	35.8	127.6	71	4.83	40	44	40	3.1	200	0.50
PC-288-14-06	15.4	35.8	340.5	68	1.84	52	56	52	3.3	200	0.75
PC-288-14-11	8.5	35.8	182.6	71	3.39	52	56	52	3.8	200	0.5

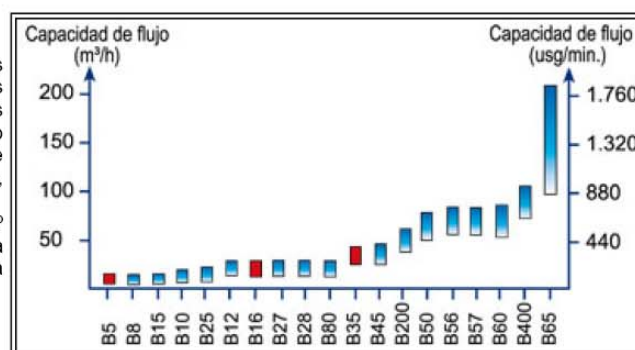
III.VI Intercambiador de Calor



INTERCAMBIADORES DE CALOR COMPACTOS, CONSTRUIDOS DE ACERO INOXIDABLE Y SOLDADOS CON COBRE

CARACTERÍSTICAS INTERCAMBIADORES SWEP MODELOS B

Los intercambiadores Swep clasificados como B son convenientes para variadas aplicaciones. Aunque estos intercambiadores estén considerados como estándar, poseen una variedad enorme de tamaños de placas, conexiones, combinaciones de placas, etc. Su diseño único, permite virtualmente un nº ilimitado de combinaciones, para ajustarse a los requerimientos de transferencia térmica de su aplicación.



Modelos de Intercambiadores que Recal comercializa.

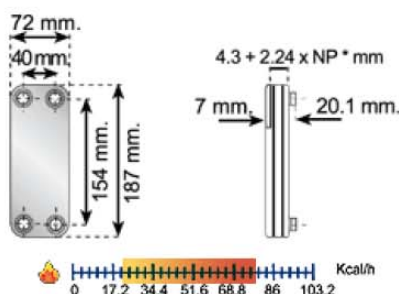
MODELO B 5

MODELO B 16

MODELO B 35

INTERCAMBIADORES MODELOS B-5

Los intercambiadores Swep modelo B5, permiten un intercambio de calor eficiente en aplicaciones con pequeños flujos y excepcionalmente en altos requerimientos, por ser compactos. Producto fácil de instalar y usar, flexible a pesar de su pequeño tamaño. Ésto lo hace una elección particularmente adecuada para pequeños enfriadores de aceite o agua.



Datos Técnicos B 5

Flujo máx.	4 m³/h (97 usg/min)
Máx. presión de trabajo a 155°C	31 bar
Máx. presión de trabajo a 225°C	27 bar
Mín. temperatura de trabajo	-196° C
Prueba de presión	50 bar
Máx. nº de placas	60
Peso seco (aprox.)	0,6 + 0,044 x NP*kg
Volumen contenido circuito interior	0,024 x (NP*/2-1) litros
Volumen contenido circuito exterior	0,024 x (NP*/2) litros
Conexión estándar	3/4"
Altura de conexión	20,1 mm - 45,1 mm

Diámetro	Máx. flujo	Área transferencia
----------	------------	--------------------

