



Oil Diffusion Pumps

Pump Fluid
Pump Accessories

Baffle

Refrigerator
LN₂-Baffle

LN₂-Supply

Cryo vacuum pumps

Cryo vacuum pumps DN100 -320 ISO-K + CF
Cryo vacuum pumps DN 400 - 1000 ISO-K / F
Helium Compressor
Cryo Pump Accessories

Pumping System Controller

UHV-Pumps

Titanium Sublimator
Controller for Titanium Sublimator
Pumping Body for Titanium Sublimator
LN₂-Supply Pumping Body

Catalyzer Trap

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Air/water cooled Small Diffusion Pumps

Selection Data

Vacuum Connection		DN 40 ISO-KF	DN 40 ISO-KF
Cooling		air	water
Pumping speed for air at 10 ⁻⁴ mbar ¹⁾			
Without baffle	l/s	38	40
With baffle	l/s	22	22
Built-in thermal protection switch		—	yes

Ordering Information²⁾

Type	PDB040-G	PDB040-W
Diffusion pump		
230 V	260-002	260-012
115 V	260-003	260-013

Technical Data

Vacuum stability	mbar	0.3	0.3
Pump fluid charge, min. / max.	cm ³	10 / 15	10 / 15
Heating/cooling time	min	10 / 6	10 / 10
Recommended pumping speed of roughing pump	m ³ /h	1.5	1.5
Weight	kg	3	1.5

Spare Parts

Seal set	BN 841 151-T	BN 841 151-T
Heating plate		
230 V	BP 335 701-T	BP 335 701-T
115 V	BP 335 474-T	BP 335 474-T

¹⁾ Measured with 66A or DC 704 according to DIN 28427

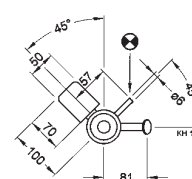
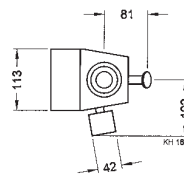
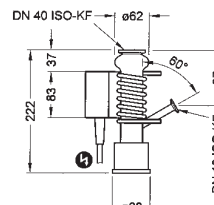
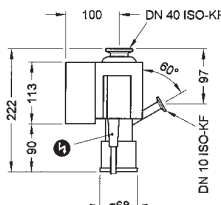
²⁾ Without pump fluid



PDB040-G



PDB040-W



- Power connection
- Water connection

Diffusion Pumps with integrated Baffle

- ◆ Built-in water baffle
- ◆ Suitable for mineral oils, silicone oils and pentaphenylether
- ◆ High vacuum stability due to integrated booster stage
- ◆ Pump unit or complete manual/automatic pumping systems on request



Selection Data

Vakuum Connection	DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K	DN 250 ISO-K
Pumping Speed ¹⁾ for air at 10 ⁻⁴ mbar l/s	150	300	650	1750

Ordering Information ²⁾ ³⁾

Type	PDI063-W	PDI100-W	PDI160-W	PDI250-W
Diffusion Pump				
230 V	260-022	260-032	260-042	260-052
115 V	260-023	260-033	260-043	260-053

Technical Data

Fore vacuum, max.	mbar	0.8	0.8	0.8	0.8
Pump fluid charge, min. / max.	cm ³	50 / 70	80 / 120	150 / 300	450 / 1000
Power consumption	W	400	650	1275	2400
Heating/cooling time, typical	min	10 / 10	12 / 10	15 / 15	17 / 60
Recommended pumping speed for roughing pump at working pressure >10 ⁻⁴ / <10 ⁻⁴ mbar	m ³ /h	4 / 4	8 / 4	16 / 8	60 / 30
Thermostatic Cut		integrated	integrated	integrated	integrated
Housing		Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Jet system		Aluminum	Aluminum	Aluminum	Aluminum
Weight	kg	4	8.5	14.5	30

Spare Parts

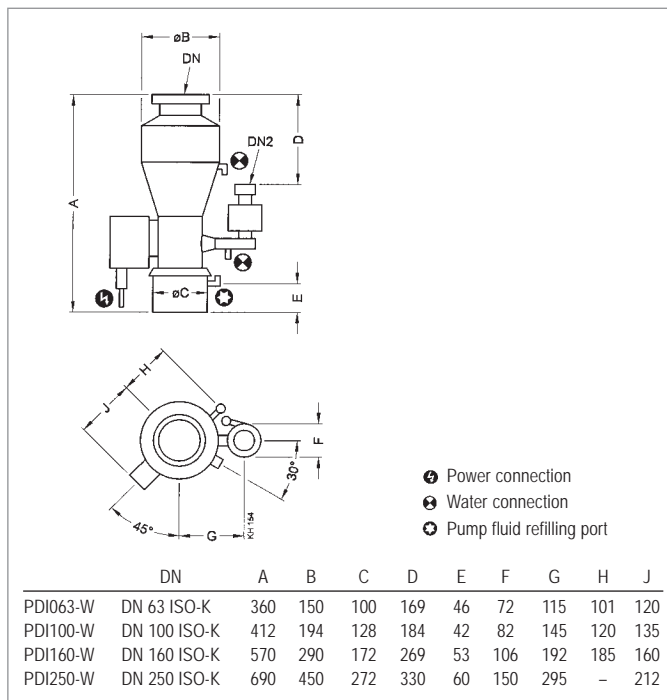
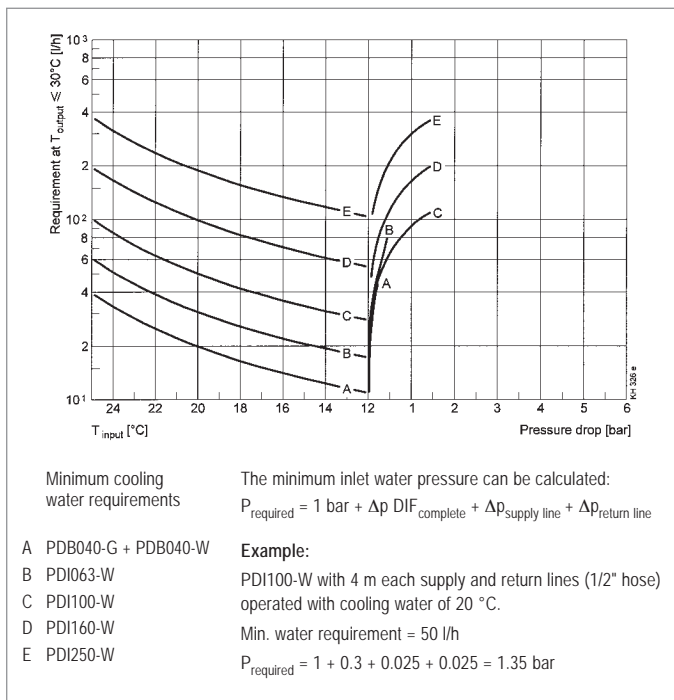
Seal set	BN 841 180-T	BN 841 181-T	BN 841 182-T	BN 841 193-T
Heating ring 230 V	B 5170 218 QG	B 5170 028 QG	B 5170 004 QG + B 5170 057 QG	B 5170 038 QG + B 5170 089 QG ⁴⁾
115 V	B 5170 217 QG	B 5170 027 QG	B 5170 003 QG + B 5170 056 QG	— —

Accessories

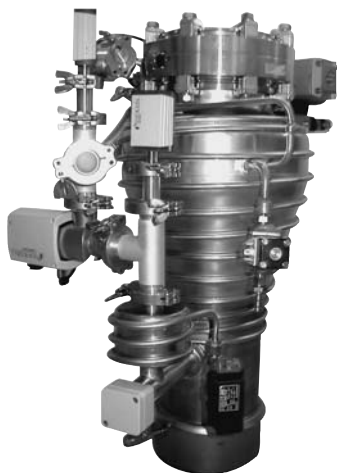
Thermal switch	216-058	216-058	216-058	216-058
Cooling water monitor without fittings	216-059	216-060	216-060	B 4747 111 SE
Orifice for flow monitor	—	—	—	B 4747 308 SE

¹⁾ Values measured according DIN 28427, gauge head calibrated with spinning rotor gauge. Experiments have shown that with other vacuum gauges and/or measuring methods (e.g. AVS) the values are up to 40% higher.

²⁾ Pump fluids to be ordered separately ³⁾ Seal on high vacuum side included in scope of delivery ⁴⁾ 230/208 V



Pump unit or complete manual/automatic pumping systems on request



Automatic



Manual

Diffusion Pumps with Cold Cap or Baffle Cap

- ◆ Rugged design
- ◆ Low ultimate pressure
- ◆ Integrated cold cap reduces oil backstreaming
- ◆ Low pump fluid consumption due to built-in fore vacuum baffle
- ◆ Suitable for mineral oils, silicone oils or pentaphenylether (e.g. Santovac)
- ◆ For high pumping speed and gas flow with baffle cap and without baffle mounted above!



Selection Data

Vacuum connection		DN 320 ISO-K	DN 400 ISO-K	DN 500 ISO-K	DN 500 ISO-K
Pumping speed for air at 10 ⁻⁴ mbar ¹⁾	l/s	3'500	5'000	7'500	6'000
AVS	l/s	5'000	7'500	11'000	9'700

Ordering Information⁵⁾

With cold cap	PDA320-W	PDA400-W	PDA501-W	—
With baffle cap	—	—	—	PDB501-W
3 x 400 V	—	—	—	—
3 x 400 V / 3 x 230 V	260-071	260-081	260-090	260-091

Technical Data

Fore vacuum, max.	mbar	0.5	0.5	0.5	0.5
Pump fluid charge, min. / max.	cm ³	1200 / 1800	2000 / 3000	3000 / 5000	3000 / 5000
Power consumption	kW	4.4	5.4	7.2	7.2
Heating/cooling time	min	17 / 50	28 / 50	25 / 80	25 / 80
Recommended pumping speed for roughing pump ²⁾ at working pressure ³⁾					
> 10 ⁻⁴ mbar	m ³ /h	120	240	250 – 500	250 – 500
< 10 ⁻⁴ mbar	m ³ /h	60	120	120	120
Weight	kg	55	75	180	188

Spare Parts

Seal set	BN 841 071-T	BN 841 070-T	203-000	203-000
Heating plate				
3 x 400 V	—	—	—	—
3 x 400 V / 3 x 230 V	BP 336 740 -T	3 x BP 336 529 -T	3 x BP 336 536 -T	3 x BP 336 536 -T

Accessories

Pump fluid replenishing device	216-061	216-061	216-061	216-061
Temperature switch	216-056	216-056	216-056	216-056
Thermostatic cut-out	216-057	216-057	216-057	216-057
Flow monitor	B 4747 111 SE	B 4747 111 SE	B 4747 111 SE	B 4747 111 SE
Orifice for flow monitor	B 4747 308 SE	B 4747 311 SE	B 4747 311 SE	B 4747 311 SE

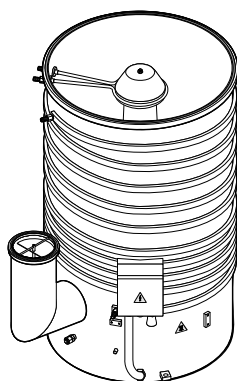
1) Values measured according DIN 28427, gauge head calibrated with spinning rotor gauge.

