

TURBOVAC iR

Performance and
robustness in demanding
environments.





TURBOVAC iR

The radiation resistant pump version of the TURBOVAC i series

Why TURBOVAC iR?

The TURBOVAC iR turbomolecular vacuum pump range has been developed to fulfill the requirements of demanding applications where high ionizing radiation is surrounding while providing the needed vacuum.

The set-up of the pump makes it both reliable and dependable during operation.

Radiation resistance up to 1 MGray

Thanks to this exceptional tolerance against radiations the performance of the TURBOVAC iR pump is assured... and so is the operation of your application.

Remote operation

With TURBOVAC iR you get the right solution for all kinds of remote operation.

The controller TURBO.DRIVE 500e can drive any of the TURBOVAC iR family members on distances of up to 200 m, and this with minimal performance losses.

When it comes to connection cables you have different options:

- You can use our standard cables with lengths ranging from 3 to 60 meters.
- You can extend these standard cables to a maximum length of 200 meters.
- You can also use standard, off the shelf cables as we support them with our adapter box for lengths up to 1000 meters. Ask for more information at your local sales office.

Long service lifetime

The TURBOVAC iR pumps offer long service lifetime: you can count on a maintenance free period from 4 and up to 5 years.

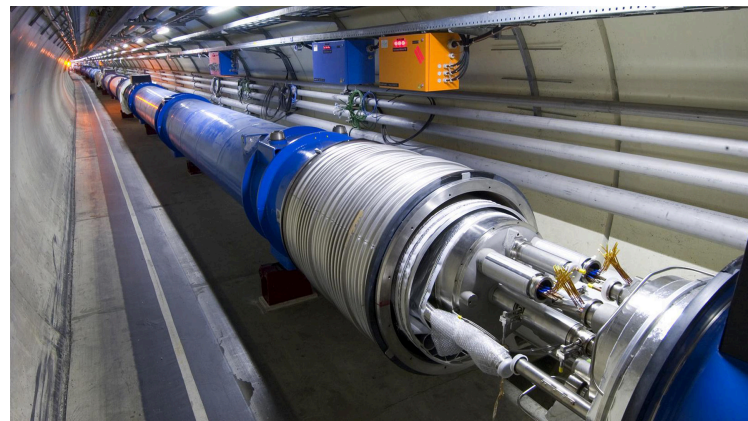
Main application fields

The robustness of our radiation resistant TURBOVAC iR makes it particularly suited for all applications where highly ionizing radiations are present.

— All around science and research

The applications in which the TURBOVAC iR are mainly in use reach from small laboratory experiments up to large research centers tenders:

- Particle accelerators - synchrotron - beamline and experimental station
- Particle accelerators - cyclotron
- Linear particle accelerators (LINAC)
- Free electron laser
- Classic fusion and laser fusion



— Medical

An array of different applications such as:

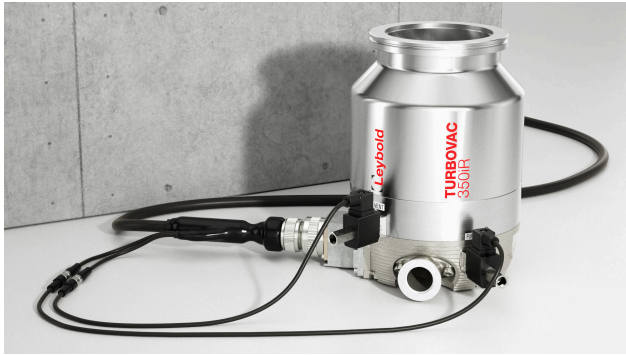
- Radiotherapy
- Radioisotope production
- Sterilization

Typically, cyclotrons or linear particle accelerators are used.



Features and benefits





1. TURBOVAC iR family

You can now use our TURBOVAC iR, from 90 to 1450 l/s which offer stress free operation with exceptional performance, optimizing pumping speed and compression ratio.



2. Robustness against radiations

Pump + cable + cooling options are resistant against radiations and our offering can be adapted depending on the requirements of your application.



