TRIVAC B, Two-Stage Rotary Vane Vacuum Pumps TRIVAC D 4 B to D 65 B

The TRIVAC B is part of the well-proven TRIVAC concept.
The TRIVAC B pumps with their comprehensive range of accessories have proven themselves time and again as rugged pumps in many and varied applications.

The inner body is assembled from individual parts without sealing components. The parts are pinned in order to ensure easy disassembly and reassembly of the parts.

All pumps from the D 4 B to the D 25 B model are equipped either with single-phase or three-phase motors. D 40 - 65 B models are equipped with three-phase motors.

In the TRIVAC B, the pump unit and the motor are linked by an elastic coupling.

The TRIVAC B range is a modular system which divides into three groups:

TRIVAC 4/8 Series
TRIVAC 16/25 Series
TRIVAC 40/65 Series

Advantages to the User

- All basic models (single-phase and three-phase motor) are certified in accordance with 94/9/EG (ATEX) (Category 3 inside)
- High water vapor tolerance
- Continuous operation even at 1000 mbar
- Built-in oil pump; pressure-lubricated sliding bearings
- All controls as well as the oil sight glass are located on the front face
- Either vertical or horizontal intake and exhaust ports
- Exchangeable inner body
- Anti-suckback valve controlled via the oil pressure
- Free of yellow metals
- Service-friendly
- Ideal as backing pump for medium and high vacuum applications, because of low oil backstreaming
- Highly leaktight (^{4}He-capable)

Typical Applications

See chapter “General, Applications and Accessories”.

Supplied Equipment

Small flanges, centering and clamping rings. The intake flange contains a dirt trap.

A carrying handle is standard for all pumps up to the D 25 B. TRIVAC B pumps with single-phase motors are delivered with ON/OFF switch, mains cord and main plug, ready for immediate operation.

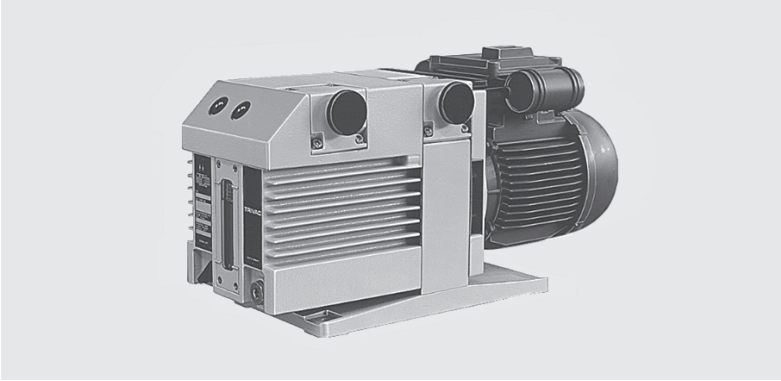
Standard TRIVAC B pumps come with a filling of oil LEYBONOL LVO 100, others with special oil fillings can be specified.

All pumps are 100% subjected to a vacuum test before delivery!

Custom Models

- ATEX (Category 3 inside and 3 outside)
- Brake fluid
- Oils for refrigerating machines, e.g. ester oils for refrigerant circuits with R 134 a
- Pressure burst resistant (for the new refrigerants propane and isobutane)
- ^{3}He-tight (for cryostats)
- Special motors

TRIVAC D 16 B-DOT to D 40 B-DOT



The TRIVAC B-DOT pumps operate with brake fluid (DOT 4) as the sealing and lubricating agent. Therefore these pumps are equipped with EPDM seals. EPDM is highly compatible with brake fluid.

Advantages to the User

- Matching exhaust filters with EPDM gaskets (AF-DOT)
- Except for the seals and the fluid the TRIVAC B-DOT pumps are identical to the oil sealed TRIVAC B pumps

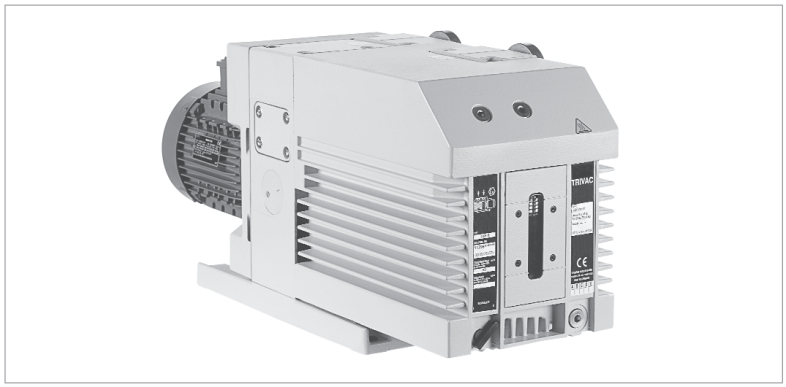
Typical Applications

- For filling of brake fluid circuits in the automotive industry

Supplied Equipment

- The brake fluid is inside the pump when shipped

TRIVAC D 65 B ^{3}He



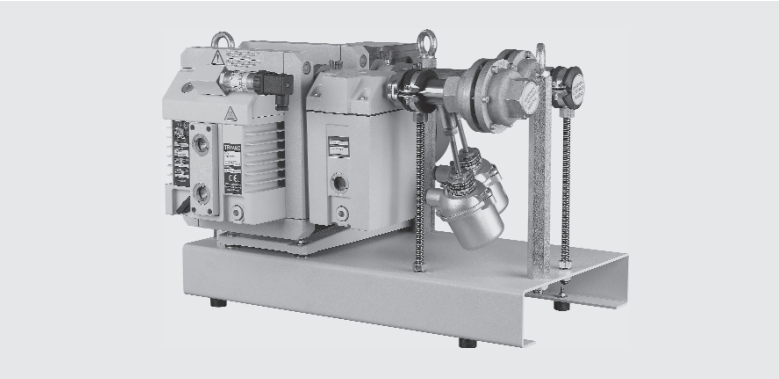
Advantages to the User

- Leak rates below 1×10^{-7} mbar l s^{-1}, also while the pump is running
- Low pressures of 100 mbar in the oil box are permitted during operation
- No gas ballast facility
- Pump is FPM (FKM)-sealed

Typical Applications

- Pumping of continuosly or discontinuously ^{3}He operated cryostats, also on ^{3}He and ^{4}He mixed cryostats
  - In these cryostats the very expensive helium isotope ^{3}He, respectively mixtures consisting of ^{3}He and ^{4}He are pumped and this is generally done continously in cycles running over weeks. The gas must neither be lost nor contaminated. For this reason exhaust lines are frequently operated at low pressures of 100 mbar (absolute)

TRIVAC D 16 B-Ex, Explosion Protected and Pressure Burst Resistant



ATEX

Category 1 inside and 2 outside

Typical Applications

- Pumping of gases belonging to Group IIB3 and IIC [1] from Zone 0

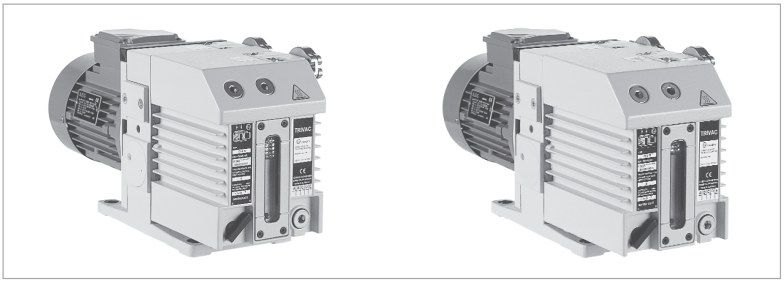
Vacuum pumps TRIVAC D 16 B-Ex meet the requirements of the European Directive 94/9/EG (ATEX Directive). TRIVAC D 16 B-Ex pumps are classified inside as Category 1, outside as Category 2. Thus these pumps are suited for pumping explosive gases from Zone 0, the pump itself may be located in Zone 1.

The vacuum pumps TRIVAC D 16 B-Ex are qualified for gases of Explosion Groups IIC [1] and IIB3. The temperature class is T4. TRIVAC D 16 B-Ex pumps are explosion resistant and correspond to the state-of-the-art. They are equipped as standard with one each temperature sensor on the intake and delivery side.

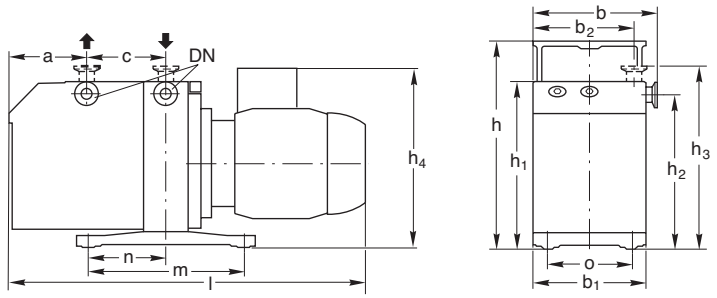
Moreover, the pressure inside the pump is monitored. Flame arresters on the intake and delivery side protect the upstream and downstream system sections. Also provided as standard is an exhaust filter for every pump.

[1] With the exception of acetylene and carbon bisulphide

TRIVAC D 4 B and D 8 B



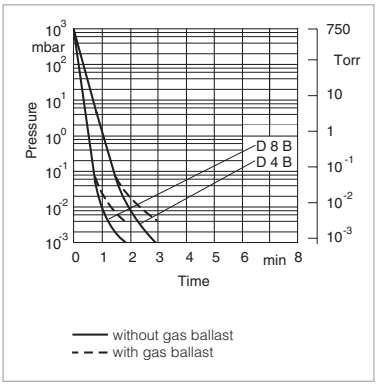
TRIVAC D 4 B (left) and TRIVAC D 8 B (right)



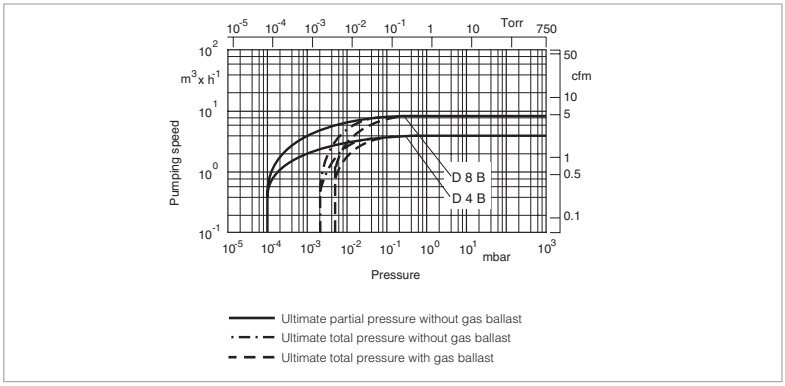
Type	DN		a	b	b_1	b_2	c	h	h_1	h_2	h_3	h_4 [1]	l [1]	m	n	o
D 4 B (Part No. 112 45)	16 KF	mm	75	162	147	132	100	265	215	200	230	234	441	198	99	108
		in.	2.95	6.38	5.79	5.23	3.94	10.43	8.46	7.87	9.06	9.21	17.36	7.80	3.90	4.25
D 8 B (Part No. 112 55)	16 KF	mm	100	162	147	132	100	265	215	200	230	234	465	198	99	108
		in.	3.94	6.38	5.79	5.23	3.94	10.43	8.46	7.87	9.06	9.21	18.31	7.80	3.90	4.25

[1] For dimensions h_4 and l for further part numbers, see paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

Dimensional drawing for the TRIVAC D 4 B and D 8 B



Pump-down characteristics of a 10 l vessel at 50 Hz



Pumping speed characteristics at 50 Hz (60 Hz curves at the end of the chapter)

Technical Data

		TRIVAC D 4 B two-stage		TRIVAC D 8 B two-stage	
		50 Hz	60 Hz	50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	4.8 (2.8)	5.8 (3.4)	9.7 (5.7)	11.6 (6.9)
Pumping speed [1]	m^3/h (cfm)	4.2 (2.5)	5.0 (3.0)	8.5 (5)	10.2 (6)
Ultimate partial pressure without gas ballast [1]	mbar (Torr)	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})
Ultimate total pressure without gas ballast [1]	mbar (Torr)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)
Ultimate total pressure with gas ballast [1]	mbar (Torr)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)
Water vapor tolerance [1]	mbar (Torr)	30.0 (22.5)	30.0 (22.5)	25.0 (18.8)	25.0 (18.8)
Water vapor capacity	g/h (lbs/h)	95 (0.209)	110 (0.243)	160 (0.353)	190 (0.419)
Oil filling, min. / max.	l (qt)	0.3 / 0.8 (0.3 / 0.85)	0.3 / 0.8 (0.3 / 0.85)	0.3 / 0.9 (0.3 / 0.95)	0.3 / 0.9 (0.3 / 0.95)
Noise level [2] to DIN 45 635, without / with gas ballast	dB(A)	50 / 52	50 / 52	50 / 52	50 / 52
Admissible ambient temperature	°C (°F)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)
Motor rating [2]	W (HP)	370 (0.50)	370 (0.50)	370 (0.50)	370 (0.50)
Nominal speed	rpm	1500	1800	1500	1800
Type of protection	IP	[3]	[3]	[3]	[3]
Weight [2]	kg (lbs)	17.9 (39.4)	17.9 (39.4)	18.9 (41.6)	18.9 (46.7)
Connections, Intake and Exhaust	DN	16 KF	16 KF	16 KF	16 KF

[1] To DIN 28 400 and following numbers

[2] Motor rating and noise levels for the the pumps with AC motor 50 Hz.
Any data that deviate from the above for pumps with other motors, and other motor-dependent data are given in chapter “Products”, paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

[3] See paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

Ordering Information

	TRIVAC D 4 B two-stage	TRIVAC D 8 B two-stage
	Part No.	Part No.
TRIVAC B		
with 1-phase motor		
230 V, 50 Hz [1]	112 45	112 55
with 3-phase motor		
200-240/380-400 V, 50 Hz / 200-240/380-480 V, 60 Hz [1]	112 46	112 56
230/400 V, 50 Hz, ATEX Category 3 inside and 3 outside inside: II (i) 3G IIC T4 (50 Hz) outside: II (o) 3G IIC T3 (50 Hz)	140 140	140 150
with dual voltage motor [2]		
110-115/210-230 V, 50/60 Hz	140 081 [2]	140 082 [2]
Mains cord for dual voltage motor [2]		
230 V Schuko plug	200 81 091	200 81 091
230 V UK plug	200 81 097	200 81 097
230 V CH plug	200 81 099	200 81 099
230 V NEMA plug (200-240 V)	200 81 141	200 81 141
115 V NEMA plug (100-120 V)	200 81 090	200 81 090
Transition connector (250 V AC, 10 A, L+N+PE) only necessary in Switzerland for 1~ pumps	800 001 274	800 001 274
Accessories		
Dust filter		
Filter pot FH 16	140 116 T	140 116 T
Dust filter insert DF 16-25	140 117 S	140 117 S
Adsorption trap		
Filter pot FH 16	140 116 T	140 116 T
Adsorption filter insert RF 16-25	140 118 A	140 118 A
Accessories for dust filter and adsorption trap		
Active charcoal	178 10	178 10
Zeolite	854 20	854 20
Activated aluminium oxide, 1.3 kg (2 l approx.)	854 10	854 10
TK 4-8 cold trap	188 20	188 20
AF 4-8 exhaust filter	189 06	189 06
AR 4-8 exhaust filter with lubricant return	189 20	189 20
AK 4-8 condensate trap	188 06	188 06
OF 4-25 mechanical oil filter	101 91	101 91
CF 4-25 chemical oil filter	101 96	101 96
Connector for gas ballast inlet M 16 x 1.5 – DN 16 KF	168 40	168 40
Oil drain tap M 16 x 1.5	190 90	190 90
Spare Parts		
Inner body	E 200 10 989	E 200 10 991
Major maintenance kit (without oil)	EK 110 002 622	EK 110 002 620
Minor maintenance kit (without oil)	EK 110 002 628	EK 110 002 627
Shaft sealing replacement kit	EK 110 002 631	EK 110 002 631
Small parts kit	EK 110 002 634	EK 110 002 634
Seal kit	197 20	197 20
For further accessories see section “Accessories for TRIVAC B, BCS and E”		

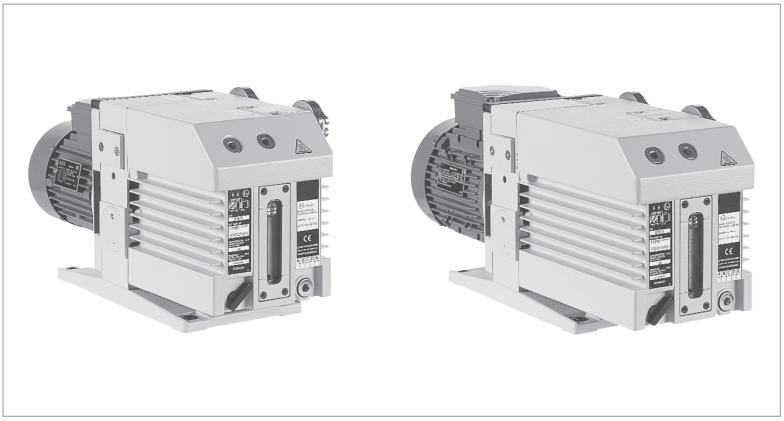
[1] Certification after 94/9/EG (ATEX), Category 3 inside. Inside: II (i) 3G IIC T4 (50 Hz), T3 (60 Hz)

[2] A mains cord needs to be ordered additionally

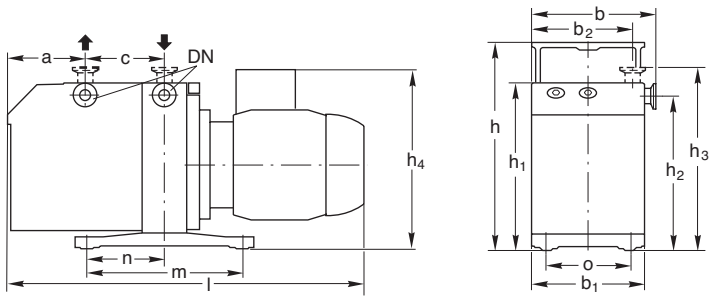
Only available for purchase in North and South America

Ordering Information	TRIVAC D 4 B two-stage	TRIVAC D 8 B two-stage
	Part No.	Part No.
TRIVAC B		
with 1-phase motor		
115 V, 50/60 Hz, NEMA plug	**912 45-1**	**912 55-1**
208-230 V, 50/60 Hz, NEMA plug	**912 45-2**	**912 55-2**
with 3-phase motor		
220-230/460 V, 60 Hz / 200/380 V, 50 Hz	**912 46-2**	**–**
208-230/460 V, 60 Hz / 208-220/380 V, 50 Hz	**–**	**912 56-2**

TRIVAC D 16 B and D 25 B



TRIVAC D 16 B (left) and TRIVAC D 25 B (right)



Type	DN		a	b	b_1	b_2	c	h	h_1	h_2	h_3	h_4 [1]	l [1]	m	n	o
D 16 B (Part No. 112 66)	25 KF	mm	82	186	172	151	135	298	248	227	262	250	508	280	140	132
		in.	3.23	7.32	6.77	5.94	5.32	11.73	9.76	8.94	10.31	9.84	20.00	11.02	5.51	5.20
D 25 B (Part No. 112 76)	25 KF	mm	144	186	172	151	135	298	248	227	262	250	570	280	140	132
		in.	5.67	7.32	6.77	5.94	5.32	11.73	9.76	8.94	10.31	9.84	22.44	11.02	5.51	5.20

[1] For dimensions h_4 and l for further part numbers, see paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

Dimensional drawing for the TRIVAC D 16 and D 25 B

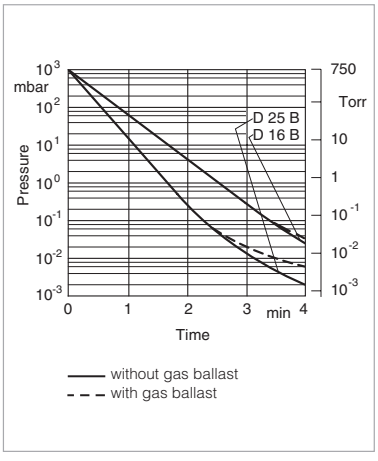
Technical Data

		TRIVAC D 16 B two-stage		TRIVAC D 25 B two-stage	
		50 Hz	60 Hz	50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	18.9 (11.1)	22.7 (13.4)	29.5 (17.4)	35.4 (20.9)
Pumping speed [1]	m^3/h (cfm)	16.5 (9.7)	19.8 (11.7)	25.7 (15.1)	30.8 (18.2)
Ultimate partial pressure without gas ballast [1]	mbar (Torr)	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})
Ultimate total pressure without gas ballast [1]	mbar (Torr)	$< 2 \times 10^{-3}$ (1.5×10^{-3})	$< 2 \times 10^{-3}$ (1.5×10^{-3})	$< 2 \times 10^{-3}$ (1.5×10^{-3})	$< 2 \times 10^{-3}$ (1.5×10^{-3})
Ultimate total pressure with gas ballast [1]	mbar (Torr)	$< 5 \times 10^{-3}$ (3.8×10^{-3})	$< 5 \times 10^{-3}$ (3.8×10^{-3})	$< 5 \times 10^{-3}$ (3.8×10^{-3})	$< 5 \times 10^{-3}$ (3.8×10^{-3})
Water vapor tolerance [1]	mbar (Torr)	25.0 (18.8)	25.0 (18.8)	25.0 (18.8)	25.0 (18.8)
Water vapor capacity	g/h (lbs/h)	305 (0.672)	370 (0.816)	480 (1.058)	570 (1.257)
Oil filling, min. / max.	l (qt)	0.5 / 1.0 (0.5 / 1.1)	0.5 / 1.0 (0.5 / 1.1)	0.6 / 1.4 (0.6 / 1.5)	0.6 / 1.4 (0.6 / 1.5)
Noise level [2] to DIN 45 635, without / with gas ballast	dB(A)	54 / 56	54 / 56	54 / 56	54 / 56
Admissible ambient temperature	°C (°F)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)
Motor rating [2]	W (HP)	550 - 750 (0.75 - 1.0)	550 - 750 (0.75 - 1.0)	750 (1)	750 (1)
Nominal speed	rpm	1500	1800	1500	1800
Type of protection	IP	3)	3)	3)	3)
Weight [2]	kg (lbs)	31.5 (69.3)	31.5 (69.3)	35.8 (78.8)	35.8 (78.8)
Connections, Intake and Exhaust	DN	25 KF	25 KF	25 KF	25 KF

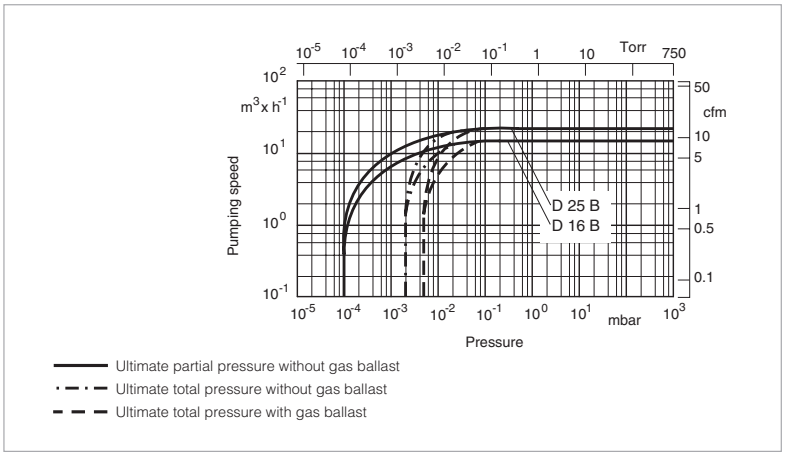
1) To DIN 28 400 and following numbers

2) Motor rating and noise levels for the pumps with AC motor 50 Hz.
Any data that deviate from the above for pumps with other motors, and other motor-dependent data are given in chapter “Products”, paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

3) See paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”



Pump-down characteristics of a 100 l vessel at 50 Hz



Pumping speed characteristics at 50 Hz (60 Hz curves at the end of the chapter)