Experiments have shown that with other vacuum gauges and/or measuring methods (e.g. AVS) the values are up to 40% higher.

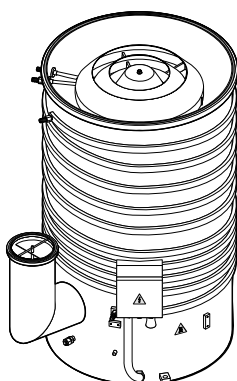
2) Two-stage rotary vane vacuum pumps, or pump combinations of one or two-stage rotary vane vacuum pump and roots pumps, are used as roughing pumps.

3) In continuous operation 4) Incl. baffle cap 5) Seal on high and fore vacuum side included

Diffusion Pumps with Cold Cap



Diffusion Pumps with Baffle Cap



The natural aging process in the cooling water circuit (not including mineral deposits, algae deposits, etc.) is taken into account in the calculation of the minimum water requirements. We recommend operating the pumps with sufficient throughput so that the temperature of the water at the outlet does not exceed 30 °C. Δp of the complete diffusion pump is the pressure drop across the pump, including the cold cap, internal connection lines and connection nipple, but not including the supply and return lines. The pressure can be calculated as follows:

$$\text{Required} = 1 \text{ bar} + \Delta p_{\text{DIF}_{\text{complete}}} + \Delta p_{\text{supply line}} + \Delta p_{\text{return line}}$$

DN 630 ISO-K	DN 630 ISO-K	DN 800 ISO-F	DN 800 ISO-F	DN 1000 ISO-F	DN 1000 ISO-F
15000	13'000 ⁴⁾	23'000	20'000 ⁴⁾	40'000	34'000 ⁴⁾
18000	16'000	30'000	26'000	50'000	40'000

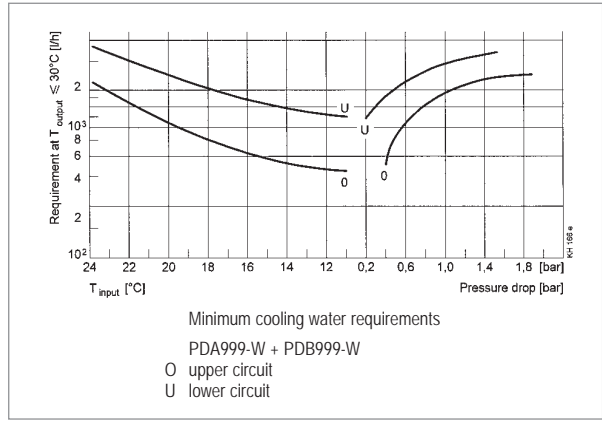
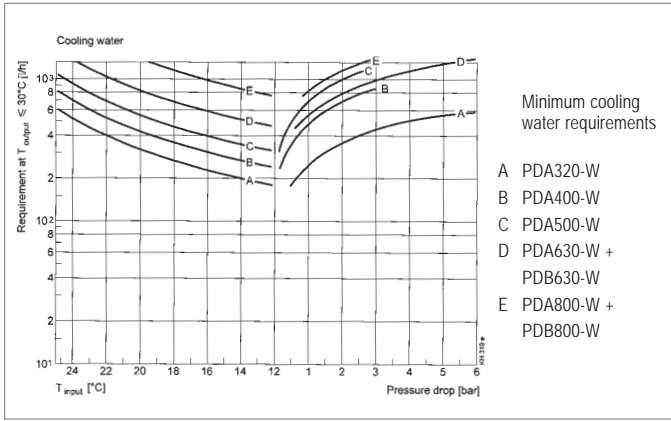
PDA631-W	—	PDA800-W	—	PDA999-W	—
—	PDB631-W	—	PDB800-W	—	PDB999-W
—	—	260-111	260-116	260-121	260-126
260-100	260-105	—	—	—	—

0.5	0.5	0.4	0.4	0.4	0.4
6000 / 8000	6000 / 8000	7000 / 13000	7000 / 13000	16000 / 24000	16000 / 24000
10.5	10.5	17.4	17.4	25.2	25.2
50 / 90	50 / 90	50 / 100	50 / 100	45 / 200	45 / 200
240 – 1000	240 – 1000	500 – 1000	500 – 1000	1000 – 2000	1000 – 2000
170	170	240 – 500	240 – 500	500 – 1000	500 – 1000
250	260	480	495	700	721

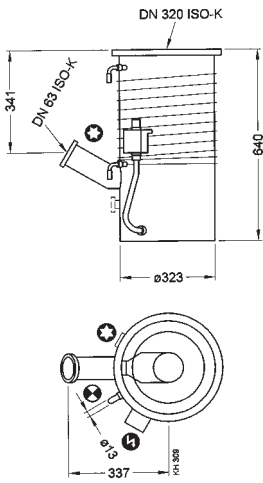
203-009	203-009	BN 841 236-T	BN 841 236-T	BN 841 237-T	BN 841 237-T
—	—	1 x BP 336 233 -T	1 x BP 336 233 -T	7 x BP 336 233 -T	7 x BP 336 233 -T
—	—	+ 6 x BP 336 252 -T	+ 6 x BP 336 252 -T	—	—
7 x BP 336 542 -T	7 x BP 336 542 -T	—	—	—	—

216-061	216-061	216-061	216-061	216-061	216-061
216-056	216-056	216-056	216-056	216-056	216-056
216-057	216-057	216-057	216-057	216-057	216-057
B 4747 111 SE	B 4747 111 SE	B 4747 111 SE	B 4747 111 SE	B 4747 111 SE	B 4747 111 SE
B 4747 311 SE	B 4747 311 SE	B 4747 326 SE	B 4747 326 SE	B 4747 326 SE	B 4747 326 SE

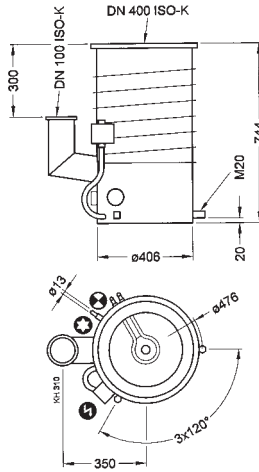
Pump unit or complete manual/automatic pumping systems on request



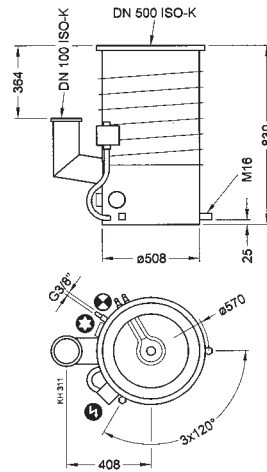
PDA320-W



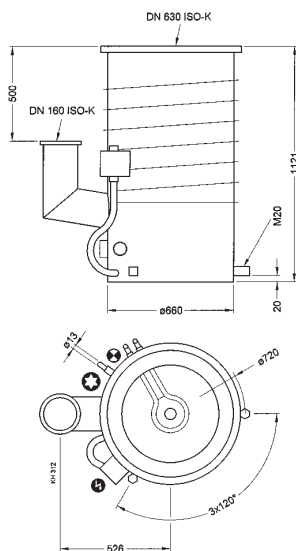
PDA400-W



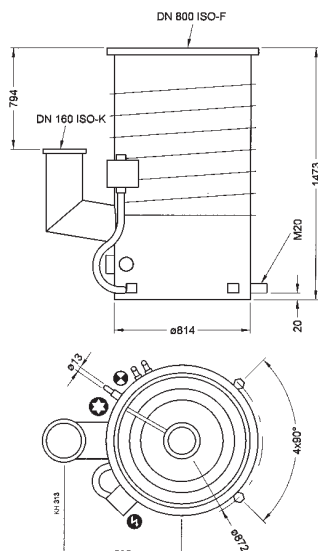
PDA500-W *



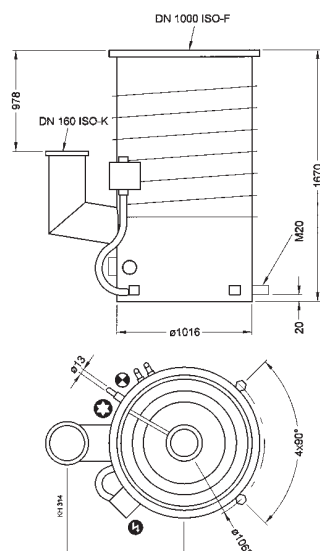
PDA630-W * + PDB630-W *



PDA800-W + PDB800-W



PDA999-W + PDB999-W



* Without groove for retaining ring

- ⚡ Power connection
- ⚙ Water connection
- 👁 Viewport

Pump Fluid

Typical Applications:

- ◆ Ophthalmic coatings
- ◆ Vacuum metallization
- ◆ Vacuum metallurgy
- ◆ Vacuum tube industry
- ◆ Electron beam welding
- ◆ Vacuum chemistry, analytics
- ◆ Isolation vacuum

Attainable ultimate pressure: The ultimate pressures indicated in the table can be attained with correct conditioning of the high vacuum pumping system. They refer to blanked off groups of pumps with an appropriate pumping fluid/baffle combination. The ultimate pressure values shown may be decreased if the gas sources are further reduced.



