Prime FLUID MANAGEMENT

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Liquid Ring Pumps

Vacuum pumps and compressors

pompetravaini

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Contents

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TRVX-TRMX Series

Liquid Ring Vacuum Pumps

pompetravaini

Capacity up to 2000 m³/h
Max vacuum 33 mbar

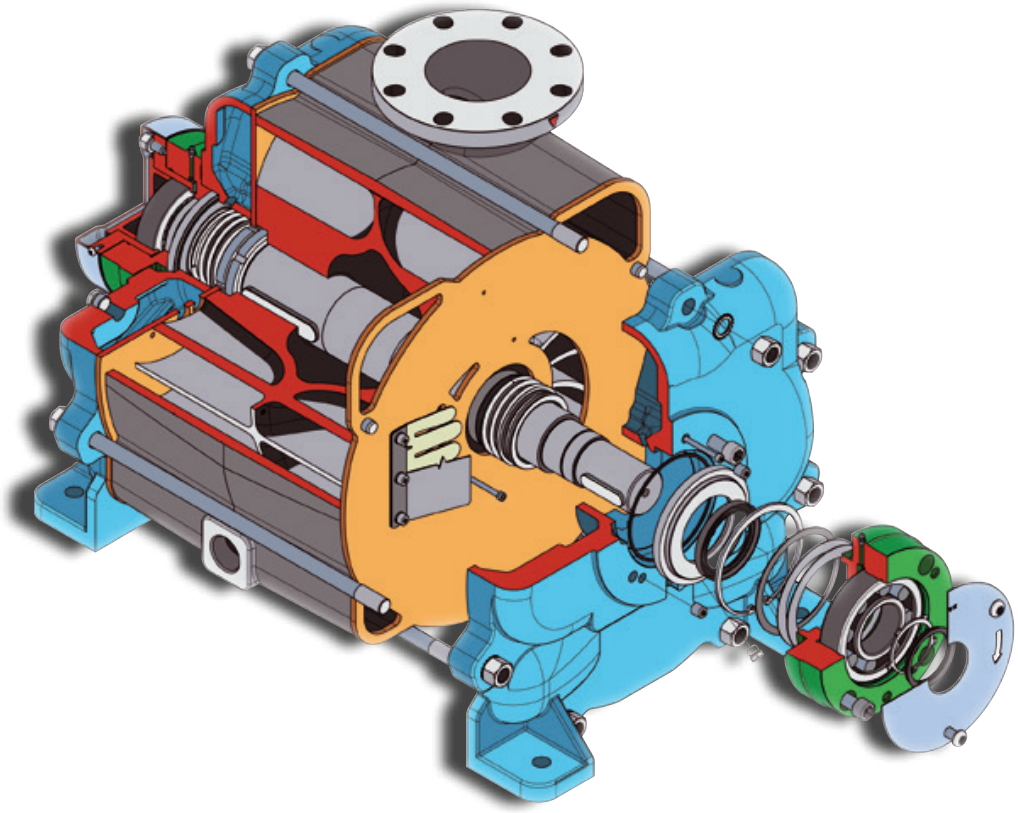
TRVX-TRMX Series

Liquid Ring Vacuum Pumps

pompetravaini

1. *The new hydraulic profile allows a performance increase over 10% than the traditional liquid ring vacuum pump designs. Increases the efficiency and operational cost savings all over the entire pump life.*

2. *The pump weight is average 30% less compared with the traditional liquid ring vacuum pump designs with compact supporting components dimensions. This advantage allows installation and transportation costs saving.*



3. *Compact dimensions and volume (L x W x H) 50% less compared with the traditional liquid ring vacuum pump designs. Optimization of factory or plant installation spaces and related costs saving.*

4. *Single and direct service liquid connection. Easy pump fitting without the use of complicate piping. This ensures a fast and economic pump installation.*

5. *Central body impeller housing with integrated suction and discharge manifolds with compact overall dimensions. This feature reduces pump components and increases robustness. The maintenance and assembly time and costs saving result to be greatly advantaged.*

6. *The suction and discharge port plates are always in stainless steel allowing a greater reliability trough the time and ensuring stable performances. They never require to be replaced during ordinary maintenance reducing down the spare parts cost.*

TRVX-TRMX Series

Liquid Ring Vacuum Pumps

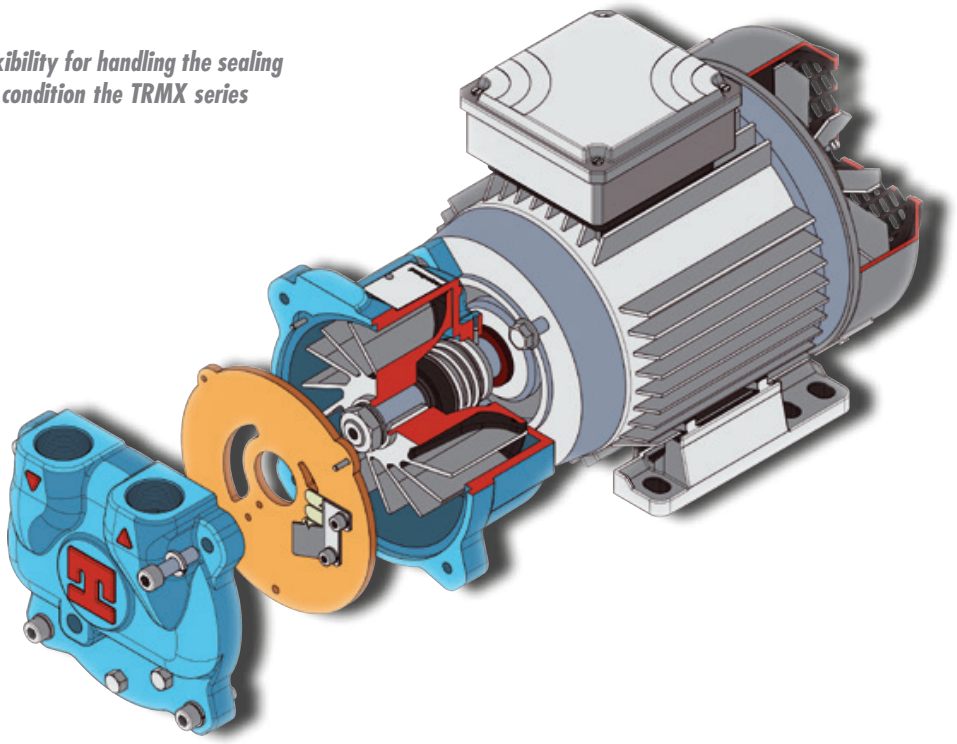
pompetravaini

1. *The TRMX series is the transfer of all the TRVX series basic concepts on the monoblock pumps production. The result is an economical pump with outstanding performance and reliability.*

2. *The new hydraulic profile design allows a performance increase from 10% to 20% compared with previous series. This increases the efficiency and operational cost savings all over the entire pump life.*

3. *Compared with the previous TRMB series, the TRMX is 10% lighter. The volume is 10-20% smaller. These two features permit fast and less expensive installations.*

4. *Maximum flexibility for handling the sealing liquid. In std. condition the TRMX series*



5. *Maximum flexibility for handling the sealing liquid. In std. condition the TRMX series requires up to 40% less sealing fluid flow compared with the previous TRMB series, ensuring a big saving in the operating cost. In the applications where is required the possibility to aspirate big sealing liquid flow, pumps are supplied with enhanced higher sealing liquid flow capability.*

6. *Inox port plate with laser cut port profiles. This solution make the port plate free from wear and the laser cut ports guarantee the execution of the best performing designed profiles. Very noticeable the increase of the pump working economy.*

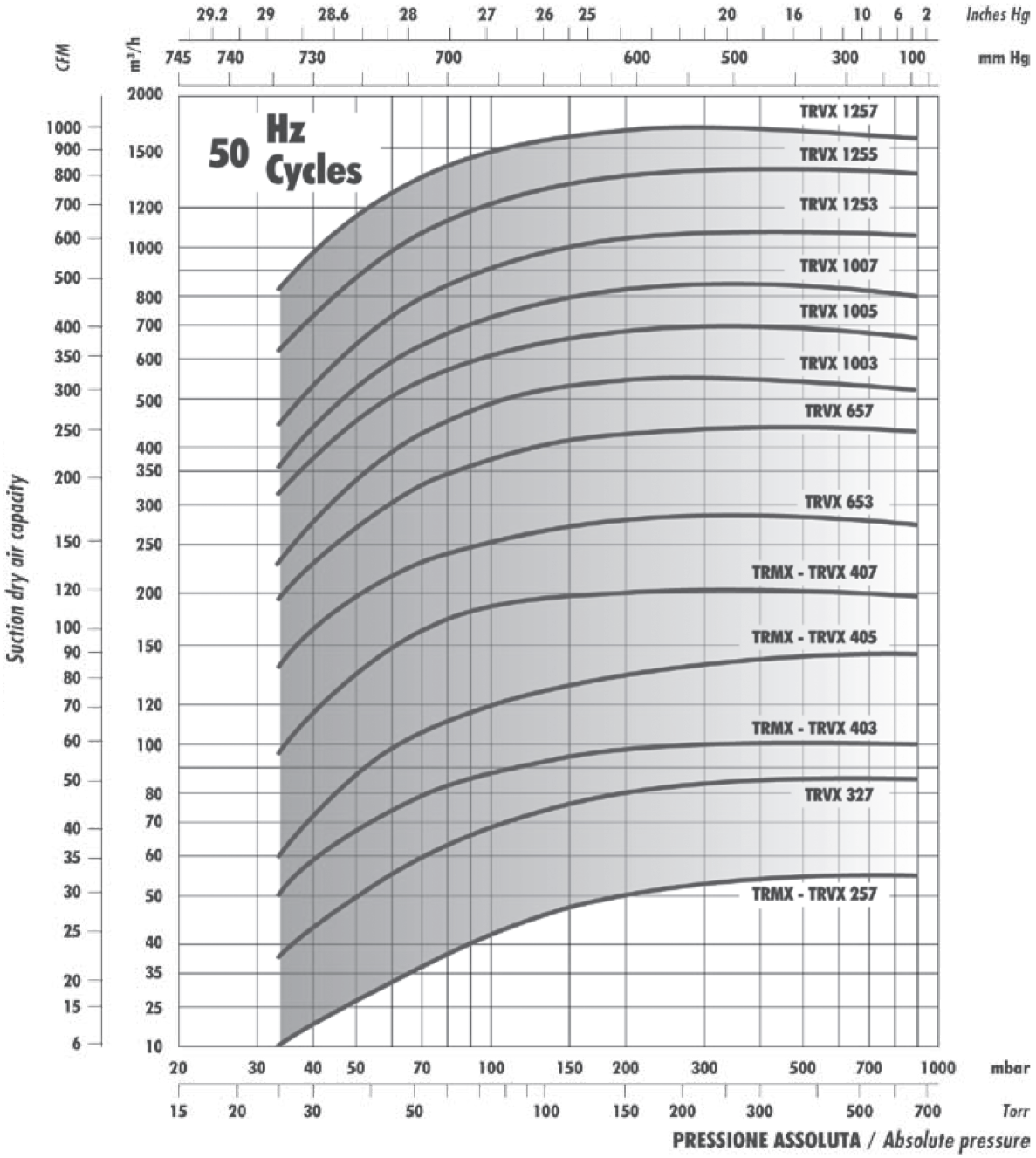
7. *Innovative anti-cavitation system derived from the TRVX series. The injection port is located very close to the suction port improving the highest operational vacuum level and guarantee higher efficiency all over the pump vacuum range. With this solution the pump operational cost is reduced in a sensible way.*

TRVX-TRMX Series
Liquid Ring Vacuum Pumps

pompetravaini

Performance field

This is a quick selection chart where to select, knowing flow and absolute pressure, the pump model. Each pump model has a specific literature where to get all working and installation parameters.