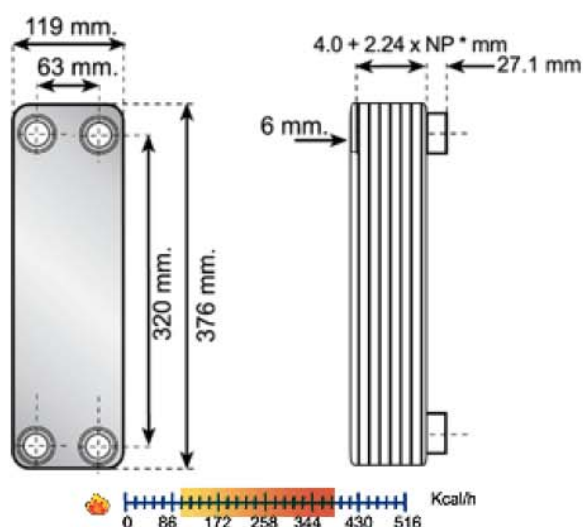
conector		máx. de calor		* NP: nº de placas
mm.	pulgadas	m ³ /h	m ²	
16	3/4"	4	0.70	
Material				
Material placa		Acero 316		
Material soldadura		cobre puro		
Material conexión		Acero 316		

INTERCAMBIADORES MODELOS B-16

Los intercambiadores Sweb modelo B16 han sido diseñados específicamente para aplicación de fase simple; especialmente fabricados para cubrir la capacidad y especificaciones de centrales térmicas, circuitos de radiadores y operaciones de agua caliente sanitaria en un rango muy amplio.

El intercambiador B 16 es óptimo para enfriamiento de aceite.

Los productos operan con flujos simétricos hasta presiones de 25 bar.



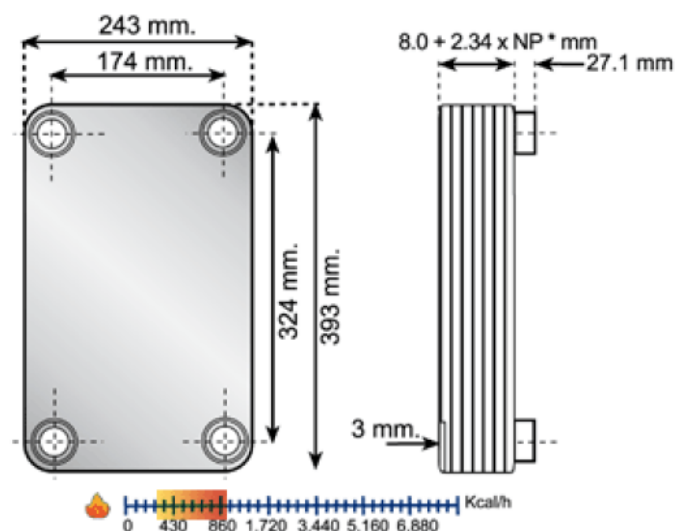
Diámetro conector		Máx. flujo	Área transferencia máx. de calor
mm.	pulgadas	m ³ /h	m ²
33	1 1/4"	22	6,2

Datos Técnicos B 16	
Flujo máx.	22 m ³ /h (97 usg/min)
Máx. presión de trabajo a 155°C	28 bar
Máx. presión de trabajo a 225°C	25 bar
Mín. temperatura de trabajo	-196°C
Prueba de presión	45 bar
Máx. nº de placas	140
Peso seco (aprox.)	1,5 + 0,114 x NP*kg
Volumen contenido a circuito interior	0,082 x (NP*/2-1) litros
Volumen contenido a circuito exterior	0,082 x (NP*/2) litros
Conexión estándar	1 1/4"
Altura de conexión	27,1 mm - 45,1 mm
* NP: nº de placas	
Material	
Material placa	Acero 316
Material a soldar	cobre puro
Material conexión	Acero 316

INTERCAMBIADORES MODELOS B-35

El intercambiador Sweb, modelo B 35 es el más flexible y está disponible en forma inmediata con numerosas alternativas de conexiones estándar. El tamaño del producto y su capacidad, hacen que opere eficientemente en numerosas operaciones de 1 y 2 fases.

A pesar de su pequeño tamaño es capaz de aceptar hasta 250 placas.