Ordering Information

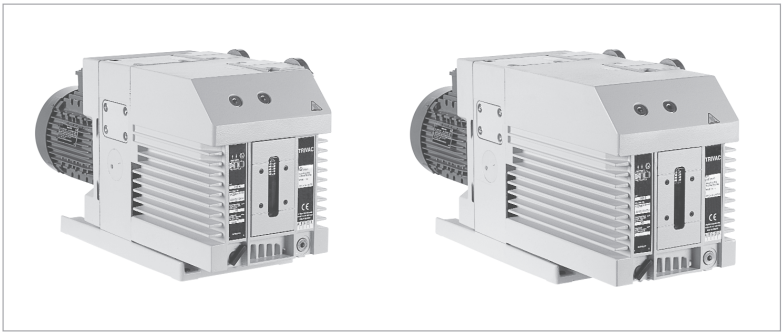
	TRIVAC D 16 B two-stage	TRIVAC D 25 B two-stage
	Part No.	**Part No.**
TRIVAC B		
with 1-phase motor		
230 V, 50/60 Hz [1]	**112 65**	**112 75**
218-242 V, 50/60 Hz [1]	**113 25** [2]	**113 35** [2]
110/220 V, 50 Hz / 115/208-230 V, 60 Hz [3]	**898 698**	–
with 3-phase motor		
200-240 V (200 V IE2) / 380-400 V (380-400 V IE 2), 50 Hz / 200-240 (208-240 V EPact) / 380-480 V (416-480 V EPact), 60 Hz [1]	**112 66** **113 33 (LVO 210)**	**112 76**
230/400 V, 50 Hz, ATEX Category 3 inside and 3 outside inside: II (i) 3G IIC T4 (50 Hz) outside: II (o) 3G IIC T3 (50 Hz)	**140 160**	**140 170**
Accessories		
Mains cord for Part No. 898 698		
115 V	**E 721 27 877**	–
230 V	**E 721 27 878**	–
Dust filter		
Filter pot FH 16	**140 125 T**	**140 125 T**
Dust filter insert DF 16-25	**140 117 S**	**140 117 S**
Adsorption trap		
Filter pot FH 25	**140 125 T**	**140 125 T**
Adsorption filter insert RF 16-25	**140 118 A**	**140 118 A**
Accessories for dust filter and adsorption trap		
Active charcoal	**178 10**	**178 10**
Zeolite	**854 20**	**854 20**
Activated aluminium oxide, 1.3 kg (2 l approx.)	**854 10**	**854 10**
AF 16-25 exhaust filter	**189 11**	**189 11**
AR 16-25 exhaust filter with lubricant return	**189 21**	**189 21**
AK 16-25 condensate trap	**188 11**	**188 11**
OF 4-25 mechanical oil filter	**101 91**	**101 91**
CF 4-25 chemical oil filter	**101 96**	**101 96**
Connector for gas ballast inlet M 16 x 1.5 – DN 16 KF	**168 40**	**168 40**
Oil drain tap M 16 x 1.5	**190 90**	**190 90**
Spare Parts		
Inner body	**E 200 10 956**	**E 200 10 960**
Major maintenance kit (without oil)	**EK 110 002 618**	**EK 110 002 616**
Minor maintenance kit (without oil)	**EK 110 002 626**	**EK 110 002 625**
Shaft sealing ring replacement kit	**EK 110 002 630**	**EK 110 002 630**
Small parts kit	**EK 110 002 635**	**EK 110 002 635**
Seal kit	**197 21**	**197 21**
For further accessories see section “Accessories for TRIVAC B, BCS and E”		

[1] Certification after 94/9/EG (ATEX), Category 3 inside. Inside: II (i) 3G IIC T4 (50 Hz), T3 (60 Hz)
[2] With cable EURO Schuko. Other cables for wide range motor upon request
[3] Mains cord for dual voltage motor see paragraph “Motor Dependant Data for the TRIVAC B, BCS and BCS-PFPE”; TRIVAC D 16 B / D 25 B

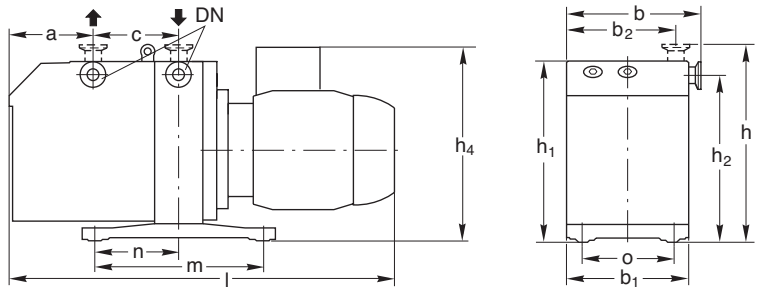
Only available for purchase in North and South America

Ordering Information	TRIVAC D 16 B two-stage	TRIVAC D 25 B two-stage
	Part No.	Part No.
TRIVAC B		
with 1-phase motor		
110 V, 50 Hz, NEMA plug / 115 V, 60 Hz, NEMA plug	**912 65-1**	**–**
208-230 V, 60/50 Hz, NEMA plug	**912 65-2**	**–**
208-230 V, 60/50 Hz, NEMA plug	**–**	**912 75-2**

TRIVAC D 40 B and D 65 B



TRIVAC D 40 B (left) and TRIVAC D 65 B (right)



Type	DN		a	b	b_1	b_2	c	h	h_1	h_2	h_4 [1]	l [1]	m	n	o
D 40 B (Part No. 112 86)	40 KF	mm	136	255	235	208	166	357	339	310	317	719	382	191	190
		in.	5.35	10.40	9.25	8.19	6.54	14.06	13.35	12.20	12.48	28.31	15.04	7.52	7.48
D 65 B (Part No. 112 96)	40 KF	mm	214	255	235	208	166	357	339	310	317	794	382	191	190
		in.	8.46	10.40	9.25	8.19	6.54	14.06	13.35	12.20	12.48	31,26	15.04	7.52	7.48

[1] For dimensions h_4 and l for further part numbers, see paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

Dimensional drawing for the TRIVAC D 40 and D 65 B

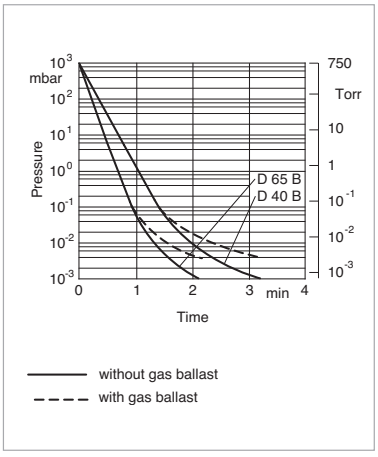
Technical Data

		TRIVAC D 40 B two-stage		TRIVAC D 65 B two-stage	
		50 Hz	60 Hz	50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	46 (27)	55 (32.5)	75 (44)	90 (53)
Pumping speed [1]	m^3/h (cfm)	40 (24)	48 (28)	65 (38)	78 (46)
Ultimate partial pressure without gas ballast [1]	mbar (Torr)	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})
Ultimate total pressure without gas ballast [1]	mbar (Torr)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)
Ultimate total pressure with gas ballast [1]	mbar (Torr)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)
Water vapor tolerance [1]	mbar (Torr)	40 (30)	40 (30)	40 (30)	40 (30)
Water vapor capacity	g/h (lbs/h)	1185 (2.612)	1420 (3.131)	1925 (4.244)	2310 (5.093)
Oil filling, min. / max.	l (qt)	1.7 / 2.6 (1.8 / 2.7)	1.7 / 2.6 (1.8 / 2.7)	2.0 / 3.3 (2.1 / 3.5)	2.0 / 3.3 (2.1 / 3.5)
Noise level [2] to DIN 45 635, without / with gas ballast	dB(A)	57 / 59	57 / 59	57 / 59	57 / 59
Admissible ambient temperature	°C (°F)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)
Motor rating 50/60 Hz [2]	W (HP)	2200 (3.0)	1500 (2.0)	2200 (3.0)	1500 (2.0)
Nominal speed [2]	rpm	1420	1710	1420	1710
Type of protection	IP	[3]	[3]	[3]	[3]
Weight [2]	kg (lbs)	72.5 (160)	72.5 (160)	81.7 (180)	81.7 (180)
Connections, Intake and Exhaust	DN	40 KF	40 KF	40 KF	40 KF

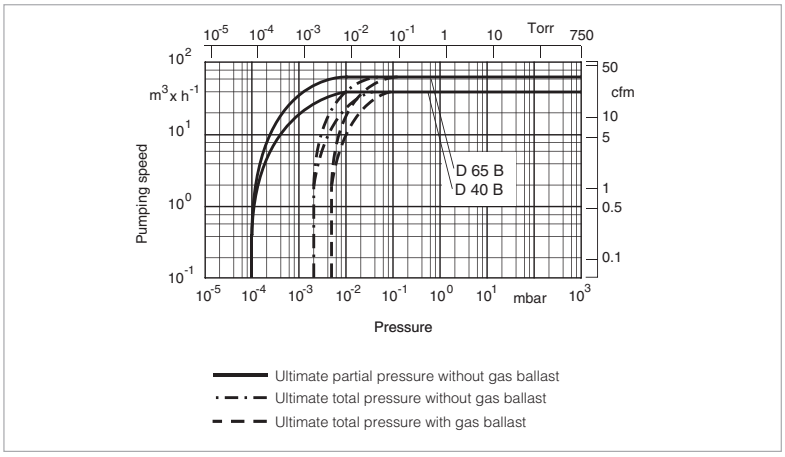
[1] To DIN 28 400 and following numbers

[2] Motor rating and noise levels for the pumps with AC motor 50 Hz.
Any data that deviate from the above for pumps with other motors, and other motor-dependent data are given in chapter “Products”, paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

[3] See paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”



Pump-down characteristics of a 100 l vessel at 50 Hz



Pumping speed characteristics at 50 Hz (60 Hz curves at the end of the chapter)

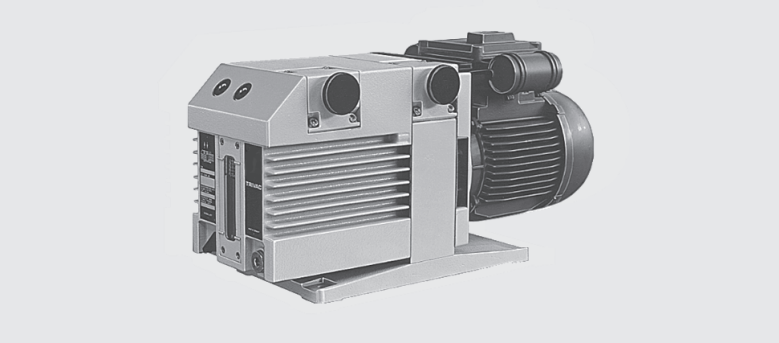
Ordering Information

	TRIVAC D 40 B two-stage	TRIVAC D 65 B two-stage
	Part No.	**Part No.**
TRIVAC B with 3-phase motor 200-240 V (200 V IE2) / 380-400 V (380-400 V IE 2), 50 Hz / 200-240 V (208-240 V EPact) / 380-480 V (416-480 V EPact), 60 Hz [1]	**112 86**	**112 96**
219-242/380-420 V, 50 Hz ATEX Category 3 inside and 3 outside inside: II (i) 3G IIC T4 (50 Hz) outside: II (o) 3G IIC T3 (50 Hz)	**140 180**	**140 190**
Accessories		
Roots pump adaptor	**168 30**	**168 30**
AS 30-60 dust separator	**186 16**	**186 16**
MF 30-60 molecular filter	**186 17**	**186 17**
Dust filter Filter pot FH 40-65 Dust filter insert DF 40-65	 **140 140 T** **140 141 S**	 **140 140 T** **140 141 S**
Adsorption trap Filter pot FH 40-65 Adsorption filter insert RF 40-65	 **140 140 T** **140 142 S**	 **140 140 T** **140 142 S**
Accessories for dust filter and adsorption trap Active charcoal Zeolite Activated aluminium oxide, 1.3 kg (2 l approx.)	 **178 10** **854 20** **854 10**	 **178 10** **854 20** **854 10**
AF 40-65 exhaust filter	**189 16**	**189 16**
AR 40-65 exhaust filter with lubricant return	**189 22**	**189 22**
AK 40-65 condensate trap	**188 16**	**188 16**
OF 40-65 mechanical oil filter	**101 92**	**101 92**
CF 40-65 chemical oil filter	**101 97**	**101 97**
Connector for gas ballast inlet M 16 x 1.5 – DN 16 KF	**168 40**	**168 40**
Oil drain tap M 16 x 1.5	**190 90**	**190 90**
Spare Parts		
Inner body	**E 200 10 933**	**E 200 10 944**
Major maintenance kit (without oil)	**EK 110 002 613**	**EK 110 002 612**
Minor maintenance kit (without oil)	**EK 110 002 624**	**EK 110 002 624**
Shaft sealing ring replacement kit	**EK 110 002 629**	**EK 110 002 629**
Small parts kit	**EK 110 002 636**	**EK 110 002 636**
Seal kit	**197 21**	**197 21**
For further accessories see section “Accessories for TRIVAC B, BCS and E”		

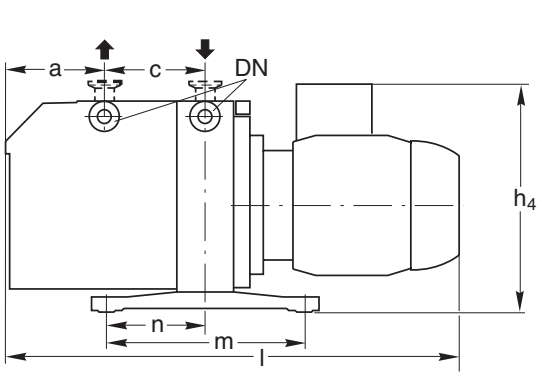
[1] Certification after 94/9/EG (ATEX), Category 3 inside. Inside: II (i) 3G IIC T4 (50 Hz), T3 (60 Hz)

Notes

TRIVAC D 16 B-DOT to D 40 B-DOT

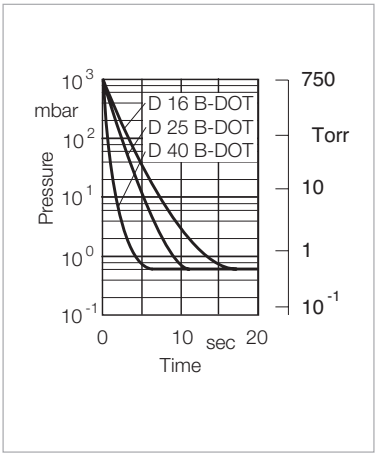


TRIVAC D 16 B-DOT

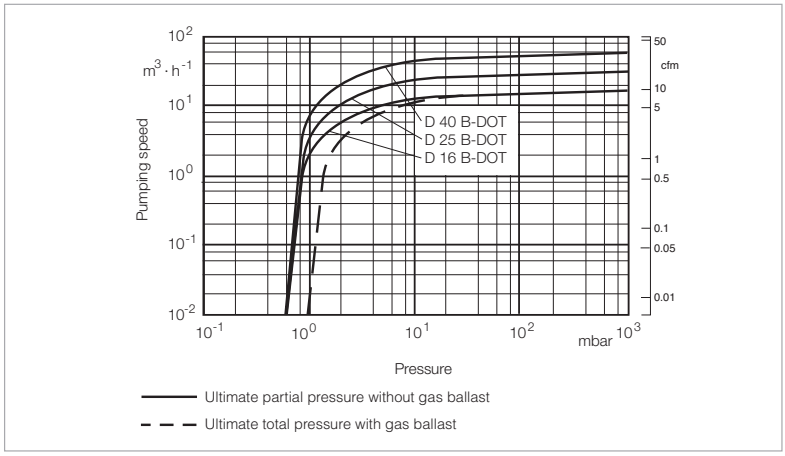


Type	DN		a	b	b_1	b_2	c	h	h_1	h_2	h_3	h_4	l	m	n	o
D 16 B-DOT (Part No. 114 06, 114 10)	25 KF	mm	82	186	172	151	136	298	248	227	262	260	508	280	140	132
		in.	3.23	7.32	6.77	5.94	5.32	11.73	9.76	8.94	10.31	10.24	20.00	11.02	5.51	5.20
D 25 B-DOT (Part No. 112 7 618)	25 KF	mm	144	186	172	151	135	298	248	227	262	260	570	280	140	132
		in.	5.67	7.32	6.77	5.94	5.32	11.73	9.76	8.94	10.31	10.24	22.44	11.02	5.51	5.20
D 40 B-DOT (Part No. 112 8 612)	40 KF	mm	136	255	235	208	166	–	339	310	315	317	719	382	191	190
		in.	5.35	10.40	9.25	8.19	6.54	–	13.35	12.20	12.83	12.48	28.31	15.04	7.52	7.48

Dimensional drawing for the TRIVAC D B-DOT pumps



Pump-down characteristics of a 10 l vessel at 50 Hz



Pumping speed characteristics at 50 Hz (60 Hz curves at the end of the chapter)

Technical Data

		TRIVAC D 16 B-DOT two-stage	
		50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	18.9 (11.1)	22.7 (13.4)
Pumping speed [1]	m^3/h (cfm)	16.5 (9.7)	19.8 (11.7)
Ultimate total pressure without gas ballast [1]	mbar (Torr)	$< 6 \times 10^{-1}$ ($< 4.5 \times 10^{-1}$)	$< 6 \times 10^{-1}$ ($< 4.5 \times 10^{-1}$)
Ultimate total pressure with gas ballast [1]	mbar (Torr)	$< 9 \times 10^{-1}$ ($< 6.75 \times 10^{-1}$)	$< 9 \times 10^{-1}$ ($< 6.75 \times 10^{-1}$)
Water vapor tolerance [1]	mbar (Torr)	25 (18.75)	25 (18.75)
Water vapor capacity	g/h (lbs/h)	305 (0.672)	370 (0.815)
Brake fluid filling, min. / max.	l (qt)	0.45 / 1.0 (0.5 / 1.1)	0.45 / 1.0 (0.5 / 1.1)
Noise level to DIN 45 635, without / with gas ballast	dB(A)	54 / 56	54 / 56
Admissible ambient temperature	°C (°F)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)
Motor rating	W (HP)	550 (0.75)	550 (0.75)
Nominal speed	rpm	1500	1800
Type of protection	IP	[2]	[2]
Weight	kg (lbs)	31.7 (69.7)	31.7 (69.7)
Connections, Intake and Exhaust	DN	25 KF	25 KF

[1] To DIN 28 400 and following numbers
[2] See paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

Ordering Information

	TRIVAC D 16 B-DOT two-stage
	Part No.
TRIVAC B-DOT with 3-phase motor 200-240 V (200 V IE2) / 380-400 V (380-400 V IE 2), 50 Hz / 200-240 (208-240 V EPact) / 380-480 V (416-480 V EPact), 60 Hz	**114 06** **114 10 (with limit switch system LSS 16-25)**
AF 16-25 DOT exhaust filter	**124 16**
AK DOT condensate trap	**110 78**
Seal kit DOT	**200 39 059**

Technical Data

		TRIVAC D 25 B-DOT two-stage	
		50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	29.5 (17.4)	35.4 (20.9)
Pumping speed [1]	m^3/h (cfm)	25.7 (17.4)	30.8 (18.2)
Ultimate total pressure without gas ballast [1]	mbar (Torr)	$< 6 \times 10^{-1}$ ($< 4.5 \times 10^{-1}$)	$< 6 \times 10^{-1}$ ($< 4.5 \times 10^{-1}$)
Ultimate total pressure with gas ballast [1]	mbar (Torr)	$< 9 \times 10^{-1}$ ($< 6.75 \times 10^{-1}$)	$< 9 \times 10^{-1}$ ($< 6.75 \times 10^{-1}$)
Water vapor tolerance [1]	mbar (Torr)	25 (18.75)	25 (18.75)
Water vapor capacity	g/h (lbs/h)	480 (1.058)	570 (1.257)
Brake fluid filling, min. / max.	l (qt)	0.6 / 1.4 (6.3 / 1.5)	0.6 / 1.4 (6.3 / 1.5)
Noise level to DIN 45 635, without / with gas ballast	dB(A)	54 / 56	54 / 56
Admissible ambient temperature	°C (°F)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)
Motor rating	W (HP)	550 (0.75)	550 (0.75)
Nominal speed	rpm	1500	1800
Type of protection	IP	[2]	[2]
Weight	kg (lbs)	36.0 (79.2)	36.0 (79.2)
Connections, Intake and Exhaust	DN	25 KF	25 KF

[1] To DIN 28 400 and following numbers
[2] See paragraph "Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE"

Ordering Information

	TRIVAC D 25 B-DOT two-stage
	Part No.
TRIVAC B-DOT with 3-phase motor 200-240 V (200 V IE2) / 380-400 V (380-400 V IE 2), 50 Hz / 200-240 (208-240 V EPact) / 380-480 V (416-480 V EPact), 60 Hz	**112 76 18**
AF 16-25 DOT exhaust filter	**124 16**
AK DOT condensate trap	**110 78**
Seal kit DOT	**200 39 059**

Technical Data

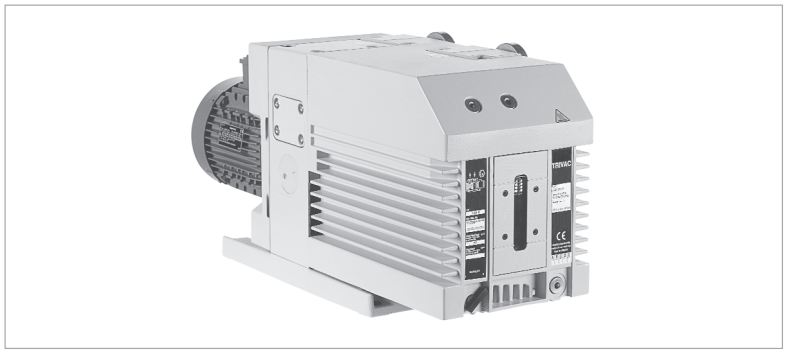
		TRIVAC D 40 B-DOT two-stage	
		50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	46.0 (27.0)	55.0 (32.5)
Pumping speed [1]	m^3/h (cfm)	40.0 (24.0)	48.0 (28.0)
Ultimate total pressure without gas ballast [1]	mbar (Torr)	$< 6 \times 10^{-1}$ ($< 4.5 \times 10^{-1}$)	$< 6 \times 10^{-1}$ ($< 4.5 \times 10^{-1}$)
Ultimate total pressure with gas ballast [1]	mbar (Torr)	$< 9 \times 10^{-1}$ ($< 6.75 \times 10^{-1}$)	$< 9 \times 10^{-1}$ ($< 6.75 \times 10^{-1}$)
Water vapor tolerance [1]	mbar (Torr)	40 (30)	40 (30)
Water vapor capacity	g/h (lbs/h)	1185 (2.612)	1420 (3.130)
Brake fluid filling, min. / max.	l (qt)	1.7 / 2.6 (1.8 / 2.7)	1.7 / 2.6 (1.8 / 2.7)
Noise level to DIN 45 635, without / with gas ballast	dB(A)	57 / 59	57 / 59
Admissible ambient temperature	°C (°F)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)
Motor rating	W (HP)	2200 (3.0)	2200 (3.0)
Nominal speed	rpm	1500	1800
Type of protection	IP	[2]	[2]
Weight	kg (lbs)	73 (161)	73 (161)
Connections, Intake and Exhaust	DN	40 KF	40 KF

[1] To DIN 28 400 and following numbers
[2] See paragraph "Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE"

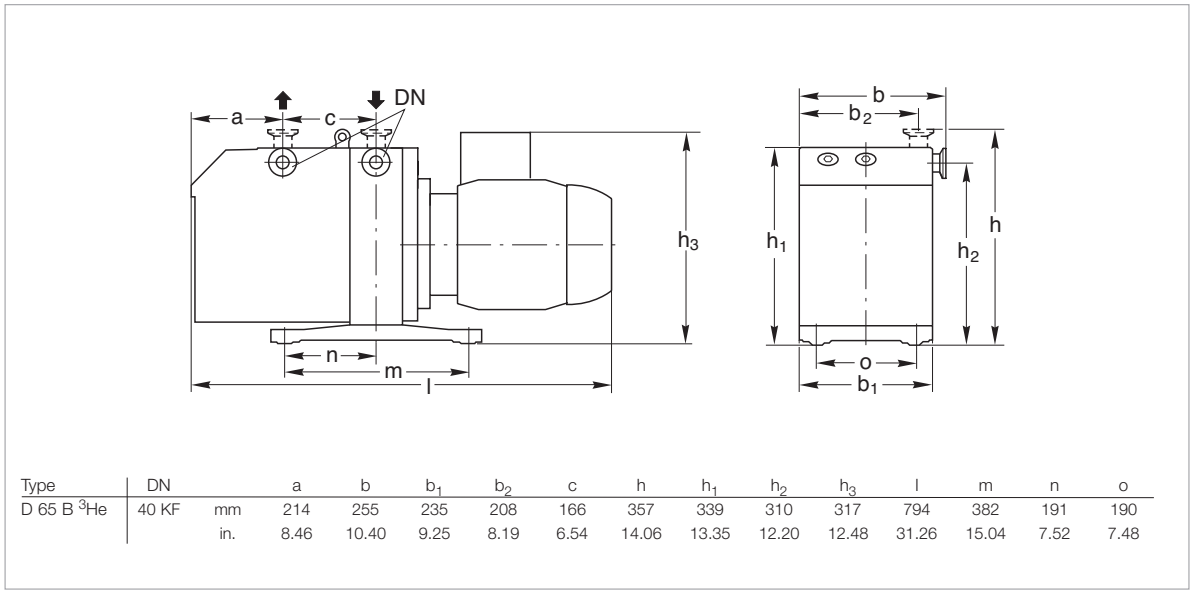
Ordering Information

	TRIVAC D 40 B-DOT two-stage
	Part No.
TRIVAC B-DOT with 3-phase motor 200-240 V (200 V IE2) / 380-400 V (380-400 V IE 2), 50 Hz / 200-240 V (208-240 V EPact) / 380-480 V (416-480 V EPact), 60 Hz	**112 86 12**
AF 40-65 DOT exhaust filter	**101 15**
AK DOT condensate trap	**upon request**
Seal kit DOT	**200 39 707**