Data refers to 15°C water as service liquid and 20°C suction dry air.

The TRVX series with double bearing shaft can work as compressor up to absolute pressure of 2000 mbar.
It is available a reinforced version that can work up to 4000 mbar absolute discharge pressure.

TRVX-TRMX Series
Liquid Ring Vacuum Pumps

pompetravaini

Codification

TRVX 100 7 / 1 - C / A3 - M

Costruzione Pompetravaini
Pompetravaini construction

Pompe per vuoto ad anello di liquido
Liquid ring vacuum pumps

Tipo di costruzione (tipo di girante)
Construction type (impeller type)
- **V** = **pompa ad uno stadio con valvole. Albero con doppia supportazione**
  single stage pump with valves. Double bearing shaft
- **M** = **pompa ad uno stadio con valvole. Girante montata direttamente sull' albero del motore**
  single stage pump with valves. Impeller assembled on motor shaft

Versione con piastra aspirante/premente da lamiera tagliata al Laser in AISI 304 o AISI 316
Suction/discharge Laser cut port plates from AISI 304 or AISI 316 sheet

DN bocche aspiranti e prementi (mm)
Suction and discharge flanges size (mm)

Grandezza nominale di progetto della girante all'interno della famiglia di pompe con la stessa bocca
Impeller nominal dimensions within the same range of flange dimensions of pump series

Numero del progetto costruttivo
Design number

Tipo di tenuta sull'albero
Shaft seal type
- **C** = **Tenute meccanica semplice (singola o bilaterale)**
  Mechanical seal (single or bilateral)
- **C2** = **N° 2 tenute meccaniche doppie contrapposte**
  Nr. 2 double back to back mechanical seals
- **CS** = **N° 2 tenute meccaniche doppie in serie**
  Nr. 2 double tandem mechanical seals

Materiali di costruzione (vedi tabella seguente)
Construction materials (see following chart)

Costruzione lanternata monoblocco (su richiesta) - Solo per esecuzione TRVX
Close-coupled lantern construction (on request) - TRVX construction only
- M = **esec. Lanternata per motore elettrico B5 unificato secondo le norme UNEL-MEC**
  lantern construction for B5 electric motor according to UNEL-MEC standard
- N = **esec. Lanternata per motore elettrico D unificato secondo le norme NEMA**
  lantern construction for D electric motor according to NEMA standard

Standard construction materials

The table is indicative: for detailed info please contact our Sales Office.
Special material available upon request.

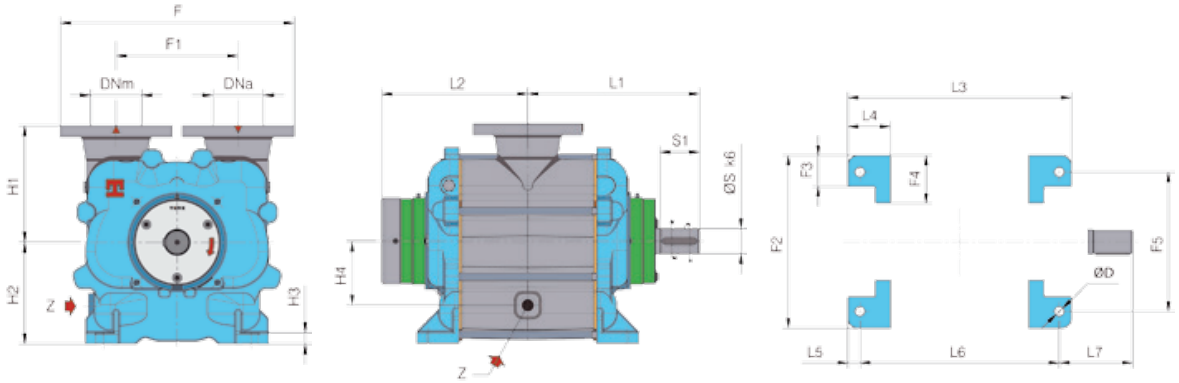
Descrizione / Description	F	RX	RA	A3
Corpo aspirante e premente / Suction and discharge casing	Ghisa / Cast iron			
Corpo posteriore / Rear casing				
Corpo intermedio / Intermediate casing				
Albero / Shaft	AISI 420 Stainless steel		AISI 316 Stainless steel	
Girante / Impeller	Ghisa / Cast iron			
Piastra idraulica / Port plate	AISI 304 Stainless steel			

TRVX-TRMX Series
Liquid Ring Vacuum Pumps

pompetravaini

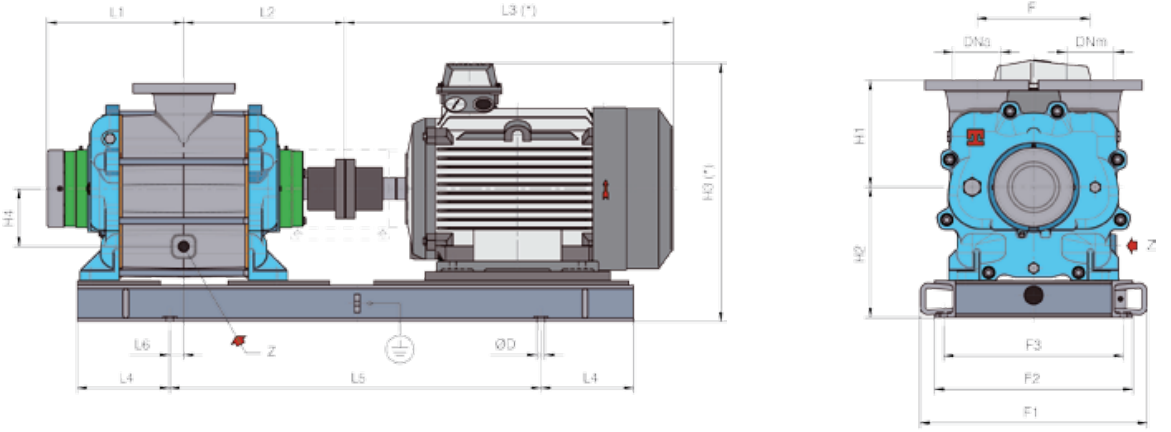
Overall dimensions

BARESHAFT construction



Pompa Pump	DN a/m	Peso Weight	ØD	Z	F	F1	F2	F3	F4	F5	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	ØS	S1
TRVX 653	65	97	Ø16	G3/4	385	200	310	60	85	250	190	180	18	105	270	215	337	85	24	289	125	38	65
TRVX 657	65	111	Ø16	G3/4	385	200	310	60	85	250	190	180	18	105	305	250	407	85	24	359	125	38	65
TRVX 1003	100	152	Ø19	G1	460	240	360	65	100	290	230	200	22	126	322	270	397	85	24	349	147	48	80
TRVX 1005	100	165	Ø19	G1	460	240	360	65	100	290	230	200	22	126	347	295	448	85	24	400	147	48	80
TRVX 1007	100	170	Ø19	G1	460	240	360	65	100	290	230	200	22	126	347	295	448	85	24	400	147	48	80
TRVX 1253	125	379	Ø21	G1½	590	340	520	95	140	430	300	285	25	187	380	323	517	120	40	437	162	60	90
TRVX 1255	125	414	Ø21	G1½	590	340	520	95	140	430	300	285	25	187	415	358	587	120	40	507	162	60	90
TRVX 1257	125	457	Ø21	G1½	590	340	520	95	140	430	300	285	25	187	450	393	657	120	40	577	162	60	90

COUPLED construction (BASEPLATE-COUPLING)



(*)= dimensioni in funzione della marca del motore installato
(*)= dimensions depend on installed motor manufacturer
Z= ingresso alimentazione
Z= liquid supply inlet
Disegno schematico.
Dimensioni in mm con tolleranze secondo EN 735-1995.
Schematic drawing.
Dimensions in mm with tolerances according to EN 735-1995.
Pesi in Kg, riferiti a pompe in ghisa escluso motore, non impegnativi.
Weights in Kgs, referred to cast iron pumps without motor, not binding.

Pompa Pump	DN a/m	Peso Weight	ØD	Z	F	F1	F2	F3	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6
TRVX 653	65	151	Ø18	G¾	200	440	370	330	190	270	*	105	215	270	*	200	700	54
TRVX 657	65	170	Ø18	G¾	200	430	370	330	190	270	*	105	250	305	*	200	700	14
TRVX 1003	100	212	Ø18	G1	240	480	420	380	230	290	*	126	270	322	*	200	800	30
TRVX 1005	100	225	Ø18	G1	240	480	420	380	230	290	*	126	295	347	*	200	800	30
TRVX 1007	100	230	Ø18	G1	240	480	420	380	230	290	*	126	295	347	*	200	800	30
TRVX 1253	125	545	Ø18	G1½	340	674	590	542	300	422	*	187	323	380	*	300	1050	43
TRVX 1255	125	580	Ø18	G1½	340	674	590	542	300	422	*	187	358	415	*	300	1050	43
TRVX 1257	125	620	Ø18	G1½	340	674	590	542	300	422	*	187	393	450	*	300	1050	43

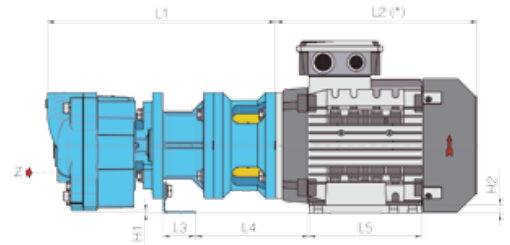
TRVX-TRMX Series
Liquid Ring Vacuum Pumps