Selection Data

		Mineral oil	Silicon oil	Silicon oil	Pentaphenylether
Vapor pressure at 20 °C	mbar	$4 \cdot 10^{-8}$	$2 \cdot 10^{-8}$	$4 \cdot 10^{-10}$	$1 \cdot 10^{-10}$
Resistance					
Chemical		good	better	better	very good
Oxidation		good	better	better	very good
Thermal		good	better	better	very good

Ordering Information

Type	66 A	DC 704	AN 175	Santovac 5
500 cm ³	260-390	260-387	260-394	B 0480 559
2000 cm ³	260-391	260-388	260-395	—
5000 cm ³	260-392	260-389	260-396	—

Technical Data

Viscosity at					
20 °C	mm ² /s	25	—	—	—
25 °C	mm ² /s	—	39	175	1000
70 °C	mm ² /s	—	—	—	12
100 °C	mm ² /s	—	—	—	12
Preferred pressure range	mbar	$5 \cdot 10^{-7} - 10^{-3}$	$10^{-7} - 10^{-3}$	$10^{-8} - 10^{-5}$	$10^{-8} - 10^{-3}$
Ultimate pressure with					
LN ₂ cooling	mbar	$< 6 \cdot 10^{-9}$	$< 6 \cdot 10^{-9}$	$< 6 \cdot 10^{-9}$	$< 6 \cdot 10^{-9}$
Machine cooling -20 °C	mbar	$< 6 \cdot 10^{-8}$	$< 3 \cdot 10^{-8}$	$< 3 \cdot 10^{-8}$	$< 3 \cdot 10^{-8}$
Water cooling 20 °C	mbar	$< 4 \cdot 10^{-7}$	$< 6 \cdot 10^{-8}$	$< 3 \cdot 10^{-8}$	$< 3 \cdot 10^{-8}$
Air cooling 25 °C	mbar	$< 1 \cdot 10^{-6}$	$< 5 \cdot 10^{-7}$	$< 2 \cdot 10^{-7}$	$< 2 \cdot 10^{-7}$

Other pump fluid on request.

Pump Accessories

Thermal Switch

- ◆ For interlocking or controlling the pumping system peripheral equipment
- ◆ The thermal relay closes when the diffusion pump is ready for operation

For Diffusion Pumps		PDI063-250-W	PDA320-1000-W PDB500-1000-W
Adjustment range	°C	—	45 – 180 ±5
Switching difference	°C	—	15
Switching point	°C	70	—
Connection	V / A	250 / 16	250 / 10
Contact opens		rising temperature	rising temperature

Ordering Informationen

Thermal Switch	216-058	216-056
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Flow Monitor

- ◆ For monitoring the cooling water flow
- ◆ Flow monitors are installed at the outlet of the cooling water circuit of the diffusion pump

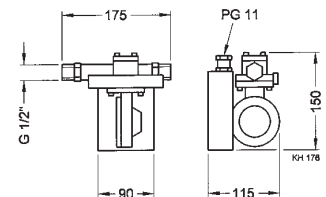
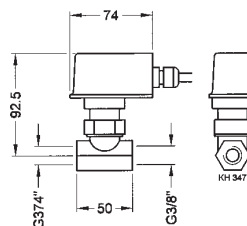
Connection		G 3/8"	G 1/2"
Closing rate, min/max.	l/min	2.2 - 2.9	Depending on the orifice
Switching			
Voltage, V AC/V DC		230 / 30	250 / 30
Current, V AC/V DC	A	1 / 1	10 / 5
Consumption, V AC/V DC	VA / W	26 / 20	—
Pressure (absolute)	bar	25	16
Weight	kg	0.8	3.1

Ordering Information

Flow Monitor	B 4747 434 SS	B 4747 111 SE
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Orifice

1-2 l/min	—	B 4747 303 SE
3-4 l/min	—	B 4747 305 SE
4-8 l/min	—	B 4747 308 SE
8-16 l/min	—	B 4747 311 SE
16-32 l/min	—	B 4747 326 SE



Thermostatic Cut-Out

- ◆ Protects DIF PDA/PDB320 - 1000 from overheating
- ◆ To cut out the electrical Power
- ◆ Manual resetting

Cut-off temperature	190 °C
Current	10 A
Contact	opens at rising temperature
Mounting	2 x M 4
Weight	225 g

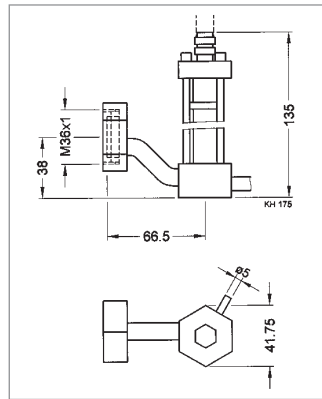
Ordering Information

Thermostatic Cut-Out	216-057
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Pump Fluid Replenishing Device

- ◆ For replenishing pump fluid in processes with high gas throughput
- ◆ Refilling is possible while pump is running
- ◆ Visual level control on the glass tube



Ordering Information

Pump fluid replenishing device	216-061
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Water Baffle

◆ Only water cooled baffle

Water Baffle

Selection Data

Vacuum Connection		DN 320 ISO-K	DN 400 ISO-K	DN 500 ISO-K	DN 630 ISO-K	DN 800 ISO-F	DN 1000 ISO-F
Conductance for molecular flow	l/s	4300	7000	9000	16000	24500	42500

Ordering Informationen

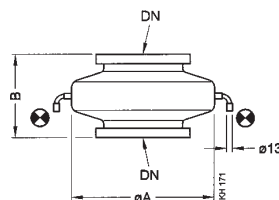
Type	PBW320-S	PBW400-S	PBW500-S	PBW630-S	PBW800-S	PBW1000-S
Order no.	260-260	260-270	260-280	260-290	260-300	260-310

Technical Data

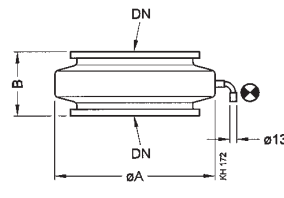
Cooling water consumption ¹⁾	l/h	20	25	32	42	52	65
Weight	kg	15.7	21.8	55	60	152	205

¹⁾ These values are valid for a 3 °C increase in cooling water temperature. In the presence of heat radiation from the high vacuum side, the values increase by a factor of up to 5.

☉ Water connection



Baffle	DN	A	B
PBW320-S	DN 320 ISO-K	460	220
PBW400-S	DN 400 ISO-K	546	245



Baffle	DN	A	B
PBW500-S*	DN 500 ISO-K	688	260
PBW630-S*	DN 630 ISO-K	840	300
PBW800-S	DN 800 ISO-F	1016	340
PBW1000-S	DN 1000 ISO-F	1212	340

* Without groove for retaining ring

Combination Baffle

- ◆ Cooling with R134a or Polycold
- ◆ LN₂ (Liquid Nitrogen) separate cooling circuit
- ◆ Increases the pumping speed for water vapor if cooled with LN₂ or Polycold

Combination Baffle

Selection Data

Vacuum Connection	DN 320 ISO-K	DN 400 ISO-K	DN 500 ISO-K	DN 630 ISO-K	DN 800 ISO-F	DN 1000 ISO-F
Pumping speed for water vapor with LN ₂ cooling l/s	11'000	17'500	24'000	47'000	71'000	110'000
Conductance ²⁾ for molecular flow l/s	3'500	5'500	6'500	12'500	16'500	33'000

Ordering Information

Type	PBC320-X	PBC400-X	PBC500-X	PBC630-X	PBC800-X	PBC1000-X
Order no.	260-265	260-275	260-285	260-295	260-305	260-315

Technical Data

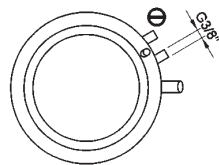
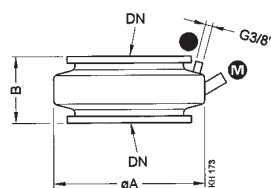
Refrigerator (PCF145-Z, page 12)							
Refrigerator charge (R134a)	g	95	120	140	250	300	380
Cooling time +10 °C / ultimate temp.	min	2 / 15	3 / 18	5 / 20	4 / 13	5 / 15	6 / 22
Attainable ultimate temperature ³⁾	°C	-17 – -20	-13 – -17	-12 – -14	-15 – -18	-12 – -14	-7 – -10
Bakeout temperature with R134a	°C	90	90	90	90	90	90
LN ₂ consumption							
Cooling to -180 °C	kg	3	4.5	6	8	12	25
Continuous operation	kg/h	1.6	2.4	3.6	5.7	7.2	11
Weight	kg	21	26.5	98	117	225	300

Accessories

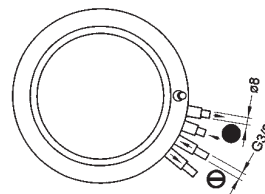
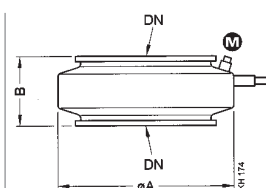
Refrigerator	260-420	260-420	260-420	260-421	260-421	260-421
Automatic LN ₂ supply for Baffles	see page 15					

²⁾ Measured acc. to PNEURO P

³⁾ Without additional heat radiation from external sources



Baffle	DN	A	B
PBC320-X	DN 320 ISO-K	460	220
PBC400-X	DN 400 ISO-K	546	245



Baffle	DN	A	B
PBC500-X*	DN 500 ISO-K	688	260
PBC630-X*	DN 630 ISO-K	840	300
PBC800-X	DN 800 ISO-F	1016	340
PBC1000-X	DN 1000 ISO-F	1212	340

* Without groove for retaining ring

Refrigerator

- ◆ Baffle refrigeration with R134a
- ◆ For baffles with a nominal width of DN 320 to DN 1000
- ◆ Ultimate baffle temperatures of -25 °C to +5 °C are achieved, depending on the size
(see Technical Data combination Baffle)



