Premier Fluid Systems

HYDROTWIN & OILTWIN

Compact packages for high vacuum applications

Vacuum level up to 2 mbar (29.86” HgV)

Capacities up to 3500 m³/h (2100 ACFM)

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Engineered vacuum packages

"Hydrotwin" and "Oiltwin" are the new series of compact high vacuum packages that guarantee a working vacuum level up to 2 mbar abs. (29.86" HgV) and capacities to 3500 m3/h (2100 ACFM).

The Package

The package has been developed in close co-operation with BORA Blowers who specialise in the manufacturing of both pressure and vacuum mechanical boosters.
A sophisticated electronic control logic for the mechanical booster operation has been developed to prevent the risk of booster seizure in the event that the operating conditions exceed the allowable working parameters.

Pompetravaini and BORA Blowers have customized the control electronics to safely operate both the liquid ring vacuum pump and vacuum booster. This ensures that the maximum pumping performance is guaranteed during the process cycle.

The innovation

The combination of LRVP/Booster is not the innovation. The actual innovation is in how these two key components are controlled to work in synchronization with each other. Until now, pressure switches, temperature switches, bypasses or hydrokinetic couplings have been used to control the operation of the mechanical booster. These devices require precise settings, restricting the operating limits and reducing the overall efficiency of the system.

The electronic control logic of the DVD2, have been optimized for the working characterics of a liquid ring vacuum pump. The operating points of the booster and liquid ring vacuum pump are variable but are always optimized by simply setting up the working parameters that can vary from atmospheric pressure to the maximum vacuum obtainable.

Features - Advantages - Benefits

With the unique "Hydrotwin" and "Oiltwin" vacuum pumping packages, it is possible to:

1. Reduce the adsorbed power from the mechanical booster motor to a minimum . In comparison with the traditional systems, the cost reduction on power saving is considerable and can be in the range of 30 - 40%.

2. Set and maintain the desired vacuum level. This allows for optimizing the package performance with each process cycle. Repeatable performance for vacuum stability in those processes where maintaining the required vacuum level is very important to the final product.

3. Have total protection against booster seizure that can be caused by overheating due to gas compression when operating outside the safe limits. Standard temperature sensors located in the Roots discharge casing area, cannot show, in real time, the elevated temperature of the lobes. These are normally the first components subject to thermal expansion. With the "Hydrotwin"and "Oiltwin", temperature control is performed by monotoring the compression ratio across the mechanical booster. The DVD2 PLC controller,works on the root of the problem and not on the consequential result of the heat of compression..

4. Recieve a "PLUG AND PLAY" product, that is ready-to-use. All of the necessary settings have been pre programmed at our factory. Any adjustements, if needed, do not require qualified technicians. It takes minutes to change the few main parameter settings if required. The requirement for PLC level programming technicians is completely eliminated.

Applications

"Hydrotwin" and "Oiltwin" systems find applications in many fields, such as:

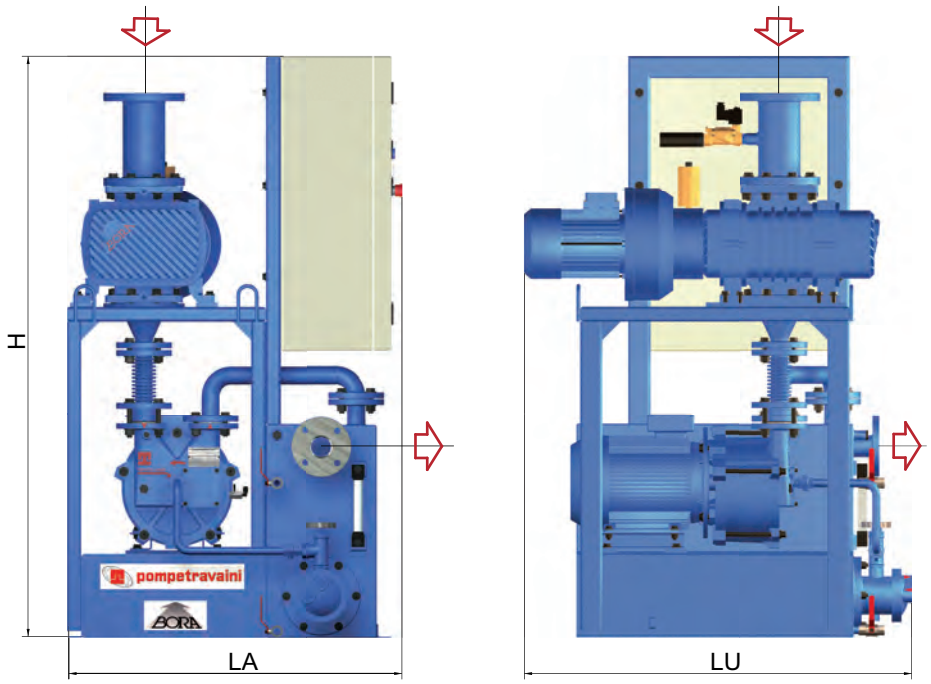
- Pasta production (water evaporation to reduce the amount of moisture in the dough).
- Pharmaceutical (filtration and crystallization process monitoring).
- Chemical (solvent extracion, gas evacuation from tanks).
- Plastics (degassing).
- Food industry (vacuum coolers for fruit and vegetables)
- Leather treatment (vacuum drying).
- Centralized vacuum systems (hospitals, industry).