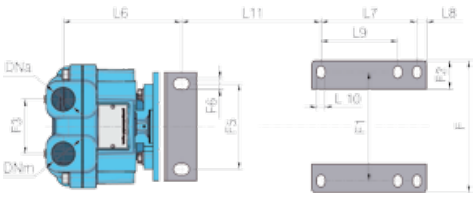
pompetravaini

Overall dimensions

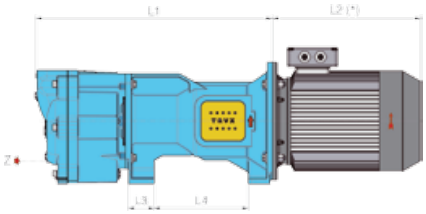
LANTERN construction

TRVX 257
motore B34
TRVX 257
B34 motor

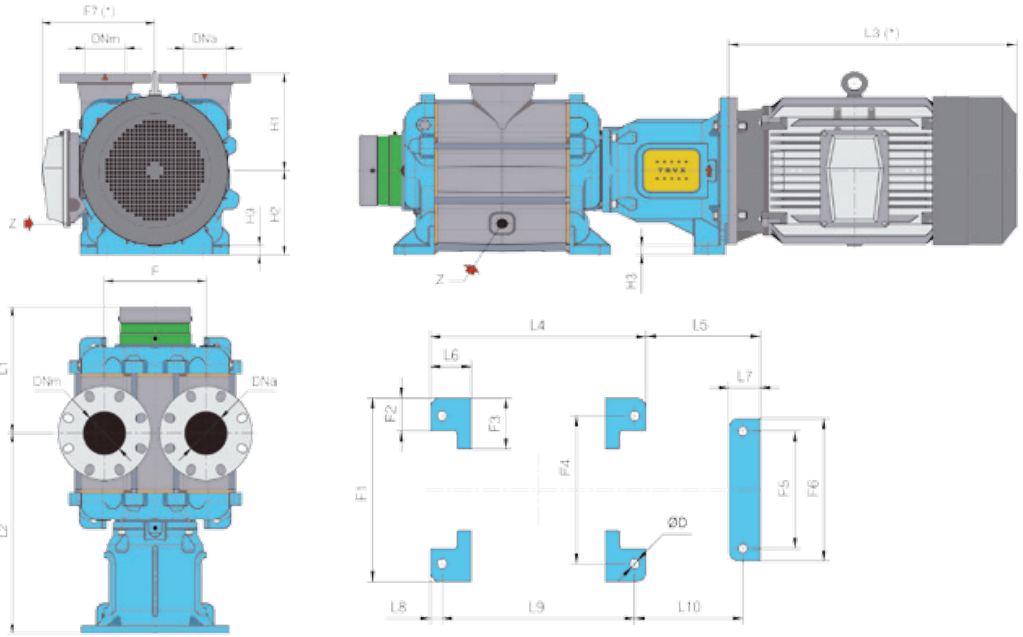




TRVX 40x
motore B5
TRVX 40x
B5 motor



Pompa Pump	DN a/m	Peso Weight	Z	F	F1	F2	F3	F4	F5	F6	H1	H2	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	Frame motore Motor frame
TRVX 257	G1	18	G ¼	170	140	37	70	17	110	14	3.5	11	160	90	70	36	303	*	43	150	150	153.8	125	12.5	100	10	182	90
TRVX 403	G1½	60	G ½	140	110	-	80	15	200	25	-	-	290	160	130	55	536	*	65	235	-	168	-	-	-	14	116	100
TRVX 405	G1½	73	G ½	140	110	-	80	15	200	25	-	-	290	160	130	55	556	*	65	235	-	191	-	-	-	14	116	112
TRVX 407	G1½	88	G ½	140	110	-	80	15	200	25	-	-	290	160	130	55	590	*	65	235	-	232	-	-	-	14	116	132



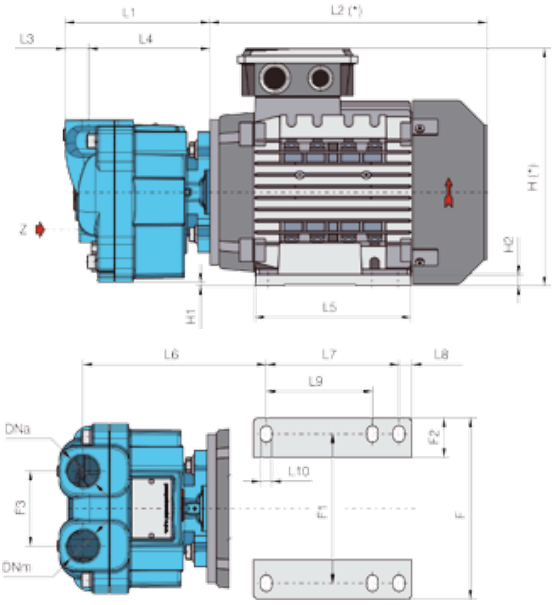
Pompa Pump	DN a/m	Peso Weight	ØD	Z	F	F1	F2	F3	F4	F5	F6	F7	H1	H2	H3	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	Frame motore Motor frame
TRVX 653	65	116	Ø16	G3/4	200	310	60	85	250	230	280	*	190	180	18	212	422	*	337	240	85	65	24	289	198	132
TRVX 657	65	136	Ø16	G3/4	200	310	60	85	250	230	280	*	190	180	18	250	420	*	407	210	85	65	24	359	198	160
TRVX 1003	100	185	Ø19	G1	240	360	65	100	290	230	280	*	230	200	22	270	442	*	397	237	85	65	24	349	225	160
TRVX 1005	100	198	Ø19	G1	240	360	65	100	290	230	280	*	230	200	22	295	467	*	448	237	85	65	24	400	225	180
TRVX 1007	100	203	Ø19	G1	240	360	65	100	290	230	280	*	230	200	22	295	467	*	448	237	85	65	24	400	225	180

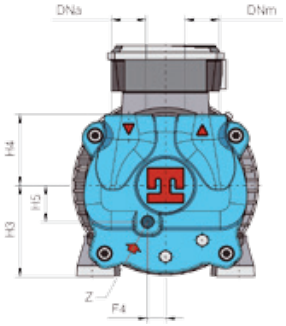
TRVX-TRMX Series
Liquid Ring Vacuum Pumps

pompetravaini

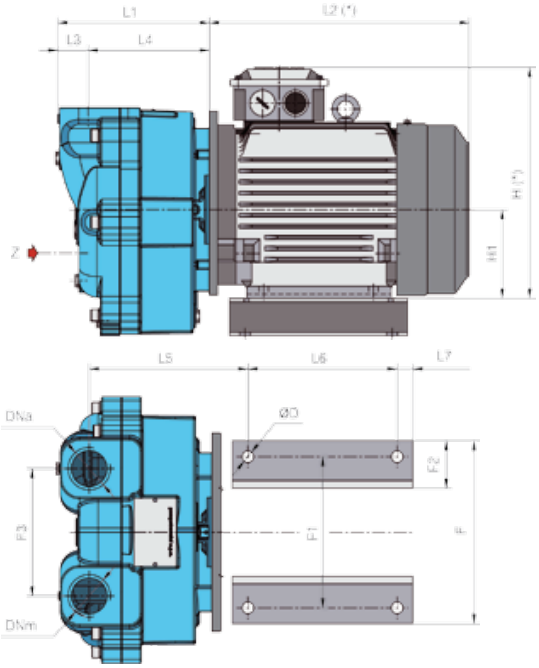
Overall dimensions

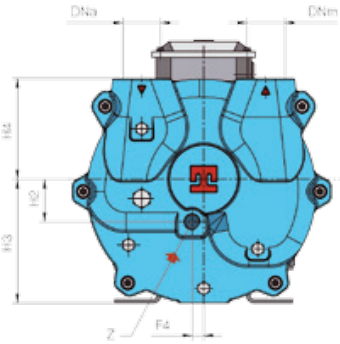
CLOSE-COUPLED construction





Pompa Pump	DN a/m	Peso Weight	Z	F	F1	F2	F3	F4	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	Frame motore Motor frame
TRMX 257	G1	27	G ¼	170	140	37	70	17	3.5	11	90	70	36	139.5	*	22.5	117	150	173	125	12.5	100	10	90
TRMX 327	G1 ¼	45	G ⅜	200	160	55	90	29	-	12	100	82	40.5	178	*	30	148	172	211	140	15	140	12	100





(*)= dimensioni in funzione della marca del motore installato
(*)= dimensions depend on installed motor manufacturer
Z= ingresso alimentazione
Z= liquid supply inlet
Disegno schematico.
Dimensioni in mm con tolleranze secondo EN 735-1995.
Schematic drawing.
Dimensions in mm with tolerances according to EN 735-1995.
Pesi in Kg, riferiti a pompe in ghisa con motore per funzionamento a 50 Hz, non impegnativi.
Weights in Kgs, referred to cast iron pumps with 50 Hz motor, not binding.

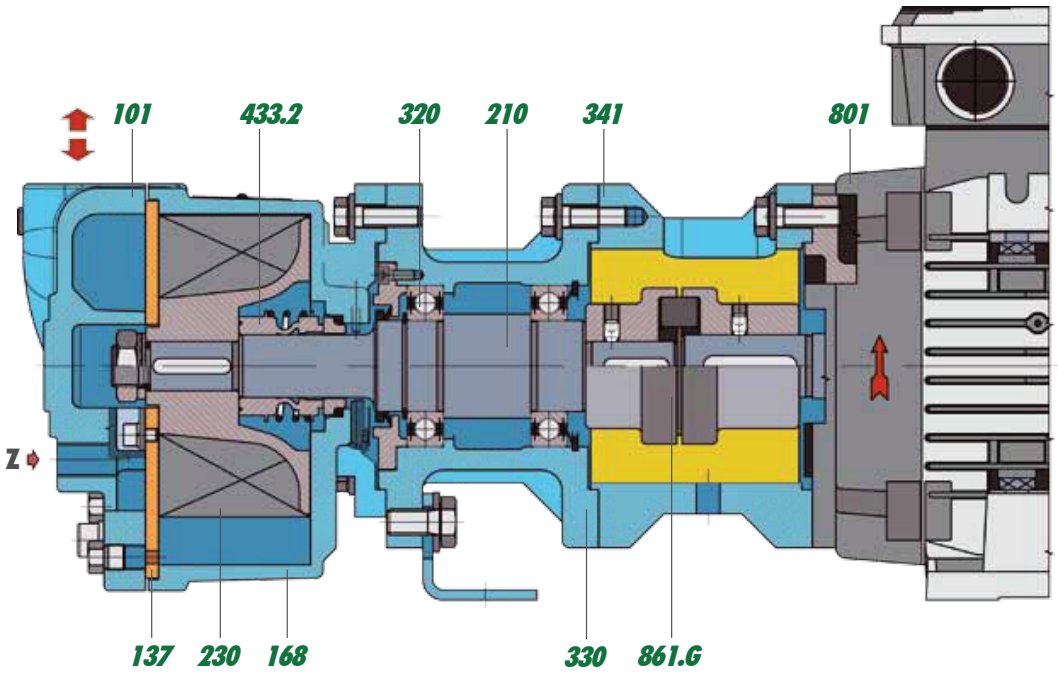
Pompa Pump	DN a/m	Peso Weight	Z	ØD	F	F1	F2	F3	F4	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7	Frame motore Motor frame
TRMX 403	G1 ½	69	G ½	14	200	160	60	160	15	100	55	160	130	193	*	39	154	200	188	20	100
TRMX 405	G1 ½	74	G ½	14	230	190	60	160	15	112	55	160	130	193	*	39	154	200	188	20	112
TRMX 407	G1 ½	110	G ½	14	262	216	60	160	15	132	55	160	130	193	*	39	154	200	188	20	132