Diámetro conector		Máx. flujo	Área transferencia máx. de calor
mm.	pulgadas	m ³ /h	m ²
35	1 1/2"	35	23

Datos Técnicos B 35	
Flujo máx.	35 m ³ /h (97 usg/min)
Máx. presión de trabajo a 155°C	31 bar
Máx. presión de trabajo a 225°C	27 bar
Mín. temperatura de trabajo	-196°C
Prueba de presión	50 bar
Máx. n° de placas	250
Peso seco (aprox.)	6,7 + 0,336 x NP*kg
Volumen contenido a circuito interior	0,175 x (NP*/2-1) litros
Volumen contenido a circuito exterior	0,175 x (NP*/2) litros
Conexión estándar	1 1/2"
Altura de conexión	27,1 mm - 54,2 mm
* NP: n° de placas	
Material	
Material placa	Acero 316
Material a soldar	cobre puro
Material conexión	Acero 316

Para una consulta personalizada comuníquese a:
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III.VII Bomba

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EXTERNAL PUMP "EXTRA"



Part no.: 570265 - 62

only £13.99

1
piece(s)



in shopping basket

Highlights

- Max. delivery height 5.7 m
- Max. flow 10 l/min

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"Extra" external pump

These high-performance external pumps are ideal anywhere that a submersible pump cannot be used. As they are not self-priming, these pumps should be placed at a level lower than the bottom of the water tank concerned. This is the most effective way of preventing the pumps from running dry. And since they can be powered either from a car battery or via a mains adaptor, you have complete flexibility regarding set-up location and power source.

Current consumption 1.0 - 1.5 A · Hose connection, dia. 8/10 mm.

Technical data

Max. flow rate:	10 l/min
Max. delivery height:	5.7 m
Max. current consumption:	1,0 - 1.5 A
Operating voltage:	12 V/DC
Operating time:	100 %
Dimensions:	(Ø x H) 38 mm x 140 mm
Weight:	approx. 0.15 kg
Cable length:	1000 mm

Problems with registration ? Tel.: **0870 732 3223** (Mon-Thu 07:00-15:30, Fri 07:00-13:00)
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III.VIII Controlador PID

West 6500 1/16 DIN Simplified Temperature Controller

ISE, Inc.



The West 6500 features a simplified operator interface, and automatic self-tuning on process start-up. Clear Go/No-go control indicator. Large 3 digit display for high visibility.

- Thermocouple or RTD
- Easy Tune (PID) or On/Off
- On control indicator
- Optional process alarm
- Foolproof operation
- Setpoint lock
- Alarm lock
- Adjustable PV offset



Technical Data

Features

Control Types	Easy Tune PID (with adjustable cycle time) or On-Off control
Output Configuration	Control relay or SSR, plus optional Alarm Relay
Alarm Type	Process high, process low, setpoint deviation or band
Human Interface	3 button operation, 3 digit 13mm red LED display, plus on-control, set-up, alarm and setpoint indicators
On-Control Indicator	Off below setpoint, on at setpoint, flashing above setpoint

Input

Thermocouple Types	J, K, T, L, & N
Thermocouple Ranges	0 to 1, 2, 3, 4, 5, 6, 7, 800°C (max temperature 400°C for type T)
RTD Type	3 Wire PT100, 50Ω per lead maximum (balanced)
RTD Ranges	-50 to 1, 2, 3, 4, 5, 6, 7, 800°C, plus 0.0 to 99.9°C
Impedance	>100MΩ
Accuracy	+/- 0.25% of input span +/- 1 LSD (T/C CJC better than 0.7°C)
Sampling	4 per second, 14 bit resolution approximately
Sensor Break Detection	<2 secs, control output turns off, high alarms activate for T/C input, low alarms activate for RTD input