TRIVAC D 65 B ^{3}He

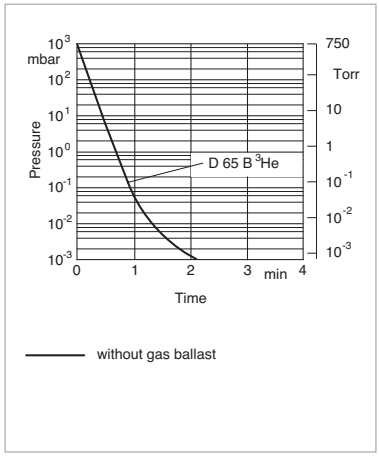


TRIVAC D 65 B ^{3}He

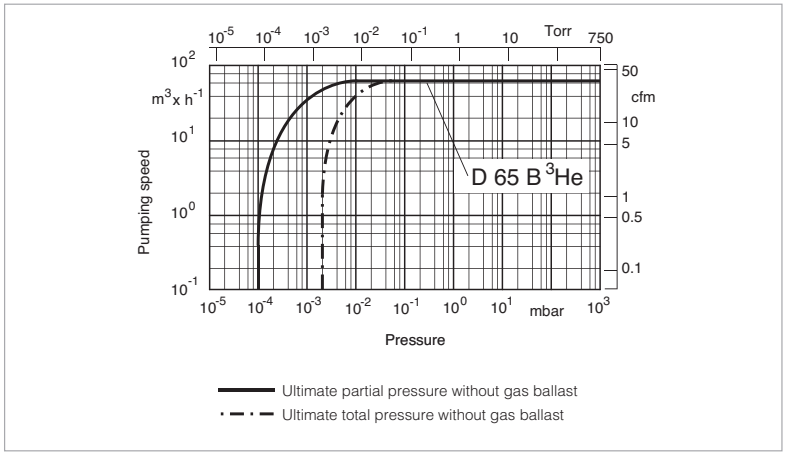


Type	DN		a	b	b_1	b_2	c	h	h_1	h_2	h_3	l	m	n	o
D 65 B ^{3}He	40 KF	mm	214	255	235	208	166	357	339	310	317	794	382	191	190
		in.	8.46	10.40	9.25	8.19	6.54	14.06	13.35	12.20	12.48	31.26	15.04	7.52	7.48

Dimensional drawing for the TRIVAC D 65 B ^{3}He



Pump-down characteristics of a 100 l vessel at 50 Hz



Pumping speed characteristics at 50 Hz (60 Hz curves at the end of the chapter)

Technical Data

TRIVAC D 65 B ^{3}He

		50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	75 (44)	90 (53)
Pumping speed [1]	m^3/h (cfm)	65 (38)	78 (46)
Ultimate partial pressure without gas ballast [1]	mbar (Torr)	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})
Ultimate total pressure without gas ballast [1]	mbar (Torr)	$< 2.0 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)	$< 2.0 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)
Oil filling, min. / max.	l (qt)	2.0 / 3.3 (2.1 / 3.5)	2.0 / 3.3 (2.1 / 3.5)
Noise level to DIN 45 635, without / with gas ballast	dB(A)	57 / 59	57 / 59
Admissible ambient temperature	°C (°F)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)
Motor rating [2]	W (HP)	2200 (3)	2200 (3)
Nominal speed [2]	rpm	1500	1800
Type of protection	IP	[3]	[3]
Weight	kg (lbs)	81.7 (180)	81.7 (180)
Connections, Intake and Exhaust	DN	40 KF	40 KF

Ordering Information

TRIVAC D 65 B ^{3}He

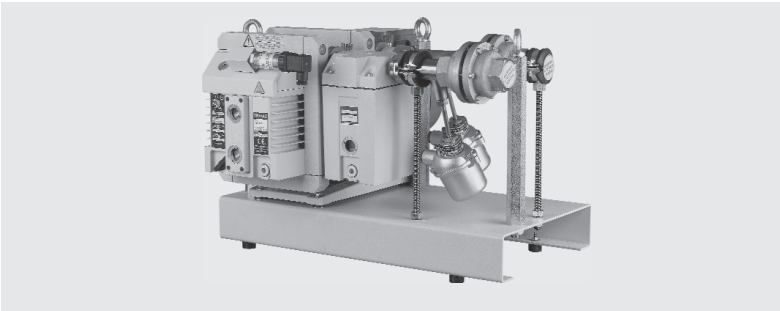
	Part No.
TRIVAC B ^{3}He with 3-phase motor 200-240 V (200 V IE2) / 380-400 V (380-400 V IE 2), 50 Hz / 200-240 V (208-240 V EPact) / 380-480 V (416-480 V EPact), 60 Hz [1]	**112 96 46**

[1] To DIN 28 400 and following numbers

[2] Motor rating and noise levels for the pumps with AC motor 50 Hz.
Any data that deviate from the above for pumps with other motors, and other motor-dependent data are given in chapter “Products”, paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

[3] See paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

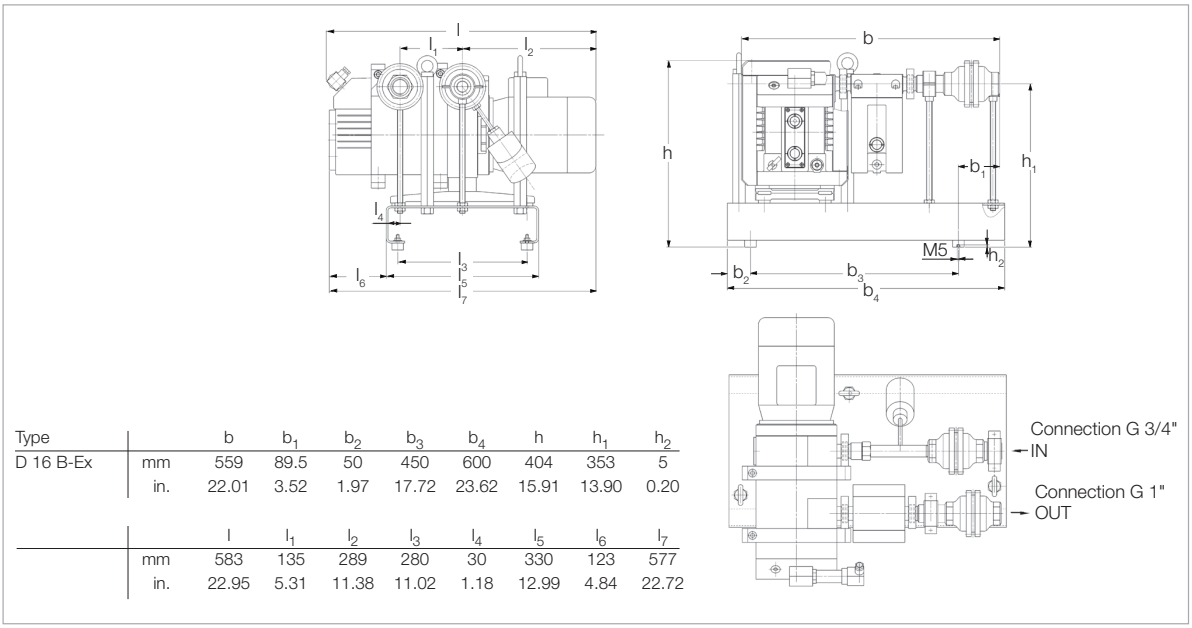
TRIVAC D 16 B-Ex (Explosion Protected and Pressure Burst Resistant)



ATEX

Category 1 inside and 2 outside

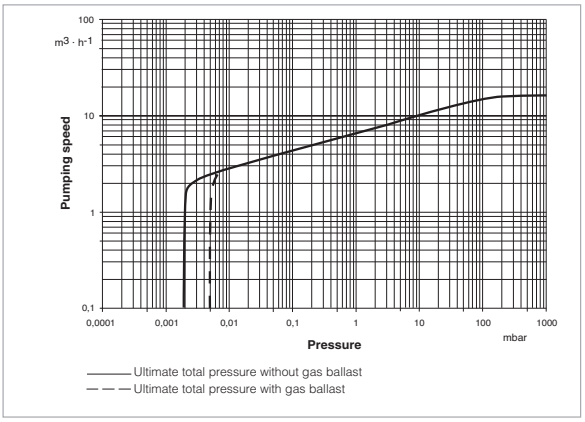
TRIVAC D 16 B-Ex



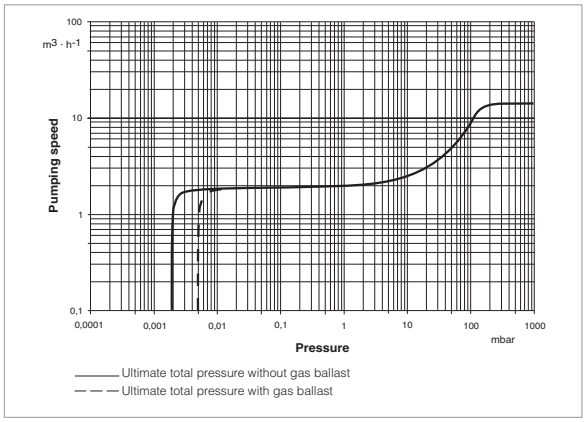
Type		b	b_1	b_2	b_3	b_4	h	h_1	h_2
D 16 B-Ex	mm	559	89.5	50	450	600	404	353	5
	in.	22.01	3.52	1.97	17.72	23.62	15.91	13.90	0.20

		l	l_1	l_2	l_3	l_4	l_5	l_6	l_7
	mm	583	135	289	280	30	330	123	577
	in.	22.95	5.31	11.38	11.02	1.18	12.99	4.84	22.72

Dimensional drawing for the TRIVAC D 16 B-Ex (explosion protected and pressure burst resistant)



Pumping speed characteristics of TRIVAC D 16 B-Ex [IIB3 T4] (Part No. 140 091)



Pumping speed characteristics of TRIVAC D 16 B-Ex [IIC T4] (Part No. 140 092)

Technical Data

TRIVAC D 16 B-Ex
(Explosion Protected and Pressure Burst Resistant) Two-Stage

Nominal pumping speed [1]	m^3/h (cfm)	18.9 (11.1)
Pumping speed (for Part No. 140 091 / 140 092) [1]	m^3/h (cfm)	16 / 15 (9.4/8.8)
Ultimate partial pressure without gas ballast [1]	mbar (Torr)	1×10^{-4} ($< 0.75 \times 10^{-3}$)
Ultimate total pressure with gas ballast [1]	mbar (Torr)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)
Water vapor tolerance [1]	mbar (Torr)	25 (18.75)
Water vapor capacity	g/h (lbs/h)	305 (0.672)
Oil filling, min. / max.	l (qt)	0.55 / 1.3 (0.58 / 1.4)
Motor		3~, 230 V / 400 V, 50 Hz, EEx e II T4
Type of protection	IP	54
Maximum gas inlet temperature	°C (°F)	60 (140)
Highest permissible pressure in the oil box	mbar (Torr)	1500 (1125)
Ambient temperature (t_a)	°C (°F)	+12 to +40 (+46 to +104)
Maximum surface temperature	°C (°F)	135 (275)
Max. Inlet pressure	mbar (Torr)	Atmospheric pressure
Weight (complete systems)	kg (lbs)	72 (159)
Materials (materials in contact with the gas)		Steel, hardened steel, spring steel, stainless steel, zinc, aluminum and aluminum alloys, grey cast iron 25, FKM, felt, glass, silicone, polyamide
Connections		
Intake side	Inside thread	G 3/4"
Pressure side	Inside thread	G 1"

Ordering Information

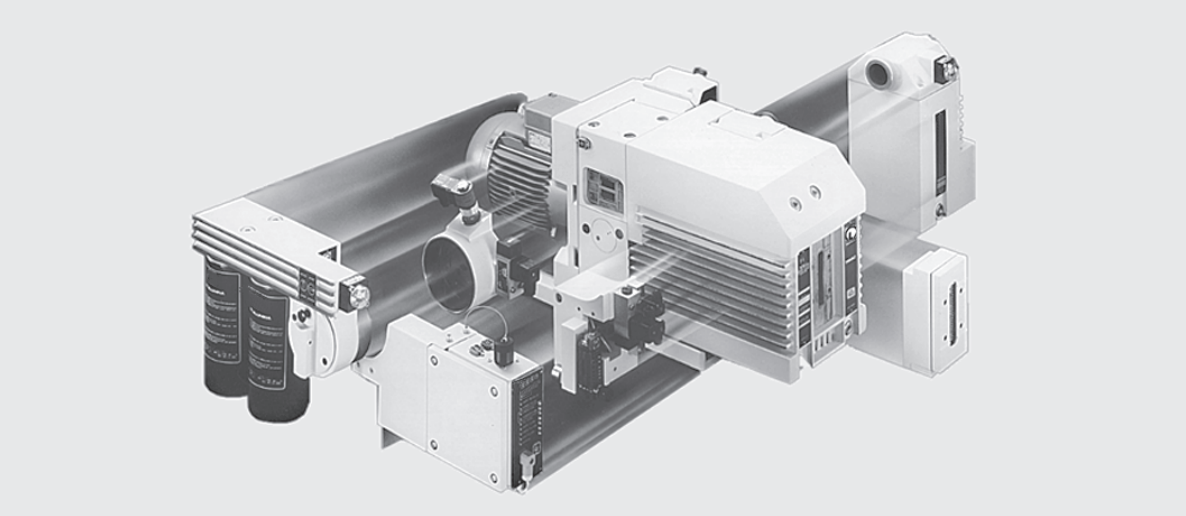
TRIVAC D 16 B-Ex
(Explosion Protected and Pressure Burst Resistant) Two-Stage

	Part No.
TRIVAC D 16 B-Ex IIB3 T4 in accordance with 94/9/EC [Ex II inside: 1G IIB3 T4 outside: 2G IIB T4 (12 °C < t_a < 40 °C) X EC Type Examination Certificate: IBExU03ATEX1017 X]	**140 091**
TRIVAC D 16 B-Ex IIC T4 [2] in accordance with 94/9/EC [Ex II inside: 1G IIC (no C_2H_2, CS_2) T4 outside: 2G IIC T4 (12 °C < t_a < 40 °C) X EC Type Examination Certificate: IBExU03ATEX1016 X]	**140 092** [2]

[1] To DIN 28 400 and following numbers
[2] with the exception of acetylene and carbon bisulphide

For all enquiries and orders relating to category 1 and 2 ATEX products please exclusively use our ATEX questionnaire.
You can find this questionnaire at the end of the full-line catalog together with the fax forms or
on the Internet under "www.oerlikon.com/leyboldvacuum" under Download Documents in the area Documentation.

TRIVAC BCS,
Two-Stage Rotary Vane Vacuum Pumps



TRIVAC SYSTEM

The TRIVAC BCS pumps are oil sealed vacuum pumps operating according to the rotary vane principle. Oil which is injected into the pump chamber is used for sealing, lubrication and cooling purposes.

The pump body is assembled from individual parts without sealing components. The parts are pinned in order to ensure easy disassembly and reassembly of the parts.

The motor is connected to the pumping section via an elastic coupling.

In addition, the TRIVAC BCS is ready for system integration (adaptable to different applications).

Advantages to the User

- Compact design
- Low noise operation with hardly any vibrations
- Built-in oil pump
- Continuous operation even at 1000 mbar (750 Torr)
- Pressure-lubricated sliding bearings
- Anti-suckback valve controlled via the oil pressure, no backstreaming of oil, independent of the operating mode, with or without gas ballast
- Low backstreaming of oil within the pump
- High pumping speed down to ultimate pressure
- Either vertical or horizontal intake and exhaust ports
- All controls as well as the oil sight glass are located on the face side
- Low power consumption
- Produces very little heat
- Exchangeable inner section
- Main flow oil filters may be fitted
- Very long service life
- Modular system
- Service-friendly
- Built-in temperature switch for temperature monitoring
- Corrosion protected – the use of yellow metals has been avoided; only grey cast iron, surface treated aluminium, steel and stainless steel is used
- Double shaft seal

Typical Applications

- In all areas of vacuum engineering
- Pumping of corrosive or aggressive media
- Production of semiconductors and in the area of chemistry
- Research and production
- Generation of rough and medium vacuum
- Backing pump in pump sets, i.e. in connection with Roots, diffusion, turbo or cryopumps

Supplied Equipment

- Small flanges
- Centering, sealing and clamping rings
- The intake port includes a dirt trap

BCS pumps are supplied with a filling of standard oil LEYBONOL LVO 100.

All pumps are subjected to a vacuum test before delivery!

TRIVAC SYSTEM

The TRIVAC BCS and its accessories

- CFS, chemical filter with safety isolation valve
- ARS, exhaust filter with lubricant return
- IGS, inert gas system
- LSS, limit switch system

make up the TRIVAC SYSTEM.

TRIVAC BCS-PFPE

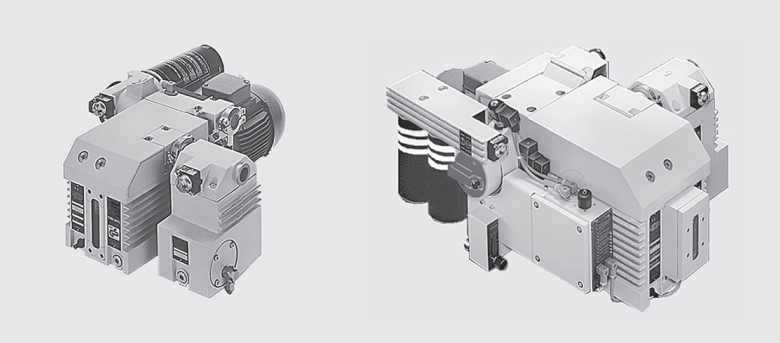
In many applications the use of synthetic lubricants like perfluoro-polyether (PFPE) offers superior characteristics compared to mineral oils.

Advantages of perfluoropolyether (PFPE) LEYBONOL LVO 400:

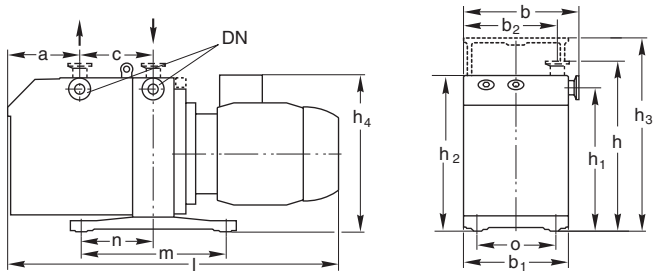
- Practically inert against all chemical and oxidizing influences.
- No polymerization under the influence of high energy radiation.
- In part significantly increased oil change intervals.
- Thermally highly stable. Thermal decomposition will only occur at temperatures over 290 °C (554 °F).

BCS-PFPE pumps have been especially prepared for operation with LEYBONOL LVO 400 and are supplied **without** the oil filling.
We recommend using our operating fluid LEYBONOL LVO 400 and always to install a chemical oil filter CF or CFS.

TRIVAC D 16 BCS to D 65 BCS



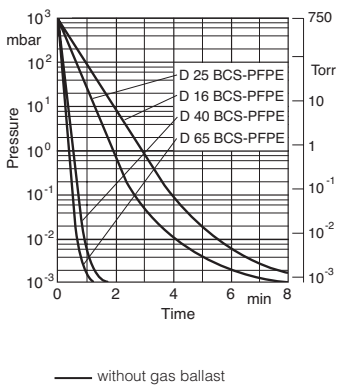
TRIVAC D 25 BCS with ARS and CFS (left)
and TRIVAC D 65 BCS with CFS, ARS, IGS, LSS, EIS – TRIVAC SYSTEM (right)



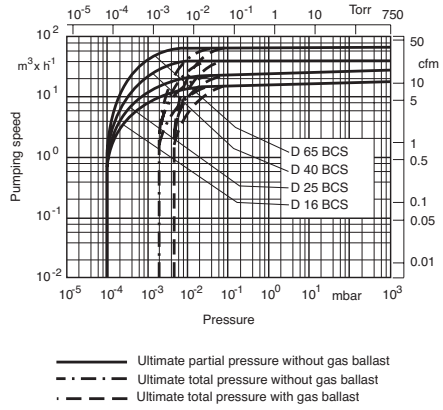
Type	DN		a	b	b_1	b_2	c	h	h_1	h_2	h_3	h_4 [1]	l [1]	m	n	o
D 16 BCS (Part No. 113 68)	25 KF	mm	82	186	172	151	135	262	227	248	298	260	508	280	140	132
		in.	3.23	7.32	6.77	5.94	5.32	10.31	8.94	9.76	11.73	10.24	20.00	11.02	5.51	5.20
D 25 BCS (Part No. 113 78)	25 KF	mm	144	186	172	151	135	262	227	248	298	260	570	280	140	132
		in.	5.67	7.32	6.77	5.94	5.32	10.31	8.94	9.76	11.73	10.24	22.44	11.02	5.51	5.20
D 40 BCS (Part No. 113 88)	40 KF	mm	135	264	234	206	166	355	308	336	–	317	719	382	191	190
		in.	5.32	10.39	9.21	8.11	6.54	13.98	12.13	13.23	–	12.48	28.31	15.04	7.52	7.48
D 65 BCS (Part No. 113 98)	40 KF	mm	213	264	234	206	166	355	308	336	–	317	794	382	191	190
		in.	8.39	10.39	9.21	8.11	6.54	13.98	12.13	13.23	–	12.48	31.26	15.04	7.52	7.48

[1] For dimensions h_4 and l for further part numbers, see paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

Dimensional drawing for the TRIVAC D 16 to D 65 BCS



Pump-down characteristics of a 100 l vessel at 50 Hz



Pumping speed characteristics at 50 Hz (60 Hz curves at the end of the chapter)

Technical Data

		TRIVAC			
		D 16 BCS two-stage		D 25 BCS two-stage	
		50 Hz	60 Hz	50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	18.9 (11.1)	22.7 (13.4)	29.5 (17.4)	35.4 (20.9)
Pumping speed [1]	m^3/h (cfm)	16.5 (9.7)	19.8 (11.7)	25.7 (15.1)	30.8 (18.2)
Ultimate partial pressure without gas ballast [1]	mbar (Torr)	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})
Ultimate total pressure without gas ballast [1]	mbar (Torr)	$< 2.5 \times 10^{-3}$ ($< 1.9 \times 10^{-3}$)	$< 2.5 \times 10^{-3}$ ($< 1.9 \times 10^{-3}$)	$< 2.5 \times 10^{-3}$ ($< 1.9 \times 10^{-3}$)	$< 2.5 \times 10^{-3}$ ($< 1.9 \times 10^{-3}$)
Ultimate total pressure with gas ballast [1]	mbar (Torr)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)
Water vapor tolerance [1]	mbar (Torr)	25 (18.8)	25 (18.8)	25 (18.8)	25 (18.8)
Water vapor capacity	g/h (lbs/h)	305 (0.672)	370 (0.816)	480 (1.058)	570 (1.257)
Oil filling, min. / max.	l (qt)	0.45 / 1.0 (0.5/1.1)	0.45 / 1.0 (0.5/1.1)	0.6 / 1.4 (0.6/1.5)	0.6 / 1.4 (0.6/1.5)
Noise level [2] to DIN 45 635, without / with gas ballast	dB(A)	54 / 56	54 / 56	54 / 56	54 / 56
Admissible ambient temperature	°C (°F)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)
Motor rating [2]	W (HP)	750 (1)	750 (1)	750 (1)	750 (1)
Nominal speed [2]	rpm	1500	1800	1500	1800
Type of protection	IP	[3]	[3]	[3]	[3]
Weight [2]	kg (lbs)	31.5 (69.3)	31.5 (69.3)	35.8 (78.8)	35.8 (78.8)
Connections, Intake and Exhaust	DN	25 KF	25 KF	25 KF	25 KF

[1] To DIN 28 400 and following numbers

[2] Motor rating and noise levels for the pumps with AC motor 50 Hz.
Any data that deviate from the above for pumps with other motors, and other motor-dependent data are given in chapter “Products”, paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