TRVX-TRMX Series
Liquid Ring Vacuum Pumps

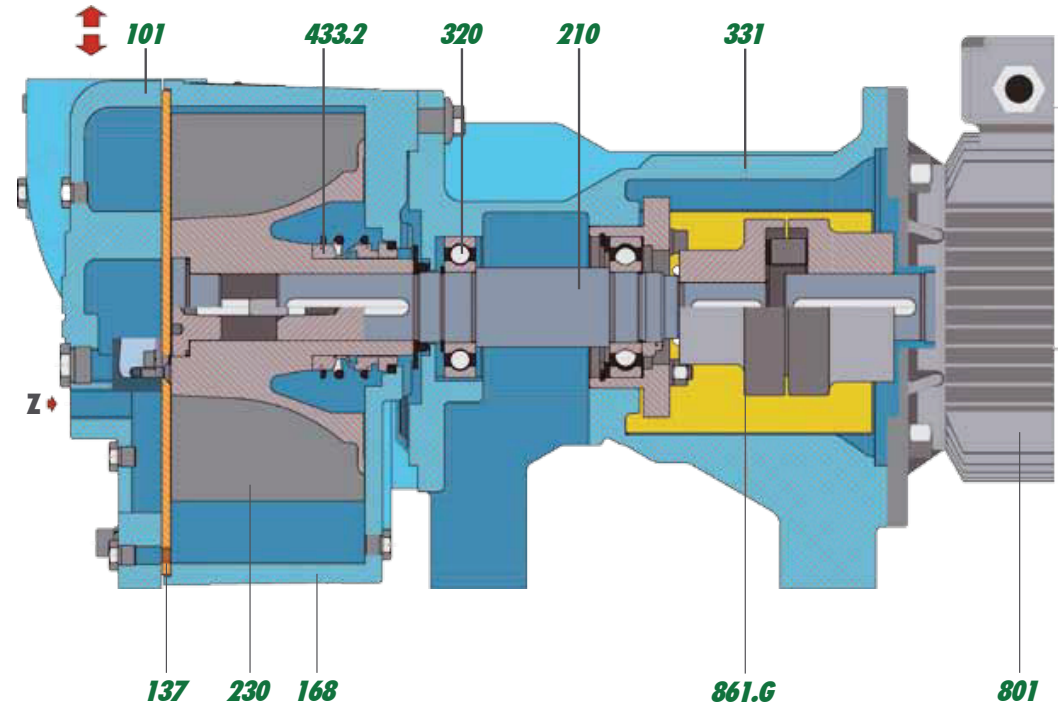
pompetravaini

Cross section drawings

TRVX 257



TRVX 40x



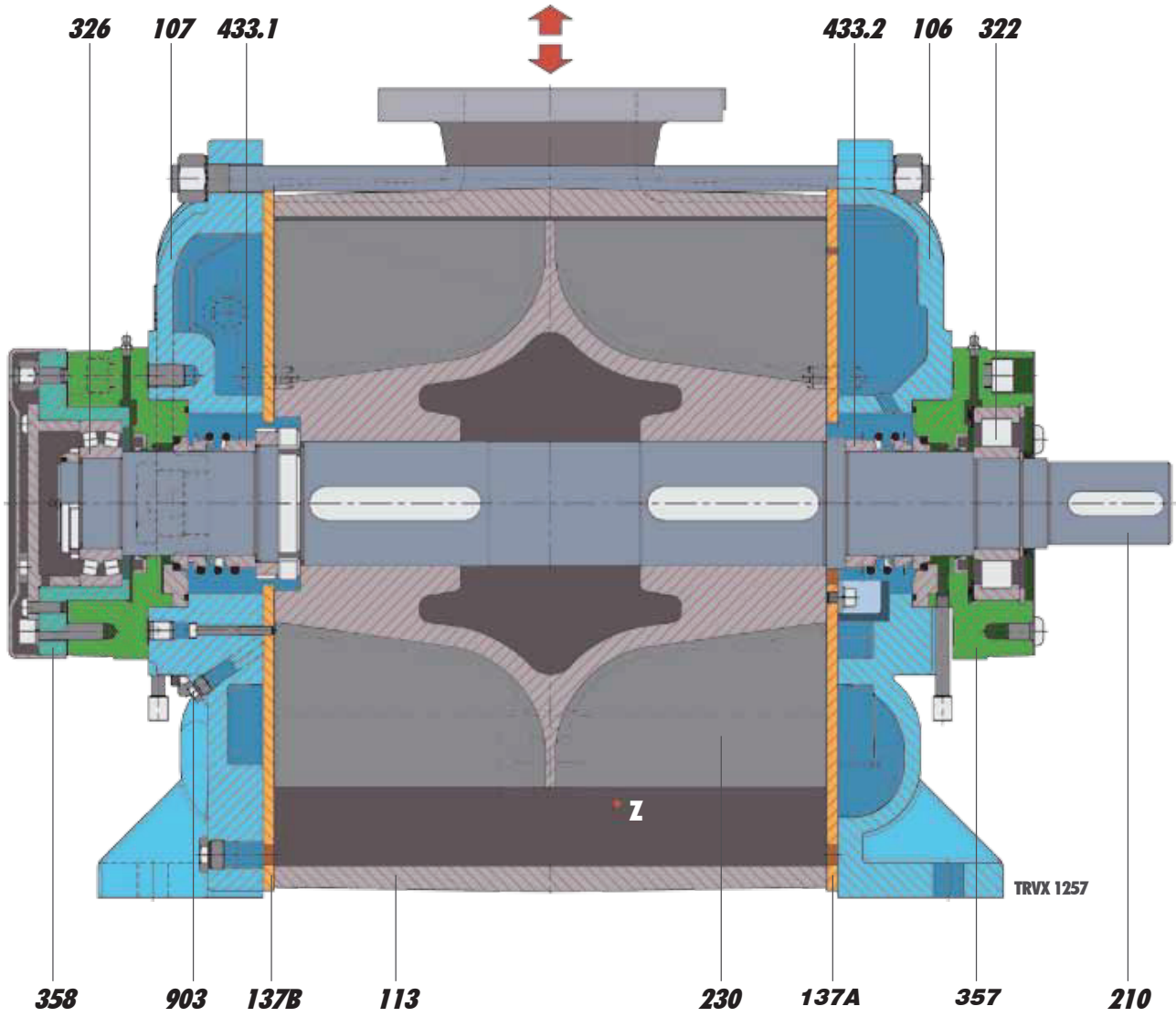
VDMA	Descrizione / *Description*	VDMA	Descrizione / *Description*
101	Corpo aspirante-premente/ *Suction-discharge casing*	331	Supporto cuscinetti con piede / *Foot mounted bearings bracket*
137	Piastra idraulica / *Port plate*	341	Lanterna / *Motor lantern*
210	Albero / *Shaft*	433.2	Tenuta meccanica - rotazione destra/*Mechanical seal - right hand rotation*
230	Girante / *Impeller*	801	Motore Elettrico flangiato /*Electric Flanged motor*
168	Coperchio girante/ *Impeller cover*	861.G	Gruppo giunto / *Coupling assembly*
320	Cuscinetto a una corona di sfere / *Single row ball bearing*		

TRVX-TRMX Series
Liquid Ring Vacuum Pumps

pompetravaini

Cross section drawings

TRVX 65x - 100x - 125x



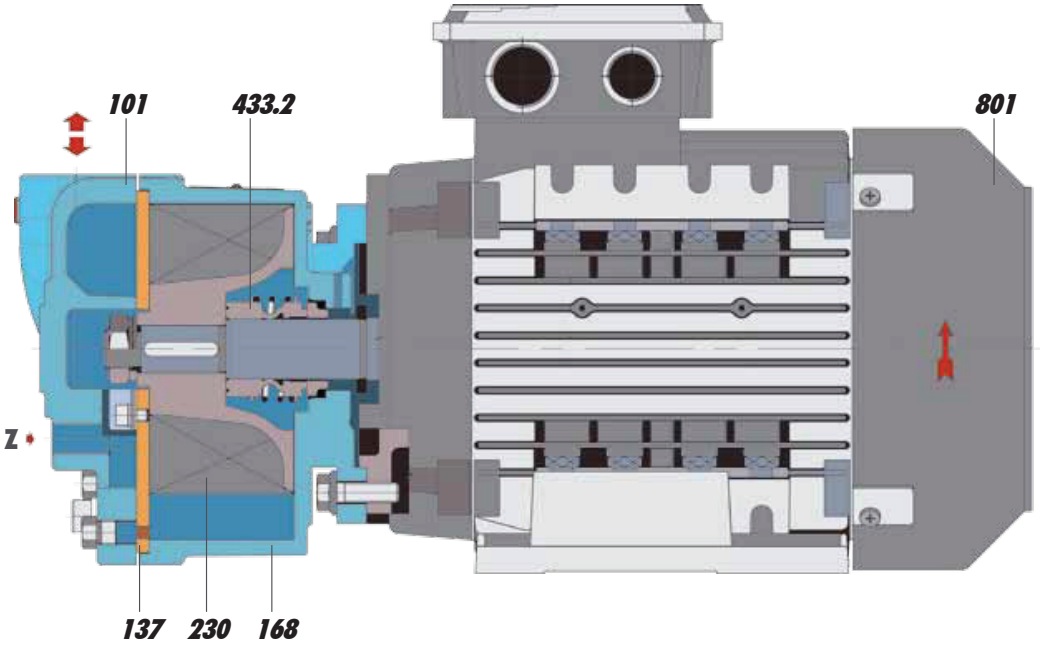
VDMA	Descrizione / *Description*	VDMA	Descrizione / *Description*
113	Corpo intermedio / *Interstage casing*	326	Cuscinetto a due corone di rulli / *Double row roller cylindrical bearing*
106	Corpo aspirante / *Suction casing*	322	Cuscinetto a una corona di rulli / *Single row cylindrical roller bearing*
107	Corpo premente / *Discharge casing*	357	Scatola cuscinetto e Tenuta Meccanica / *Mech. seal and bearing housing*
137A	Elemento piastra - Anteriore / *Port plate - Front side*	358	Supp. cuscinetto per reg. assiale / *Bearing housing for axial regulation*
137B	Elemento piastra - Posteriore / *Port plate - Rear side*	433.1	Tenuta meccanica -rotazione sinistra / *Mechanical seal - left hand rotation*
210	Albero / *Shaft*	433.2	Tenuta meccanica -rotazione destra / *Mechanical seal - right hand rotation*
230	Girante / *Impeller*	903	Attacco anticavitazione / *Anticavitation connection*