Selection Data

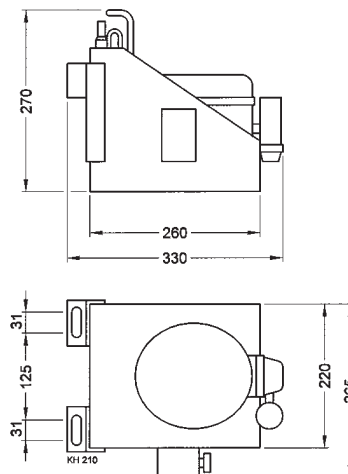
For Combination Baffle PBC . . . -X	320/400/500	630/800/1000
Refrigerant	R134a	R134a
Refrigeration capacity at		
+15 °C	385 W	860 W
-10 °C	140 W	350 W

Ordering Information

Type	PCF145-Z	PCF245-Z
Order no.	260-420	260-421

Technical Data

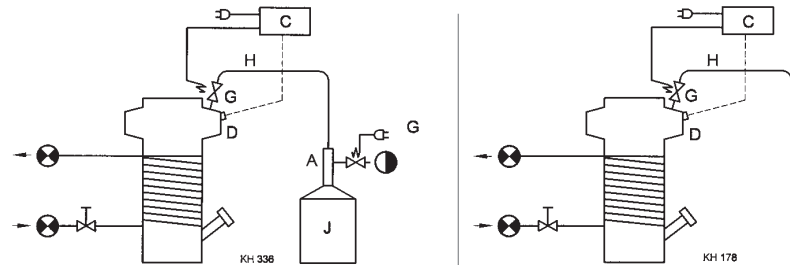
Power requirements		
Voltage	240 V	240 V
Frequency	50/60 Hz	50/60 Hz
Power consumption	145 W	352 W
Motor starting current	8 A	10 A
Cooling water		
Consumption	3 – 8 l/h	7 – 15 l/h
Pressure (overpressure)	11 bar	11 bar
Noise level	39 dB(A)	43 dB (A)
Connections		
Refrigerant	G 3/6"	G 3/6"
Water	ø14	ø14
Weight	15 kg	18 kg



Automatic LN₂ Supply

Selection Data

LN ₂ With For baffle	Dewar vessel PBC320-400-X —	Dewar vessel — PBC500-1000-X	Central supply PBC320-400-X —	Central supply — PBC500-1000-X
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- ⊕ Water connection
- ⊙ Compressed air connection

Ordering Information

Order no.	216-062	216-063	216-064	216-065
Center ring DN 50 KF AL/Viton	211-064	211-064	211-064	211-064
Clamping ring DN 50 AL	211-004	211-004	211-004	211-004

Supply components

A PCB100-A, LN ₂ filling device ¹⁾ , 230 V / 50 Hz	●	●	—	—
C PCF200-Z, LN ₂ control module	●	●	●	●
D LN ₂ sensor PCF190-Z	●	—	●	—
PCF220-Z	—	●	—	●
G Solenoid valve for LN ₂ , 24 V, 50/60 Hz, with fitting for pipe diameter 8/10	●	●	●	●
H LN ₂ line, diameter 8/10 with insulating hose, 1.8 m	●	●	●	●
J Dewar vessel (on request)	—	—	—	—

¹⁾ DN 50 ISO-KF clamping ring and centering ring to be ordered separately

Solenoid Valve for LN₂

- ◆ Solenoid Valve for LN₂ supplies!
- ◆ Valve is closed without current!

Ordering Information

Order no.	BP334488-T
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Technical Data

Input :	8 3/8 Serto	
Output:	Ø 8 mm tube outer diameter	
Supply voltage	24VAC 50-60Hz	
connections	G1/4"	
Mounting position	beliebig	
Nominal width	7 mm	
Material	Valve body	Brass
	Valve seat	Teflon
	Internal parts	stainless steel

This solenoid valve is used for example to control the LN₂ supply together with a LN₂ sensor at the exit of a Meissner trap!



LN₂ Supply for Dewars

- ◆ For feeding LN₂ to the point of use
- ◆ The LN₂ admission is regulated by means of a pressure reducing valve
- ◆ Over pressure relief valve and rupture disc implemented

Selection Data

LN ₂ filling	automatically	manually
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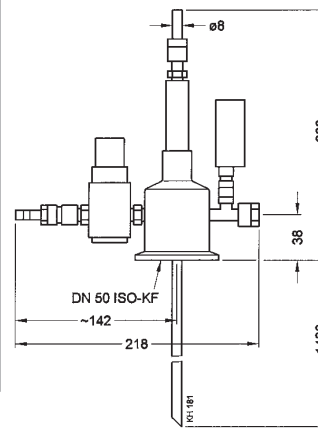
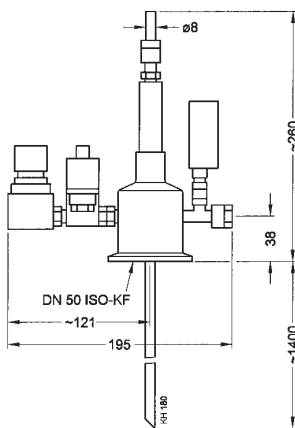
Ordering Information

Type	PCB100-A	PCB100-H
230 V / 50 Hz	260-350	—
115 V / 60 Hz	260-351	—
24 V / 50 Hz	260-352	—
	—	260-355

Technical Data

Air pressure in the supply line ¹⁾	bar	1 – 8	1 – 8
Adjustable pressure in Dewar ¹⁾	bar	0 – 1	0 – 1
Bursting pressure of the rupture disc ¹⁾	bar	1.7	1.7
LN ₂ throughput	l/h	0 – 300	0 – 300
Power consumption	W	8	—
Weight	kg	1.9	1.6

¹⁾ Overpressure



Automatic currentless LN₂ Level Valve

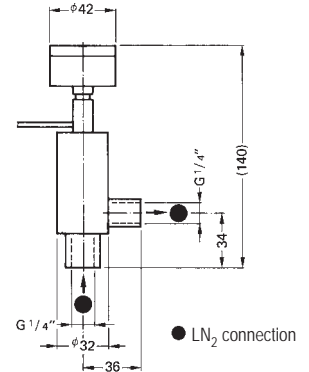
- ◆ For controlling a constant LN₂ level in reservoir cold traps
- ◆ LN₂ flow control on Meissner or port traps
- ◆ Automatic vent valve in large, central LN₂ supply system
- ◆ No power supply required

Ordering Information

Type	PBF101-Z
Order no.	260-360

Technical Data

Flow rate	0 - 300 l/h
Pressure indication on the pressure gauge with	
- Warm probe	4 kp/cm ²
- Cold probe (vacuum)	0 kp/cm ²
Mounting position	vertical (pressure gauge on top)
Weight	350 g



Phase Separator

- ◆ On exit of Meissner or port traps to separate liquid from gaseous nitrogen
- ◆ With PBF101-Z optimized LN₂ consumption

Ordering Information

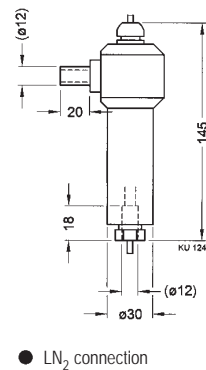
Type	PSU101-Z
Order no.	BP 414 839 -T

Technical Data

LN ₂ entry	6 - 1/4"
LN ₂ exit	MS 12 Nippel
Mounting position	vertical (cable feedthrough on top)
Weight	250 g



Phase Separator



Isolated LN₂ Line

- ◆ Flexibel only in warm status

Ordering Information

Type	ILT 200
Order no.	BP 334 039 -T

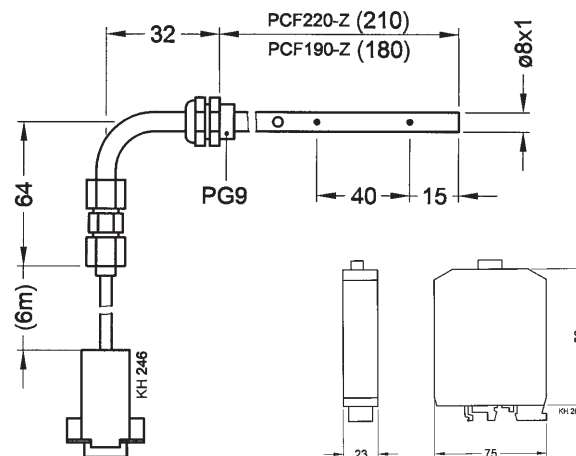
Technical Data

LN ₂ line diameter in/outside	8 / 10 mm
Isolation diameter outside	33 mm
Weight	150 g



Automatic LN₂ Level Control System

- ◆ For controlling LN₂ level in combination baffles DN 320 - 1000
- ◆ One- or two- point level control operation
- ◆ Alarm in case of sensor or cable failure
- ◆ Sensor especially reliable due to patented sensor principle
- ◆ PTC resistor for emergency cooling with refrigerator



Selection Data

For Baffle	—	PBC320-400-X	PBC500-1000-X
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Ordering Information

Type	PCF200-Z	PCF190-Z	PCF220-Z
Control module	260-410	—	—
Sensor	—	260-412	260-413

Technical Data

Control module / supply-voltage, selectable	24 V AC or 24 V DC	—	—
Current consumption with closed valve	100 mA	—	—
Contact rating	2 – 4 A bei 48 V	—	—
DIN standard housing	EN 50022-35	—	—
For mounting rails	EN 500035-G32	—	—
Operating temperature	—	-196 – +50 °C	-196 – +50 °C

Diffusion pump Temperature Measuring

Diffusion pump Temperature Measuring unit for DIF 320 - 1000

- ◆ Existing of : Sensor, feed through and LCD Display unit
- ◆ Simple exchange of the Sensor without venting the DIF
- ◆ 4 - 20 mA output

Ordering Information

Typ	DTM 100
Order no.	H001801

Technical Data

Temperature range	0 - 350 °C
Response time	t 0.5 = 30 sec.
Connection cable	2 m long
Dimension	100 mm long Ø 4mm
	Sensor with 2 m long cable



Temperature Sensor DIF 320 - 1000

- ◆ With spring mechanism for optimized contact
- ◆ Bajonet fixation

Ordering Information

Typ	DTS
Order nr.	H001810

Technical Data

Temperature range	0 - 350 ° C
Response time	t 0.5 = 30 sec.
Connection cable	2 m long
Dimension	100 mm long Ø 4mm