These new "Hydrotwin" and "Oiltwin" series allows Pompetravaini to extend its range of maximum vacuum from 33 mbar (28.95" HgV) to 2 mbar absolute (29.86" HgV), raising its performance level in the vacuum pumping industry. These two vacuum pumps, surely "different twins", perfectly match each other thanks to the "plug and play" electronics in the DVD2. To start the "Hydrotwin" and "Oiltwin" systems, all that is required is the input setting of the final vacuum level. Then two more detailed processing levels, regulating the reaction time of the system are required. One level that includes some pre-selected settings , such as,careful operation, constant operation, fast operation, high vacuum, autoclave, and another level where the programmer is free to adjust every single parameter available.

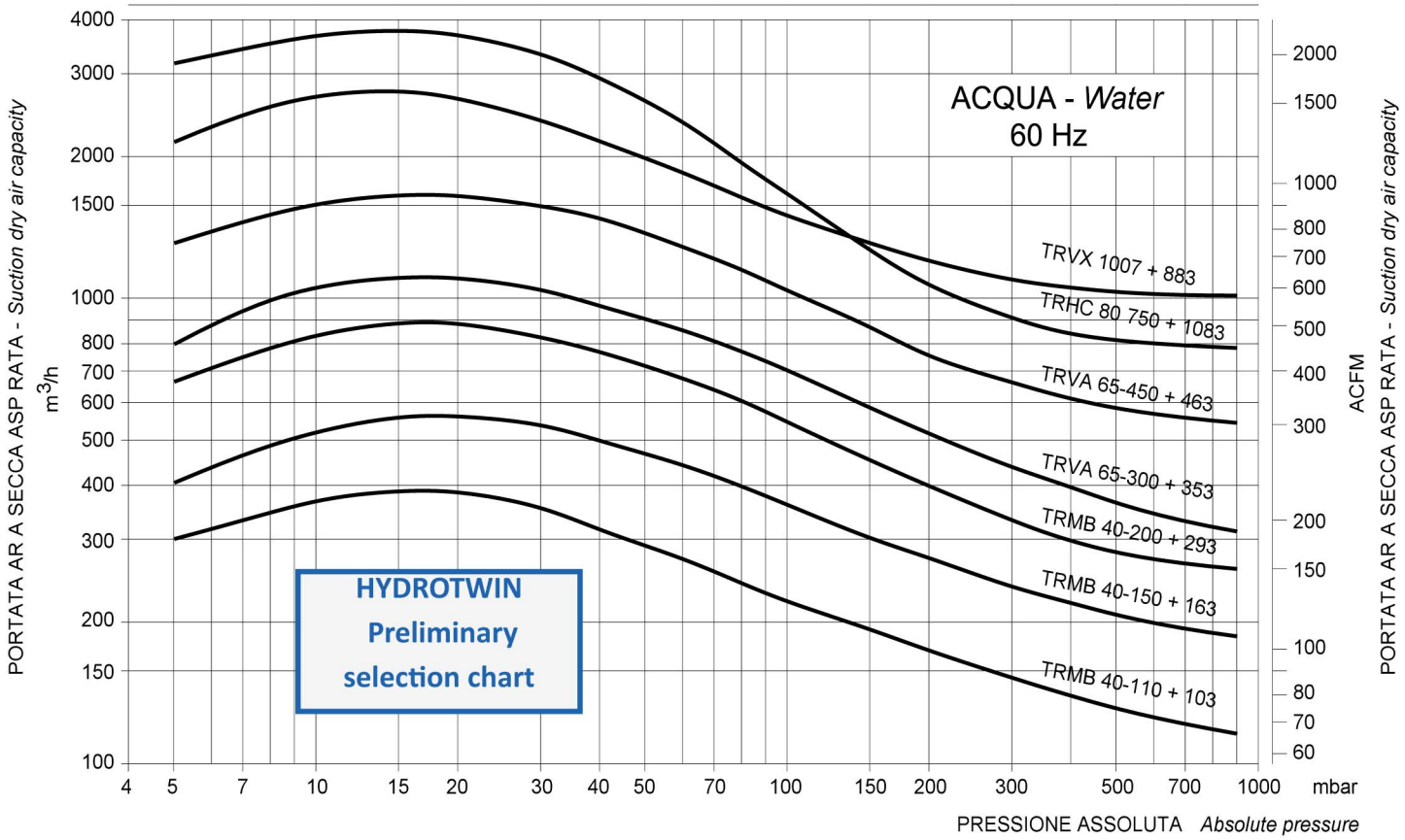