TRVX-TRMX Series
Liquid Ring Vacuum Pumps

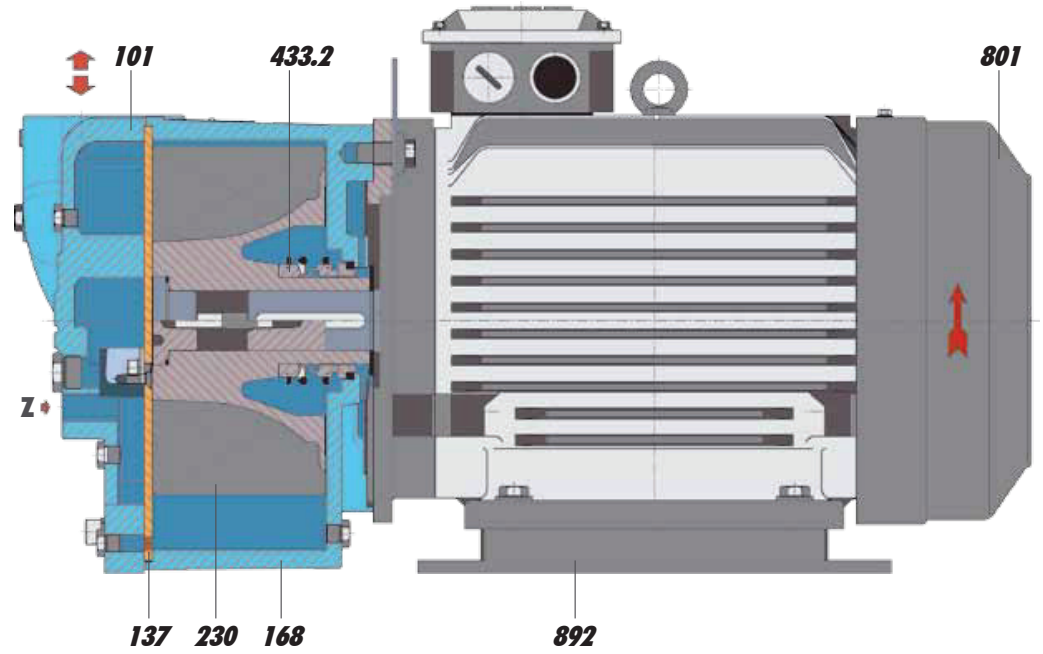
pompetravaini

Cross section drawings

TRMX 257



TRMX 40x



VDMA	Descrizione / *Description*	VDMA	Descrizione / *Description*
101	Corpo aspirante-premente / *Suction-discharge casing*	433.2	Tenuta meccanica - rotazione destra / *Mechanical seal - right hand rotation*
137	Elemento piastra / *Port plate*	801	Motore flangiato / *Flanged motor*
230	Girante / *Impeller*	892	Spessore di allineamento / *Raising pad*
168	Coperchio girante / *Impeller cover*		

Prime FLUID MANAGEMENT

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TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

pompetravaini

Capacity up to 3500 m3/h
Max vacuum 33 mbar

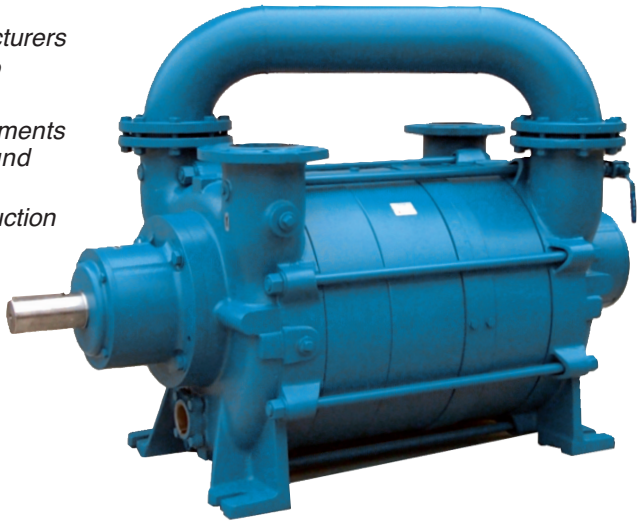
TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

pompetravaini

POMPETRAVAINI is one of the leading worldwide ma-nufacturers of liquid ring vacuum pumps with single stage (TRS) and two stages (TRH) pump series. With the experience acquired through decades of engineering research, continual investments in the latest technological advanced machinery, and sound mechanical know-how, Pompetravaini's product is today synonymous with high quality, high efficiency, robust construction and maximum reliability.



Pumps series **TRH**
Portata / *Capacity* = 3 - 3500 m³/h
Vuoto / *Vacuum* = 33 - 200 mbar

APPLICATIONS

- *CENTRAL VACUUM SYSTEMS*
- *DE-AERATION*
- *IMPREGNATION*
- *BOILING PROCESSES*
- *VACUUM CONDENSING*
- *DISTILLATION*
- *DRYING SYSTEMS*
- *STERILIZATION*
- *FILTRATION*
- *SOLVENT RECOVERY*

LIQUID HANDLING CAPABILITY

Pumps are capable of handling even high volumes of vapours, condensables and liquids, without detrimental consequences to their performance or their mechanical reliability. Pump service liquid can be water or other liquids such as oils, solvents, etc. to satisfy almost any process requirements.

DISCHARGE OIL FREE AIR

With clean water as pump service liquid, the aspirated air (or gas) is "washed clean" within the pump. Contrary to other types of vacuum pumps the discharged air is, therefore, completely free of any oils, carbon or plastic particles.

MOUNTING TO B3 OR B5 MOTORS
Pompetravaini standard design may be base-mounted coupled to motors type B3. Pumps up to 30 kW can also be close coupled to motors type B5 utilizing specially designed attachment flange. This close-coupled arrangement allows utilization of standard readily available electric motors, eliminates lenghty alignment procedures and costly breakdowns associated with misalignments. Overall dimensions are reduced and engineered baseplates are no longer required.

PRESSURE TO LESS THAN 33 mbar
Liquid ring vacuum pumps, type TRH in series with devices such as ejector and/or vacuum boosters can operate at pressure lower than 1 mbar.

TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

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FEATURES

QUALITY
Designed and manufactured under the ISO 9001 standards, every components is guaranteed for the selected materials, workmanship and performance through scrupulous inspections during production stages and final testing of finished product.

FEWER COMPONENTS
Through engineered disegn innovations and co-operation with the finest technologically advanced foundries, the pumps are manufactured with less components than typically required. Fewer parts add to the rigidity and toughness of the pumps, they are easier to assemble and maintenance is greatly facilitated.

COMPACT DIMENSIONS
The conventional stuffing boxes construction is eliminated with the Pompetravaini standard design. The shaft lenght is greatly reduced thus eliminating the pontential danger for shaft deflections and vibrations to the mechanical seals which would increase seals and bearing wear.

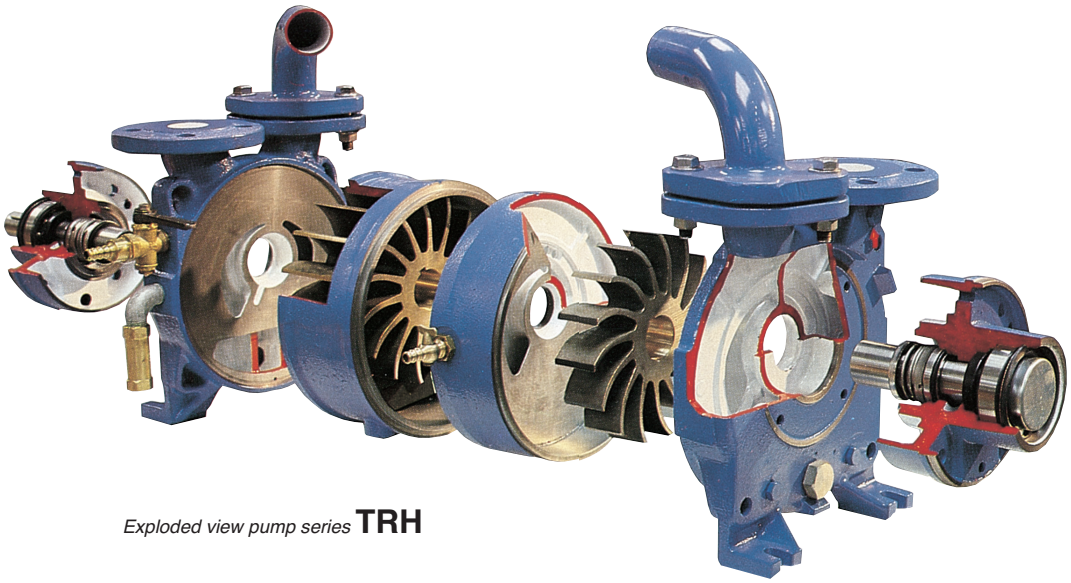
STANDARD MECHANICAL SEALS
In keeping pace with today technology, Pompetravaini has standardized all pumps to accept unified mechanical seals to DIN 24960 standards. Also available upon request, are constructions with double mechanical seals (tandem or back to back) or cartridge type mechanical seals.

LARGE SELECTION OF MATERIALS
In addition to the standard materials, Pompetravaini pumps are also available with special exotic materials such as Ni-Resist D2B, Hastelloy B or C, Uranus B6, etc. to meet specific requirements.

MECHANICAL RELIABILITY
With the simple design of liquid ring pumps there are no reciprocating parts, no valves or sliding vanes. The impeller is the only rotating component with no metal-to-metal contact. Pump operation is therefore with minimal wear, vibrations free and noise levels are greatly reduced.

Pumps series **TRS**

Portata / *Capacity* = 10 - 3500 m^3/h
Vuoto / *Vacuum* = 200 - 900 mbar



Exploded view pump series **TRH**

TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

pompetravaini

EXAMPLE FOR MODEL DESIGNATION

T	R	H	C	80	-	750	/	C	-	M	/	GH

T	Costruzione POMPETRAVAINI *POMPETRAVAINI Construction*
R	Pompa ad anello di liquido *Liquid ring pump*
H	H = Pompa a due stadi per alto vuoto *Double stage pump for high vacuum* S = Pompa ad uno stadio per medio vvuoto *Single stage pump for medium vacuum*
C	Numero di progetto / *Design number*
80	Ø Bocche (mm) / *Ø Flange size (mm)*
750	Portata nominale m^3/h / *Nominal capacity m^3/h*
C	Tenuta sull'albero / *Shaft sealing* C = Meccanica / *Mechanical seal* C2 = Meccanica doppia/ *Double mech. seal* B = Baderna / *Packing seal*
M	Esecuzione monoblocco con lanterna (su richiesta) *Close-coupled construction with lantern* *(on request)*
GH	Materiali di costruzione / *Materials of costruction* GH = F = RA = A3 = Vedere tabella / *See table*

STANDARD MATERIALS OF CONSTRUCTION

VDMA N°	DESCRIZIONE *Description*	GH	F	RA	A3
106	Corpo aspirante *Suction casing*	Ghisa *Cast iron*			
107	Corpo premente *Discharge casing*				
137	Elemento *Port plate*				
110	Distanziale *Impeller housing*				
210	Albero *Shaft*	Acciaio inox AISI 420 *Stainless steel AISI 420*		Acciaio inox AISI 316 ASTM-CF8M *Stainless steel AISI 316 ASTM-CF8M*	
147	Collettore *Manifold*	Acciaio *Steel*			
357	Scatola cusc. e ten . mecc. *Bearing and mech. seal hous.*	Ghisa *Cast iron*			
230	Girante *Impeller*	Bronzo *Bronze*	Ghisa sferoidale *Ductile iron*	Acciaio inox AISI 316 ASTM-CF8M *Stainless steel AISI 316 ASTM-CF8M*	

MATERIALI SPECIALI SU RICHIESTA / *SPECIAL MATERIALS AVAILABLE UPON REQUEST*

Pompa serie **TRH** in esecuzione accoppiata su basamento
*Pump series **TRH** base-mounted coupled construction*