Durchführung in Diffusionspumpen

- ◆ the feed through replaces the blind nut at the oil drain connection

Ordering Information

Typ	DTD
Dif 320 - 1000	H001820

Technical Data

Dimension	130 x Ø8 x Ø6 mm With Bajonet fixation and Swagelok
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Temperature Display DIF

- ◆ DIF oil Temperature display instead of missing Monitor

Ordering Information

Typ	DTA
Order nr.	H001800

Technical Data

Temperature range	0 - 350 ° C
Display	3 1/2 LCD 12 mm high
Accuracy	±0.1% ±1 Digit of F.S.
Temperature drift	<±0.01%/K
output	4 - 20 mA current loop U < 4.5V
Supply voltage	24VDC,
Protection	IP 69K
Mounting rails	Hole distance 110 mm 2 x holes 8.4 mm dia.
Material housing	Inox 1.403
Dimensions	Ø 89 x 46 mm

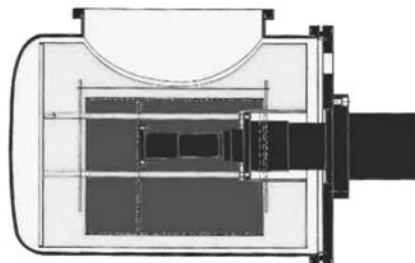


Cryo vacuum pumps

Flange size DN 100 bis DN 160

- ◆ Long up times between regeneration cycles due to big condensation surfaces of the 20 K panel!
- ◆ Small total height in case of the besides position of the main flange .
- ◆ 20K-Panel with charcoal .
- ◆ Any mounting position

Scope of delivery see page 21



Principle

Selection data

Vacuum connection		DN 100 ISO-K DN 100 ISO-CF	DN 160 ISO-K DN 160 ISO-CF
Gas Pumping speeds at 10E-4 mbar	l/sec		
Water vapor		1'100	2'800
Air		480	1200
Argon		400	1'000
Hydrogen		580	1'500

Ordering Information

With Main Flange		ISO-K	VCP 100 VCP 160
Order no.		On request	H10000160-T
In Version Conflat Flange	CF	VCP 100C	VCP 160C
Order no.		On request	H10000162-T

Technical Data

Gas capacities	bar l		
Argon / Air		100	300
Hydrogen (<10E-5)		4	10
Crossover	mbar l	50	140
Cool down time	min	65	85
Time to unfreeze	h		
Without purge gas		ca. 2.5	ca. 3
With heated purge gas		< 1	< 1
Cold Head type		M350CS	CP204S
Compressor type (see sep. techn. Data)		M125W	HC-10
Power consumption total	kW		
During cool down time		1.8	1,8
At Final Temperature		1,5	1,5
Cooling water requirements	l / min	See page 24	See page 24
Weight	kg	25	28 (VCP 160C, 32)

Spare Parts

Seal set for Pump		H000D100	H000D160
Indium Foil		H1501001	H1501001
Kryo Temperature Sensor		H010310	H010310
20K - Panel		H20K0100	H20K0160

Cryo vacuum pumps

Flange sizes DN 200 bis DN 320

Scope of delivery:

- ◆ Pump body
- ◆ 80 K shield
- ◆ 10 K panel
- ◆ Cold head
- ◆ Compressor
- ◆ Over pressure relief valve
- ◆ 2 x 3m He Flexlines
- ◆ Cable compressor cold head
- ◆ Toolkit
- ◆ Temperature sensor with DN16KF feed through

VCP C



VCP



DN 200 ISO-K DN 200 ISO-CF	DN 250 ISO-K DN 250 ISO-CF	DN 320 ISO-K
4'000	7'500	11'000
1'800	3'200	5'000
1'550	2'700	4'000
2'000	4'500	5'000

VCP 200 H10000205-T	VCP 250 H10000255-T	VCP 320 H10000320-T
VCP 200C H10000201-T	VCP 250C H10000251-T	—
		—

700	1600	2000
15	20	27
200	300	450
105	80	135
ca. 4	ca. 5	ca. 6
< 1.5	< 1.5	< 2
CP204S	CH-210	CH-210
HC-10	HC-10	HC-10
3.3	8.2	8.2
3.0	6.0	6.0
See page 24	See page 24	See page 24
35	45	55

H000D200	H000D250	H000D320
H1501001	H1501001	H1501001
H010310	H010310	H010310
H20K0200	H20K0250	H20K0320

Cryo pumps

Flange sizes DN 400 bis DN 630

Scope of delivery:

- ◆ Pump body
- ◆ 80 K shield
- ◆ 10 K panel
- ◆ Cold head
- ◆ Compressor
- ◆ Over pressure relief valve
- ◆ 2 x 3m He Flexlines
- ◆ Cable compressor cold head
- ◆ Toolkit
- ◆ Temperature sensor with DN16KF feed through

Principle



VELCO DN 400 / 500 / 630



Selection data

Vacuum connection	DN 400 ISO-K	DN 500 ISO-K	DN 630 ISO-K
Gas Pumping speeds at 10E-4 mbar l/sec			
Water vapor	18'500	27'000	45'000
Air	8'000	12'000	16'500
Argon	6'800	8'500	13'500
Hydrogen	7'500	9'100	10'000

Ordering Information

With Main Flange Order no.	ISO-K	VELCO 400 H10000415-T	VELCO 500 H10000516-T	VELCO 630 H10000615-T
Special version Order no.				

Technical Data

Gas capacities	bar l			
Argon / Air		8000	10000	15000
Wasserstoff (<10E-5)		38	38	50
Crossover	mbar l	750	750	900
Cool down time	min	100	105	150
Time to unfreeze	h			
Without purge gas		6	6	8
With heated purge gas		< 2	< 2	< 3
Cold Head type		CH-210	CH-210	CH-210
Compressor type (see sep. tecn. Data)		HC-10	HC-10	HC-10
Power consumption total	kW			
During cool down time		8.2	8.2	6.5
At Final Temperature		6.0	6.0	6.0
Cooling water requirements	l / min	See page 24	See page 24	See page 24
Weight	kg	40	45	85

Spare Parts

Seal set for Pump	H000D400	H000D500	H000D630
Indium Foil	H1501001	H1501001	H1501001
Kryo Temperatur Sensor KTS 100	H010310	H010310	H010310
20K - Panel	H20K0400	H20K0500	H20K630

Cryo vacuum pumps

Flange sizes DN 800 und DN 1000

Scope of delivery DN 800:

- ◆ Pumping body
- ◆ 80K-shield
- ◆ 20K Panel
- ◆ 2 x cold heads
- ◆ 2 x Compressors
- ◆ 2 x Temperature sensor with DN16KF feed through
- ◆ Overpressure relief valve
- ◆ 4 x 3 m Flexlines
- ◆ Toolkit
- ◆ 2 x Cable compressor cold head



Selection data

Vacuum connection		DN 800 ISO-F	DN 1000 ISO-F
Gas Pumping speeds at 10E-4 mbar	l/sec		
Water vapor		75'000	110'000
Air		28'000	45'000
Argon		24'000	38'000
Hydrogen	25'000	40'000	

Ordering Information

With Main Flange	ISO-F	VELCO 801	VELCO 1000
Order no.		H10000800-T	On request
special Version			
Order nr.			

Technical Data

Gas capacities		bar l	
Argon / Air		20000	22000
Hydrogen (<10E-5)		100	120
Crossover	mbar l	1500	1500
Cool down time	min	180	190
Time to unfreeze	h		
Without purge gas		8	8
With heated purge gas		< 3	< 3
Cold Head type		2 x CH-210	3x CH-210
Compressor type (see sep. tecn. Data)		2 x HC-10	3 x HC-10
Power consumption total	kW		
During cool down time		2 x 8.2	2 x 8.2
At Final Temperature		2 x 6.0	2 x 6.0
Cooling water requirements	l / min	See page 24	See page 24
Weight	kg	260	ca. 310

Spare Parts

Seal set for Pump	H000D800	H00D1000
Indium Foil	H1501001	H1501001
Kryo Temperature Sensor	H010310	H010310
20K - Panel	H20K800	H20K1000

Helium Compressors for Cryo vacuum pumps DN 100 up to DN 1000

- ◆ For each cryo vacuum pump the optimized Compressor power!
- ◆ Rugged design and for high lifetime optimized construction!
- ◆ Low noise
- ◆ Remote control and surveillance via interface
- ◆ Easy maintenance and Field service in shortest possible time!



Selection data

Use on the mentioned Cryo vacuum pumps:	VCP 100	VCP160 / 200 / 250 / 320 VELCO 400 / 500 / 630 / 801 / 1000
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Ordering Information

Type	M125W	HC-10
Order no.	H10100125	H0451580
aircooled version	On request	On request
Order no.		