[3] See paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

Technical Data

		TRIVAC D 40 BCS two-stage		TRIVAC D 65 BCS two-stage	
		50 Hz	60 Hz	50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	46 (27)	55 (32.5)	75 (44)	90 (53)
Pumping speed [1]	m^3/h (cfm)	40 (24)	48 (28)	65 (38)	78 (46)
Ultimate partial pressure without gas ballast [1]	mbar (Torr)	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})	10^{-4} (0.75×10^{-4})
Ultimate total pressure without gas ballast [1]	mbar (Torr)	$< 2 \times 10^{-3}$) ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$) ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)
Ultimate total pressure with gas ballast [1]	mbar (Torr)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)
Water vapor tolerance [1]	mbar (Torr)	40 (30)	40 (30)	40 (30)	40 (30)
Water vapor capacity	g/h (lbs/h)	1185 (2.612)	1420 (3.131)	1925 (4.244)	2310 (5.093)
Oil filling, min. / max.	l (qt)	1.7 / 2.6 (1.8/2.7)	2.0 / 3.3 (2.1/3.5)	1.7 / 2.6 (1.8/2.7)	2.0 / 3.3 (2.1/3.5)
Noise level [2] to DIN 45 635, without / with gas ballast	dB(A)	57 / 59	57 / 59	57 / 59	57 / 59
Admissible ambient temperature	°C (°F)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)
Motor rating [2]	W (HP)	2200 (3)	2200 (3)	2200 (3)	2200 (3)
Nominal speed [2]	rpm	1500	1800	1500	1800
Type of protection	IP	[3]	[3]	[3]	[3]
Weight [2]	kg (lbs)	72.5 (160)	72.5 (160)	81.7 (180)	81.7 (180)
Connections, Intake and Exhaust	DN	40 KF	40 KF	40 KF	40 KF

[1] To DIN 28 400 and following numbers

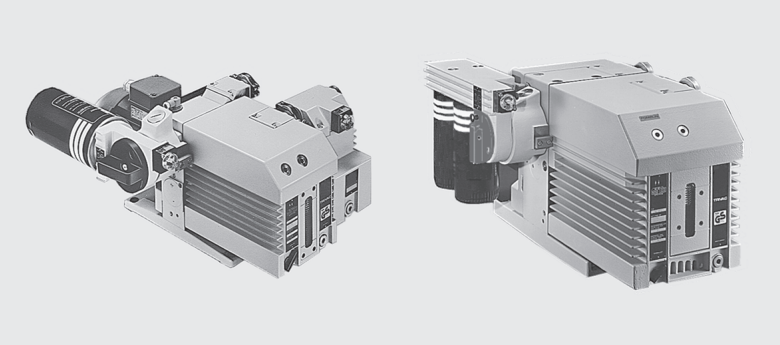
[2] Motor rating and noise levels for the pumps with AC motor 50 Hz.
Any data that deviate from the above for pumps with other motors, and other motor-dependent data are given in chapter “Products”, paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

[3] See paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

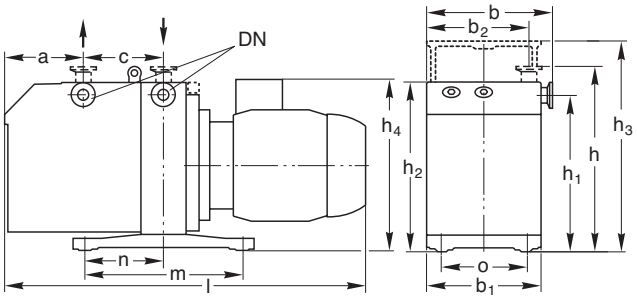
Ordering Information

	TRIVAC			
	D 16 BCS two-stage	D 25 BCS two-stage	D 40 BCS two-stage	D 65 BCS two-stage
	Part No.	Part No.	Part No.	Part No.
TRIVAC BCS with 3-phase motor 200-240 V (200 V IE2) / 380-400 V (380-400 V IE 2), 50 Hz / 200-240 (208-240 V EPact) / 380-480 V (416-480 V EPact), 60 Hz	**113 68**	**113 78**	**113 88**	**113 98**
Accessories				
Roots pump adaptor	**–**	**–**	**168 30**	**168 30**
Exhaust filter with lubricant return				
ARS 16-25	**189 56**	**189 56**	**–**	**–**
ARS 40-65	**–**	**–**	**189 57**	**189 57**
Condensate separator				
AK 16-25	**188 11**	**188 11**	**–**	**–**
AK 40-65	**–**	**–**	**188 16**	**188 16**
Chemical filter with safety blocking valve				
CFS 16-25	**101 76**	**101 76**	**–**	**–**
CFS 40-65	**–**	**–**	**101 77**	**101 77**
Inert gas system				
IGS 16-25	**161 76**	**161 76**	**–**	**–**
IGS 40-65	**–**	**–**	**161 68V**	**161 68V**
Limit switch system				
LSS 16-25	**161 06**	**161 06**	**–**	**–**
LSS 40-65	**–**	**–**	**161 07**	**161 07**
Spare Parts				
Inner body	**200 39 762**	**200 39 764**	**200 39 758**	**200 39 760**
Major maintenance kit for LVO 100 (without oil)	**EK 110 002 646**	**EK 110 002 647**	**EK 110 002 641**	**EK 110 002 642**
Minor maintenance kit for LVO 100 (without oil)	**EK 110 002 649**	**EK 110 002 648**	**–**	**–**
Shaft sealing replacement kit	**EK 110 002 650**	**EK 110 002 650**	**EK 110 002 643**	**EK 110 002 643**
Small parts kit	**–**	**–**	**EK 110 002 651**	**EK 110 002 651**
Seal kit	**197 20**	**197 20**	**197 21**	**197 21**
For further accessories see section “Accessories for TRIVAC B, BCS and E”				

TRIVAC D 16 BCS-PFPE to D 65 BCS-PFPE



TRIVAC D 25 BCS-PFPE with CFS 16-25 and ARS 16-25 (left) and
TRIVAC D 65 BCS-PFPE with CFS 40-65 (right)



Type	DN		a	b	b_1	b_2	c	h	h_1	h_2	h_3	h_4 [1]	l [1]	m	n	o
D 16 BCS-PFPE (Part No. 113 69)	25 KF	mm	82	190	175	150	135	263	226	250	298	260	508	280	140	132
		in.	3.23	7.48	6.89	5.91	5.32	10.35	8.90	9.84	11.73	10.24	20.00	11.02	5.51	5.20
D 25 BCS-PFPE (Part No. 113 79)	25 KF	mm	142	190	175	150	135	263	226	250	298	260	570	280	140	132
		in.	5.59	7.48	6.89	5.91	5.32	10.35	8.90	9.84	11.73	10.24	22.44	11.02	5.51	5.20
D 40 BCS-PFPE (Part No. 113 89)	40 KF	mm	135	264	234	206	166	355	308	336	–	317	719	382	191	190
		in.	5.32	10.39	9.21	8.11	6.54	13.98	12.13	13.23	–	12.48	28.31	15.04	7.52	7.48
D 65 BCS-PFPE (Part No. 113 99)	40 KF	mm	213	264	234	206	166	355	308	336	–	317	794	382	191	190
		in.	8.39	10.39	9.21	8.11	6.54	13.98	12.13	13.23	–	12.28	31.26	15.04	7.52	7.48

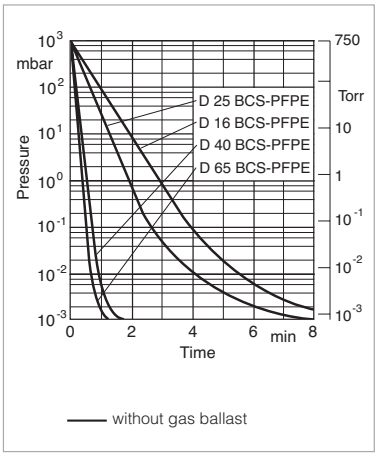
[1] For dimensions h_4 and l for further part numbers, see paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

Dimensional drawing for the TRIVAC D 16 to D 65 BCS-PFPE

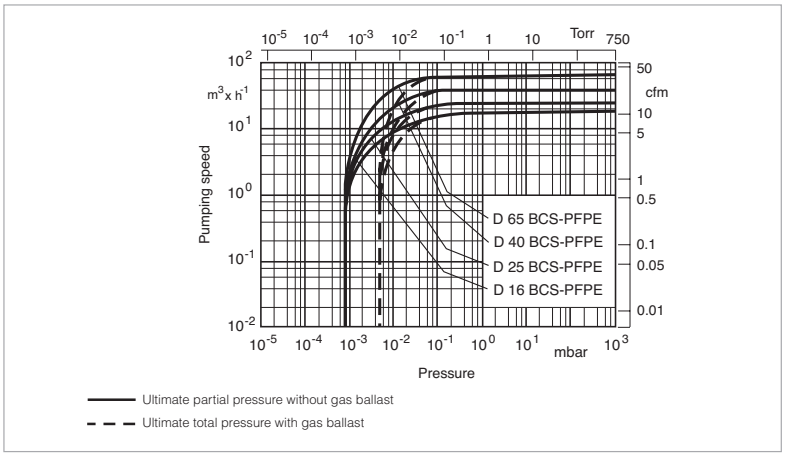
Technical Data

		TRIVAC D 16 BCS-PFPE two-stage		TRIVAC D 25 BCS-PFPE two-stage	
		50 Hz	60 Hz	50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	18.9 (11.1)	22.7 (13.4)	29.5 (17.4)	35.4 (20.9)
Pumping speed [1]	m^3/h (cfm)	16.5 (9.7)	19.8 (11.7)	25.7 (15.1)	30.8 (18.2)
Ultimate partial pressure without gas ballast [1]	mbar (Torr)	$< 8 \times 10^{-4}$ ($< 6 \times 10^{-4}$)	$< 8 \times 10^{-4}$ ($< 6 \times 10^{-4}$)	$< 8 \times 10^{-4}$ ($< 6 \times 10^{-4}$)	$< 8 \times 10^{-4}$ ($< 6 \times 10^{-4}$)
Ultimate total pressure with gas ballast [1]	mbar (Torr)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)
Ultimate total pressure with reduced gas ballast, 200 l x h^{-1} [1]	mbar (Torr)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)	$< 2 \times 10^{-3}$ ($< 1.5 \times 10^{-3}$)
Lubricant filling min. / max. upon delivery	 l (qt) l (qt)	 0.45 / 1.0 (0.5 / 1.1) 0.2 (0.2)	 0.45 / 1.0 (0.5 / 1.1) 0.2 (0.2)	 0.6 / 1.4 (0.6 / 1.5) 0.4 (0.4)	 0.6 / 1.4 (0.6 / 1.5) 0.4 (0.4)
Noise level [2] to DIN 45 635, without / with gas ballast	dB(A)	54 / 56	54 / 56	54 / 56	54 / 56
Admissible ambient temperature	°C (°F)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)
Motor rating [2]	W (HP)	750 (1)	750 (1)	750 (1)	750 (1)
Nominal speed [2]	rpm	1500	1800	1500	1800
Type of protection	IP	3)	3)	3)	3)
Weight [2]	kg (lbs)	30.8 (67.8) [4]	30.8 (67.8) [4]	35.3 (77.7) [4]	35.3 (77.7) [4]
Connections, Intake and Exhaust	DN	25 KF	25 KF	25 KF	25 KF

1) To DIN 28 400 and following numbers
2) Motor rating and noise levels for the pumps with AC motor 50 Hz.
Any data that deviate from the above for pumps with other motors, and other motor-dependent data are given in chapter “Products”, paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”
3) See paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”
4) Upon delivery



Pump-down characteristics of a 100 l vessel at 50 Hz



Pumping speed characteristics at 50 Hz (60 Hz curves at the end of the chapter)

Technical Data

		TRIVAC D 40 BCS-PFPE two-stage		TRIVAC D 65 BCS-PFPE two-stage	
		50 Hz	60 Hz	50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	46 (27)	55 (32.5)	75 (44)	90 (53)
Pumping speed [1]	m^3/h (cfm)	40 (24)	48 (28)	65 (38)	78 (46)
Ultimate partial pressure without gas ballast [1]	mbar (Torr)	$< 8 \times 10^{-4}$ ($< 6 \times 10^{-4}$)	$< 8 \times 10^{-4}$ ($< 6 \times 10^{-4}$)	$< 8 \times 10^{-4}$ ($< 6 \times 10^{-4}$)	$< 8 \times 10^{-4}$ ($< 6 \times 10^{-4}$)
Ultimate total pressure with gas ballast [1]	mbar (Torr)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)	$< 5 \times 10^{-3}$ ($< 3.8 \times 10^{-3}$)
Lubricant filling					
min. / max.	l (qt)	1.7 / 2.6 (1.8 / 2.7)	1.7 / 2.6 (1.8 / 2.7)	2.0 / 3.3 (2.1 / 3.5)	2.0 / 3.3 (2.1 / 3.5)
upon delivery	l (qt)	0.6 (0.6)	0.6 (0.6)	0.75 (0.8)	0.75 (0.8)
Noise level [2] to DIN 45 635, without / with gas ballast	dB(A)	57 / 59	57 / 59	57 / 59	57 / 59
Admissible ambient temperature	°C (°F)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)	+12 to +40 (+54 to +104)
Motor rating [2]	W (HP)	2200 (3)	2200 (3)	2200 (3)	2200 (3)
Nominal speed [2]	rpm	1500	1800	1500	1800
Type of protection	IP	[3]	[3]	[3]	[3]
Weight [2]	kg (lbs)	71.3 (157) [4]	71.3 (157) [4]	80.2 (176) [4]	80.2 (176) [4]
Connections, Intake and Exhaust	DN	40 KF	40 KF	40 KF	40 KF

[1] To DIN 28 400 and following numbers

[2] Motor rating and noise levels for the pumps with AC motor 50 Hz.
Any data that deviate from the above for pumps with other motors, and other motor-dependent data are given in chapter “Products”, paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

[3] See paragraph “Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE”

[4] Upon delivery

Ordering Information

	TRIVAC			
	D 16 BCS-PFPE two-stage	D 25 BCS-PFPE two-stage	D 40 BCS-PFPE two-stage	D 65 BCS-PFPE two-stage
	Part No.	Part No.	Part No.	Part No.
TRIVAC BCS-PFPE with 3-phase motor 200-240 V (200 V IE2) / 380-400 V (380-400 V IE 2), 50 Hz / 200-240 (208-240 V EPact) / 380-480 V (416-480 V EPact), 60 Hz	**113 69**	**113 79**	**113 89**	**113 99**
Accessories				
Roots pump adaptor	–	–	**168 30**	**168 30**
Exhaust filter with lubricant return ARS 16-25 ARS 40-65	 **189 56** –	 **189 56** –	 – **189 57**	 – **189 57**
Condensate trap AK 16-25 AK 40-65	 **188 11** –	 **188 11** –	 – **188 16**	 – **188 16**
Chemical filter with safety isolation valve CFS 16-25 CFS 40-65	 **101 76** –	 **101 76** –	 – **101 77**	 – **101 77**
Inert gas system IGS 16-25 IGS 40-65	 **161 76** –	 **161 76** –	 – **161 68V**	 – **161 68V**
Limit switch system LSS 16-25 LSS 40-65	 **161 06** –	 **161 06** –	 – **161 07**	 – **161 07**
Spare Parts				
Major maintenance kit, LVO 400 (without oil)	**EK 110 002 644**	**EK 110 002 645**	**EK 110 002 637**	**EK 110 002 638**
Shaft sealing replacement kit	**EK 110 002 650**	**EK 110 002 650**	**EK 110 002 643**	**EK 110 002 643**
Small parts kit	–	–	**EK 110 002 651**	**EK 110 002 651**
Seal kit	**197 20**	**197 20**	**197 21**	**197 21**
For further accessories see section “Accessories for TRIVAC B, BCS and E”				

Only available for purchase in North and South America

Ordering Information

	TRIVAC	
	D 16 BCS-PFPE two-stage	D 25 BCS-PFPE two-stage
	Part No.	Part No.
TRIVAC BCS-PFPE with 1-phase motor 220-230 V, 50/60 Hz, NEMA plug	–	**913 79-2**

Motor Dependent Data for the TRIVAC B, BCS and BCS-PFPE

Pump type	D 4 / 8 B	D 4 / 8 B	D 4 / 8 B	D 4 / 8 B
Part No. of the pump	140 081, 140 082	112 45, 112 55	112 46, 112 56 112 5631, 140 246	140 140, 140 150
Motor part number	100002292	E 38066008	E 38066006	20010406
Size	80	70	71	71L
Protection class	IP 54	IP 55	IP 55	IP 55
Operating mode in acc. w. IEC 34 / NEMA	S1	S1	S1	S1
Insulation class	F	F	F	F
Phases	1~	1~	3~	3~
Efficiency class	–	–	–	–
Number of poles	4	4	4	4
Nominal output power at 50 Hz at 60 Hz	 570 W 660 W	 370 W –	 370 W 440 W	 370 W –
Nominal input frequency	50 Hz / 60 Hz	50 Hz	50 Hz / 60 Hz	50 Hz
Nominal voltage range and nominal current (Mains voltage tolerance ±10 %) at 50 Hz	 100-115 V / 7.7 A – 210-230 V / 4.0 A –	 230 V / 3.0 A – – –	 200-240 V / 2.3 A – 380-400 V / 1.07 A –	 230 V / 1.84 A – 400 V / 1.06 A –
at 60 Hz	100-115 V / 5.6 A – 210-230 V / 2.8 A –	– – – –	200-240 V / 2.15 A – 380-480 V / 1.07 A –	– – – –
Nominal speed 50 Hz rpm 60 Hz rpm	 1420 1690	 1410 –	 1430 1745	 1390 –
Maximum operating altitude above sea level	1000 m above sea level	1000 m above sea level	1000 m above sea level	1000 m above sea level
Max. ambient temperature during operation °C (°F)	40 (104)	40 (104)	40 (104)	40 (104)
Terminal board / plug	Multi-pin plug at junction box, mains cord 20081091 (1.8 m) with Schuko plug CEE 7/7 (Included in delivery), mains cord 20081097 (1,8 m) with UK plug BS 1363 (optional), mains cord 20081099 (1,8 m) with CH plug SEV 1011 (optional), mains cord 20081141 (1,8 m) with US plug NEMA 6-15P (optional)	mains cord (2 m) with Schuko plug CEE	9 pins	6 pins
Certifications	CE	CE	CE	CE II 2 G EEx e II T3
Shaft dimension ⌀d / l mm (in.)	14 / 30 (0.55 / 1.18)	14 / 30 (0.55 / 1.18)	14 / 30 (0.55 / 1.18)	14 / 30 (0.55 / 1.18)
Size of flange A/B mm (in.)	140 / 95 (5.51 / 3.74)	140 / 95 (5.51 / 3.74)	140 / 95 (5.51 / 3.74)	140 / 95 (5.51 / 3.74)
Length of the pump mm (in.)	480 (18.90) **(D 4 B)** 504 (19.84) **(D 8 B)**	460 (18.11) **(D 4 B)** 484 (19.06) **(D 8 B)**	473 (18.62) **(D 4 B)** 497 (19.57) **(D 8 B)**	467 (18.39) **(D 4 B)** 491 (19.33) **(D 8 B)**
Height up to top edge of junction box h_4 mm (in.)	254 (10.0)	234 (9.21)	247 (9.72)	241 (9.49)

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Pump type	D 4 B	D 4 B	D 4 B
Part No. of the pump	912 46-2	898 973	898 393, 898 850 912 45-1, 912 45-2
Motor part number	72260067	72260195	72260095
Size	56C	56C	56C
Protection class	IP 44	TEFC	TEFC
Operating mode in acc. w. IEC 34 / NEMA	continous	continous	continous
Insulation class	B	B	B
Phases	3~	1~	1~
Efficiency class	–	–	–
Number of poles	4	4	4
Nominal output power at 50 Hz at 60 Hz	 240 W 240 W	 180 W 240 W	 180 W 250 W
Nominal input frequency	50 Hz / 60 Hz	50 Hz / 60 Hz	50 Hz / 60 Hz
Nominal voltage range and nominal current (Mains voltage tolerance ±10 %) at 50 Hz	 200 V / 1.6 A – 380 V / 0.8 A –	 110 V / 6.8 A – 220 V/ 3.4 A –	 110 V / 8.8 A – 200-220 V / 3.6-4.4 A –
at 60 Hz	220-230 V / 1.5-1.6 A – 460 V / 0.8 A –	115 V / 6.0 A – 208-230 V / 3.1 A –	115 V / 7.0 A – 200-230 V / 3.2-3.5 A –
Nominal speed 50 Hz rpm 60 Hz rpm	 1425 1725	 1425 1725	 1725 1425
Maximum operating altitude above sea level	1000 m above sea level	1000 m above sea level	1000 m above sea level
Max. ambient temperature during operation °C (°F)	40 (104)	40 (104)	40 (104)
Terminal board / plug	9 wires	12 pin plug at the motor, mains cord (1.8 m) 721 27 874 with US plug NEMA 5-15P (115 V) (optional)	mains cord (1,8 m) with plug NEMA 5-15P, (912 45-2 with mains cord (1,8 m) and US plug NEMA 6-15P (230 V)
Certifications	CE CSA		CSA
Shaft dimension ⌀d / l mm (in.)	15.87 / 52.32 (0.625 / 2.06)	15.87 / 52.32 (0.625 / 2.06)	15.87 / 52.32 (0.625 / 2.06)
Size of flange A/B mm (in.)	114.3 (4.5)	114.3 (4.5)	114.3 (4.5)
Length of the pump mm (in.)	469 (18.47) **(D 4 B)**	464 (18.27) **(D 4 B)**	466 (18.35) **(D 4 B)**
Height up to top edge of junction box h_4 mm (in.)	243 (9.57)	252 (9.92)	240 (9.45)

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Pump type	D 8 B	D 8 B	D 8 B
Part No. of the pump	170 028, 898 852 912 55-1, 912 55-2	898 974	912 56-2
Motor part number	72260117	72260196	72260135
Size	56C	56C	56C
Protection class	P 43	TEFC	–
Operating mode in acc. w. IEC 34 / NEMA	continous	continous	continous
Insulation class	B	B	B
Phases	1~	1~	3~
Efficiency class	– –	– –	– –
Number of poles	4	4	4
Nominal output power at 50 Hz at 60 Hz	 550 W 550 W	 240 W 370 W	 750 W 750 W
Nominal input frequency	50 Hz / 60 Hz	50 Hz / 60 Hz	50 Hz / 60 Hz
Nominal voltage range and nominal current (Mains voltage tolerance ±10 %) at 50 Hz	 115 V / 13.0 A – 208-230 V / 5.5-6.5 A	 110 V / 9.6 A – 220 V / 4.8 A –	 208-220 V – 380 V –
at 60 Hz	115 V / 9.4 A – 208-230 V / 4.8-4.7 A –	115 V / 8.8 A – 208-230 V / 4.5 A –	208-230 V / 3.6 A – 460 V / 1.7 A –
Nominal speed 50 Hz rpm 60 Hz rpm	 1425 1725	 1425 1725	 1500 1725
Maximum operating altitude above sea level	1000 m above sea level	1000 m above sea level	1000 m above sea level
Max. ambient temperature during operation °C (°F)	40 (104)	40 (104)	40 (104)
Terminal board / plug	mains cord (1.8 m) with US plug NEMA 5-15P (115 V), (898 853 and 912 55-2 with mains cord (1.8 m) and US plug NEMA 6-15P (230 V)	12 pin plug at the motor, mains cord (1.8 m) 721 27 874 with US plug NEMA 5-15P (115 V) (optional)	12 pin plug at the motor, mains cord (1.8 m) 721 27 874 with US plug NEMA 5-15P (115 V) (optional)
Certifications	CE CSA	CE CSA RoHS UL	CSA UL
Shaft dimension ⌀d / l mm (in.)	15.87 / 52.32 (0.625 / 2.06)	15.87 / 52.32 (0.625 / 2.06)	15.87 / 52.32 (0.625 / 2.06)
Size of flange A/B mm (in.)	114.3 (4.5)	114.3 (4.5)	114.3 (4.5)
Length of the pump mm (in.)	502 (19.78) **(D 8 B)**	488 (19.21) **(D 8 B)**	250 (9.84) **(D 8 B)**
Height up to top edge of junction box h_4 mm (in.)	252 (9.92)	287 (11.30)	260 (10.24)