TRH-TRS Series

Liquid Ring Pumps and Compressors

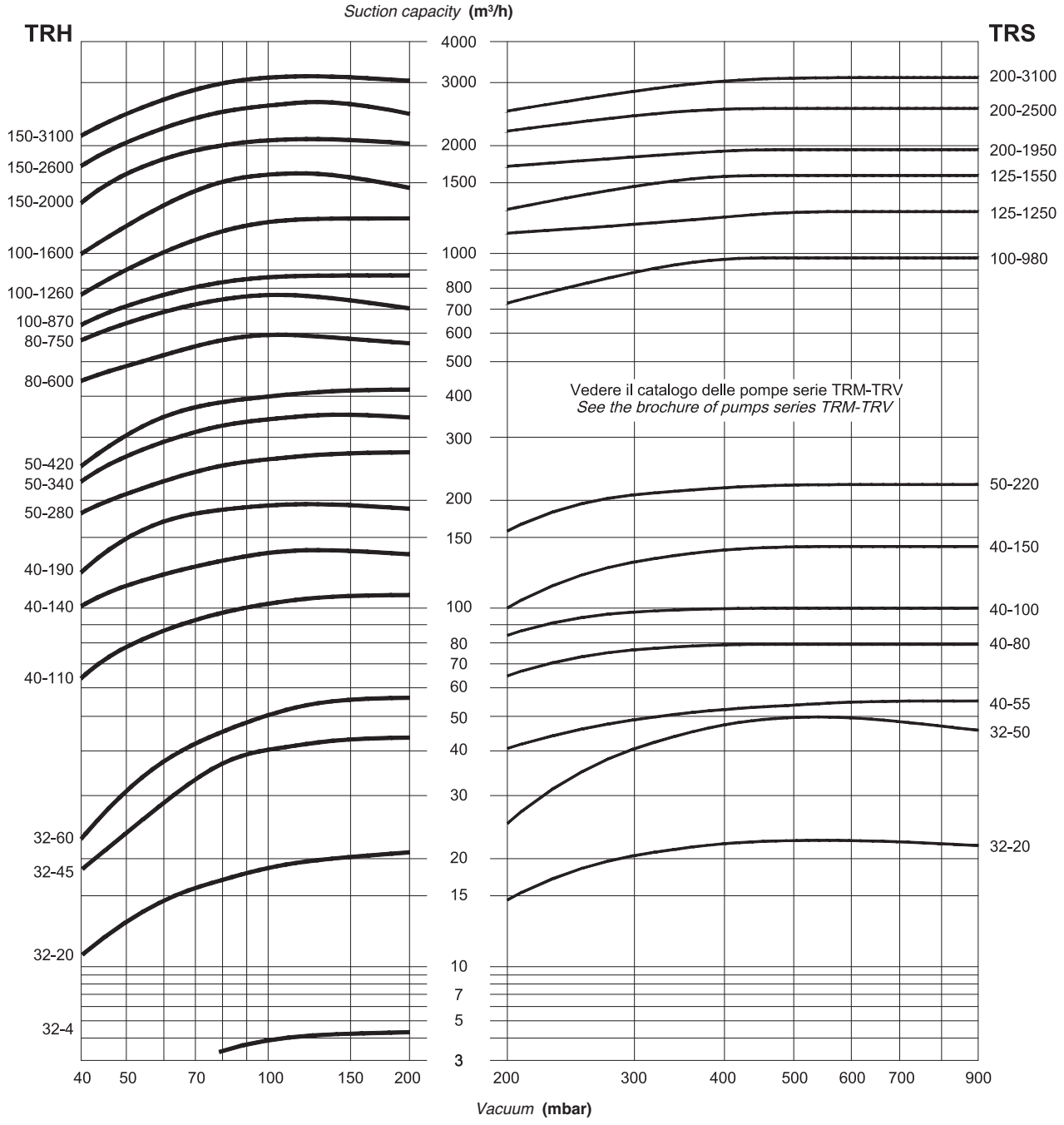
Single (TRS) and two-stage (TRH)

pompetravaini

PERFORMANCE CURVES AT 50 CYCLES

20°C (68°F)
acqua / *water*
15°C (59°F)
1013 mbar

Data based on:
Suction dry air
Service liquid
Service liquid temperature
Discharge pressure



When handling saturated air and/or using service liquid with temperature other than 15°C (59°F) the capacity will change substantially (see diagrams on page 16).
*The vacuum pumps can operate as compressors at a pressure **2 bar** maximum higher than suction pressure. For working performances contact our Sales Office.*

TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

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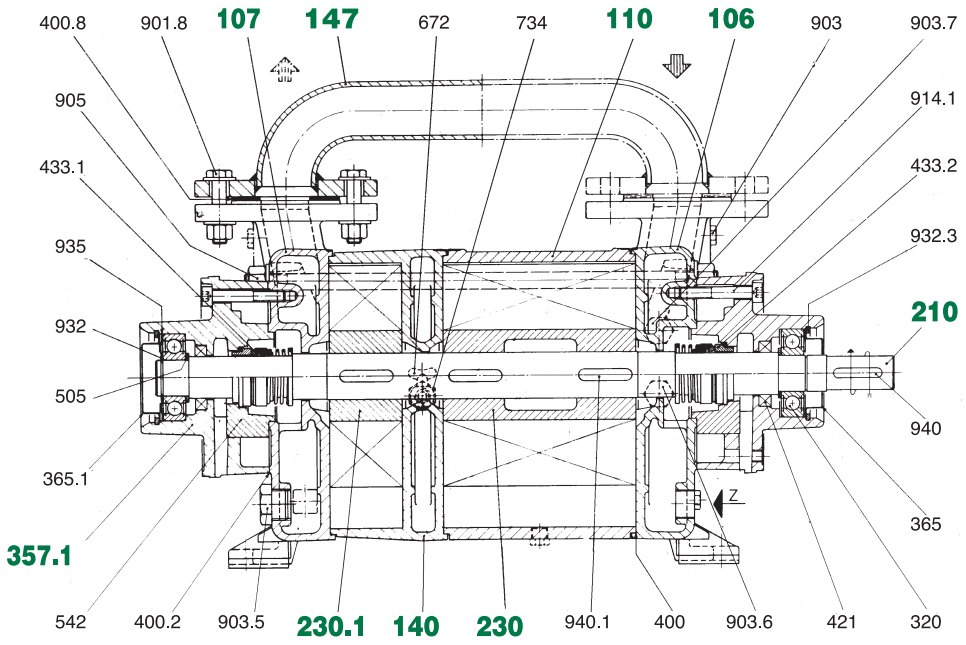
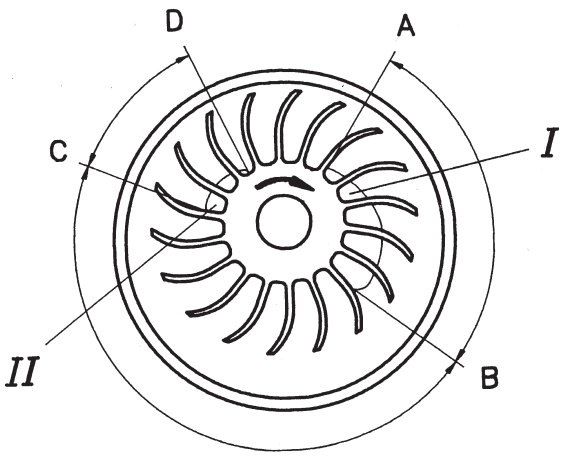


TYPICAL CROSS SECTION OF A DOUBLE STAGE VACUUM PUMP WITH MECHANICAL SEAL

COMPONENTS

VDMA N°.	*DESIGNATION*
106	*Suction casing*
107	*Discharge casing*
110	*Impeller casing*
140	*Intermediate element*
147	*Manifold*
210	*Shaft*
230	*1st stage impeller*
230.1	*2nd stage impeller*
357.1	*Bearing and mechanical seal housing*

PRINCIPLE OF OPERATION



Gas entering via the suction port is conveyed into the impeller casing AB and trapped in the space between two impeller blades. As the impeller rotates - eccentrically to the liquid ring and casing - the volume between the blades increases creating vacuum. As the cycle progresses towards the discharge port the volume decreases as the liquid ring creates compression. This compression continues until the gas in discharged through the discharge port CD. A small amount of seal liquid is discharged with the gas and it is necessary to supply make-up continuously. This make-up liquid also maintains the liquid ring and absorbs the heat energy of compression.

I = Suction phase

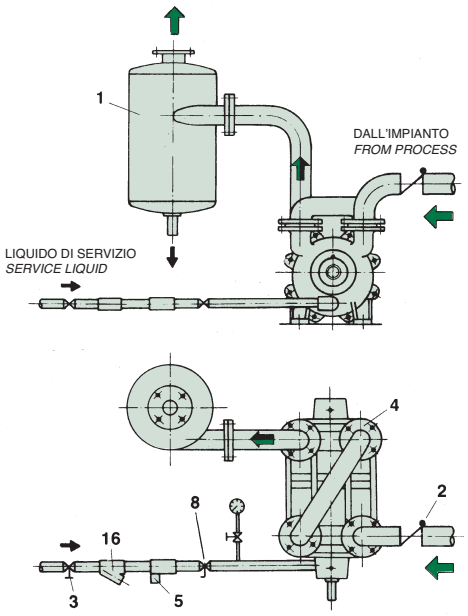
II = Compression phase

TRH-TRS Series

Liquid Ring Pumps and Compressors

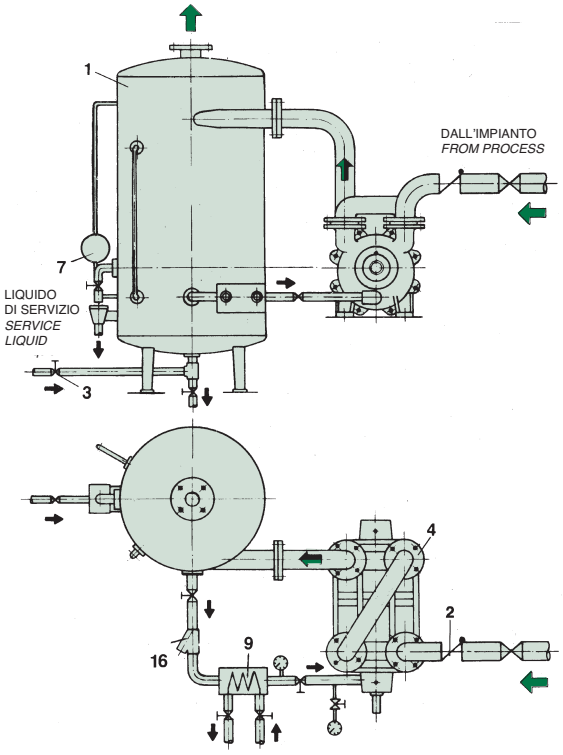
Single (TRS) and two-stage (TRH)

pompetravaini



ONCE THROUGH (no recovery)

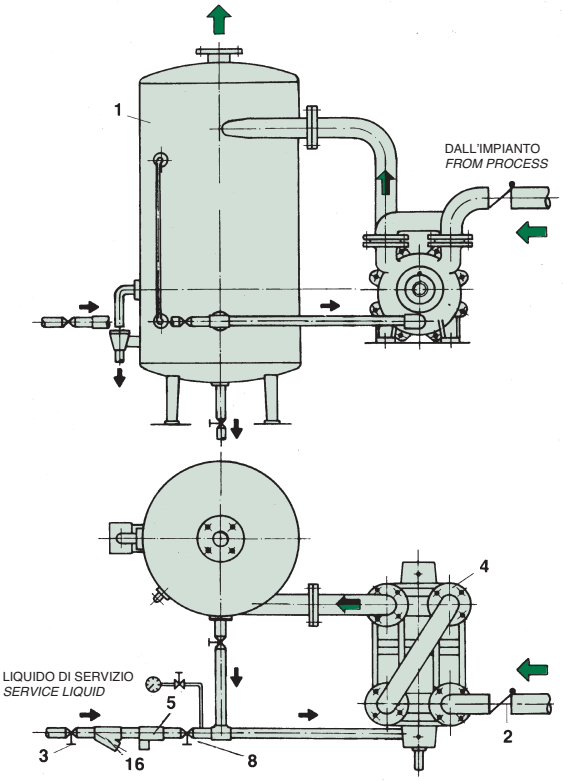
Usually used where a constant supply of liquid is readily available.