Technical Data

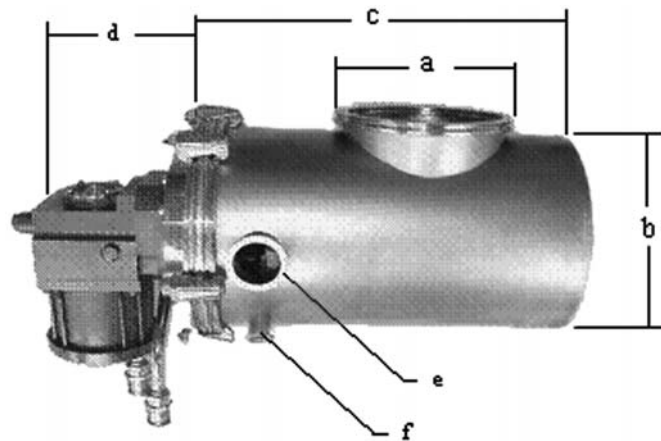
Power consumption:	kW		
During cool down		1.8	8.2
At final Temperature		1.5	6.5
Voltage / Frequency	V / Hz	210/240 / 50Hz	3 x 380 / 415 ; 50 / 60 Hz
Current	A	208/230 / 60Hz	Other Voltages on request
Helium filling pressure, static	bar	13.0 ± 0.5	14.5 ± 0.5
	psi	190 ± 7	210 ± 5
Helium Gas flow	(50Hz) < sm ³ /h		28 88.5
Absorber Exchange After	h	13000 / 60Hz	13000 / 60Hz
		15500 / 50 Hz	15500/ 50 Hz
Cooling water consumption (at 15°C)	l / min	3	8
Noise level (at 1m Distance)	dBA	< 75	< 65
Dimensions			
Width x Height x Depth	mm	495 x 406 x 483	446 x 567 x 453
Weight	kg	68	98
Connections:			
He- supply; self sealing coupling		aeroquip male # 6	aeroquip male # 8
He - return, self sealing coupling		aeroquip male # 6	aeroquip male # 8
He - Refill, self sealing coupling		aeroquip male # 4	aeroquip male # 4
Cooling water, Hose Ø	in	1/2	3/4

Spare parts

Absorber		H0100031-T	H0100052-T
Cable compressor cold head	3m	H0452101-T	H0452103-T

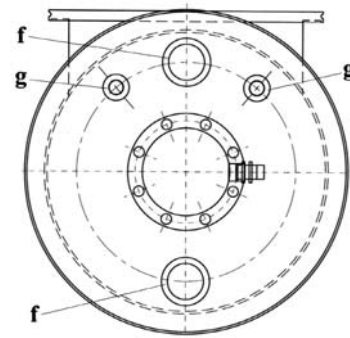
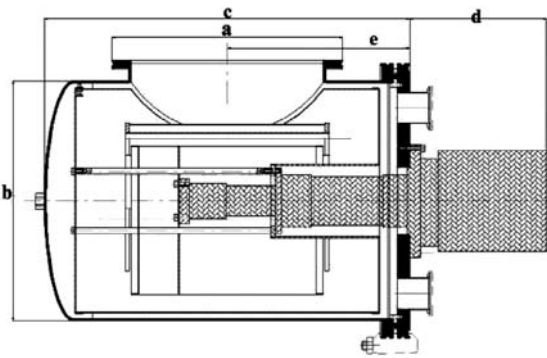
Dimension of Cryo vacuum pumps DN100 up to DN 160 ISO-K / CF

	VCP 100	VCP 100C	VCP 160	VCP 160C
a	DN 100 ISO-K	DN 100 CF	DN 160 ISO-K	DN 160 CF
b	ca 483	ca 483	DN 200	220
c	DN 160	DN 160	370	373
d	130	130	198	198
e	2 x DN 40 KF	2 x DN 40 CF	2x DN 40 KF	2 x DN 40 CF
f	2 x DN 16 KF	2 x DN 16 CF	2x DN 40 KF	2 x DN 16 CF



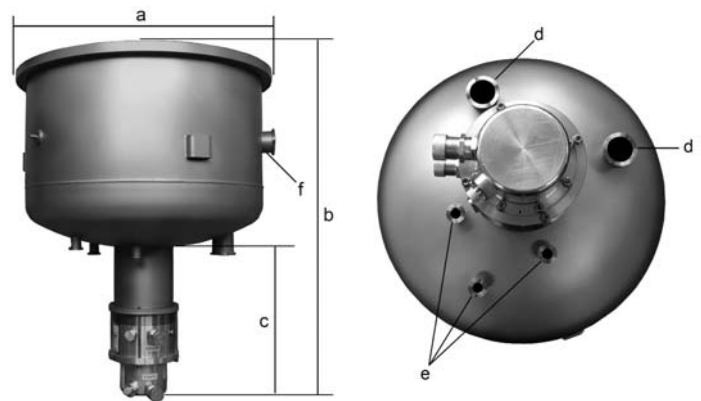
Dimension of Cryo vacuum pumps DN 200 up to DN 320

	VCP 200	VCP 200C	VCP 250	VCP 250C	VCP 320
a	DN 200 ISO-K	DN 200 CF	DN 250 ISO-K	DN 250 CF	DN 320 ISO-K
b	DN 250	DN 250	DN 320	DN 320	DN 400
c	380	385	505	505	550
d	198	198	177	177	177
e	185	185	250	250	270
f	1 x DN 40 KF	2 x DN 16 CF	DN 40 KF	DN 40 CF	DN 40 KF
g	1 x DN 40 KF	1 x DN 40 CF	DN 16 KF	DN 16 CF	DN 16 KF



Dimension of Cryo vacuum pumps DN 400 up to DN 630

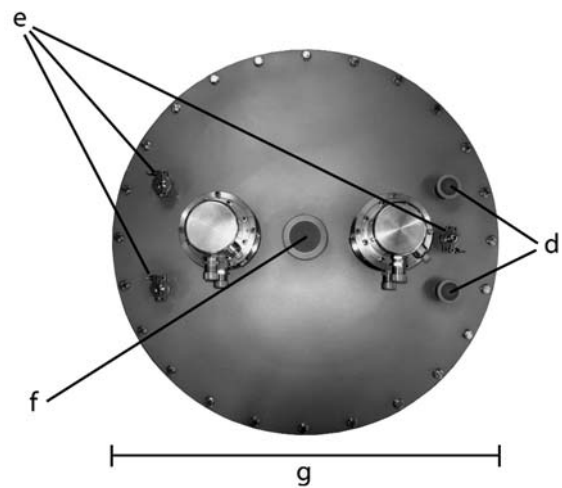
	VELCO 400	VELCO 500	VELCO 630
a	DN 400 ISO - K	DN 500 ISO - K	DN 630 ISO - K
b	680	680	~ 750
c	330	350	~ 400
d	2 x DN 40 KF	2 x DN 40 KF	1 < x DN 63 ISO-K
e	3 x DN 16 KF	3 x DN 16 KF	2 x DN 16 KF
f	DN 40 KF	DN 40 KF	DN 40 KF



Changes in Dimensions are possible without notice!

Dimension of Cryo vacuum pumps DN 800 and DN 1000

	VELCO 801	VELCO 1000
a	DN 800 ISO - F	DN 1000 ISO - F
b	680	~ 840
c	330	~ 360
d	2 x DN 40 KF	2 x DN 40 KF
e	3 x DN 16 KF	3 x DN 16 KF
f	DN 63 ISO-K	DN 63 ISO-K
g	920	1120



Cryo vacuum pump Accessories

Kryo Temperature Measuring system with Sensor

- ◆ Measuring accuracy with high resolution
- ◆ Digital LED Measuring unit with 4 adjustable Thresholds for the outputs
- ◆ DN 16 KF feed through



Ordering Information

KTC 100 Kryo stress stripes Temperature Measuring system (complete)	H106100
3 1/2 LED Monitor KTM 100	H106080
Cryo Temperature Sensor (4 cables) KTS 100	H010310
Connection cable with feed through to the Sensor	H214111
Connection cable to the feed through	H6020701-T

Technical data

Temperature display range	4 - 325 K
Measuring accuracy and resolution	0.1% ±1 Digit, 15bit
Switching outputs, 4 two way contacts	250V 3A; Hysteresis and threshold adjustable
Analog output	4 - 20 mA / 0 - 10 V
Supply voltage	230 V 50Hz ca. 7VA
Protection front / backside	IP 65 / IP 20

Computer Interface for Sensors

Order Information

Measuring Transducer IFR100 1 x Sensor	H111420
Measuring Transducer IFR102 2 x Sensors	H111422

Technical Data

Installation	Rack rails
Connection of the Sensor	Screw bar
Analog Output:	4 - 20 mA
Supply Voltage	24VDC



Pressure Reducing Valve to Helium Bottle

- ◆ Reduces the Helium pressure from the Steel Bottles with 200 bar adjustable to the Service Adapter from 0 up to 50 bar to refill the compressor or a cold head

Order Information

Pressure Reducing valve	H1110025
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Technical Data

Primary Pressure	bar	200
Secondary Pressure	bar	0 - 50
Connection Input		W 21.8 x 1/14
Connection Output		G 1/4



Helium - Flexlines

Order Information

3 m Flexlines NW20/12, S5	H00020020
3 m Flexlines NW16/8 S5	H02003016
3 m Flexlines NW10/4 S5	H02003010
Connection hose from Helium pressure reducing valve to the cryo Service adapter, incl. coupling to the Helium pressure reducing valve!	H0200006
Hose to exchange Oil on helium compressors (Balzers, CTI und ASC)	H0200005-T
Flexline to refill Helium on compressor, NW12/6, 1,5m (Balzers Compressor)	H02003006



Technical Data

Flexible Metal hoses in all Dimensions up to 12 m length can be delivered on request. S5 =female , S2 = male

On request are different sizes of the Aeroquip couplings deliverable!

Purge Gas Heater for quick-regeneration on cryo vacuum pumps

- ◆ Time saving regeneration

Order Information

Complete set with feed through Adapter for DN 16KF:	
- 24V 50/60 Hz Valve	H12001124
- 24VDC Valve	H12000014
Heater 230 V	H12000220
Heater 115V	H12000115
Purge gas valve 230V	H12000015

Technical Data

Suggested Data	
Purge Gas :	N2 oder AR
Purge Gas pressure :	Max. 3 bar
Gas consumption for each Regeneration, depends on the size of the pump!	Ca. 1 - 3 m3
Purge Gas heating Temperature :	ca. 60°C
Purge Gas connection :	Ø3/8 inch.
Purge Gas connection of the pump :	DN16KF
Electrical Data:: Valve Voltage	24 VAC oder VDC, 220 VAC
Heater Supply Voltage	220 VAC
Heater Power	100 Watt



Cryo Service Adapter

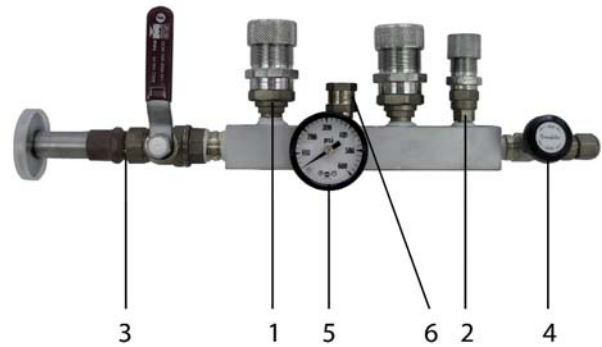
- ◆ necessary for Maintenance and Service
- ◆ to evacuate and vent the Helium in Cryo pump Systems

Order Information

Cryo Service-Adapter	H1013400
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Technical Data

Existing of:	1 2 x Aeroquip NW16/8 male
	2 1 x Aeroquip NW10/4 male
	3 DN25KF Flange to for vacuum pump with ball valve
	4 Hose connection to the He-bottle with Hand valve
	5 He- pressure manometer to 600 psi
	6 Safety and overpressure relief valve



Adapter to Aeroquip connectors

- ◆ To adapt to different sizes of Flexlines
- ◆ At existing Flexlines
- ◆ To evacuate or deplete the compressor and other things (Flexlines, cold heads etc.)