Pump type	D 16 / 25 B D 16 / 25 BCS D 16 / 25 BCS-PFPE D 16 / 25 B-DOT	D 16 / 25 B (3i/3o)	D 16 B-Ex
Part No. of the pump	112 66, 112 76, 113 33 914 63-1 112 68, 112 78 112 69, 112 79 114 06, 114 10, 112 76 18	140 160, 140 170	140 091, 140 092
Motor part number	E 6506939	20010409	100002330
Size	80	80L	80L
Protection class	IP 55	IP 55	IP 55
Operating mode in acc. w. IEC 34 / NEMA	S1	S1	S1
Insulation class	F	F	F
Phases	3~	3~	3~
Efficiency class	IE2 EPAct	– –	– –
Number of poles	4	4	4
Nominal output power at 50 Hz at 60 Hz	 750 W 750 W	 750 W –	 750 W –
Nominal input frequency	50 Hz / 60 Hz	–	–
Nominal voltage range and nominal current (Mains voltage tolerance ±10 %) at 50 Hz	 200-240 V / 3.6 A 200 V / 3.6 A (IE2) 380-400 V / 1.8 A 380-400 V / 1.8 A (IE2)	 230 V / 3.35 A – 400 V / 1.94 A –	 230 V / 3.4 A – 400 V / 1.95 A –
at 60 Hz	200-240 V / 3.4 A 208-240 V / 3.2 A (EPAct) 380-480 V / 1.7 A 416-480 V / 1.6 A (EPAct)	– – – –	– – – –
Nominal speed 50 Hz rpm 60 Hz rpm	 1430 1740	 1380 –	 1405 –
Maximum operating altitude above sea level	1000 m above sea level	1000 m above sea level	1000 m above sea level
Maximum ambient temperature during operation °C (°F)	40 (104)	40 (104)	40 (104)
Terminal board	9 pins	6 pins	6 pins
Certifications	CE RoHS ENERGY c UL us	CE II 2 G EEx e II T3	CE II 2 G EEx e II T4
Shaft dimension ⌀d / l mm (in.)	19 / 40 (0.75 / 1.58)	19 / 40 (0.75 / 1.58)	19 / 40 (0.75 / 1.58)
Size of flange A/B mm (in.)	160 / 110 (6.30 / 4.33)	160 / 110 (6.30 / 4.33)	160 / 110 (6.30 / 4.33)
Length of the pump mm (in.)	508 (20.00) **(D 16 B)** 570 (22.44) **(D 25 B)**	510 (20.08) **(D 16 B)** 572 (22.52) **(D 25 B)**	510 (20.08) **(D 16 B)** –
Height up to top edge of junction box h_4 mm (in.)	260 (10.24)	268 (10.55)	268 (10.55)

Pump type	D 16 / 25 B	D 16 / 25 B	D 16 B
Part No. of the pump	112 65, 112 75	113 25, 113 35	898 698
Motor part number	E 38066003	E 110001212	72260187
Size	90	90	56C
Protection class	IP 44	IP 54	IP44
Operating mode in acc. w. IEC 34 / NEMA	S1	H	continous
Insulation class	F	F	F
Phases	1~	1~	1~
Efficiency class	–	–	–
Number of poles	4	4	4
Nominal output power at 50 Hz at 60 Hz	 750 W 750 W	 750 W 750 W	 750 W 750 W
Nominal input frequency	50 Hz / 60 Hz	50 Hz / 60 Hz	50 Hz / 60 Hz
Nominal voltage range and nominal current (Mains voltage tolerance ±10 %) at 50 Hz [1)]	 230 V / 5.6 A – – –	 230 V / 5.7 A – – –	 110 V / 15.0 A – 220 V / 7,5 A –
at 60 Hz [1)]	230 V / 5.7 A – – –	230 V / 4,.9 A – – –	115 V / 12.4 A – 208-230 V / 6,3-6,2 A –
Nominal speed 50 Hz rpm 60 Hz rpm	 1460 1750	 1420 1680	 1500 1800
Maximum operating altitude above sea level	1000 m above sea level	1000 m above sea level	1000 m above sea level
Maximum ambient temperature during operation °C (°F)	40 (104)	40 (104)	40 (104)
Terminal board	mains cord (2 m) with Schuko plug CEE	Multi-pin plug at junction box, mains cord 20081091 (1.8 m) with Schuko plug CEE 7/7 (Included in delivery), mains cord 20081097 (1.8 m) with UK plug BS 1363 (optional), mains cord 20081099 (1.8 m) with CH plug SEV 1011 (optional), mains cord 20081141 (1.8 m) with US plug NEMA 6-15P (230 V) (optional)	Multi-pin plug at junction box, mains cord (1.8 m) E72127877 with US plug NEMA 5-15P (115 V), mains cord (1.8 m) E72127878 with US plug NEMA 6-15P (230 V)
Certifications	CE	CE	CE CSA UL
Shaft dimension ⌀d / l mm (in.)	19 / 40 (0.75 / 1.58)	19 / 40 (0.75 / 1.58)	15.87 / 53.32 (0.625 / 2.06)
Size of flange A/B mm (in.)	160 / 110 (6.30 / 4.33)	160 / 110 (6.30 / 4.33)	114.3 (4.5)
Length of the pump mm (in.)	521 (20.51) **(D 16 B)** 583 (22.95) **(D 25 B)**	505 (19.88) **(D 16 B)** 567 (22.32) **(D 25 B)**	582 (22.91) **(D 16 B)** –
Height up to top edge of junction box h_4 mm (in.)	278 (10.95)	279 (10.98)	263 (10.35)

Only available for purchase in North and South America

Pump type	D 16 B	D 25 B
Part No. of the pump	**912 65-2**	**170 119**
Motor part number	**72260005**	**190260213**
Size	56C	56C
Protection class	TEFC	TEFC
Operating mode in acc. w. IEC 34 / NEMA	continous	continous
Insulation class	B3	F
Phases	1~	3~
Efficiency class	–	–
Number of poles	4	4
Nominal output power **at 50 Hz** **at 60 Hz**	 550 W 550 W	 – 1100
Nominal input frequency	50 Hz / 60 Hz	60 Hz
Nominal voltage range and nominal current (Mains voltage tolerance ±10 %) **at 50 Hz**	 208-230 V / 5.5-6.5 A – – –	 – – – –
at 60 Hz	208-230 V / 4.8-4.7 A – – –	115 V / 18.0 A 208-230 V / 8.4-8.0 A – –
Nominal speed **50 Hz** rpm **60 Hz** rpm	 1500 1800	 – 1725
Maximum operating altitude above sea level	1000 m above sea level	1000 m above sea level
Maximum ambient temperature during operation °C (°F)	40 (104)	40 (104)
Terminal board	mains cord (1.8 m) with US plug NEMA 6-15P (230 V)	9 wires
Certifications		
Shaft dimension ⌀d / l mm (in.)	15.87 / 53.32 (0.625 / 2.06)	15.87 / 53.32 (0.625 / 2.06)
Size of flange A/B mm (in.)	114.3 (4.5)	114.3 (4.5)
Length of the pump mm (in.)	538 (21.18) **(D 16 B)**	644 (25.35) **(D 16 B)**
Height up to top edge of junction box h_4 mm (in.)	247 (9.72)	263 (10.35)

Only available for purchase in North and South America

Pump type	D 25 B	D 25 B
Part No. of the pump	898 208, 912 65-1	912 75-2, 913 79-2
Motor part number	72260117	72260022
Size	56C	–
Protection class	IP 43	IP 44
Operating mode in acc. w. IEC 34 / NEMA	continous	continous
Insulation class	F	F
Phases	1~	1~
Efficiency class	–	–
Number of poles	4	4
Nominal output power at 50 Hz at 60 Hz	 560 560	 1100 1100
Nominal input frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
Nominal voltage range and nominal current (Mains voltage tolerance ±10 %) at 50 Hz [1)]	 115 V / 13.0 A – 208-230 V / 5.5-6.5 A –	 220-230 V / 9.6-9.2 A – – –
at 60 Hz [1)]	115 V / 9.4 A – 208-230 V / 4.8-7.4 A –	220-230 V / 9.6-8.0 A – – –
Nominal speed 50 Hz rpm 60 Hz rpm	 1425 1725	 1425 1725
Maximum operating altitude above sea level	1000 m above sea level	1000 m above sea leve
Maximum ambient temperature during operation °C (°F)	40 (104)	40 (104)
Terminal board	mains cord (1.8 m) with US plug NEMA 5-15P (115 V)	mains cord (1.8 m) with plug NEMA 6-15P (230 V)
Certifications	CE CSA	CE CSA
Shaft dimension ⌀d / l mm (in.)	15.87 / 53.32 (0.625 / 2.06)	15.87 / 53.32 (0.625 / 2.06)
Size of flange A/B mm (in.)	114.3 (4.5)	114.3 (4.5)
Length of the pump mm (in.)	624 (24.57) **(D 25 B)**	639 (25.16) **(D 25 B)**
Height up to top edge of junction box h_4 mm (in.)	265 (10.43)	265 (10.43)

Pump type	D 40 / 65 B D 40 / 65 BCS D 40 / 65 BCS-PFPE D 40 B-DOT + D 65 B ^{3}He	D 40 / 65 B-Ex
Part No. of the pump	112 86, 112 96 113 88, 113 98 113 89, 113 99 112 86 12 / 112 96 46	140 180, 140 190
Motor part number	E 6506961	20010411
Size	100L	100L
Protection class	IP 55	IP 55
Operating mode in acc. w. IEC 34 / NEMA	S1	S1
Insulation class	F	F
Phases	3~	3~
Efficiency class	IE2 EPAct	– –
Number of poles	4	4
Nominal output power at 50 Hz at 60 Hz	 2200 W 2200 W	 2600 W –
Nominal input frequency	50 Hz / 60 Hz	50 Hz
Nominal voltage range and nominal current (Mains voltage tolerance ±10 %) at 50 Hz	 200-240 V / 15.0 A 200 V / 10.4 A (IE2) 380-400 V / 5.2 A 380-400 V / 5.2 A (IE2)	 219-242 V / 10.1 A – 380-420 V / 5.8 A –
at 60 Hz	200-240 V / 12.0 A 208-240 V / 9.2 A (EPAct) 380-480 V / 5.2 A 416-480 V / 4.6 A (EPAct)	– – – –
Nominal speed 50 Hz rpm 60 Hz rpm	 1430 1735	 1420 –
Maximum operating altitude above sea level	1000 m above sea level	1000 m above sea level
Maximum ambient temperature during operation °C (°F)	40 (104)	40 (104)
Terminal board	9 pins	6 pins
Certifications	CE RoHS ENERGY c UL us	CE II 2 G EEx e II T3
Shaft dimension ⌀d / l mm (in.)	28 / 60 (1.10 / 2.36)	28 / 60 (1.10 / 2.36)
Size of flange A/B mm (in.)	160 / 110 (6.30 / 4.33)	160 / 110 (6.30 / 4.33)
Length of the pump mm (in.)	719 (28.31) **(D 40 B)** 794 (31.26) **(D 65 B)**	719 (28.31) **(D 40 B)** 794 (31.26) **(D 65 B)**
Height up to top edge of junction box h_4 mm (in.)	317 (12.48)	328 (12.91)

TRIVAC E, Two-Stage, Oil Sealed Rotary Vane Vacuum Pump

TRIVAC D 2,5 E

The TRIVAC E pump is an oil sealed vacuum pump operating according to the rotary vane principle. Oil which is injected into the pump chamber is used for sealing, lubrication and cooling purposes.

The result is the TRIVAC E rotary vane vacuum pump.

Beyond the usual quality and reliability of the B series pumps, the TRIVAC E pump offers improvements in the area of quieter operation, smaller size and improved service-friendliness.

The intake and exhaust ports are equipped with small flanges. Besides standard voltages and frequencies, Oerlikon Leybold Vacuum offers world motors, which are specially required by OEMs.

Advantages to the User

- Highly reliable
- Small and compact
- Quiet operation
- Environmentally compatible (low oil consumption, EMI compatible; IP 54 protection)
- Process quality (low backstreaming of oil)
- Motor for all standard supply voltages and frequencies
- Safe and intelligent vacuum protection (hermetically sealed)
- Free of yellow metals
- Compliance with international standards (CE and CSA)
- Suitable for continuous operation at 1000 mbar (750 Torr)
- Low power consumption
- Better individual performance given by 3 stage gas ballast device
- High water vapor tolerance
- Simplified customizing ability

Typical Applications

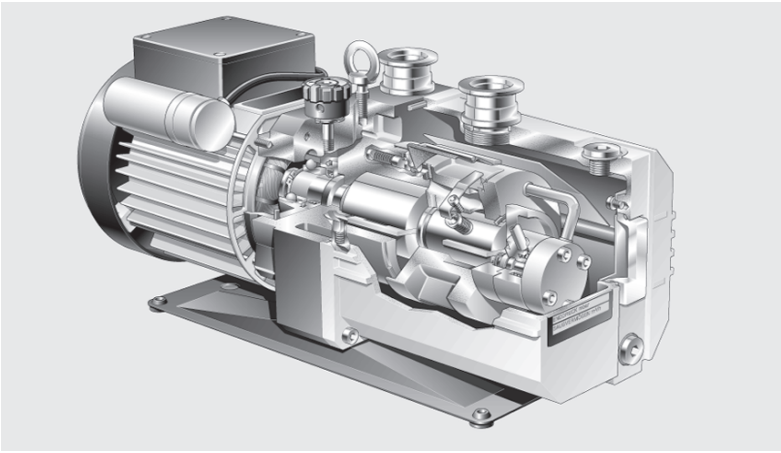
- Mass and X-ray spectrometers
- Leak detectors
- Electron beam microscopes
- Sterilizers
- Freeze-drying systems
- Chemical and research labs
- General vacuum engineering
- Backing pump for high vacuum pump systems

Supplied Equipment

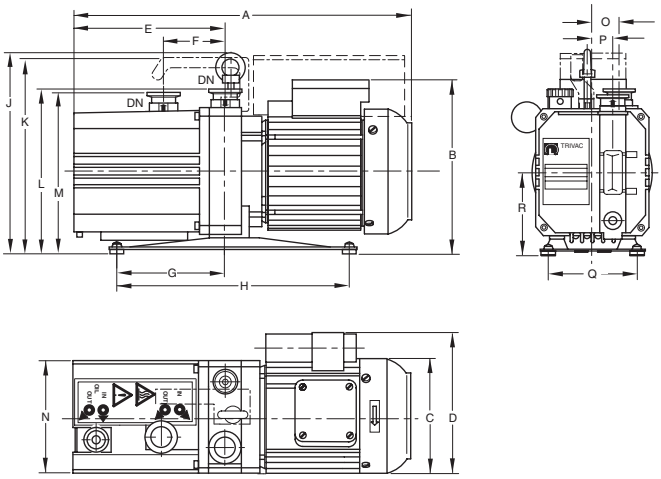
- Dirt trap
- Oil filling included separately (standard LVO 100)
- Gas ballast device
- Mains cord with the specific plug for EURO, US and Japan motors
- Optional: Mains cord with country specific plug for the world motor
- With handle

All pumps are 100% subjected to a vacuum test before delivery!

TRIVAC D 2,5 E



TRIVAC E



Type	A		B	
	EURO Jap, US	World 1 ~	EURO Jap, US	World 1 ~
mm	388.5	393.5	210.5	227.5
in.	15.3	15.5	8.29	8.96

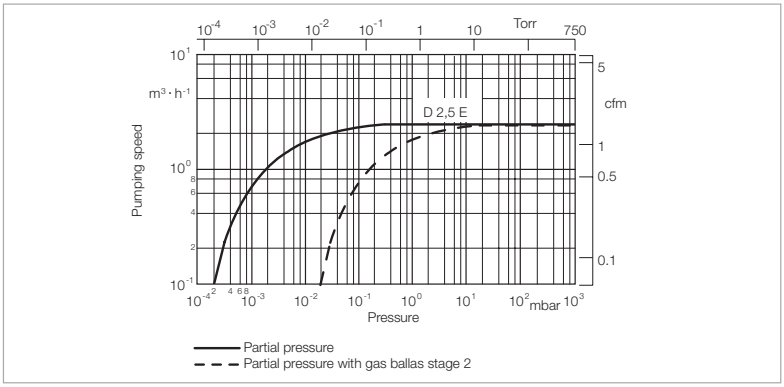
	C		D			
	EURO Jap, US	World 1 ~	EURO	Jap	US	World 1 ~
mm	127	127	148.5	153.5	153.5	1)
in.	5	5	5.85	6.04	6.04	1)

	E	F	G	H	J	K
mm	162.5	75.5	119.5	225	231.5	225
in.	6.4	2.97	4.7	8.86	9.90	8.86

	L	M	N	O	P	Q	R	DN
mm	182	177	113	27	15	83	84.5	16 KF
in.	7.16	6.97	4.45	1.06	0.59	3.27	3.33	16 KF

1) Capacitors in the connection box

Dimensional drawing for the TRIVAC D 2,5 E



Pumping speed of the TRIVAC D 2,5 E at 50 Hz (60 Hz curves at the end of the chapter)

Technical Data

TRIVAC D 2,5 E

		50 Hz	60 Hz
Nominal pumping speed [1]	m^3/h (cfm)	3.2 (1.9)	3.6 (2.1)
Pumping speed [1]	m^3/h (cfm)	2.7 (1.6)	3.3 (1.9)
Ultimate partial pressure without gas ballast	mbar (Torr)	$\leq 5 \times 10^{-4}$ ($\leq 3.8 \times 10^{-4}$)	$\leq 5 \times 10^{-4}$ ($\leq 3.8 \times 10^{-4}$)
Ultimate total pressure without gas ballast [2]	mbar (Torr)	$\leq 2 \times 10^{-3}$ ($\leq 1.5 \times 10^{-3}$)	$\leq 2 \times 10^{-3}$ ($\leq 1.5 \times 10^{-3}$)
Ultimate total pressure with gas ballast Stage 2 [2]	mbar (Torr)	$\leq 3 \times 10^{-2}$ ($\leq 2.3 \times 10^{-2}$)	$\leq 3 \times 10^{-2}$ ($\leq 2.3 \times 10^{-2}$)
Water vapor tolerance			
Stage 1	mbar (Torr)	10 (7.5)	10 (7.5)
Stage 2	mbar (Torr)	20 (15)	20 (15)
Stage 3	mbar (Torr)	30 (22.5)	30 (22.5)
Water vapor capacity			
Stage 1	g/h (lbs/h)	20 (0.044)	25 (0.055)
Stage 2	g/h (lbs/h)	40 (0.088)	50 (0.110)
Stage 3	g/h (lbs/h)	60 (0.132)	75 (0.165)
Oil filling, min. / max.	l (qt)	0.4 / 0.7 (0.42 / 0.74)	0.4 / 0.7 (0.42 / 0.74)
Noise level	dB(A)	≤ 47	≤ 49
Admissible ambient temperature	°C (°F)	+10 to +50 (+50 to +122) (EURO motor) / +10 to +40 (+50 to +104) (US/Japan motor)	+10 to +50 (+50 to +122) (EURO motor) / +10 to +40 (+50 to +104) (US/Japan motor)
Motor rating	W (HP)	250 (0.34)	300 (0.41)
Nominal speed	rpm	1400	1600
Type of protection	IP	54	54
Weight (with oil filling)	kg (lbs)	16.1 (35.4)	16.1 (35.4)
Connections (Intake and Exhaust)	DN	16 KF	16 KF

[1] To DIN 28 426 T1
[2] To DIN 28 400 and following numbers

Motor Dependent Data

Motors for D 2,5 E	Voltage (V)	Frequency (Hz)	Voltage tolerance	Power consumption (W (HP))	Nominal current (A)	Protection	Nominal speed (rpm)
EURO 1 ~	220-240/230	50/60	± 5%	250/300 (0.34/0.41)	1.8/1.4	IP 54	1400/1600
Japan 1 ~	100	50/60	± 5%	250/300 (0.34/0.41)	5.5/4.0	IP 54	1400/1600
US 1 ~	110-120	60	± 5%	300 (0.41)	3.3	IP 54	1600
World 1 ~	100-120 200-240	50/60	± 5%	250/300 (0.34/0.41)	4.4/3.0 2.2/1.5	IP 54	1400/1600

Ordering Information

TRIVAC D 2,5 E

	Part No.
TRIVAC E with 1.8 m (6 ft.) long mains cord	
EURO version, 1-ph., 220-240 V, 50 Hz; 230 V, 60 Hz	
Schuko plug	**140 000**
UK plug	**140 004**
CH plug	**140 005**
US version, 1-ph., 110-120 V, 60 Hz, NEMA plug	**140 002**
Japan version, 1-ph., 100 V, 50/60 Hz, NEMA plug	**140 003**
Single phase world motor, 100-120 V, 200-240 V 50/60 Hz (without mains cord)	**140 001**
Further variants upon request	
Accessories	
Connection cable for single phase world motor	
230 V Schuko plug	**200 81 091**
230 V UK plug	**200 81 097**
230 V CH plug	**200 81 099**
230 V NEMA plug (200-240 V)	**200 81 141**
115 V NEMA plug (100-120 V)	**200 81 090**
Exhaust filter AF 8	**190 50**
Replacement filter elements FE 8 for AF 8 (pack of 5)	**190 80**
Exhaust filter drain tap (G 1/4")	**190 95**
Manual oil return AR-M via gas ballast inlet (kit for AF 8-16)	**190 93**
Oil suction AR-V controlled by a solenoid valve via the gas ballast inlet (kit for AF 8-16)	**190 92**
Condensate trap AK 8	**190 60**
Oil drain tap (M 16 x 1.5)	**190 90**
Oil drain kit (M 16 x 1.5)	**190 94**
Connection components	
Elbow (1x) DN 16 KF	**184 36**
Centering ring with O-ring (2x) DN 16 KF	**183 26**
Clamping ring (2x) DN 16 KF	**183 41**
Spare Parts	
Maintenance kit 1 (oil demister, oil box seal)	**200 40 022**
Repair kit 1 (motor side sealing, shaft sealing ring, coupling sleeves, compression spring)	**E 100 000 351**
Repair kit 2 (valves, oil demister, oil box seal)	**200 40 024**
Repair kit 3 (oil demister, sealing, wearing parts)	**E 100 000 347**
For further accessories see Chapter “Accessories for TRIVAC B, BCS and E”	

Accessories

For TRIVAC B, BCS and E

Exhaust Filters AF 8 to AF 25
Condensate Traps AK 8 to AK 25

Exhaust filter (left) and condensate trap (right)

Exhaust-Filter

Oil mists and aerosols are retained in the exhaust filter.

Advantages to the User

- Filtering of the exhaust gas by removal of entrained lubricant particles
- Emptying via drain screw or exhaust filter drain tap
- Separation efficiency > 99%
- Filter elements (made of glass fiber) are exchangeable

Condensate Trap

Condensate traps prevent the formation of condensate in the pump as well as the backstreaming of fluids.

Advantages to the User

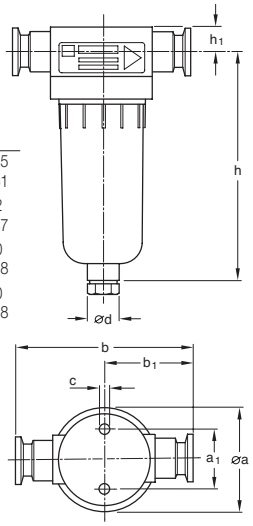
- Can be connected to either the intake or the exhaust side
- Protects against condensate forming from sucked in vapors or gases (intake line)
- Protects against backstreaming liquids (exhaust line)
- Emptying via drain screw/drain tap

Technical Information

The exhaust filter is not capable of retaining toxic and/or aggressive gases. For such applications we recommend the use of an exhaust gas line (e.g. a gas washer).

Since the material is not resistant to all gases and solvents, a materials compatibility chart is available upon request.

Type		a	a_1	b	b_1	c	d	h	h_1
AF 8 / AK 8	mm	66.4	38	115	57.5	M 6	20	145	15.5
	in.	2.61	1.50	4.53	2.26		0.79	5.71	0.61
AF 10 / AK 10	mm	90	64	140	70	M 10	20	200	22
	in.	3.54	2.52	5.51	2.76		0.79	7.87	0.87
AF 16 / AK 16	mm	115	-	165	82.5	M 10	20	210	30
	in.	4.53	-	6.50	3.25		0.79	8.27	1.18
AF 25 / AK 25	mm	115	80	165	82.5	M 10	20	250	30
	in.	4.53	3.15	6.50	3.25		0.79	9.84	1.18



Dimensional drawing for the AF exhaust filter and AK condensate trap

Technical Data

		AF 8	AK 8	AF 10	AK 10	AF 16	AK 16	AF 25	AK 25
Connection to pump (required accessories for TRIVAC E: elbow)	TRIVAC	D 2,5 E D 4 B D 8 B	D 2,5 E D 4 B D 8 B	D 16 B	D 16 B	D 16 B	D 16 B	D 16 B D 25 B	D 16 B D 25 B
Connection flanges	DN	16 KF	16 KF	25 KF	25 KF	25 KF	25 KF	25 KF	25 KF
Max. filling level (for vertical installation)	ml (qt)	60	60	145	145	285	285	285	285
Permissible leak rate	mbar x l x s^{-1}	$\leq 1 \times 10^{-5}$	$\leq 1 \times 10^{-5}$	$\leq 1 \times 10^{-5}$	$\leq 1 \times 10^{-5}$	$\leq 1 \times 10^{-5}$	$\leq 1 \times 10^{-5}$	$\leq 1 \times 10^{-5}$	$\leq 1 \times 10^{-5}$
Max. continuous temperature	°C (°F)	90	90	90	90	90	90	90	90
Material		Polyamide 6	Polyamide 6	Polyamide 6	Polyamide 6	Polyamide 6	Polyamide 6	Polyamide 6	Polyamide 6

Ordering Information

	AF 8	AK 8	AF 10	AK 10	AF 16	AK 16	AF 25	AK 25
	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
Exhaust filter	190 50	–	190 51	–	190 52	–	190 53	–
Exhaust filter drain tap	190 95	190 95	190 95	190 95	190 95	190 95	190 95	190 95
Condensate trap	–	190 60	–	190 61	–	190 62	–	190 63
Replacement filter element (pack of 5)								
FE 8	ES 190 80	–	–	–	–	–	–	–
FE 10	–	–	ES 190 81	–	–	–	–	–
FE 16	–	–	–	–	ES 190 82	–	–	–
FE 25	–	–	–	–	–	–	ES 190 83	–
Reducer DN 25/16 KF [1)]								
Aluminum (if necessary)	183 86	183 86	183 86	183 86	183 86	183 86	183 86	183 86
Elbow (1x)								
Aluminum	184 36	184 36	184 37	184 37	184 37	184 37	184 37	184 37
Centering ring with O-ring (2x)								
aluminium / NBR	183 26	183 26	183 27	183 27	183 27	183 27	183 27	183 27
stainless steal / FPM (FKM)	883 46	883 46	883 47	883 47	883 47	883 47	883 47	883 47
Clamping ring (2x)	183 41	183 41	183 42	183 42	183 42	183 42	183 42	183 42

[1)] When using the reducer, an elbow is required

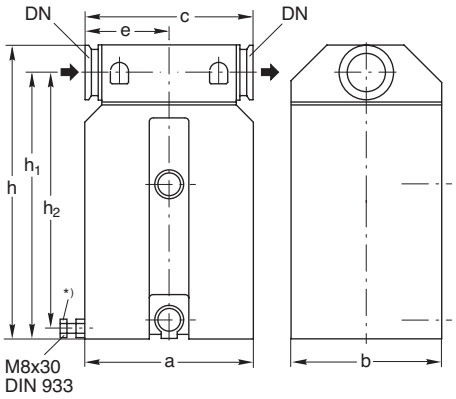
Exhaust Filters
AF 4-8 to AF 40-65
AF 16-25 DOT and AF 40-65 DOT

AF 4-8 exhaust filter

Exhaust filters retain oil mists and aerosols.