TOTAL RECIRCULATION

This system is used when it is not possible to drain the service liquid due to contamination or the liquid is not water or there is scarcity of water. A heat exchanger is required for cooling.

LIQUID RING VACUUM PUMPS



PARTIAL RECIRCULATION

This system offers economy of service liquid consumption. The service liquid discharged by the pump is partially recycled while a fresh controlled supply of liquid is introduced to remove the generated compression heat. A similar amount of service liquid is overflowed to maintain the liquid level within the system at or below the pump shaft centerline.

AIR OR GAS

LIQUID GAS-MIXTURE

LIQUID

1 *Separator tank*
2 *Non-return valve*
3 *Isolating valve*
4 *Liquid ring vacuum pump*
5 *Solenoid valve*
7 *Level*
8 *Flow control valve*
9 *Heat exchanger*
16 *Strainer*

Note: *The drawings are indicative.*

TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

pompetravaini

PRESSIONE ASSOLUTA *ABSOLUTE PRESSURE*			mbar	213		147		107		80		53		40		33		Portata media anello di liquido (1) *Average service liquid flow* (1)
			Torr	160		110		80		60		40		30		25		
VUOTO / *VACUUM*			mm Hg	600		650		680		700		720		730		735		
POMPA TIPO *PUMP TYPE*	Ø Bocche DN *Flange size*	Potenza Motore *Motor Power kW*	Giri/1' *R.P.M.*	m³/h	kW	m³/h	kW	m³/h	kW	m³/h	kW	m³/h	kW	m³/h	kW	m³/h	kW	m³/h
TRH 32-4	32	0,55	1450	4,4	0,4	4,2	0,4	4	0,4	3,3	0,4	–	–	–	–	–	–	0,16
		0,75	1750	5,7	0,59	5,1	0,59	4,9	0,59	4,9	0,59	–	–	–	–	–	–	
TRH 32-20	32	1,1	2900	21	0,8	20	0,8	19	0,8	17	0,8	14	0,8	11	0,8	–	–	0,3
		1,5	3500	25	1,32	24,5	1,32	23	1,32	21	1,32	16	1,32	12,1	1,32	–	–	
TRH 32-45	32	1,5	2900	44	1,3	43	1,3	40	1,2	36	1,2	27	1,2	18	1,2	–	–	0,3
		2,2	3500	53	1,84	52,5	1,76	48	1,76	45	1,76	33	1,76	20	1,76	–	–	
TRH 32-60	32	2,2	2900	54	1,8	55	1,75	51	1,6	46	1,6	35	1,6	24	1,6	17	1,6	0,7
		3	3500	59	2,3	59	2,3	57	2,3	54	2,3	40	2,3	28,9	2,3	20	2,3	
TRH 40-110	40	4	1450	105	2,9	107	2,9	102	2,9	98	2,8	81	2,7	66	2,6	51	2,6	0,75
		5,5	1750	125	3,8	124	3,7	115	3,6	105	3,6	90	3,5	71	3,5	55	3,5	
TRH 40-140	40	4	1450	140	3,4	144	3,2	142	3	136	2,9	122	2,8	104	2,8	85	2,8	0,8
		5,5	1750	165	4,5	168	4,3	162	4,1	155	4	134	3,9	120	3,9	100	3,9	
TRH 40-190	40	5,5	1450	184	4,5	190	4,2	190	4	186	3,8	162	3,7	130	3,6	100	3,6	0,85
		7,5	1750	218	6	224	5,6	222	5,5	219	5,3	190	5,2	150	5	119	5	
TRH 50-280	50	9	1450	285	7,5	281	7,3	270	7	255	6,6	215	6,6	180	6,6	160	6,6	1,2
		15	1750	309	10,8	306	10,3	290	10	271	10	243	10	220	10	200	10	
TRH 50-340	50	11	1450	340	9,1	345	8,6	340	8,3	325	8,2	280	8,1	230	8,1	185	8,1	1,7
		15	1750	400	12,3	400	11,8	388	11,4	370	11	310	11	258	11	210	11	
TRH 50-420	50	15	1450	415	10,8	420	10,3	410	9,6	390	9,2	330	8,8	260	8,8	210	8,8	2,3
		18,5	1750	465	13,9	460	13	440	12,9	410	12,9	340	12,9	275	12,9	225	12,9	
TRH 80-600	80	22	1450	555	17,4	575	17	580	16,5	570	15,9	510	15,1	450	14,7	400	14,5	2,1
		30	1750	665	25,8	680	25,3	690	24,4	670	23,8	575	22,5	490	22,1	430	22	
TRH 80-750	80	30	1450	690	22	745	21	760	20,2	740	19,8	670	18,8	580	18	520	17,6	2,4
		37	1750	820	32	850	30,8	855	29,6	840	28,4	725	27	635	26	545	25,4	
TRH 100-870	100	30	960	870	24	880	23	860	22	820	21	740	21	630	21	569	21	4,8
		37	1150	975	36,8	975	35,5	950	34	900	32,6	775	32,6	637	32,6	578	32,6	
TRH 100-1260	100	37	960	1260	33,4	1260	32	1240	31	1150	30,4	970	30	770	29,7	663	29,4	5,0
		45	1150	1390	46,2	1440	44,5	1390	43,5	1240	42,8	1050	42,8	799	42,8	680	42,8	
TRH 100-1600	100	45	960	1450	40,5	1620	39,5	1620	38,5	1540	36,5	1280	34,5	1030	34	867	34	5,4
		75	1150	1630	56	1700	56	1700	55	1623	54,4	1400	52,9	1104	52,9	862	52,9	
TRH 150-2000	150	75	730	1940	58	2050	55	2080	52	2000	50	1620	48	1380	46	1199	45	9
		90	880	2250	88	2320	88	2200	88	2020	86,8	1640	82	1340	80,1	–	–	
TRH 150-2600	150	90	730	2350	70	2620	68	2600	65	2410	62	2050	59	1750	57	1480	55,9	10
		110	880	2650	105	2940	107	2860	107	2560	103	2000	100	1660	97	–	–	
TRH 150-3100	150	110	730	3000	85	3150	79	3180	74	3080	70	2650	66	2160	65	1700	64,7	12
		160	880	3550	123	3650	121	3610	118	3380	113	2450	109	1920	108	–	–	

TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

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PRESSIONE ASSOLUTA *ABSOLUTE PRESSURE*			mbar	880		746		613		480		347		213		147		Portata media anello di liquido (1) *Average service liquid flow* (1)
			Torr	660		560		460		360		260		160		110		
VUOTO / *VACUUM*			mm Hg	100		200		300		400		500		600		650		
POMPA TIPO *PUMP TYPE*	Ø Bocche DN *Flange size*	Potenza Motore *Motor Power kW*	Giri/1' *R.P.M.*	m³/h	kW	m³/h	kW	m³/h	kW	m³/h	kW	m³/h	kW	m³/h	kW	m³/h	kW	m³/h
TRS 32-20	32	1,1	2900	18	0,4	19	0,45	20	0,55	20	0,6	18	0,7	13	0,75	7	0,75	0,3
		1,5	*3500*	*23*	*0,8*	*24*	*0,85*	*25*	*0,95*	*25*	*1*	*24*	*1,5*	*19,5*	*1,1*	*14*	*1,1*	
TRS 32-50	32	1,5	2900	42	0,7	45	0,8	46	1	45	1,1	40	1,2	28	1,2	10	1,3	0,32
		2,2	*3500*	*50*	*1*	*54*	*1,18*	*57*	*1,32*	*58*	*1,54*	*55*	*1,7*	*42*	*1,84*	*25*	*1,84*	
TRS 40-55	40	2,2	1450	54	0,9	54	1	54	1,3	52	1,4	49	1,5	42	1,5	32	1,5	0,5
		3	*1750*	*68*	*1,4*	*68*	*1,5*	*68*	*1,6*	*68*	*1,7*	*67*	*1,8*	*54*	*1,9*	*37*	*1,9*	
TRS 40-80	40	3	1450	80	1,2	80	1,5	80	1,8	80	1,9	79	2	68	2,1	50	2,1	0,55
		4	*1750*	*100*	*2*	*100*	*2,2*	*100*	*2,4*	*100*	*2,5*	*98*	*2,7*	*82*	*2,8*	*55*	*2,85*	
TRS 40-100	40	3	1450	100	1,8	100	2,2	100	2,4	100	2,5	98	2,7	85	2,9	65	2,9	0,65
		4	*1750*	*127*	*2,35*	*127*	*2,6*	*127*	*2,8*	*127*	*3*	*125*	*3,1*	*110*	*3,2*	*75*	*3,3*	
TRS 40-150	40	4	1450	144	1,9	144	2,3	144	2,7	144	3	134	3,3	105	3,4	65	3,3	0,72
		5,5	*1750*	*180*	*2,6*	*180*	*3,1*	*180*	*3,5*	*175*	*4*	*163*	*4,2*	*127*	*4,4*	*90*	*4,5*	
TRS 50-220	50	5,5	1450	220	3,1	220	3,8	220	4,3	220	4,7	210	4,9	165	5	115	5	1
		7,5	*1750*	*258*	*4,9*	*265*	*5,2*	*268*	*5,6*	*268*	*5,9*	*258*	*6,3*	*212*	*6,5*	*160*	*6,5*	
TRS 100-980	100	30	1450	980	19,9	980	22	980	24	975	24	935	25	720	26	–	–	5
		37	*1750*	*1190*	*29,4*	*1190*	*30,1*	*1190*	*30,9*	*1190*	*32,3*	*1147*	*34*	*824*	*35,8*	–	–	
TRS 125-1250	125	37	960	1250	26	1250	28	1250	29	1250	30	1200	31	1120	32	–	–	4
		45	*1150*	*1402*	*39*	*1393*	*39,7*	*1380*	*40,4*	*1376*	*41,2*	*1342*	*42,6*	*1147*	*42,6*	–	–	
TRS 125-1550	125	45	960	1550	35	1550	37	1550	38	1550	39	1500	40	1320	40	–	–	4,4
		75	*1150*	*1800*	*51,5*	*1800*	*52,9*	*1800*	*53,7*	*1800*	*54,4*	*1784*	*55,9*	*1393*	*55*	–	–	
TRS 200-1950	200	75	730	1950	37	1950	42	1950	47	1940	50	1900	54	1710	56	–	–	10
		90	*880*	*2396*	*55,9*	*2396*	*64*	*2396*	*70,6*	*2379*	*75,7*	*2277*	*82,3*	*1920*	*85,3*	–	–	
TRS 200-2500	200	75	730	2500	46	2500	52	2500	59	2500	63	2460	66	2210	70	–	–	12
		110	*880*	*2975*	*69,8*	*2975*	*79,4*	*2975*	*89,7*	*2935*	*96,3*	*2825*	*101*	*2362*	*105*	–	–	
TRS 200-3100	200	110	730	3100	65	3100	70	3100	74	3100	77	2900	81	2550	85	–	–	14
		160	*880*	*3660*	*97*	*3660*	*103*	*3660*	*110*	*3600*	*116*	*3390*	*123*	*2718*	*129*	–	–	

For pumps with capacities from 200 to 800 m³/h see the brochure of pumps series TRV - TRM

This data represents average values for pumps in standard and all iron materials of construction (GH, RA, F), discharging against atmospheric pressure at sea level (1013 mbar).
All stainless steel (A3) pumps have 10% less capacity. Capacity in m³/h subject to 10% tolerance handling dry air at 20°C (68°F) and using 15°C (59°F) water as service liquid. When handling 100% saturated air capacity increases substantially (see diagrams on page 16).