3. TURBO.DRIVE 500e

A powerful and compact solution to operate the TURBOVAC iR series products at any required distance. Besides driving the pump, the TURBO.DRIVE 500e controller can also independently control two TURBOVAC i pumps and standard accessories such as cooling fans or valves.

Drive remote electronics with on/off function and status LEDs, LEYASSIST software option via USB port.



4. TURBO.DRIVE 500e connectivity

The flexible interface architecture allows you to use the communication method of your choice. Direct start/stop as well as I/O. Serial RS 485 and many Fieldbus communication methods are optional features.

Also available: accessory ports and pump cable.



5. Remote operation

Operation of your system made easy thanks to the remote cables from 3 to 200 m for all variants.



6. Accessories

The accessories are available in radiation and non radiation resistant variants.

Technical Data

Technical Data

	Unit	TURBOVAC 90 iR	TURBOVAC 250 iR	TURBOVAC 350 iR	TURBOVAC 450 iR	TURBOVAC 850 iR	TURBOVAC 950 iR	TURBOVAC 1350 iR	TURBOVAC 1450 iR
High vacuum connection	DN	40 ISO-KF, 63 ISO-KF, 63 CF	100 ISO-K, 100 CF	00 ISO-K, 100 CF	160 ISO-K, 160 CF	160 ISO-K, 160 CF	200 ISO-K, 200 CF	200 ISO-K, 200 ISO-F	250 ISO-K, 250 ISO-F
Fore vacuum connection	DN	16 KF	16 KF	25 KF	25 KF	25 KF	25 KF	40 KF	40 KF
Pumping speed									
N ₂	l x s	90	225	290	430	720	900	1,250	1,380
Ar		83	210	260	400	655	840	1,150	1,280
He		90	250	360	440	850	925	1,350	1,390
H ₂		78	210	350	420	755	770	1,150	1,210
Gas throughput									
N ₂	mbar x l x s	8.5	2.6	4.5	4.5	14	14	16	16
Ar		3.5	1.9	3.0	3.0	3.8	3.8	12.5	12.5
He		11	4	8.0	8.0	12	12	18	18
H ₂		11	6.5	8.0	8.0	Greater than 15	Greater than 15	10	10
Noise level									
With convection cooling	dB(A)	Less than 41	Less than 41	Less than 44	Less than 44	Less than 40	Less than 40	-	-
With radial air cooler		Less than 44	Less than 44	Less than 47	Less than 47	Less than 55	Less than 55	-	-
With axial air cooler		Less than 49	Less than 49	Less than 49	Less than 49	Less than 49	Less than 49	-	-
Maximum bake-out temperature of the CF version, water cooled	°C	100							
Purge gas flow	mbar x l x s	0.4							
	sccm	24							
Purge gas connection	inch	G 1/8							
Venting connection									
Compression ratio									
N ₂		1 x 10 ¹¹	1 x 10 ¹¹	1 x 10 ¹¹	1 x 10 ¹¹	Greater than 1 x 10 ¹¹	Greater than 1 x 10 ¹¹	1 x 10 ⁸	1 x 10 ⁸
Ar		1 x 10 ¹¹	1 x 10 ¹¹	1 x 10 ¹¹	1 x 10 ¹¹	Greater than 1 x 10 ¹¹	Greater than 1 x 10 ¹¹	1 x 10 ⁸	1 x 10 ⁸
He		1 x 10 ⁸	1 x 10 ⁸	1 x 10 ⁸	1 x 10 ⁸	1.3 x 10 ⁸	1.3 x 10 ⁸	1 x 10 ⁵	1 x 10 ⁵
H ₂		5 x 10 ⁷	2 x 10 ⁷	5 x 10 ⁶	5 x 10 ⁶	4.4 x 10 ⁶	4.4 x 10 ⁶	2 x 10 ⁴	2 x 10 ⁴