Order Information

NW 20/12 female to NW 16/ 8 male	H5452852-T
NW 20/12 male to NW 16/ 8 female	H5458212-T
NW 16/8 female discharge	H5458213-T



Tool Box

Order Information

Tool Box ①	H1010010
Fork wrench to Aeroquip coupling size 12 ②	H1110020
Fork wrench to Aeroquip coupling size 8 ②	H1110019

Technical Data

Included in the scope of delivery of each cryo vacuum pump!



Leak Spray

- ◆ for simple and quick Helium Leak check or detection on:
 - Connections
 - Flexlines and fix piping
 - in Helium Compressor
- ◆ the alternative to a Helium Leak detector

Order Information

Leak Spray Bottle 400 ml	H1110026
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Technical Data

Power gas is compressed air, Further it has a corrossions retardant effect !



Absorber to different Compressors

Order Information

ASC for 450W/A	H0100030-T
ASC for M125 W	H0100031-T
APD SHI for 1L/R02W	H0100051-T
APD SHI for HC-10	H0100052-T
APD SHI for HC-4	H010256390
Balzers UCC064	H0100041-T
CTI Compressors for M 8500 / M8510 / M 8200 / SC	H0100020-T
CTI M9600	H0100021-T
CTI MC	H8080265
CTI Cryodrive 3	H970200
Leybold to RW4000/6000	On request
Leybold touAD-RW2/3	On request



Compressor Oil

Order Information

Oil for Helium - Compressor 1 l Pack	H0100050-T
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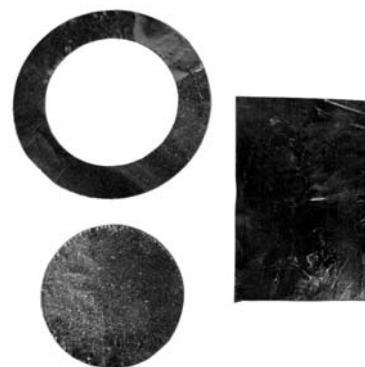


Indium Foil

- ◆ Thermal conduction foil for 80 K and 20 K Panel

Order Information

Indium Foil, 100 x 100 x 0.1mm	H1501001
Indium Foil for APD 208 -R	H1500110
Indium Foil for APD CH-210	H1500210
Indium Foil for APD CH-204	H1500204



Seal set to the cold heads

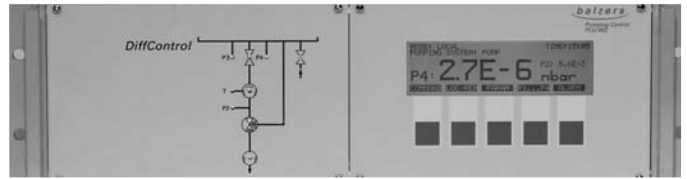
Order Information

APD	On request
CH 208R	On request
CH 210	On request
CH 204	On request



Pumping System Controller

- ◆ Controller for pumping systems DN 063 to DN 1000
- ◆ Remote control and monitoring via digital inputs and outputs or RS 232 C
- ◆ Status view with mimic display
- ◆ Error indication, time and reason stated
- ◆ Menu guided parameterization



Pressure display: The main display indicates the pressure relevant in the actual operating mode. The secondary display indicates the pressure of one of the vacuum gauges selected at will.

Programmable parameters: Upper and lower switching point of all four vacuum gauges as well as the system times, e.g. maximum roughing time, heat-up and cool down time of the diffusion pump.

Selection Data

Controller type	Diffusion Pump
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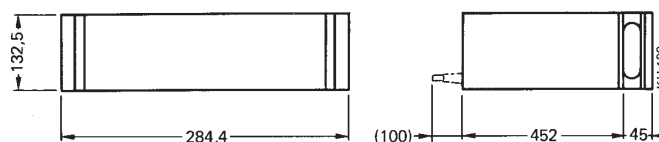
Ordering Information

Type	PCA600-Z
Pumping system controller	on request 1) 2) 3)
Mimic display for two valves	260-401

Technical Data

Input	
Analog	4 compact gauges (Pfeiffer Vacuum or Inficon)
Digital	16
Interface	
Integrated	RS 232C
Optional	RS 485
Output	
Analog	4 x 0 – 10 V
Digital	16 x 24 / 1 V DC / A
Power unit, integrated	7 kW ²⁾
Supply (controller)	
Voltage	230 / 50 V / Hz ³⁾
Consumption	340 VA
Weight	13.6 kg

- 1) The exact configuration of the PCA600-Z depends on the pumping unit and has to be defined.
- 2) Pumping systems over 7 kW are controlled by the PCA600-Z with external relays for motors and diffusion pump heater.
- 3) Other voltages on request



Titanium Sublimator

- ◆ Working range $5 \cdot 10^{-5}$ mbar up to 10^{-12} mbar
- ◆ Base pressure in the 10^{-12} mbar range
- ◆ High pumping speed for chemically active gases



Titanium Sublimator

Selection Data

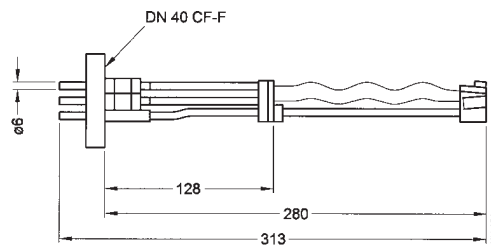
Connection flange	DN 40 CF-F
Sublimation filaments	3
Titanium Sublimator	Ti-Mo

Ordering Information

Type	PSU040-T
Titanium sublimator	260-430
Sublimation wire, set of 12 pcs	260-431
Spare parts set	260-432
1 Seal set copper DN 40 CF, 10 pcs	BN 845 036 -T
1 Seal set sopper DN 40 CF, silverplated, 10 pcs	BN 845 042 -T

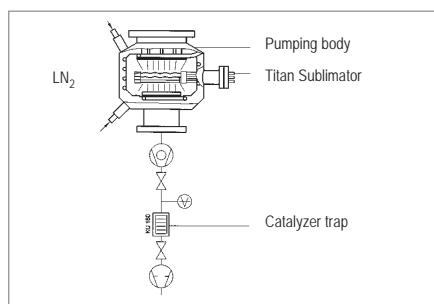
Technical Data

Usable titanium quantity	3 x 1.2 g
Sublimation rate, max.	0.2 g/h
Operating data	
Voltage	3 – 6 V
Current	30 – 50 A
Connected load, max.	0.3 kVA
Bakeout temperature, max.	450 °C
Weight	0.6 kg



Specific Pumping Speed

In UHV systems titanium sublimation pumps are used as supplementary pumps for gases which react chemically with titanium.

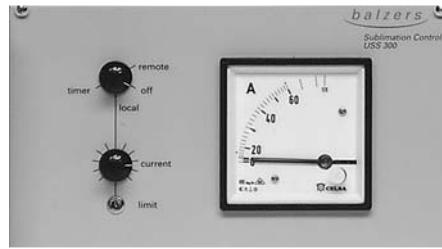


Approximate value of a freshly coated surface 10^{-6} mbar

Gas Type	H2	N2	O2	CO	CO2	H2O
Getter layer temperature of 20 °C l/s cm ²	3	5	9	9	8	3
-195 °C l/s cm ²	9	9	11	11	9	14

Controller

- ◆ Manual or remote control of 1 titanium sublimator with 3 filaments
- ◆ Remote control (RS 232) with PCU 306/312 of each 6 or 12 titanium sublimators with each 3 filaments
- ◆ With PCU 306/312 it is possible to measure/control in remote the current of each filament (optional)
- ◆ To avoid short lifetime of the filaments and pressure rise the high current will be ramped up during 30 seconds



Controller

Selection Data

Sublimators	1	6	12
Heating voltage	0 – 6 V	0 – 6 V	0 – 6 V
Heating current, max.	50 A	50 A	50 A
Run-up time	30 s	30 s	30 s
RS 232/485	–	yes/on request	yes/on request

Ordering Information

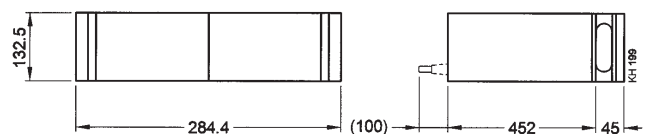
Typ	PCU300-T	PCU306-T	PCU312-T
Controller 90 – 240 V			
230 V	260-365	TCU30600	TCU31200
115 V	260-366		
Cable PSU – PCU300-T (2 pcs. required)			
2 m	B 4564 491 AD		
5 m	B 4564 491 AC		
12 m	B 4564 491 AF		
Transformer in housing incl. high current cables 0.25 m (for each sublimator)		203-025	203-025

Technical Data

Voltage	115/230 V	90 – 240 V	90 – 240 V
Frequency	50 – 60 Hz	50 – 60 Hz	50 – 60 Hz
Power consumption	0 – 350 VA	60 VA	60 VA
Protection	IP23	IP23	IP23
Weight PCU	16.5 kg	9 kg	9.5 kg
Weight trafo in housing		7 kg	7 kg

Integrated Timer – Option

- ◆ For PCU 300-T



Selection Data

Time ranges	7
Programmable	0.05 s – 10 h

Ordering Information

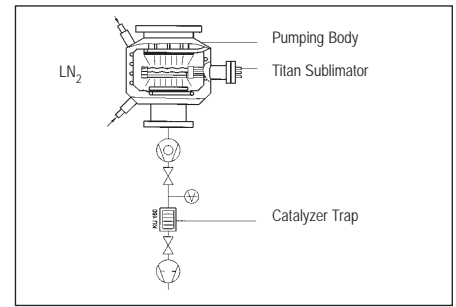
Order no.	B 4779 251 GM
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Technical Data