Advantages to the User

- Can be fitted without additional accessories
- Separation efficiency over 99 %
- Exchangeable filter inserts
- Built-in over-pressure relief valve (threshold at about 1.5 bar (7.2 psi, differential))
- Sight glass for checking of the quantity of collected oil
- Resistant against solvents
- Seals for
  AF made of FPM (FKM)
  AF-DOT made of EPDM
- Easy to clean and use
- Retains dirt and cracked products



Type	DN		a	b	c	e	h	h_1	h_2
AF 4-8	16 KF	mm	90	90	120	60	194	178	–
		in.	3.54	3.54	4.72	2.36	7.64	7.01	–
AF 16-25 (DOT)	25 KF	mm	110	125	142	71	214	193	–
		in.	4.33	4.92	5.59	2.80	8.43	7.60	–
AF 40-65 (DOT)	40 KF	mm	170	157	170	85	300	272	261
		in.	6.69	6.18	6.69	3.35	11.81	10.71	10.28

*) Supporting screw only for AF 40-65

Dimensional drawing for the AF exhaust filters

Typical Application

- Improvement of oil separating capacity

Technical Information

An exhaust line must be connected in case of hazardous exhaust gases.

Technical Data

		AF 4-8	AF 16-25	AF 40-65
Connection to pump	TRIVAC	D 4/8 B	D 16/25 B/BCS	D 40/65 B/BCS
Max. capacity for condensate, approx.	l (qt)	0.4 (0.45)	0.5 (0.57)	1.0 (1.14)
Weight	kg (lbs)	1.9 (4.1)	3.2 (7.1)	6.5 (14.3)

Ordering Information

	AF 4-8	AF 16-25	AF 40-65
	Part No.	**Part No.**	**Part No.**
Exhaust filter	**189 06**	**189 11**	**189 16**
Replacement filter element			
FE 4-8	**189 71**	**–**	**–**
FE 16-25	**–**	**189 72**	**–**
FE 40-65	**–**	**–**	**189 73**
Oil drain tap M 16 x 1.5 (vacuum-tight)	**190 90**	**190 90**	**190 90**

Technical Data

		AF 16-25 DOT	AF 40-65 DOT
Connection to pump	TRIVAC	D 16/25 B-DOT	D 40 B-DOT

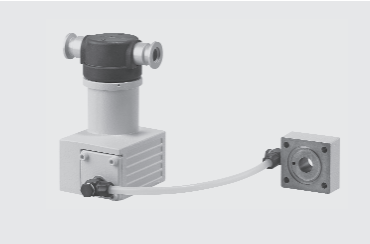
Ordering Information

	AF 16-25 DOT	AF 40-65 DOT
	Part No.	**Part No.**
Exhaust filter DOT	**124 16**	**101 15**
Replacement filter element		
FE 16-25 DOT	**200 10 304**	**–**
FE 40-65 DOT	**–**	**200 39 840** [1]

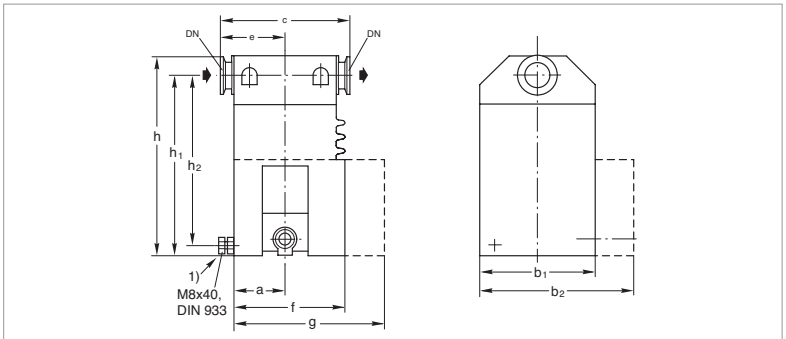
[1] 2 pieces are required

Exhaust Filters with Lubricant Return
ARP 4-8 and AR 4-8 to AR 40-65

AR 4-8 exhaust filter with lubricant return



ARP 4-8 exhaust filter with lubricant return



Type	DN		a	b_1	b_2	c	e	f	g	h	h_1	h_2
AR 4-8	16 KF	mm	45	90	136	120	60	100	113	194	179	167
		in.	1.77	3.54	5.35	4.72	2.36	3.94	4.37	7.64	7.05	6.57
AR 16-25	25 KF	mm	55	125	167	142	71	120	–	214	194	182
		in.	2.17	4.92	6.57	5.59	2.80	4.72	–	8.43	7.64	7.17
AR 40-65	40 KF	mm	70	156	–	170	85	152	195	300	271	261
		in.	2.76	6.14	–	6.69	3.35	5.98	7.68	11.8	10.7	10.3

1) Supporting screw only for AR 40-65

Dimensional drawing for the AR exhaust filters with lubricant return
(dimensions for the ARP exhaust filter with lubricant return upon request)

This combination of an exhaust filter with a float-controlled valve considerably extends the maintenance intervals for the TRIVAC pumps.

Advantages to the User

- Filtering the exhaust air of entrained lubricant particles
- Lubricant return with the aid of a float-controlled valve back into the intake port
- No operating costs caused by lost lubricant
- Hardly any oil consumption
- Standard filter element
- Built-in over-pressure relief valve
- Resists solvents
- All seals made of FPM (FKM)
- Easy change of the return port for horizontal or vertical connection

Typical Application

- Extending the maintenance intervals

Technical Data

		ARP 4-8	AR 4-8	AR 16-25	AR 40-65
Connection to pump	TRIVAC	D 4/8 B	D 4/8 B	D 16/25 B/BCS	D 40/65 B/BCS
For opening the float-controlled valve					
required amount of oil LVO 100	cm^3 (qt)	–	430 (0.45)	510 (0.54)	760 (0.80)
remaining amount of oil LVO 100	cm^3 (qt)	–	350 (0.37)	430 (0.45)	700 (0.74)
Weight	kg (lbs)	1.7 (3.8)	3.1 (6.89	4.7 (10.4)	8.5 (18.7)

Ordering Information

	ARP 4-8	AR 4-8	AR 16-25	AR 40-65
	Part No.	**Part No.**	**Part No.**	**Part No.**
Exhaust filter with lubricant return	**140 065**	**189 20**	**189 21**	**189 22**
Replacement filter element				
FE 8	**190 80**	**–**	**–**	**–**
FE 4-8	**–**	**189 71**	**–**	**–**
FE 16-25	**–**	**–**	**189 72**	**–**
FE 40-65	**–**	**–**	**–**	**189 73**

Supplied Equipment

Intermediate flange, connecting lines with hollow screws, required gaskets as well as mounting screws for the intake flange.

Technical Information

The AR is connected to the exhaust port of the TRIVAC B, the return line is connected at the intermediate flange under the intake port.

An exhaust line must be connected in case of hazardous exhaust gases.

Exhaust Filters with Lubricant Return ARS 16-25 and ARS 40-65

ARS 40-65

This combination of an exhaust filter with a float-controlled valve considerably extends the maintenance intervals of the TRIVAC BCS.

The ARS is part of the TRIVAC SYSTEM.

Advantages to the User

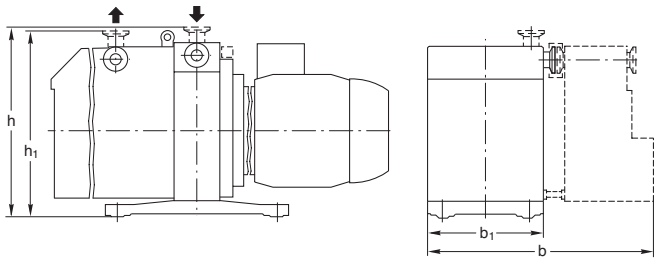
- Lubricant return with the aid of a float-controlled valve back into the intake port
- The intake port may be easily exchanged (either vertical or horizontal orientation)
- No operating costs caused by lost lubricant
- Hardly any oil consumption
- Visual indication of the differential pressure
- Standard filter element
- All aluminium parts are surface protected
- Built-in over-pressure relief valve
- Resists solvents
- All seals made of FPM (FKM)

Typical Application

- Filtering the exhaust air of entrained lubricant particles

Technical Information

An exhaust line must be connected in case of hazardous exhaust gases.



Type		b	b_1	h	h_1
ARS 16-25	mm	≈ 360	176	282	264
	in.	≈ 14.2	6.93	11.1	10.4
ARS 40-65	mm	≈ 468	234	381	356
	in.	≈ 18.4	9.21	15.0	14.0

Dimensional drawing for the ARS mounted on a TRIVAC BCS

The ARS is connected to the exhaust port of the TRIVAC BCS, the return line is connected at the intermediate flange under the intake port.

The ARS is cleaned in the factory to such an extent, that it may be operated either with mineral oil (e.g. LEYBONOL LVO 100) or perfluoropolyther ((PFPE) (e.g. LEYBONOL LVO 400).

Supplied Equipment

Intermediate flange, connecting lines with hollow screws, required gaskets as well as mounting screws for the intake flange.

Wrapped in foil for shipping.

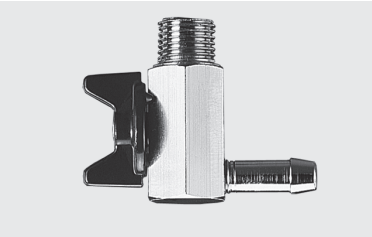
Technical Data

		ARS 16-25	ARS 40-65
Connection to pump	**TRIVAC**	D 16/25 B D 16/25 BCS (-PFPE)	D 40/65 B D 40/65 BCS (-PFPE)
Connection flanges	**DN**	25 KF	40 KF
Amount of oil required for opening the float-controlled valve			
LEYBONOL LVO 100	**cm^3 (qt)**	510 (0.54)	760 (0.80)
LEYBONOL LVO 400	**cm^3 (qt)**	340 (0.36)	420 (0.44)
Remaining amount of oil			
LEYBONOL LVO 100	**cm^3 (qt)**	430 (0.45)	700 (0.74)
LEYBONOL LVO 400	**cm^3 (qt)**	300 (0.31)	390 (0.41)
Weight with intermediate flange, tubing and filter, without lubricant	**kg (lbs)**	4.7 (10.4)	8.5 (16.7)

Ordering Information

	ARS 16-25	ARS 40-65
	Part No.	**Part No.**
Exhaust filter with lubricant return	**189 56**	**189 57**
Replacement filter element		
FE 16-25	**189 72**	**–**
FE 40-65	**–**	**189 73**

Exhaust Filter Drain Tap

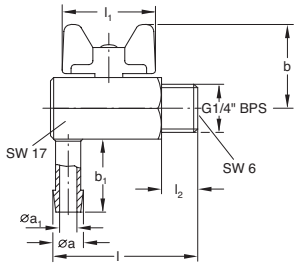


The exhaust filter drain tap simplifies draining of the oil from the exhaust filter.

Technical Note

May also be used in connection with the condensate separator AK.

	a	a_1	b	b_1	l	l_1	l_2
mm	8.5	5	23	20	41	26	10
in.	0.33	0.20	0.90	0.79	1.61	1.02	0.39



Dimensional drawing for the exhaust filter drain tap

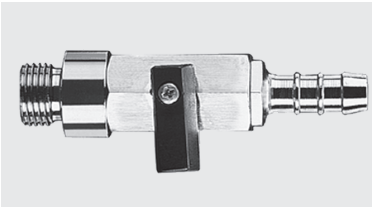
Technical Data — Exhaust Filter Drain Tap

Leak rate	mbar x l x s^{-1}	$\leq 10^{-5}$

Ordering Information — Exhaust Filter Drain Tap

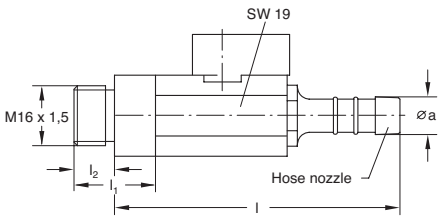
	Part No.
Exhaust filter drain tap	**190 95**

Oil Drain Tap



This oil drain tap may be screwed into the oil drain when wanting to change the oil in the rotary vane pumps. It is also suited for the condensate separators and exhaust filters of the TRIVAC B series.

	a	l	l_1	l_2
mm	10.5	76	22	11
in.	0.41	2.99	0.87	0.43



Dimensional drawing for the oil drain tap

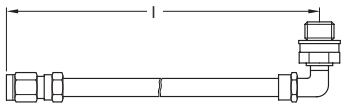
Technical Data — Oil Drain Tap

Leak rate	mbar x l x s^{-1}	$\leq 10^{-5}$

Ordering Information — Oil Drain Tap

	Part No.
Oil drain tap	**190 90**

Oil Drain Kit



l = 280 mm = 11 in.

Dimensional drawing for the oil drain kit

Technical Data — Oil Drain Kit

Length	mm (in.)	280 (11)
Leak rate	mbar x l x s^{-1}	$\leq 10^{-5}$

Ordering Information — Oil Drain Kit

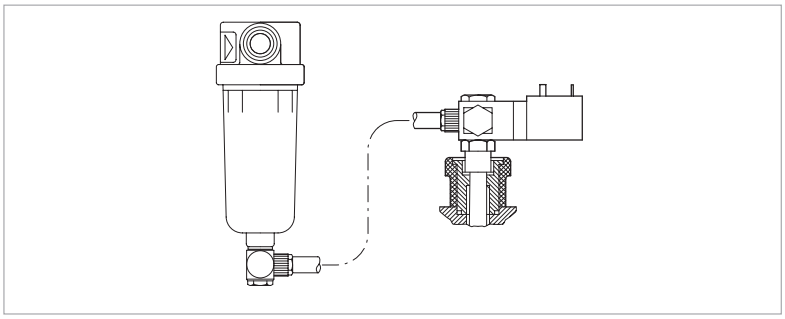
	Part No.
Oil drain kit	**190 94**

Oil Suction Facility AR-V Controlled by Solenoid Valve

Suited for the AF 8 or AK 8 when connected to the D 2.5 E the oil suction facility AR-V with its solenoid valve allows the removal of oil via the gas ballast which has collected in the exhaust filter. When the valve is closed the gas ballast remains fully operational.
For this, a hose link is provided between the exhaust filter and the gas ballast.

Technical Note

If oil which has collected in the exhaust filter is to be removed, the solenoid valve is opened briefly.



AR-V oil suction facility controlled by solenoid valve (kit without exhaust filter)

Technical Data

		AR-V Oil Suction Facility Controlled by Solenoid Valve
Leak rate	mbar x l x s^{-1}	$\leq 10^{-5}$

Ordering Information

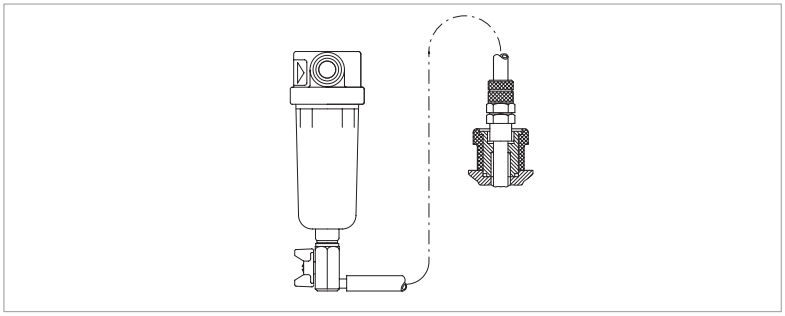
	AR-V Oil Suction Facility Controlled by Solenoid Valve
	Part No.
AR-V oil suction facility controlled by solenoid valve 24 V DC, 4 W, normally closed	**190 92**

Manually Operated Oil Suction Facility AR-M

Suited for the AF 8 or AK 8 when connected to the D 2,5 E the oil suction facility AR-M allows the removal of oil via the gas ballast which has collected in the exhaust filter, whereby the gas ballast remains fully operational as long as the angled ball valve remains closed.
For this, a hose link is provided between the exhaust filter and the gas ballast.

Technical Note

If oil which has collected in the exhaust filter is to be removed, the angled ball valve is manually opened briefly.



AR-M manually operated oil suction facility (kit without exhaust filter)

Technical Data

		AR-M Manually Operated Oil Suction Facility
Leak rate	mbar x l x s^{-1}	$\leq 10^{-5}$

Ordering Information

	AR-M Manually Operated Oil Suction Facility
	Part No.
AR-M manually operated oil suction facility	**190 93**

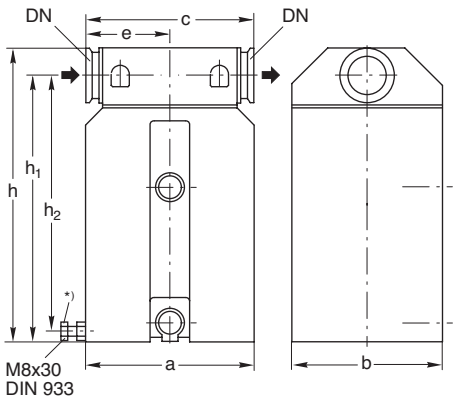
Condensate Separators
AK 4-8 to AK 40-65

AK 4-8 condensate separator

Separators protect the pump against condensate.

Advantages to the User

- May be installed without accessories
- May be used either on the intake or the exhaust side
- Independent of the direction of flow
- Condensate level check via inspection glass
- Resists solvents
- All seals made of FPM (FKM)
- Simple to clean
- Easy to use
- Drained via drain screw or drain tap



Type	DN		a	b	c	e	h	h_1	h_2
AK 4-8	16 KF	mm	90	90	120	60	194	178	–
		in.	3.54	3.54	4.72	2.36	7.64	7.01	–
AK 16-25	25 KF	mm	110	125	142	71	214	193	–
		in.	4.33	4.92	5.59	2.80	8.43	7.60	–
AK 40-65	40 KF	mm	140	156	170	85	300	271	261
		in.	5.51	6.14	6.69	3.35	11.8	10.7	10.3

*) Supporting screw, only for AK 40-65

Dimensional drawing for the AK condensate separators

Typical Application

- Prevention of the collection of liquids in the intake line

Technical Information

Depending upon the layout and pipe run of an exhaust line, it may be necessary to install a separator to prevent condensate draining back to the pump.

Technical Data

		AK 4-8	AK 16-25	AK 40-65
Connection to pump	**TRIVAC**	D 4/8 B	D 16/25 B D 16/25 BCS (-PFPE)	D 40/65 B D 40/65 BCS (-PFPE)
Capacity for condensate	**l (qt)**	0.66 (0.7)	1.2 (1.3)	3.0 (3.2)
Weight	**kg (lbs)**	1.7 (3.7)	2.4 (5.3)	5.5 (12.1)

Ordering Information

	AK 4-8	AK 16-25	AK 40-65
	Part No.	**Part No.**	**Part No.**
Condensate separator	**188 06**	**188 11**	**188 16**
Oil drain tap M 16 x 1.5 (vacuum-tight)	**190 90**	**190 90**	**190 90**
Adaptor DN 16 KF – hose nozzle DN 7	**182 90**	**–**	**–**

Dust Filters DN 16 KF to DN 40 KF

Filter housing FH 16 to FH 40 for dust filter insert DF

Dust filters protect the pump against sucked in dust. They are suited for oil sealed and also for dry compressing pumps.

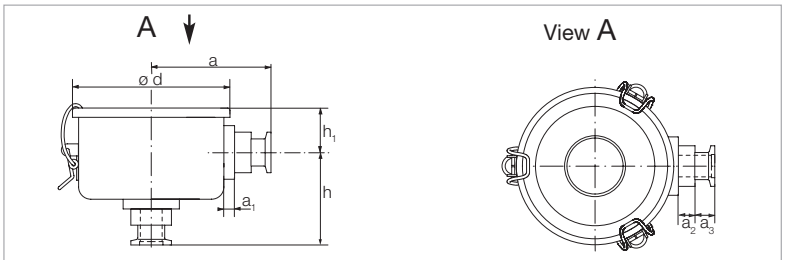
Advantages to the User

- Easy to disassemble
- Vacuum-tight steel housing
- Easily exchangeable replacement filter
- High filter capacity

Technical Information

Installing a dust filter in the intake line of the pump throttles its pumping speed at lower intake pressures much more than at higher intake pressures. Throttling reference values are stated in the Technical Data. These must be taken into account when dimensioning the vacuum system.

Since the collection capacity of dust filters is limited, we recommend the two-stage dust filters AS when larger quantities of dust are involved.



Type	DN		a	a_1	a_2	a_3	d	h	h_1
FH 16	16 KF	mm	96	11	12	15	133	65	46
		in.	3.78	0.43	0.47	0.59	5.24	2.56	1.81
FH 25	25 KF		96	11	12	15	133	65	46
		in.	3.78	0.43	0.47	0.59	5.24	2.56	1.81
FH 40	40 KF		123	11	12	15	176	106	76
		in.	4.84	0.43	0.47	0.59	6.93	4.17	2.99

Dimensional drawing for the filter housings FH 16 to FH 40 for dust filter inserts DF

Technical Data

		Dust Filter		
		DN 16 KF	**DN 25 KF**	**DN 40 KF**
Use for	**TRIVAC**	D 4/8 B	D 16/25 B	D 40/65 B
Share of filtered out particles > 5 µm	**%**	98	98	98
Throttling of pumping speed				
at 10 mbar (7.5 Torr)	**%**	3	3	3
at 1 mbar (0.75 Torr)	**%**	6	6	6
Weight with dust filter insert	**kg (lbs)**	1.3 (2.9)	1.3 (2.9)	2.3 (5.1)

Ordering Information

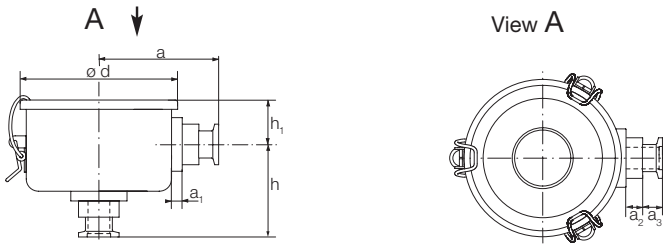
	Dust Filter		
	DN 16 KF	**DN 25 KF**	**DN 40 KF**
	Part No.	**Part No.**	**Part No.**
Dust filter			
filter housing FH [1]	**140 116T**	**140 125T**	**140 140T**
dust filter insert			
DF 16-25	**140 117S**	**140 117S**	**–**
DF 40-65	**–**	**–**	**140 141S**

[1] The filter housing is supplied without filter cartridge (dust filter insert) since it may also be used in connection with the adsorption trap or dust filter insert

Adsorption Traps DN 16 KF to DN 40 KF

Filter housing FH 16 to FH 40
for adsorption trap filter inserts RF

Adsorption traps are containers with a stainless steel insert which can be filled with a number of different adsorbents thereby offering a high adsorbing capacity for vapours, water vapour in particular.