Current limitations

- "Hydrotwin" and "Oiltwin" systems CANNOT be Atex certified (BORA roots pumps do not comply to Atex).
- Boosters are ONLY available in cast iron.
- Boosters CANNOT handle solids or liquids, otherwise they may seize.
- The final vacuum will depend on the water temperature within the liquid ring pump (Hydrotwin). It is possible to have a system using oil instead of water for service liquid (Oiltwin), in such case it is possible to achieve a stable vacuum level up to 2 mbar absolute (29.86" HgV). Oil, whith a working temperature varying from 60 to 80°C (140 to 175°F), can be easily air-cooled through a simple radiator (air-oil heat exchanger) instead of a shell and tube heat exchanger (water heat exchanger).

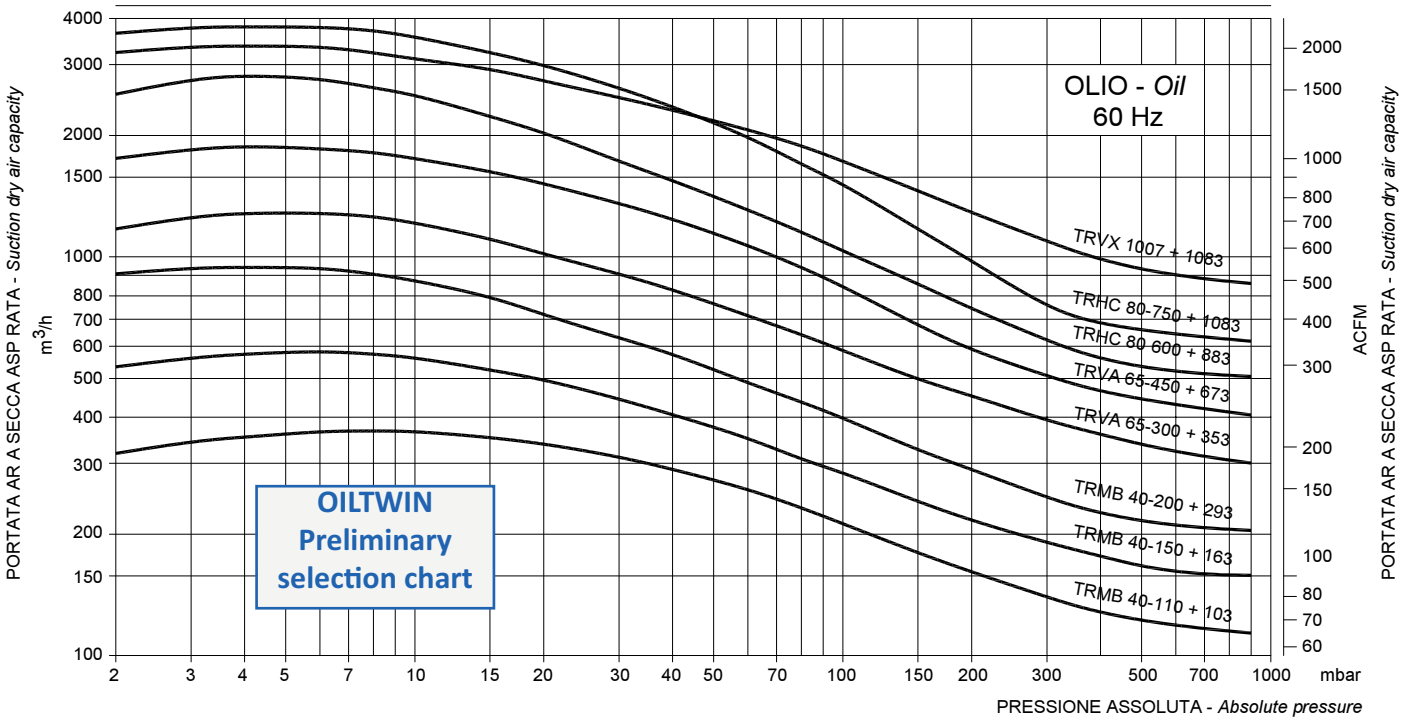
Configurations currently available (approximate dimensions)