Weight	0.15 kg
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Pumping Body

- ◆ Additional pumping speed for turbo or ion getter pumping units
- ◆ Effective water vapor condenser with LN₂ cooling



Selection Data

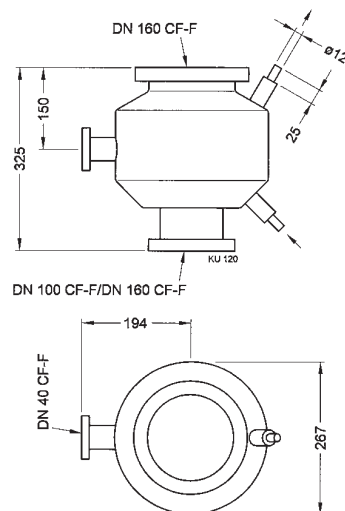
Connection Flange			
Vacuum chamber	DN 160 CF-F	DN 160 CF-F	DN 250 CF-F
High vacuum pump	DN 100 CF-F	DN 160 CF-F	DN 250 CF-F
Titan sublimator	DN 40 CF-F	DN 40 CF-F	DN 40 CF-F

Ordering Information

Type	PSU100-T	PSU160-T	PSU250-W
Order no.	260-440	260-445	TU 250100

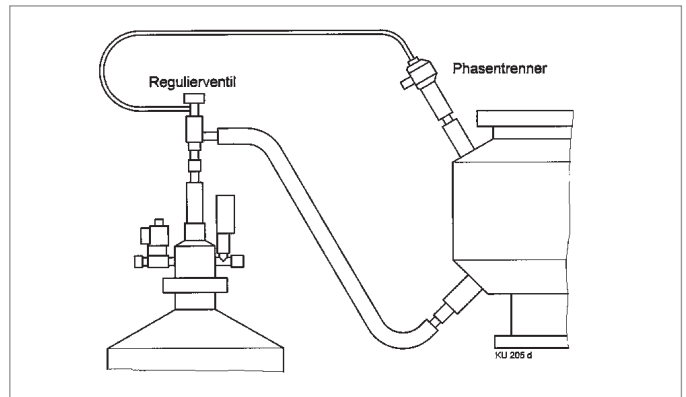
Technical Data

Conductance	l/s	500	600	2000
Mounting orientation		any	any	any
Pumping speed on vacuum chamber for				
H ₂ O vapor (LN ₂ cooling)	l/s	1500	1500	
N ₂ /H ₂ (titan sublimation, LN ₂ cooling)	l/s	1300/3600	1300/3600	
only Water Cooling N ₂ /H ₂	l/s			2200/3700
Bakeout temperature	°C	400	400	400
Consumption of liquid nitrogen for initial charge at room temperature, approx.	kg	2	2	water cooled
Per hour of cont. cooling, approx.	kg	1.4	1.4	—
Cooling time from room temperature to 77K at 0.4 bar	min	8	8	
Materials				
Housing, flanges		Stainless steel	Stainless steel	Stainless steel
Getter surfaces		Copper	Copper	Copper
Weight	kg	14	15	24



LN₂ Supply for Pumping Body

- ◆ Current-less automatic LN₂ supply
- ◆ Regulated constant liquid level with phase separator

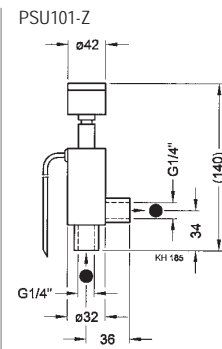
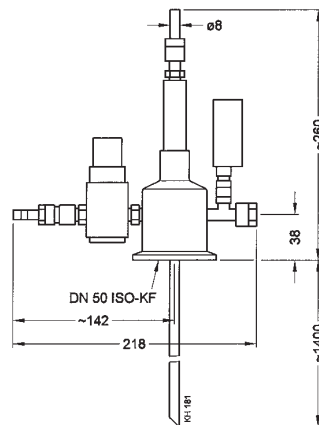


Ordering Information

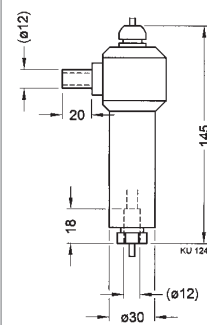
	LN ₂ -Filling Device	LN ₂ Control Valve
	PCB100-H	with Phase Separator PSU101-Z and LN ₂ line
	260-355	260-361

Technical Data

Compressed air in the supply line, overpressure, min.	bar	1	1
Operating pressure, adjustable/recommended	bar	0.1 - 1	0.4
Sensor length	m	2	2
Weight PCB + PSU	kg	2.3	2.3



Phase separator



● LN₂ connection

Catalyzer Trap

- ◆ Eliminates hydrocarbon backstreaming from rotary vane pumps
- ◆ Catalytic combustion technology reduces hydrocarbon levels by a factor of at least 1000
- ◆ Continuous maintenance-free operation — costs less to operate than a zeolite trap
- ◆ No regeneration required due to self-regeneration during venting and pump down
- ◆ Over two years of operation with one filling



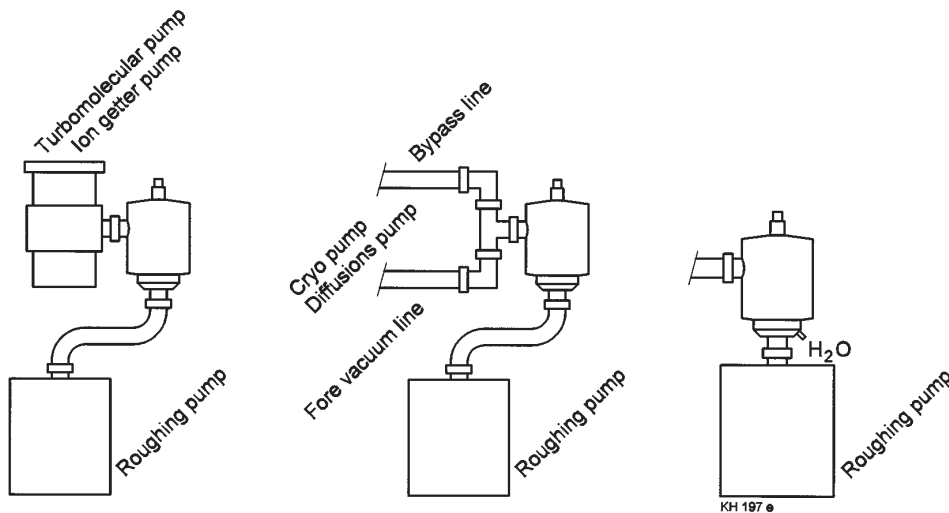
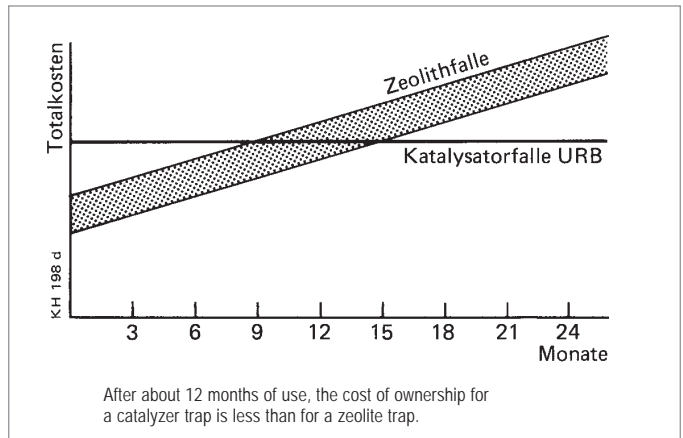
Eliminate back streaming hydrocarbons in your vacuum system with the catalyzer traps. Just place the trap between your roughing pump and the vacuum chamber or the high vacuum pump.

Potentially damaging and contaminating oil vapors are eliminated by catalytic combustion into the gases CO₂ and H₂O which are harmlessly pumped down.

The catalyzer operates at elevated temperatures of approx. 250 °C and automatically regenerates itself with the oxygen in the air each time the vacuum system is vented and pumped down.

The traps do not adsorb gases so they have a very short uptime, unlike zeolite traps which require frequent, time consuming regeneration.

The catalyzer trap can not to be used for synthetic oils.



Selection Data

Connection flange	DN 25 ISO-KF	DN 40 ISO-KF	DN 160 ISO-K
Cooling	—	Water	—

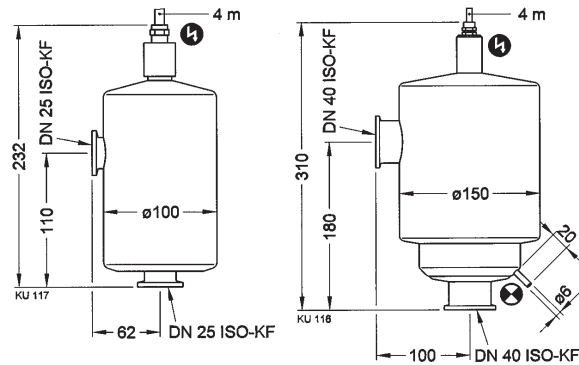
Ordering Information

Type	PTR025-U	PTR040-U	PTR160-U
100 V	260-373	—	on request
110/115 V	260-372	260-382	on request
230/240 V	260-370	260-380	BPB12300
208 V	260-371	260-381	on request
1 catalyzer filling	216-106	216-107	216-108

Technical Data

Mounting orientation				
Normal operation		any	any	any
With water cooling		—	vertical	—
Conductance at $1 \cdot 10^{-2} / 1 \text{ mbar}$	l/s	3 / 9	9 / 45	220 / 1500
Power consumption	W	25	50	200
Lifetime of one filling, normal operation	Years	2	2	2
Catalyzer charge	gr	210	480	4600
Cooling water consumption, approx.	l/h	—	5	—
Weight incl. catalyzer filling	kg	1.8	3.6	14.5

- ⚡ Power connection
- ⊕ Water connection





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