Type	DN		a	a_1	a_2	a_3	d	h	h_1
RF 16	16 KF	mm	96	11	12	15	133	65	46
		in.	3.78	0.43	0.47	0.59	5.24	2.56	1.81
RF 25	25 KF		96	11	12	15	133	65	46
		in.	3.78	0.43	0.47	0.59	5.24	2.56	1.81
RF 40	40 KF		123	11	12	15	176	106	76
		in.	4.84	0.43	0.47	0.59	6.93	4.17	2.99

Dimensional drawing for the filter housings FH 16 to FH 40 for adsorption trap filter inserts RF

Advantages to the User

- Vacuum-tight steel housing
- Stainless steel, degassable up to 300 °C (572 °F)
- Different adsorbents and separating elements can be used
- Quick to replace
- Easy to disassemble

Technical Information

The adsorption traps have been developed specially for use in connection with oil sealed pumps. They are capable of retaining oil vapours discharged from forevacuum pumps and are at the same time in the position to separate vapours (water vapour) coming from the side of the process. Through the use of adsorption traps and a suitable adsorbent, a vacuum free of hydrocarbons can be produced. The stainless steel inserts with the corresponding adsorbent can be heated in a drying cabinet at 300 °C (572 °F) for regeneration.
Depending on the type of adsorbent and operating pressure, the pumping speed of the pumps is reduced.

As to any questions relating to the selection of a suitable absorbent, please consult us.

Technical Data

		Adsorption Trap		
		DN 16 KF	DN 25 KF	DN 40 KF
Use for	TRIVAC	D 4/8 B	D 16/25 B	D 40/65 B
Conductance				
at 10 mbar (7.5 Torr) for				
aluminium oxide	l/s	2	6	14
zeolite	l/s	2	6	12
active charcoal filling	l/s	2	6	16
baffle ring filling	l/s	2	7	18
at 1 mbar (0.75 Torr) for				
aluminium oxide	l/s	1	4	5
zeolite	l/s	1	6	5
active charcoal filling	l/s	2	6	6
baffle ring filling	l/s	2	6	16
Filling quantity				
aluminium oxide	kg (lbs)	0.3 (0.7)	0.3 (0.7)	1.0 (2.2)
zeolite	kg (lbs)	0.2 (0.4)	0.2 (0.4)	0.7 (1.5)
active charcoal filling	kg (lbs)	0.1 (0.2)	0.1 (0.2)	0.5 (1.1)
baffle ring filling	kg (lbs)	0.1 (0.2)	0.1 (0.2)	0.3 (0.7)
Filling volume	l (qt)	0.3 (0.3)	0.3 (0.3)	1.2 (1.3)
Weight with adsorption trap insert	kg (lbs)	1.3 (2.9)	1.3 (2.9)	2.3 (5.1)

Ordering Information

	Adsorption Trap		
	DN 16 KF	DN 25 KF	DN 40 KF
	Part No.	Part No.	Part No.
Adsorption trap			
filter housing FH [1]	140 116T	140 125T	140 140T
adsorption trap filter insert			
RF 16-25	140 118A	140 118A	–
RF 40-65	–	–	140 142A
Active charcoal, un-dried, 5 kg	178 10	178 10	178 10
Zeolite, 1 kg	854 20	854 20	854 20
Aluminium oxide, 1.2 kg	854 10	854 10	854 10
Baffle ring 15 x 15 x 0.3, 1 liter			
Stainless steel 1.4301	390 26 126	390 26 126	390 26 126

[1] The filter housing is supplied without filter cartridge (dust filter insert) since it may also be used in connection with the adsorption trap or dust filter insert

Cold Trap TK 4-8

TK 4-8 cold trap

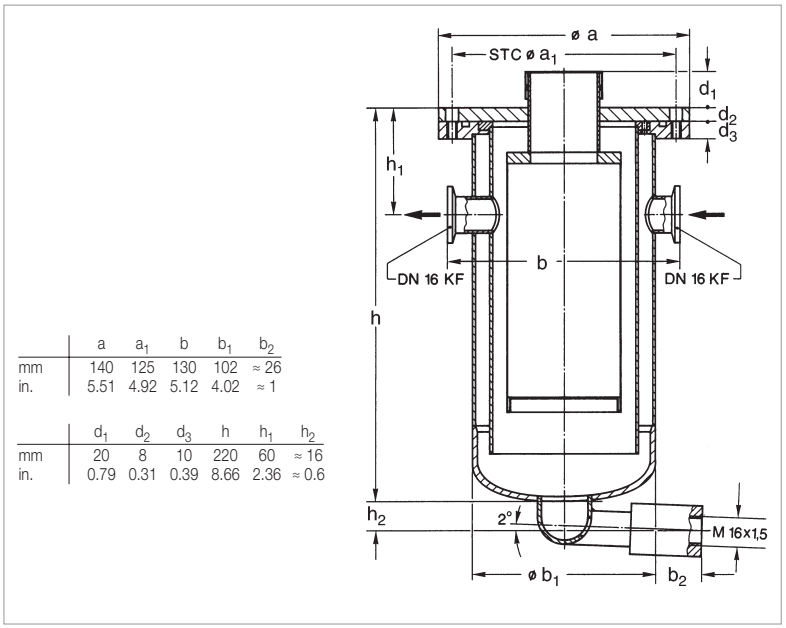
The cold trap protects the pump against damaging vapors.

Advantages to the User

- Rugged and implosion resistant
- May be fitted directly on the flange of the pump
- Safe draining of the condensate without problems
- Casing made of corrosion resistant stainless steel
- Simple filling with refrigerant (liquid nitrogen (LN_2) or a mixture of acetone and carbon di-oxide ice)

Typical Applications

- Prevention of oil from backstreaming into the vacuum system when operating at ultimate pressure
- Freezing of gases and vapors in the laboratory



	a	a_1	b	b_1	b_2
mm	140	125	130	102	≈ 26
in.	5.51	4.92	5.12	4.02	≈ 1

	d_1	d_2	d_3	h	h_1	h_2
mm	20	8	10	220	60	≈ 16
in.	0.79	0.31	0.39	8.66	2.36	≈ 0.6

Dimensional drawing for the TK 4-8 cold trap

Technical Data — TK 4-8

Connection to pump	**TRIVAC**	D 2,5 E / D 4/8 B
Capacity for refrigerant, approx.	**l (qt)**	0.4 (0.42)
Connections	**DN**	16 KF
Weight	**kg (lbs)**	4 (8.8)

Ordering Information — TK 4-8

	Part No.
Cold trap	**188 20**
Drain tap for the intake side, vacuum-tight	**190 90**
Elbow (1x)	**184 36**
Centering ring	
aluminum/NBR (2x)	**183 26**
stainless steel/FPM (FKM) (2x)	**883 46**
Clamping ring (2x)	**183 41**

Dust Separators AS 8-16 and AS 30-60 / Molecular Filters MF 8-16 and MF 30-60

AS 30-60 dust separator
(MF 30-60 molecular filter is similar)

Dust separators protect pumps against contamination and damage by sucked-in dust.

Advantages to the User

- Dust separators for large quantities of dust
- Two-stage, thus hardly any throttling
- Cyclone (for coarse dust) and wet filter (for fine dust)
- Dust separator and molecular filter have the same housing (for easy conversion)

Typical Application

- Separation of coarse and medium size dust starting at a grain size of 2 µm

Technical Information

Installing a dust filter in the intake line of the pump will throttle its pumping speed at low intake pressures more than at higher intake pressures. This must be taken into account when designing a vacuum system.

Even when large quantities of dust are deposited, the throttling effect will hardly increase.

Supplied Equipment

Blanked off drain port.

Molecular filters are used to separate vapors of a high molecular weight (i.e. monomers, vapors from resins).

Advantages to the User

- Molecular filter and dust separator have the same housing (for easy conversion)
- Separation of high-molecular weight vapors
- Protection of the pump's oil against damaging vapors

Technical Information

Installing a molecular filter in the intake line of the pump will throttle its pumping speed at low intake pressures more than at higher intake pressures. This must be taken into account when designing a vacuum system.

Supplied Equipment

Blanked off drain port.

Technical Data

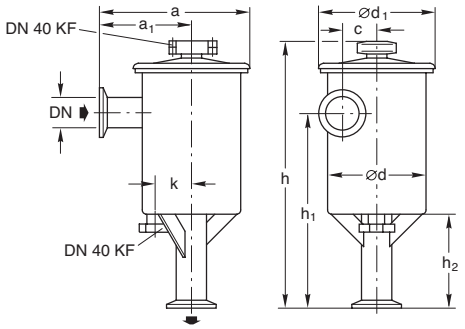
	AS 8-16	AS 30-60	MF 8-16	MF 30-60

Connection to pump	TRIVAC	D 16 B	D 25 B	D 40 B	D 65 B	D 16 B/BCS	D 25 B/BCS	D 40 B/BCS	D 65 B/BCS
Throttling of the pumping speed at 1 mbar (0.75 Torr) intake pressure, approx.	%	10	15	8	16	10	15	8	16
at 10 mbar (7.5 Torr) intake pressure, approx.	%	5	7	4	9	5	7	4	9
Capacity for dust	l (qt)	0.6 (0.63)	0.6 (0.63)	2.0 (2.11)	2.0 (2.11)	–	–	–	–
Capacity for resin vapors or similar	kg (lbs)	–	–	–	–	0.15 (0.3)	0.15 (0.3)	0.35 (0.8)	0.35 (0.8)
Impact ring filling	l (qt)	0.5 (0.53)	0.5 (0.53)	3.5 (3.70)	3.5 (3.70)	–	–	–	–
Active charcoal filling	kg (lbs)	–			–	0.6 (1.3)	0.6 (1.3)	1.4 (3.1)	1.4 (3.1)
Weight	kg (lbs)	4.5 (9.9)	4.5 (9.9)	18.4 (40.6)	18.4 (40.6)	4.5 (9.9)	4.5 (9.9)	18.4 (40.6)	18.4 (40.6)

Ordering Information

	AS 8-16	AS 30-60	MF 8-16	MF 30-60

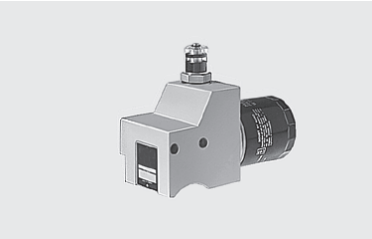
	Part No.	Part No.	Part No.	Part No.
Dust separator	**186 11**	**186 16**	**–**	**–**
Molecular filter	**–**	**–**	**186 12**	**186 17**
Replacement filter insert	**–**	**178 43**	**–**	**–**
Replacement active charcoal insert	**–**	**–**	**178 07**	**178 08**
Active charcoal, undried, 5 kg (11 lbs)	**–**	**–**	**178 10**	**178 10**



Type	DN		a	a_1	c	⌀ d	⌀ d_1	h	h_1	h_2	k
AS/MF 8-16	25 KF	mm	181	100	43	133	162	247	150	37	–
		in.	7.13	3.94	1.69	5.24	6.38	9.72	5.91	1.46	–
AS/MF 30-60	40 KF	mm	310	190	70	205	234	530	395	190	75
		in.	12.2	7.48	2.76	8.07	9.12	20.9	15.6	7.48	2.95

Dimensional drawing for the AS dust separators and MF molecular filters

Mechanical Oil Filters OF 4-25 and OF 40-65 / Chemical Oil Filters CF 4-25 and CF 40-65

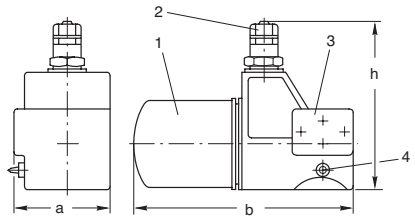


OF 4-25 mechanical oil filter

Since there is a pressure-lubrication system with an oil pump in every TRIVAC B, it is possible to connect main flow oil filters.

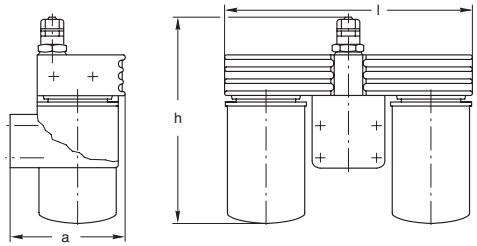
These filters are available either for mechanical filtering (OF types) or combined chemical/mechanical filtering (CF types).

OF/CF 4-25



1 Interchangeable filter
2 Maintenance indicator
3 Connection flange
4 Pin for protection against twisting

OF/CF 40-65



Type		a	b	h	l
OF 4-25	mm	≈ 100	200	150	–
	in.	≈ 4.0	7.87	5.91	–
CF 4-25	mm	≈ 100	315	160	–
	in.	≈ 4.0	12.4	6.30	–
OF 40-65	mm	135	–	239	296
	in.	5.31	–	9.41	11.7
CF 40-65	mm	135	–	307	296
	in.	5.31	–	12.1	11.7

Dimensional drawings for the OF mechanical oil filters and CF chemical oil filters

Advantages to the User

- Main flow oil filter
- Longer service life for the oil depending on the type of application
- Can be installed without problems to the TRIVAC B
- Hose connections are not required
- Easily interchangeable filters
- Only a small amount of oil needs to be added when changing the filters
- Expansion of the range of applications in case of special requirements
- Same casing for OF and CF types
- Greater reliability by standard maintenance indicator
- Built-in bypass valve
- Owing to the highly effective adsorbent for polar substances, an up to ten-fold adsorption effect is attained over normal bleaching earth (CF)
- Prevents mechanical damage to the pump

Typical Application

- Separation of fine particles from the pump's oil (sizes between 5 and 10 µm (OF))

Technical Data

		OF 4-25	CF 4-25	OF 40-65	CF 40-65
Connection to pump	TRIVAC	D 4/8 B, D 16/25 B	D 4/8 B, D 16/25 B	D 40/65 B	D 40/65 B
Nominal throughput	l x h^{-1}	900	900	2000	2000
Separation					
mechanical oil filter	µm	5 to 10	5 to 10	5 to 10	5 to 10
chemical oil filter	µm	to 3	to 3	to 3	to 3
Permissible operating pressure	bar (psig)	2.5 (21.7)	2.5 (21.7)	2.5 (21.7)	2.5 (21.7)
Opening pressure,					
non-return valve	bar (psid)	0.12 (1.7)	0.12 (1.7)	0.12 (1.7)	0.12 (1.7)
bypass valve	bar (psid)	2.5 ±0.3 (21.7 ±4.3)	2.5 ±0.3 (21.7 ±4.3)	2.5 ±0.3 (21.7 ±4.3)	2.5 ±0.3 (21.7 ±4.3)
Topping up amount during					
first time installation	l (qt)	1.0 (1.1)	1.0 (1.1)	2.5 (2.6)	2.5 (2.6)
filter exchange	l (qt)	1.0 (1.1)	1.0 (1.1)	2.0 (2.1)	2.0 (2.1)
Weight, ready for operation, dry	kg (lbs)	4.0 (8.8)	4.0 (8.8)	10.0 (22.1)	10.0 (22.1)

Ordering Information

	OF 4-25	CF 4-25	OF 40-65	CF 40-65
	Part No.	**Part No.**	**Part No.**	**Part No.**
Mechanical oil filter	**101 91**	**–**	**101 92**	**–**
Chemical oil filter	**–**	**101 96**	**–**	**101 97**
WF 4-25 interchangeable filter, paper, 0.5 l (0.5 qt)	**189 91**	**–**	**–**	**–**
WF 40-65 interchangeable filter, paper 0.75 l (0.8 qt)	**–**	**–**	**189 92** [1)]	**189 92** [1)]
WF Alu 4-65 interchangeable filter, paper and Al_2O_3, 1 l (1.1 qt)	**–**	**189 96**	**–**	**189 96** [1)]

[1)] 2 pieces are required

Chemical Filters with Safety Isolation Valve CFS 16-25 and CFS 40-65

CFS 40-65

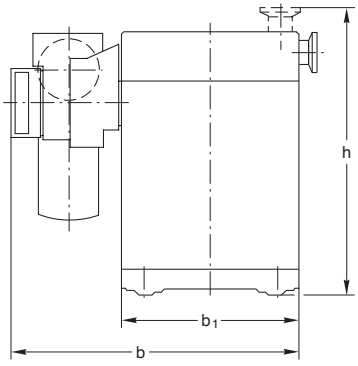
The CFS chemical filters with safety isolation valve are main flow oil filters for the TRIVAC B and BCS pumps.

The CFS is part of the TRIVAC SYSTEM.

Advantages to the User

- The CFS is included in the main lubricant flow
- Rapid filter exchange – the pump may contniue to operate while changing the filters
- Visual indication of the filter's condition through a maintenance indicator
- Aluminum component with isolation valve for one or two interchangeable filters
- All aluminium parts are surface protected
- May be operated with different interchangeable filters
- Over-pressure relief valve in the interchangeable filters
- Prepared for connection of a differential pressure switch and an oil pressure switch
- May also be used on the TRIVAC B pumps

Type		b	b_1	h
CFS 16-25	mm	≈ 327	176	264
	in.	≈ 12.9	6.9	10.4
CFS 40-65	mm	≈ 390	234	356
	in.	≈ 15.4	9.21	14.0



Dimensional drawing for the CFS (mounted on a TRIVAC BCS)

Technical Information

The CFS is cleaned in the factory to such an extent, that it may be operated either with mineral oil (e.g. LEYBONOL LVO 100) or perfluoropolyether (PFPE, e.g. LEYBONOL LVO 400).

Supplied Equipment

All gaskets and mounting parts required for installation.

Aluminium particle filters (WF Alu-Part) sealed for shipping are included separately.

Technical Data

		CFS 16-25	CFS 40-65
Connection to pump	**TRIVAC**	D 16/25 B D 16/25 BCS (-PFPE)	D 40/65 B D 40/65 BCS (-PFPE)
Nominal throughput	**l x h^{-1}**	900	2000
Permissible operating pressure	**bar (psig)**	2.5 (21.7)	2.5 (21.7)
Opening pressure			
Non-return valve	**bar (psid)**	2.5 (21.7)	2.5 (21.7)
Bypass valve	**bar (psid)**	2.5 ±0.3 (21.7 ±4.3)	2.5 ±0.3 (21.7 ±4.3)
Filter medium		Al_2O_3	Al_2O_3
Lubricant filling when using WF Alu-Part	**l (qt)**	1.4 (1.5)	3.3 (3.5)
Weight, ready for operation, dry	**kg (lbs)**	7.0 (15.4)	15.5 (34.1)

Ordering Information

	CFS 16-25	CFS 40-65
	Part No.	**Part No.**
Chemical filter with safety isolation valve	**101 76**	**101 77**
WF Alu-Part combination filter, paper and Al_2O_3, 1.6 l (1.7 qt)	**189 99**	**189 99** [1)]
WF particle filter, paper, 1.6 l (1.7 qt)	**200 09 804**	**200 09 804** [1)]
WFG particle filter, paper with support mesh, 1 l (1.1 qt)	**189 90**	**189 90** [1)]

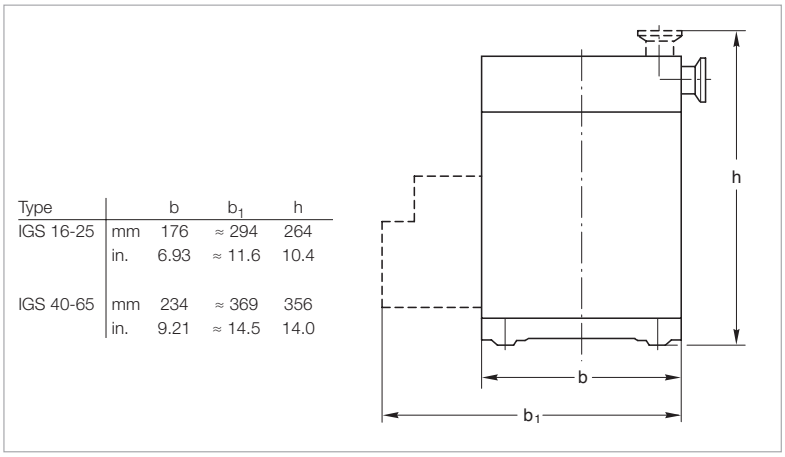
[1)] 2 pieces are required

Inert Gas System
IGS 16-25 and IGS 40-65

IGS

This accessory, which is controlled via solenoid valves, permits the controlled admission of special gases into the TRIVAC BCS.

The IGS is part of the TRIVAC SYSTEM.



Type		b	b_1	h
IGS 16-25	mm	176	≈ 294	264
	in.	6.93	≈ 11.6	10.4
IGS 40-65	mm	234	≈ 369	356
	in.	9.21	≈ 14.5	14.0

Dimensional drawing for the IGS (mounted on a TRIVAC BCS)

Advantages to the User

- Ready for connection to an inert gas supply
- Solenoid valve for reduced gas ballast
- Solenoid valve for purging the oil box
- Float throughput gauge with throttling valve adjustable from 200 to 700 l x h^{-1}
- The flowing quantity can be read directly
- System protection by a non-return valve (requires a reservoir pressure of at least 3 bar (29 psi, gauge)) – this reliably prevents the reservoir vessel from being evacuated
- Connects directly on to the TRIVAC BCS

Typical Applications

- Reduction of the contamination levels in the lubricant
- Reduction in the dwell time of volatile substances within the pump

Technical Information

The amount of inert gas ballast is restricted by a nozzle to 200 l x h^{-1}. Larger quantities are used for purging.

Supplied Equipment

Solenoid valves with connection cables and plugs, the required connecting pieces, mounting screws and cover panel.

Technical Data

		IGS 16-25	IGS 40-65
Connection to pump	**TRIVAC**	D 16/25 BCS (-PFPE)	D 40/65 BCS (-PFPE)
Min. amount of admitted gas at a reservoir pressure of 3.0 bar (29 psig)	**l x h^{-1}**	200	200
Max. amount of admitted gas at a reservoir pressure of 6.0 bar (72.5 psig)	**l x h^{-1}**	1450	1450
Supply voltage for the solenoid valves	**V DC**	24	24
Power consumption	**W**	10	10
Weight	**kg (lbs)**	1.0 (2.2)	1.4 (3.1)
Connection thread	**G (BPS)**	1/8"	1/8"

Ordering Information

	IGS 16-25	IGS 40-65
	Part No.	**Part No.**
Inert gas system	**161 76**	**–**
Inert gas system, UL conform	**–**	**161 68V**

Limit Switch System
LSS 16-25 and LSS 40-65

LSS

This accessory consists of a package of limit switches. It is used to monitor system functions.

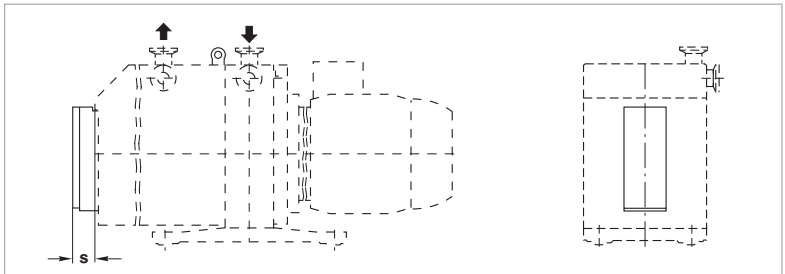
The LSS is part of the TRIVAC SYSTEM.

The package of limit switches includes:

- Differential pressure switch to monitor the CFS
- Oil pressure switch to monitor the operating pressure
- Flow switch to monitor the inert gas flow
- Pressure switch to monitor the pressure in the oil box of the pump
- Connection cable and plug for the temperature switch used for temperature monitoring
- Float switch with housing to monitor the oil level

Advantages to the User

- Errors are indicated well in advance so that it will in most cases be possible to complete the process for the running batch
- The switching action is independent of the optical displays (for optimum reliability)
- The temperature switch is already present in the TRIVAC BCS



Type		s
LSS 16-25	mm	55
	in.	2.17
LSS 40-65	mm	51
	in.	2.01

Dimensional drawing for the LSS (mounted on a TRIVAC BCS)

Typical Application

- Changing the status in case operating conditions arise which are not permissible

Supplied Equipment

Fully wired-up switches with plugs as well as all required gaskets and mounting parts.