N°	ROOTS	L.R.V.P.	NOMINAL FLOW (at 15 mbar - 29.48 "HgV)		INSTALLED POWER (HP)		OVERALL APPROX. DIMENSIONS (mm)		
			m³/h	ACFM	ROOTS	L.R.V.P.	LA	LU	H
1	103	TRMB 40-110	390	229	3	5	910	940	1580
2	163	TRMB 40-150	560	329	5	7.5	910	940	1580
3	293	TRMB 40-200	890	523	5	10	910	1030	1580
4	353	TRVA 65-300	1100	523	7.5	15	1050	1340	1680
5	463	TRVA 65-450	1600	941	10	20	1050	1500	1680
6	883	TRVX 1007	2800	1648	15	40	1200	1630	2060
7	1083	TRHC 80-750	3800	2236	15	50	1200	1630	2060



N°	ROOTS	L.R.V.P.	NOMINAL FLOW (at 5 mbar - 29.7 "HgV)		INSTALLED POWER (HP)		OVERALL APPROX. DIMENSIONS (mm)		
			m³/h	ACFM	ROOTS	L.R.V.P.	LA	LU	H
1	103	TRMB 40-110	360	211	3	5	910	1118	1580
2	163	TRMB 40-150	590	347	5	7.5	910	1118	1580
3	293	TRMB 40-200	950	559	5	10	910	1118	1580
4	353	TRVA 65-300	1300	765	7.5	15	1050	1780	1680
5	463	TRVA 65-450	1700	1000	10	20	1050	1900	1680
6	883	TRVX 1007	2800	1648	15	40	1200	2000	2060
7	1083	TRHC 80-600	3400	2001	15	40	1200	2100	2060
8	1083	TRHC 80-750	3800	2236	15	50	1200	2200	2060



HYDROTWIN/OILTWIN standard components

The "Hydrotwin" vacuum package consists of following basic components (from suction to discharge):

- Inlet pressure transducer (PTi).
- BORA roots (BR).
- Outlet pressure transducer (PTo).
- Expansion joint.
- Non-return valve.
- POMPETRAVAINI LRVP (VP).
- Gas/water separator tank.
- Liquid/liquid heat exchanger (Radiator for OILTWIN).
- Separator tank level indicator (LI).
- Temperature gauge for service liquid.
- Separator tank draining/refilling connections.
- LRVP e-motor (MP).
- Roots e-motor (MB).
- Frequency converter to control the roots e-motor (RF).
- Logic unit DVD2 acquiring the pressure transducers data and controlling the roots frequency converter (DVD2).

Optional components

- Solenoid valve for purging air in roots pump inlet (FV) with filter and silencer.
- Separator tank level switch for minimum/maximum liquid level.
- Output control for inlet isolating valve to be fitted above the purging air solenoid valve.