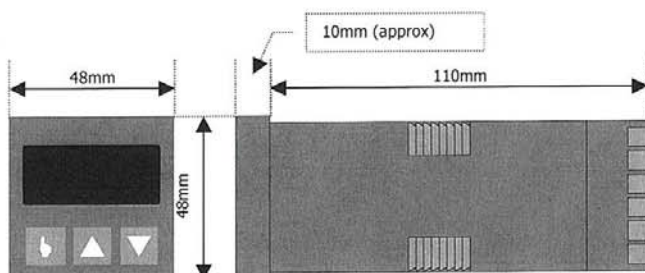
Outputs & Options

Control & Alarm Relays	Contacts SPDT 2Amp resistive at 240V AC, >500,000 operations
Control SSR Outputs	Drive capability >10V DC into 500Ω

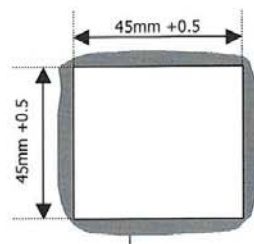
Operating & Environmental

Temperature & RH	0 to 55°C (-20 to 80°C storage), 20% to 95%RH non-condensing
Power Supply	90 to 264V 50/60Hz (optional 20 to 55V AC/22 to 65V DC), approx 4 Watts
Front Panel Protection	IEC IP66 (Behind panel protection is IP20)
Approvals and Certification	CE, UL & ULc

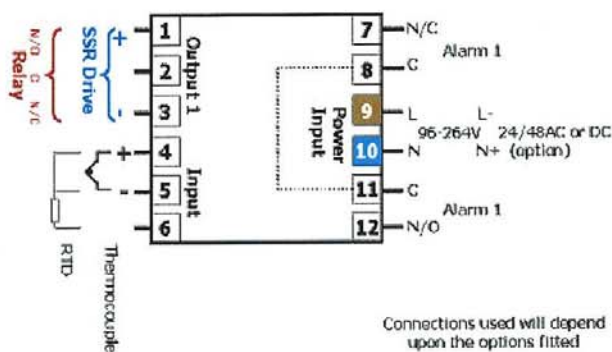
Dimensions



Panel Cut-out



Connection Details



Field Reconfiguration

Input

Configurable for thermocouple or RTD, no extra parts required

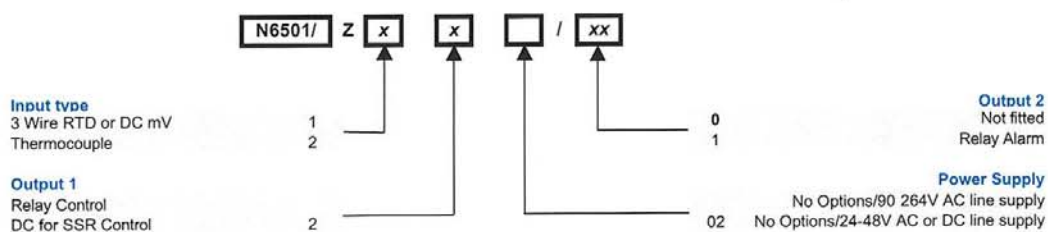
Output 1

Type is fixed as Relay or SSR, not field configurable

Output 2

Type is fixed as None or Alarm Relay, not field configurable

Order Code



<http://instserv.com>

ISE, Inc.

10100 Royalton Rd.
Cleveland, OH 44133 USA
Tel: (440) 237-3200 • Fax: (440) 237-1744

Toledo, OH area:

417 Tomahawk Dr.
Maumee, OH 43537
Tel: (419) 893-3330 • Fax: (419) 893-2151

III.VIV Compresor

Trocken laufende Drehschieber-Pumpen
Dry running rotary vane pumps
Pompes sèches à palettes rotatives



Seco
SV/SD 1010 - 1040 C



SV 1025 C

Seco SV Drehschieber-Vakuumpumpen verdichten vollkommen Öl frei mit selbst schmierenden Schiebern aus Spezialkohle. Sie sind die idealen Vakuumerzeuger überall in der Industrie, wo absolut Öl freie Verdichtung gefordert wird. Mit dem Typ SD ist auch eine Überdruck-Version dieser Pumpe erhältlich.