Technical Data

	Unit	TURBOVAC 90 iR	TURBOVAC 250 iR	TURBOVAC 350 iR	TURBOVAC 450 iR	TURBOVAC 850 iR	TURBOVAC 950 iR	TURBOVAC 1350 iR	TURBOVAC 1450 iR
Ultimate pressure with 2-stage oil-sealed rotary vane pump ISO-K / CF	mbar	Less than 8 x $10^{-8} / 5 \times 10^{-10}$	Less than 8 x $10^{-8} / 5 \times 10^{-10}$	Less than 8 x $10^{-8} / 5 \times 10^{-10}$	Less than 8 x $10^{-8} / 5 \times 10^{-10}$	Less than 3 x $10^{-8} / 3 \times 10^{-10}$	Less than 3 x $10^{-8} / 3 \times 10^{-10}$	Less than 7.5×10^{-9}	Less than 7.5×10^{-9}
Maximum permissible fore vacuum pressure for N ₂	mbar	14	11	10	10	12	12	4	4
Operating speed	rpm	72,000	72,000	60,000	60,000	49,200	49,200	42,000	42,000
Approximate run-up time (with 3 m cable)	min	1.5	1.5	3.5	3.5	4.5	4.5	4,5	4.5
Maximum power consumption	W	240	240	200	200	500	500	500	500
Type of protection		IP 40							
Ambient temperature during operation	°C	+5 to +40							
Ambient temperature storage	°C	-15 to +70							
Standard cooling		Convection	Convection	Convection	Convection	Convection	Convection	Water	Water
Optional cooling		Air or water	Air or water	Air or water	Air or water	Air or water	Air or water	Water	Water
Cooling water connection		Plug connection for 6 x 1 hose / alternatively G 1/8 inch screw-in thread							
Cooling water consumption	l / h	30 to 60	30 to 60	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100	50 to 100
Permissible cooling water pressure	bar(g)*	3-6	3-6	3-6	3-6	3-6	3-6	6	6
Permissible cooling water temperature	°C	15 to 35							
Weight ISO-K / CF	kg	3.1 / 4.0 / 8.0	4.0 / 6.6	7.5 / 11.5	7.4 / 12.5	14.6 / -	15.4 / -	23.5 / 24.3	24.4 / 25.5

* bar(g) = bar (gauge) is overpressure, for example, atmospheric pressure = 0 bar(g)

Ordering information

Pumps

Material number	Description
810011A00	TURBOVAC 90 iR, DN 40 ISO-KF
810031A00	TURBOVAC 90 iR, DN 63 ISO-K
810041A00	TURBOVAC 90 iR, DN 63 CF
820051A00	TURBOVAC 250 iR, DN 100 ISO-K
820061A00	TURBOVAC 250 iR, DN 100 CF
830051A00	TURBOVAC 350 iR, DN 100 ISO-K
830061A00	TURBOVAC 350 iR, DN 100 CF
830071A00	TURBOVAC 450 iR, DN 160 ISO-K
830081A00	TURBOVAC 450 iR, DN 160 CF
840071A00	TURBOVAC 850 iR, DN 160 ISO-K
840081A00	TURBOVAC 850 iR, DN 160 CF
840091A00	TURBOVAC 950 iR, DN 200 ISO-K
840111A00	TURBOVAC 950 iR, DN 200 CF
850092A00	TURBOVAC1350 iR, DN 200 ISO-K
850102A00	TURBOVAC1350 iR, DN 200 ISO-F
850122A00	TURBOVAC1450 iR, DN 250 ISO-K
850132A00	TURBOVAC1450 iR, DN 250 ISO-F
Controller	
800100V0500	TURBO.DRIVE 500e (without display)
Cables	
800190V0003	Remote cable TURBOVAC, 3 m
800190V0005	Remote cable TURBOVAC, 5 m
800190V0010	Remote cable TURBOVAC, 10 m
800190V0020	Remote cable TURBOVAC, 20 m
800190V0040	Remote cable TURBOVAC, 40 m
800190V0060	Remote cable TURBOVAC, 60 m
800110V0050	Adapter cable - TD20 Classic to TURBOVAC iR, 0.3 m
Cooling	
800135V0008	Water cooling unit – TURBOVAC 90 - 450 iR, G 1/8 inch (radiation environments)
800135V0009	Water cooling unit – TURBOVAC 850 - 1450 iR, G 1/8 inch (radiation environments)
800136V0020	Air cooling kit – TURBOVAC 90-950 iR, 230V AC radial (radiation environments)

TURBOVAC iR



 **Leybold**

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