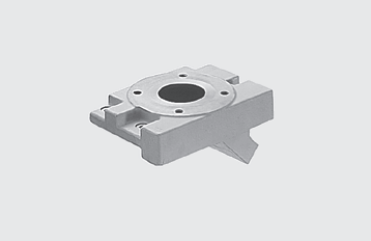
Technical Data

		LSS 16-25	LSS 40-65
Connection to pump	**TRIVAC**	D 16/25 BCS (-PFPE)	D 40/65 BCS (-PFPE)
Operating voltage	**V DC**	24	24
Switching capacity	**W / A**	10.0 / 0.4	10.0 / 0.4
Type of protection	**IP**	54	54
Weight, approx.	**kg (lbs)**	2.5 (5.5)	2.5 (5.5)

Ordering Information

	LSS 16-25	LSS 40-65
	Part No.	**Part No.**
Limit switch system	**161 06**	**161 07**

Roots Pump Adaptor



Roots pump adaptor

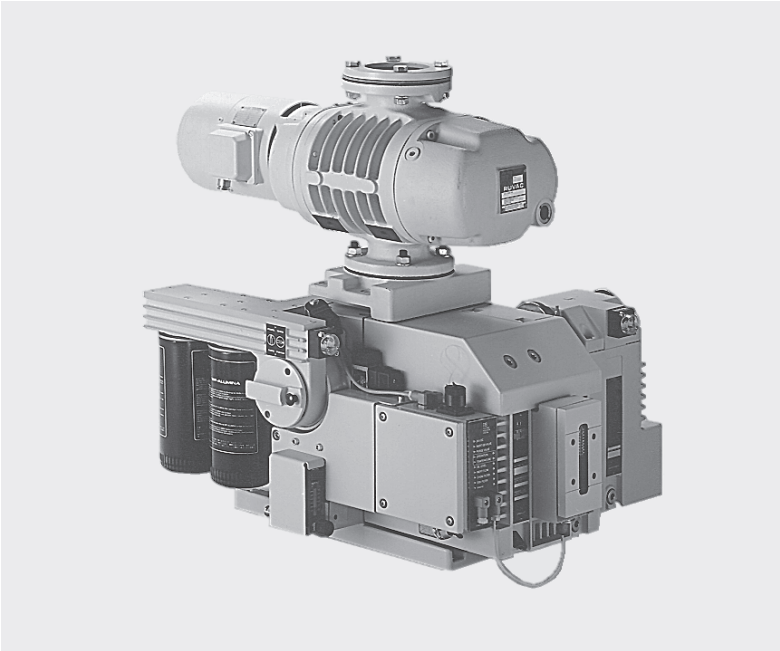
The Roots pump adaptor allows the direct installation of a Roots pump on a TRIVAC D 40/65 B/BCS.

Advantages to the User

- Compact and space-saving
- Short and direct connection between the pumps
- Minimal conductance loss
- Easy installation

Typical Application

- Simple assembly of a small pump system



Pump system consisting of a TRIVAC D 65 BCS and a RUVAC WS 251

Technical Data — Roots Pump Adaptor

Connection to pump	**TRIVAC**	D 40/65 B/BCS (-PFPE) and RUVAC WA/WAU/WS/WSU 251
Weight, approx.	**kg (lbs)**	11.5 (25.4)

Ordering Information — Roots Pump Adaptor

	Part No.
Roots pump adaptor	**168 30**

Only available for purchase in North and South America

RST Refillable Traps

RST refillable trap

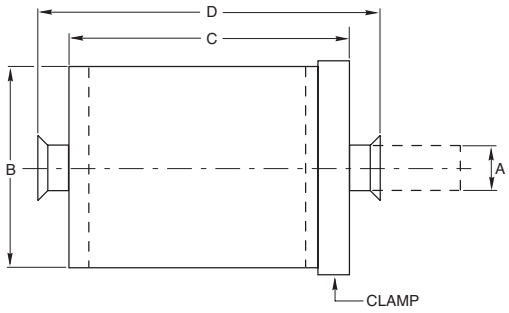
The RST traps are made from 304 stainless steel, and when specified with stainless steel filtration media, are fully suited for corrosive applications. The media is inserted directly into the trap. This ensures direct contact with the trap walls. There is no oil path between the trap wall and the retainer gasket to reduce trap effectiveness.

Advantages to the User

- Refillable
- Two filtration media
- Easy to clean
- Easy to recharge
- KF flanges

Applications

Foreline traps are utilized whenever long-term effects of mechanical pump oil back migration into the pumped chamber or higher vacuum (oil diffusion) pump may be undesirable. Copper wool for standard applications and stainless steel wool for corrosive applications are available.



Model	Flange	Dimension	⌀ A	⌀ B	C	D
RST16KF	DN 16 KF both ends	mm	KF 16	63	83	133
		in.		$2^1/_2$	$3^1/_4$	$5^1/_4$
RST25KF	DN 25 KF both ends	mm	KF 25	76	108	171
		in.		3	$4^1/_4$	$6^3/_4$
RST40KF	DN 40 KF both ends	mm	KF 40	102	102	178
		in.		4	4	7

Dimensional drawing for the RST

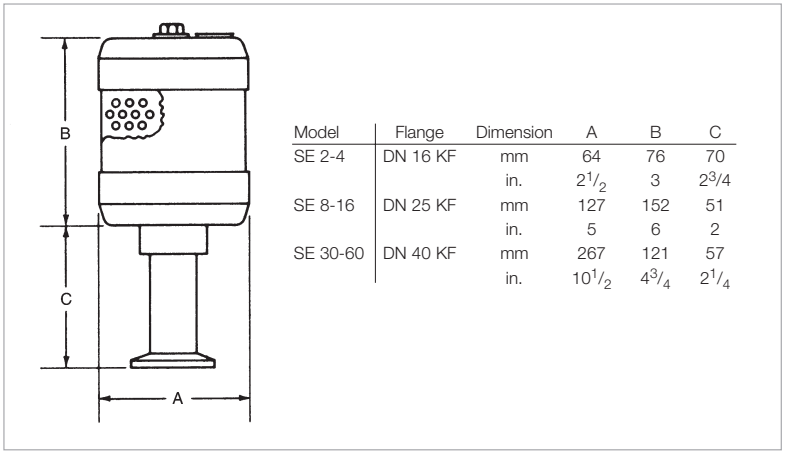
Technical Data		**RST16KF**	**RST25KF**	**RST40KF**
Connection to pump	TRIVAC	D 4/8 B/BCS	D 16/25 B/BCS	D 40/65 B/BCS

Ordering Information	**RST16KF**	**RST25KF**	**RST40KF**
	Part No.	**Part No.**	**Part No.**
RST16KF 1.9 lb (0.9 kg)	**99 171 135**	–	–
RST25KF 2.6 lb (1.2 kg)	–	**99 171 136**	–
RST40KF 4.1 lb (1.9 kg)	–	–	**99 171 137**
Filtering media Stainless steel Copper	 **99 171 141** **99 171 145**	 **99 171 141** **99 171 146**	 **99 171 141** **99 171 147**

Only available for purchase in North and South America

SE Smoke Eliminator

SE smoke eliminator



Model	Flange	Dimension	A	B	C
SE 2-4	DN 16 KF	mm	64	76	70
		in.	$2^1/_2$	3	$2^3/4$
SE 8-16	DN 25 KF	mm	127	152	51
		in.	5	6	2
SE 30-60	DN 40 KF	mm	267	121	57
		in.	$10^1/_2$	$4^3/_4$	$2^1/_4$

Dimensional drawing for the SE

The Oerlikon Leybold Vacuum SE smoke eliminator can be utilized on all TRIVAC B rotary vane vacuum pumps where pump fluid loss at the exhaust port must be eliminated. These filters consist of a replaceable two-stage coalescing element mounted in a steel housing. For maintenance purposes, the top of the housing can be removed by loosening a single bolt. The filter assembly attaches to the exhaust port of the TRIVAC pump by means of a KF flange. Since three models are available, an SE smoke eliminator is available for each TRIVAC pump model.

Advantages to the User

- Two stage design
- Three sizes for all TRIVAC models
- KF flanges

Applications

When any oil sealed mechanical vacuum pump is used to pump a fixed volume from atmospheric pressure to some lower pressure or when a dynamic gas flow from a process stream is pumped, some mechanical pump fluid loss will occur at the exhaust of the pump. The more often a fixed volume is cycled from atmospheric pressure to a lower pressure or the longer a pump operates at a relatively high inlet pressure in a dynamic flow condition, the greater will be the fluid loss at the exhaust port of the pump.

By utilizing a coalescing exhaust filter for these applications, the fluid and exhaust gases are separated, and in the case of the SE smoke eliminator, the coalesced fluid is allowed to drain back into the pump fluid reservoir. Annoying oil fog to the atmosphere is thus eliminated.

Eventually, after about a year's normal operation, the coalescing element will become totally saturated and oil fog will be apparent when high inlet pressures are prevailing. The low cost coalescing element can be easily replaced.

Note: For applications where toxic, corrosive, radioactive or precious gases are pumped, we highly recommend the use of our AF coalescing exhaust filters in-stead of the SE smoke eliminator. The AF is an in-line type coalescing filter and much more suitable for these applications.

Technical Data		**SE 2-4**	**SE 8-16**	**SE 30-60**
Connection to pump	TRIVAC	D 4/8 B	D 16/25 B	D 40/65 B

Ordering Information	**SE 2-4**	**SE 8-16**	**SE 30-60**
	Part No.	**Part No.**	**Part No.**
Smoke eliminator	**99 171 125**	**99 171 126**	**99 171 127**
Replacement element			
RE 2-4	**99 171 128**	**–**	**–**
RE 8-16	**–**	**99 171 129**	**–**
RE 30-60	**–**	**–**	**99 171 130**

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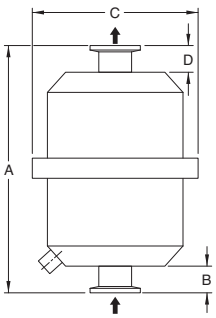
Compact Oil Mist Exhaust Filters

Compact oil mist exhaust filter



Model		A	B	⌀C	D
DN 25	mm	196.85	22.23	133.35	22.23
	in.	7 3/4	7/8	5 1/4	7/8

Dimensional drawing for the compact oil mist exhaust filter

Applications and Equipment

- Rotary vane pumps
- Vacuum furnaces, ovens and degassing
- Refrigeration and air condition
- Vacuum freeze drying
- Vacuum metallizing
- Vacuum coating
- Laboratory furnaces, test stands
- Autoclaving, sterilization
- Leak detection

Features and Specifications

- Minimum 99.97% D.O.P. on 3 micron particles
- Captures oil fog, mist or smoke from exhaust of oil lubricated vacuum pumps
- Compact, low profile design
- Stainless steel housing and internals
- Pleated filter element provides increased surface area for low back pressure
- Back pressure valve designed to release element at 7.35 PSI (0.5 bar) differential for pump safety
- 1/8" NPT oil drain
- Easy release V-band clamp
- Seamless drawn housings - no welds to rust or vibrate apart
- Easy field maintenance
- Operating temperature: 40 °F (4 °C) to 220 °F (104 °C)

Technical Data — Compact Oil Mist Exhaust Filter

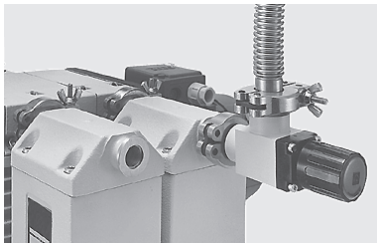
Connection to pump	**TRIVAC**	D 16/25 B
Inlet and outlet	**DN**	25 ISO-KF
Nominal vacuum pump rating	**scfm (m^3/h)**	20 (34)
Element rating	**scfm (m^3/h)**	20 (34)
Weight, approx.	**kg (lbs)**	1 (2.2)

Ordering Information — Compact Oil Mist Exhaust Filter

	Part No.
Compact oil mist exhaust filter	**721 87 113**
Replacement filter insert filter	**180 102**

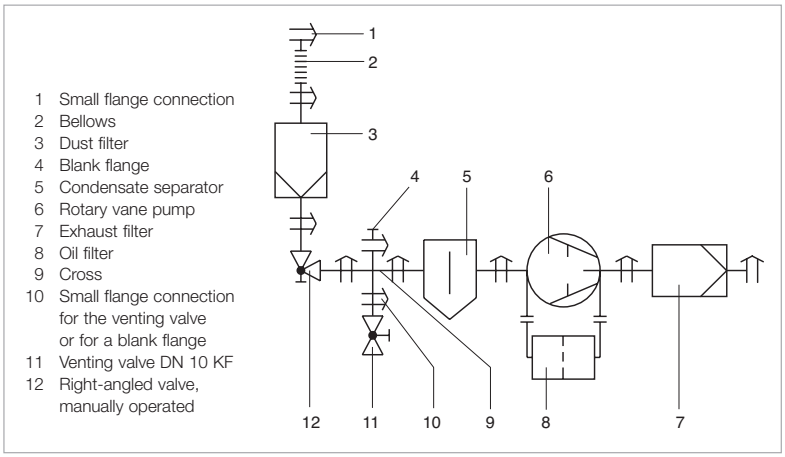
General Accessories

Flange Components, Valves



Our range of flange components and valves is described in detail in the Catalog Parts “Flanges and Fittings” and “Valves”.

Given in the following are only some components which you might find particularly useful when planning your system.



Example of connecting a pump with accessories

Isolation Valve

- The pump is allowed to warm up with the intake line isolated
- The pump may continue to operate in the energy-saving and environmentally compatible ultimate pressure mode when the vacuum chamber is vented briefly
- The pump may be left on after completion of the process so as to regenerate the oil

Branch (Cross)

- Installing a cross in the intake line permits the connection of a vacuum gauge and a venting valve

Flange Connections

Each flange connection requires one each centering and clamping ring.

Ordering Information

	DN 16 KF	DN 25 KF	DN 40 KF
	Part No.	Part No.	Part No.
Small flange connection			
Clamping ring	183 41	183 42	183 43
Centering ring, aluminum/CR	183 26	183 27	183 28
Centering ring, stainless steel/ FPM (FKM)	883 46	883 47	883 48
Bellows	872 41	872 43	872 45
Right-angled valve, manually operated			
Aluminum casing	215 375	215 376	215 377
Stainless steel casing	215 383	215 385	215 386
Blank flange for (reducing) cross			
Aluminium	184 46	184 41	184 41
Stainless steel	884 36	884 41	884 41
Reducing cross (to DN 10 KF)			
Aluminum	–	184 17	184 19
Stainless steel	–	884 92	884 94
Cross DN 16 KF			
Aluminum	184 71	–	–
Stainless steel	884 85	–	–
Small flange connection for venting valve or blank flange			
Clamping ring	183 41	183 41	183 41
(Adaptor) centering ring, aluminum/NBR	183 56	183 21	183 21
(Adaptor) centering ring, stainless steel/FPM (FKM)	883 56	883 21	883 21
Venting valve DN 10 KF			
Aluminum	173 24	173 24	173 24
Stainless steel	173 37	173 37	173 37

Services

On-site Replacement of the Dynamic Seals (with LEYBONOL LVO 100)

The on-site replacement of the dynamic seals includes the following:
Partial disassembly of the pump, replacement of the complete shaft seal, mounting of the pump including new gaskets and standard oil LEYBONOL LVO 100, electrical safety test, test run including check of the attained ultimate pressure levels

Ordering Information

On-site Replacement of the Dynamic Seals (with LEYBONOL LVO 100)

	Part No.
For pump	
TRIVAC D 4 B	**AS 1130 F**
TRIVAC D 8 B	**AS 1130 F**
TRIVAC D 16/25 B	**AS 1129 F**
TRIVAC D 40/65 B	**AS 1128 F**
TRIVAC D 40/65 BCS	**AS 1137 F**

Small On-site Maintenance (with LEYBONOL LVO 100)

The small on-site maintenance includes the following:
Oil change (standard LEYBONOL LVO 100), filter replacement, visual inspection of the subassemblies, cleaning of the pump module and the oil box, electrical safety test, test run including check of the attained ultimate pressure levels

Ordering Information

On-site Maintenance (with LEYBONOL LVO 100)

	Part No.
For pump	
TRIVAC D 4 B	**AS 1160 F**
TRIVAC D 8 B	**AS 1159 F**
TRIVAC D 16 B + BCS	
with standard gaskets	**AS 1158 F**
TRIVAC D 25 B + BCS	
with standard gaskets	**AS 1157 F**
TRIVAC D 40/65 B + BCS	
with standard gaskets	**AS 1156 F**

Comprehensive On-site Maintenance (with LEYBONOL LVO 100) [1)]

Comprehensive on-site maintenance includes the following:
Disassembly of the pump, cleaning of all individual components, replacement of all wearing parts, mounting of the pump including new gaskets and standard oil LEYBONOL LVO 100, electrical safety test, test run including check of the attained ultimate pressure levels

Ordering Information

	Comprehensive On-site Maintenance (with LEYBONOL LVO 100) [1)]
	Part No.
For pump	
TRIVAC D 4 B	**AS 1125 F**
TRIVAC D 8 B	**AS 1124 F**
TRIVAC D 16 B	**AS 1121 F**
TRIVAC D 25 B	**AS 1120 F**
TRIVAC D 40 B	**AS 1117 F**
TRIVAC D 65 B	**AS 1116 F**
TRIVAC D 40 BCS with Viton gaskets	**AS 1136 F**
TRIVAC D 65 BCS with Viton gaskets	**AS 1135 F**
TRIVAC D 40 BCS with standard gaskets	**AS 1132 F**
TRIVAC D 65 BCS with standard gaskets	**AS 1131 F**

[1)] Notes on our on-site after sales service

The listed services include the costs for material and working hours on site for standard TRIVAC pumps. Services for pump variants upon request.
Transportation and travelling expenses are invoiced at cost. All services refer to the repair of freely accessible and not contaminated vacuum components.

As to services for TRIVAC B-DOT, TRIVAC B-Ex and TRIVAC B ^{3}He please ask us for a quotation.

Complete Refurbishing at the Service Centre (with LEYBONOL LVO 100)

Complete refurbishing at the service centre includes the following:
Disassembly of the pump, visual inspection of the subassemblies, replacement of all wearing parts, machined reworking of the pump module, mounting of the pump including new gaskets and standard oil LEYBONOL LVO 100, electrical safety test, test run including check of the attained ultimate pressure levels.

Ordering Information

Complete Refurbishing at the Service Centre (with LEYBONOL LVO 100)

	Part No.
For pump	
TRIVAC D 4 B	**AS 1125**
TRIVAC D 8 B	**AS 1124**
TRIVAC D 16 B	**AS 1121**
TRIVAC D 25 B	**AS 1120**
TRIVAC D 40 B	**AS 1117**
TRIVAC D 65 B	**AS 1116**
TRIVAC D 40 BCS with Viton gaskets	**AS 1136**
TRIVAC D 65 BCS with Viton gaskets	**AS 1135**
TRIVAC D 40 BCS with standard gaskets	**AS 1132**
TRIVAC D 65 BCS with standard gaskets	**AS 1131**

Complete Refurbishing with Decontamination at the Service Centre (with LEYBONOL LVO 100)

Complete refurbishing with decontamination at the service centre includes the following:
Disassembly of the pump, decontamination of the individual components, visual inspection of the individual subassemblies, replacement of all wearing parts, machined reworking of the pump module, mounting of the pump including new gaskets and standard oil LEYBONOL LVO 100, electrical safety test, test run including check of the attained ultimate pressure levels.

Ordering Information

Complete Refurbishing with Decontamination at the Service Centre (with LEYBONOL LVO 100)

	Part No.
For pump	
TRIVAC D 4 B	**AS 1125 D**
TRIVAC D 8 B	**AS 1124 D**
TRIVAC D 16 B	**AS 1121 D**
TRIVAC D 25 B	**AS 1120 D**
TRIVAC D 40 B	**AS 1117 D**
TRIVAC D 65 B	**AS 1116 D**
TRIVAC D 40 BCS with Viton gaskets	**AS 1155 D**
TRIVAC D 65 BCS with Viton gaskets	**AS 1154 D**
TRIVAC D 40 BCS with standard gaskets	**AS 1132 D**
TRIVAC D 65 BCS with standard gaskets	**AS 1131 D**

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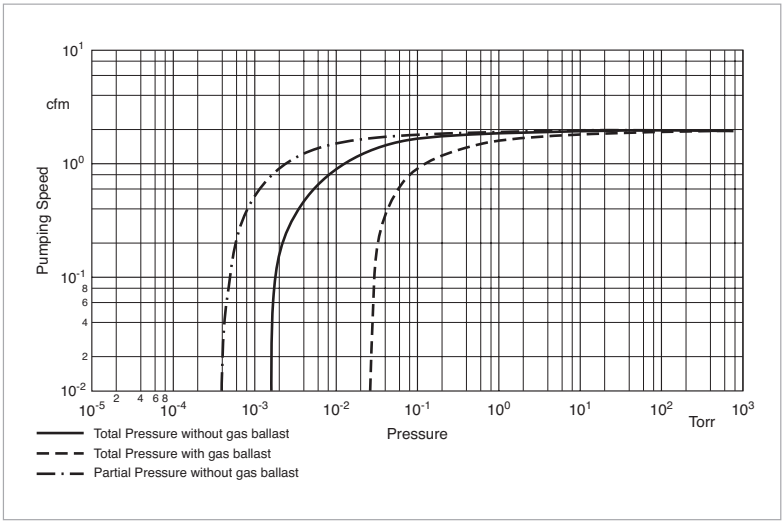
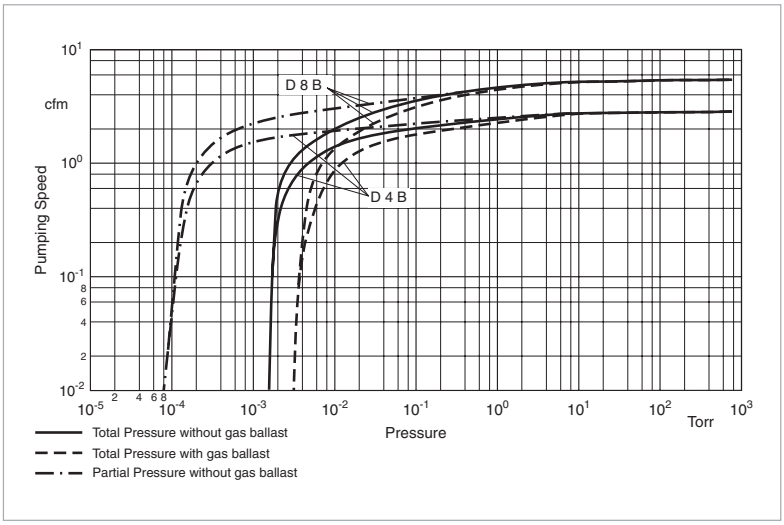
60 Hz Curves

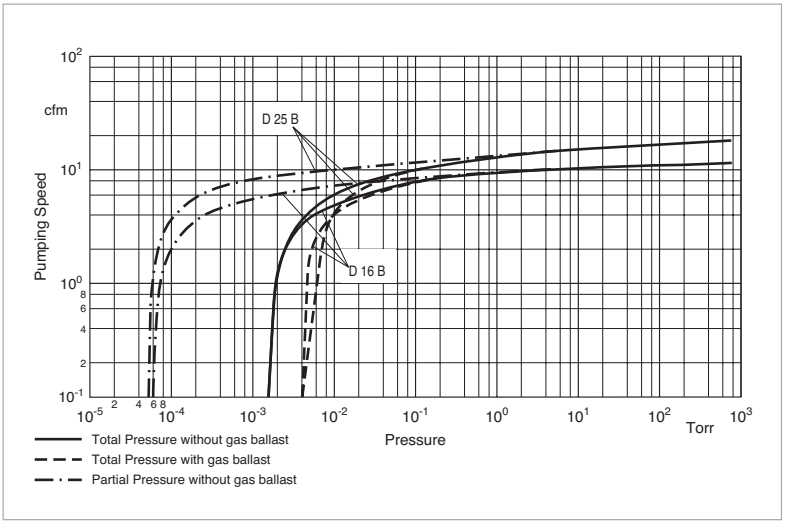


Pumping speed characteristics for the TRIVAC D 2.5 E at 60 Hz

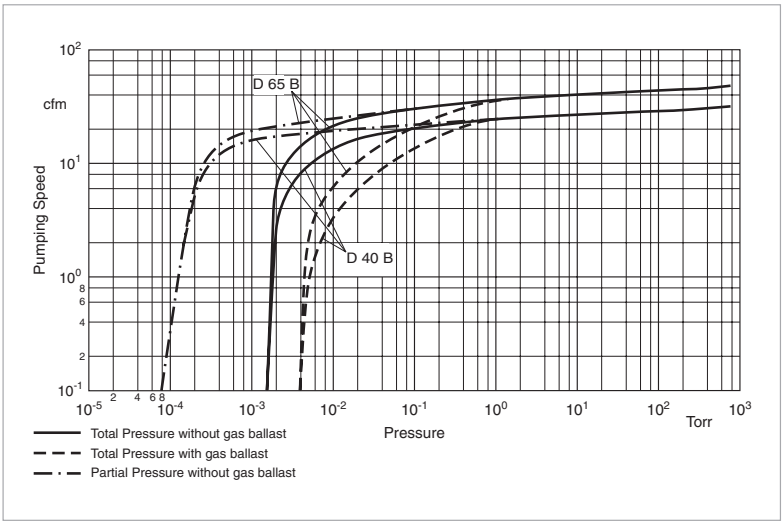


Pumping speed characteristics for the TRIVAC D 4 B and D 8 B at 60 Hz

Only available for purchase in North and South America



Pumping speed characteristics for the TRIVAC D 16 B/BCS and D 25 B/BCS at 60 Hz



Pumping speed characteristics for the TRIVAC D 40 B/BCS and D 65 B/BCS at 60 Hz