Wirtschaftlich und umweltfreundlich

Seco Vakuumpumpen zeichnen sich durch einen niedrigen Energieverbrauch aus. Sie arbeiten leise und sind durch die Schmiermittel freie Verdichtung äußerst umweltfreundlich.

Kompakt

Der Pumpenkörper ist direkt an den Motor angeflanscht. Die neue Seco SV besticht durch kompaktes Design.

Wartungsarm

Die robuste Konstruktion, dauergeschmierte Lager und der oberflächengekühlte Antriebsmotor garantieren eine lange Lebensdauer.

Seco SV rotary vane vacuum pumps compress totally oil-free with self-lubricating vanes made of special carbon. These vacuum generators are ideal for industrial processes in which a totally oil-free compression is required. A compressor version of the Seco pump is also available (Type SD).

Economical and environmentally friendly

Seco vacuum pumps stand out due to their low energy consumption. They are quiet and environmentally friendly because no lubrication fluids are required for compression.

Compact design

Compact pump dimensions are guaranteed by the motor being directly flange-mounted to the pump casing.

Low in maintenance

Robust design, lifetime lubricated bearings and the surface-cooled driving motor guarantee long service life of this pump.

Les pompes à vide Seco SV fonctionnent absolument sans huile grâce à l'utilisation de palettes autolubrifiantes en carbone. Elles sont spécialement conçues pour toutes les applications qui nécessitent un fonctionnement absolument sans huile. La pompe est aussi disponible en version pression (SD).

Economique et écologique

Grâce à une faible consommation d'énergie, un faible niveau sonore et un fonctionnement totalement exempt d'huile.

Compact

Grâce à un corps de pompe fixé directement sur l'arbre moteur. La nouvelle Seco SV se distingue par une ligne compacte et épurée.

Entretien facile

Grâce à une construction robuste, au graissage à vie des roulements et au moteur électrique à ventilation externe, qui garantissent une longue durée de fonctionnement de la pompe.

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Trocken laufende Drehschieber-Pumpen

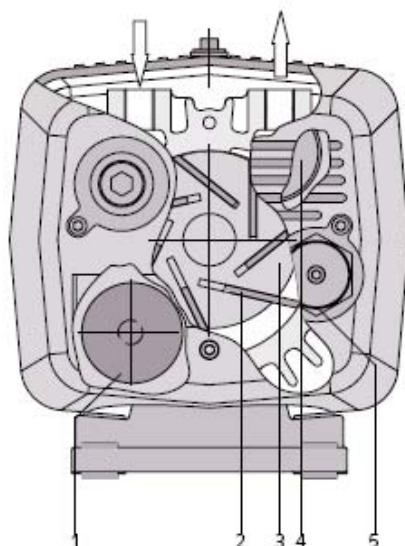
Dry running rotary vane pumps

Pompes sèches à palettes rotatives

Funktionsprinzip

Principle of operation

Principe de fonctionnement



- 1 Ansaugfilter
- 2 Schieber
- 3 Rotor
- 4 Druckfilter (nur bei SD)
- 5 Schalldämpferventil (nur bei SV)

- 1 Inlet filter
- 2 Vane
- 3 Rotor
- 4 pressure filter (SD series only)
- 5 Discharge silencer valve (SV series only)

- 1 Filtre d'aspiration
- 2 Palette
- 3 Rotor
- 4 Filtre au refoulement (uniquement sur SD)
- 5 Soupape du silencieux (uniquement sur SV)

Funktionsprinzip und Arbeitsweise

Seco Drehschieber-Pumpen arbeiten nach dem bewährten Vielzellenprinzip ohne Einsatz von Fremdmedien zur Schmierung. Die Verdichtung erfolgt nahezu pulsationsfrei und absolut Öl frei.

Ein leistungsstarker Lüfter sorgt für gute Wärmeabfuhr an Motor und Pumpenkörper.

Principle of operation

Seco vacuum pumps operate according to the proven rotary vane principle without using additional sealing fluids for lubrication. These pumps compress almost without pulsation and completely oil-free.

An efficient fan guarantees good heat removal from motor and pump.

Principe de fonctionnement

Les pompes Seco travaillent selon le principe éprouvé des pompes rotatives à palettes et sans aucune lubrification. La compression s'effectue presque sans pulsations et 100% sans huile.

Un ventilateur efficace se charge de la dissipation de la chaleur du moteur et de la pompe.

Zubehör

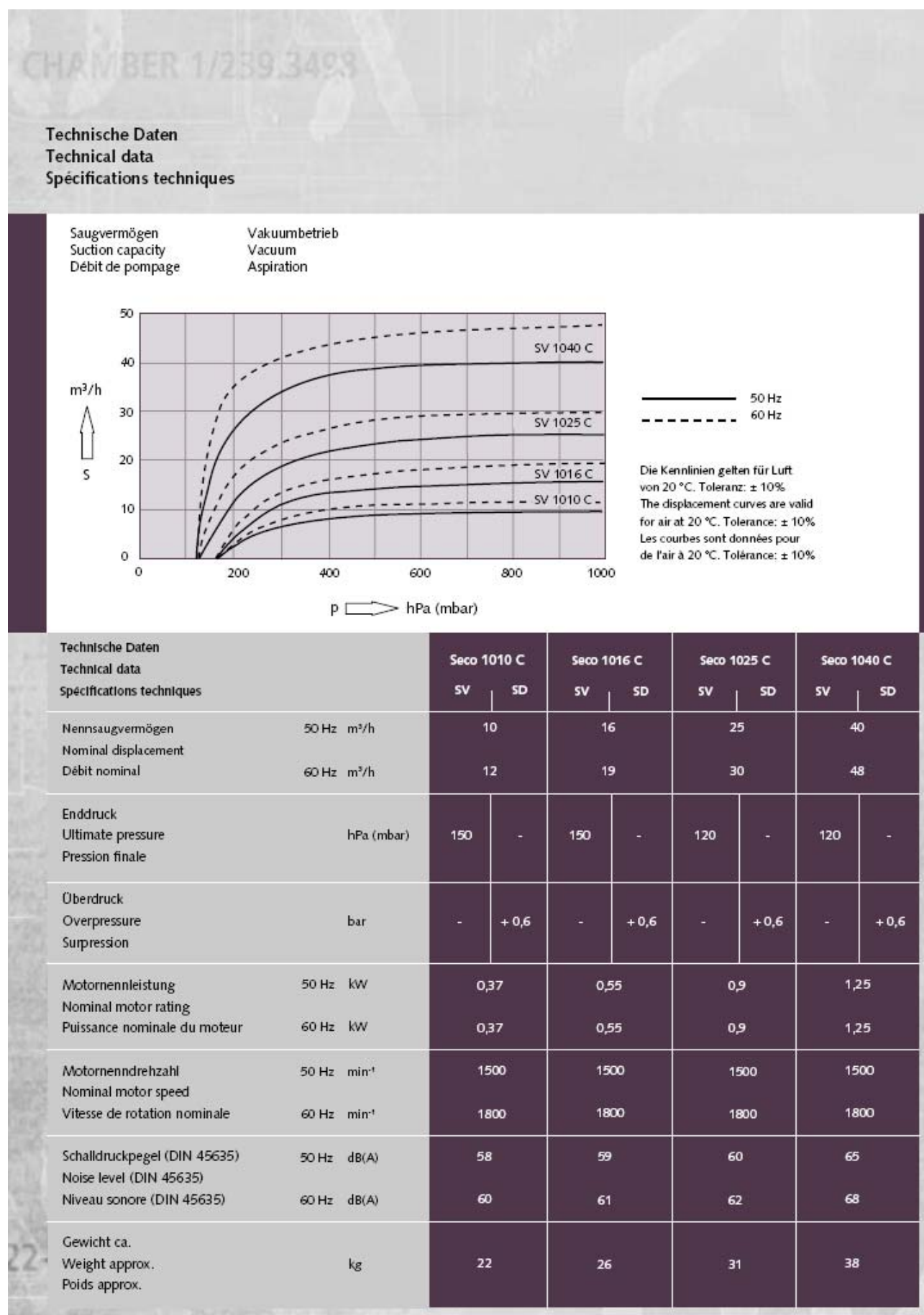
- Ansaugfilter zum Vorschalten an den integrierten Feinfilter bei hohem Staubanfall.
- Vakuumreguliertventil zum Einstellen eines bestimmten Ansaugdruckes bei Saugbetrieb
- Rückschlagventil zum Einbau in die Saug- oder Druckleitung, um eine irrtümliche Be- oder Entlüftung des Rezipienten zu verhindern

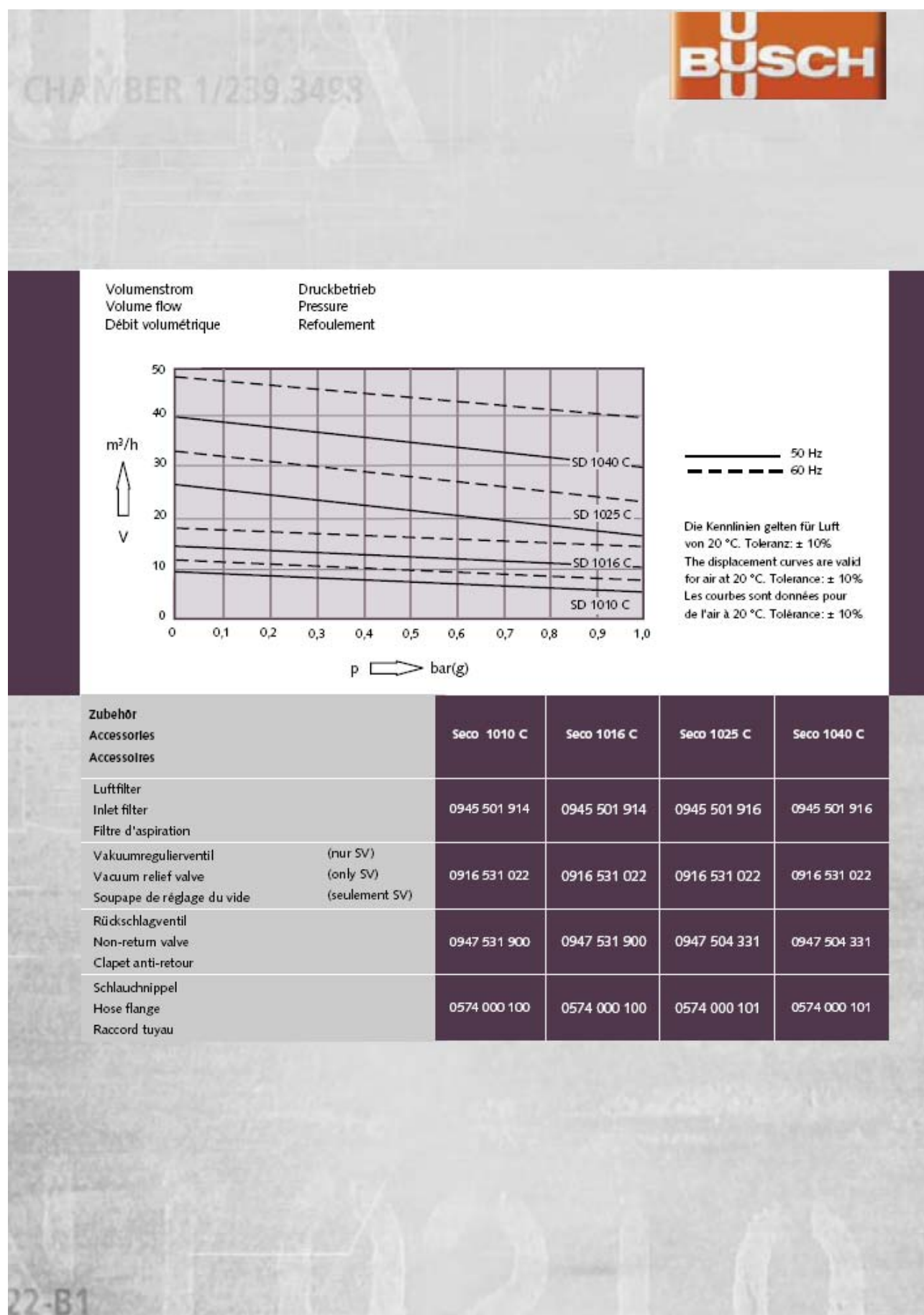
Accessories

- Inlet filter to be coupled to the integrated fine filter in case of applications in extremely dusty environment
- Vacuum relief valve to adjust inlet pressure in vacuum applications
- Non-return valve restricts air admittance into vacuum chamber

Accessoires

- Filtre d'aspiration à monter en amont du filtre fin intégré, en cas d'absorption importante de poussières
- Soupape de réglage du vide, pour régler la pression d'aspiration
- Clapet anti-retour à monter dans la conduite d'aspiration ou de refoulement, pour éviter une remise de l'enceinte à la pression atmosphérique

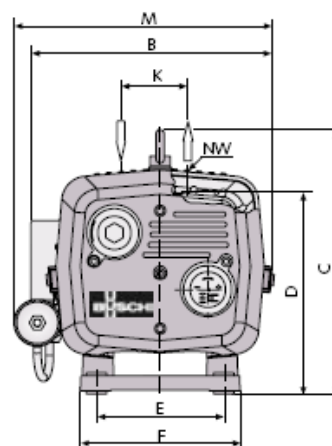
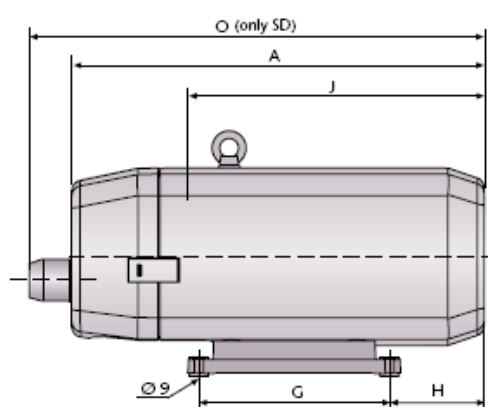




Trocken laufende Drehschieber-Pumpen
Dry running rotary vane pumps
Pompes sèches à palettes rotatives



Abmessungen
 Dimensions
 Dimensions



Abmessungen Dimensions Dimensions	A	B	C	D	E	F	G	H	J	K	M	O	NW
SV 1010 C	413	239	260	199	125	157	202	100	303	75	250	-	G 1/2
SD 1010 C	413	239	260	199	125	157	202	100	303	75	250	461	G 1/2
SV 1016 C	436	239	260	199	125	157	202	100	319	75	256	-	G 1/2
SD 1016 C	436	239	260	199	125	157	202	100	319	75	256	484	G 1/2
SV 1025 C	495	251	282	223	125	157	202	109	344	80	284	-	G 3/4
SD 1025 C	495	251	282	223	125	157	202	109	344	80	284	542	G 3/4
SV 1040 C	545	251	282	223	208	240	220	154	383	80	289	-	G 3/4
SD 1040 C	545	251	282	223	208	240	220	154	383	80	289	592	G 3/4



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Technische Änderungen vorbehalten / Technical changes reserved / Sujet à modifications techniques.

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