Break horse power in kW is referred to water at 15°C (59°F) used as service liquid and tolerance 10%.
(1) For detailed information pls consult the specific performance curves of the requested pump.
FIGURES IN THIN CHARACTERS ARE REFERRED TO 60 Hz.

TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

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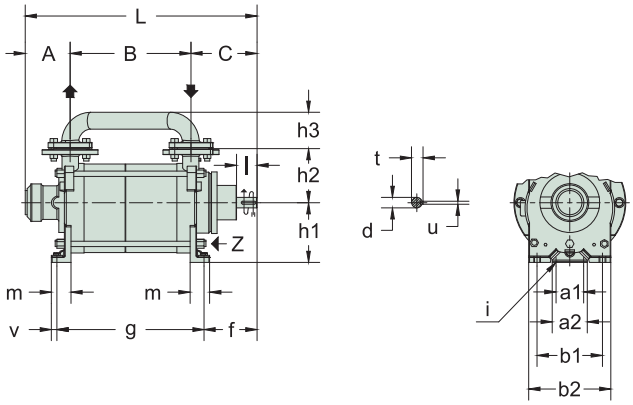
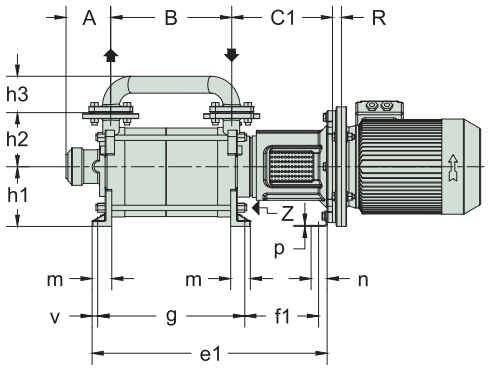
DOUBLE STAGE VACUUM PUMPS BARESHAFT DESIGN WITH MECHANICAL SEAL (/C)



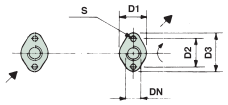
DOUBLE STAGE VACUUM PUMPS CLOSE-COUPLED DESIGN WITH MECHANICAL SEALS (/CM)



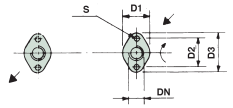
POMPA TIPO *PUMP TYPE*	DN	/C	/CM MOTORE *MOTOR* UNEL-MEC-B5		PESO ESCLUSO MOTORE *WEIGHT WITHOUT MOTOR ca*	A	B	C	C1	L	R	a1	a2	b1	b2	d	e	e1	f	f1	g	h1	h2	h3	i	l	m	n	p	t	u	v	z
		PESO *WEIG.* ca	TIPO *TYPE*	kW																													
TRHE 32-4		14	80 A	0,55	19	43	108	109	168	260			120		155	14	90	214	64		64					90				16	5		1/4"
TRHE 32-20 •	1 1/4"	18	80 B	1,1	23	75	139	113	172	327		90	125	120	160	19	219	351	75	105	193	100	100	–	12	35	45	33	3	21,5	6	13	3/8"
TRHE 32-45 •		21	90 S	1,5	26		189			377							269	401			243												
TRHE 32-60 •		26	90 L	2,2	31	80	214	118	177	412							304	436	73	114	278			85									1/2"
TRHE 40-110 •	1 1/2"	49	112 M	4	61	101	224	154	230	479						24	324	504	104	154	294		140	–		45				27			
TRHE 40-140 •	40	67			77	120	254	177	249	551	–	110	175	140	220	28	354	552	127	173	324	160	145	97	14	55	50	45	4	31	8	15	3/4"
TRHE 40-190 •		75	132 SA	5,5	89		324			621							424	644			394												
TRHB 50-280		130	132 MB	9	146		319		313	679							459	685		222	419												
TRHB 50-340	50	140	160 M	11	170	144	379	216	342	739		230	240	280	300	32	519	780	146	244	479	200	180	137	16	65	70	65	39	35	10	20	1"
TRHB 50-420		145	160 L	15	178		419			779							559	820			519												
TRHC 80-600	80	220	180 L	22	245	139	475	233	348	847			290		335	42	624	899	160	248	575	225	210	174	18	90	85	75	22	45	12	24,5	1 1/4"
TRHC 80-750		240	200 L	30	280		560			932	24						709	984			660												
TRHE 100-870		376					546			918							716				672												
TRHE 100-1260	100	475				137	696	235		1068			330		410	60	866		150		822	315	270	225	20		100			64	18	22	1 1/2"
TRHE 100-1600		515	–	–	–		796		–	1168	–	–		–			966	–		–	922							–	–				
TRHA 150-2000		1330					830			1660							1080				960												
TRHA 150-2600	150	1480				333	980	497		1810			520		650	80	1230		372		1110	430	370	331	24	160	150			85	22	60	2 1/2"
TRHA 150-3100		1630					1080			1910							1330				1210												

DIMENSIONI FLANGE / *FLANGE DIMENSIONS*

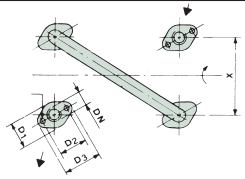
TRHE 32-4

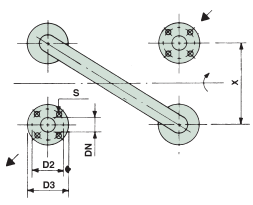


TRHE 32-20 •
TRHE 32-45 •
TRHE 40-110 •



TRHE 32-60 •





TRHE 40-140 •
TRHE 40-190 •

TRHB 50-280
TRHB 50-340
TRHB 50-420

TRHC 80-600
TRHC 80-750

TRHE 100-870
TRHE 100-1260
TRHE 100-1600

TRHA 150-2000
TRHA 150-2600
TRHA 150-3100

TPOMPA TIPO *PUMP TYPE*	DN	D1	D2	D3	X	S
TRHE 32-4 TRHE 32-20 • TRHE 32-45 •	1 1/4"	85	90	118	–	2x14
TRHE 32-60 •					100	
TRHE 40-110 •	1 1/2"	95	100	132	–	4x18
TRHE 40-140 • TRHE 40-190 •	40	–	110	150	140	
TRHB 50-280 TRHB 50-340 TRHB 50-420	50		125	165	230	
TRHC 80-600 TRHC 80-750	80		160	200		
TRHE 100-870 TRHE 100-1260 TRHE 100-1600	100		180	220	270	8x18
TRHA 150-2000 TRHA 150-2600 TRHA 150-3100	150		240	285	500	8x22

TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

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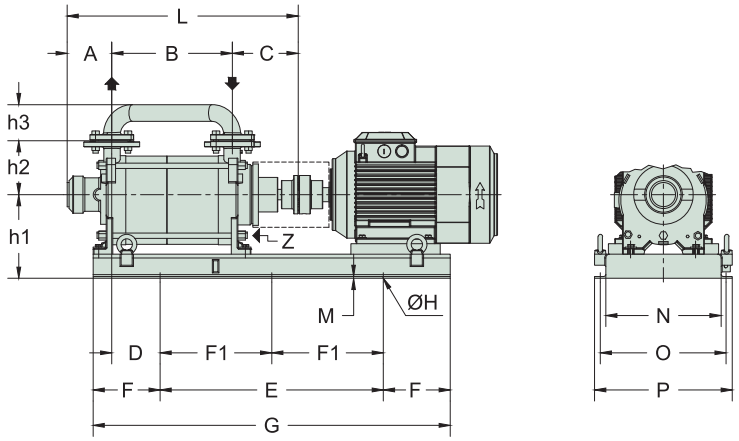
DOUBLE STAGE VACUUM PUMPS
BASE-MOUNTED COUPLED CONSTRUCTION
WITH MECHANICAL SEALS (/CM)



POMPA TIPO *PUMP TYPE*	DN	MOTORE *MOTOR* UNEL-MEC-B3		PESO ESCLUSO MOTORE *WEIGHT WITHOUT MOTOR*	BASE N°	A	B	C	D	E	F	F1	G	H	L	M	N	O	P	h2	h3	h4	z
		TIPO *TYPE*	kW																				
TRHE 32-4	1 1/4"	80A - B	0,55 - 0,75	32	905	43	108	109	0	250	80	–	410	9	260	4	160	185	210	100	–	140	1/4"
TRHE 32-20 •		80B - S	1,1 - 1,5	34	902	75	139	118	45	370	120		610	14	332	5	210	240	270			150	3/8"
TRHE 32-45 •		90S - L	1,5 - 2,2	37			189		75						382								
TRHE 32-60 •		90L - 100LA	2,2 - 3	43	901	80	214	123	90	420	175		770		412		290	320	350		81	160	1/2"
TRHE 40-110 •	1 1/2"	112M	4	74		101	224	154	125						479					140	–	220	3/4"
		111M	5,5	87					50	600	180		960				310	340	370				
TRHE 40-140 •	40	112M	4	100	900	120	254	177							551					145	97	225	
TRHE 40-190 •		132SA	5,5	110					90														
		132SA - MA	5,5 - 7,5	118			324		130						621								
TRHB 50-280	50	132MB	9	195	903	144	319	216	70	770	200		1170		679	6	350	380	410	180	137	290	1"
		160L	15						130														
TRHB 50-340		160M - L	11 - 15	215	906		379		50	950	225		1400		739							300	
TRHB 50-420		160L	15	189			419		100						779								
		180M	18,5	241	041				140	900			1350	18		7	420	510	560			330	
TRHC 80-600	80	180M - 200L	18,5 - 30	367	034	139	475	233	0	1100	300		1700		847		450	540	590	210	174	355	1 1/4"
TRHC 80-750		200L - 225S	30 - 37	377			560		90						932								
TRHE 100-870	100	225M	30	574		137	546	235							918					270	225	445	1 1/2"
		250M	37		042				80	1400	200	700	1800				500	590	640				
TRHE 100-1260		250M - 280S	37 - 45	657	039		696		40	1600	275	800	2150		1068		540	630	680				
TRHE 100-1600		280S - 315S	45 - 75	690			796		150						1168								
TRHA 150-2000	150	315MA	75	1805	60F	333	830	497	145	1800	300	900	2400	22	1660	60	750	850	930	370	331	680	2 1/2"
		315MB	90	1945	61F				110	1900	450	950	2800		1810								
TRHA 150-2600				2095			980		225														
		315L	110						250						1910								
TRHA 150-3100		355MB	160	2245			1080		315														

Disegni schematici - Dimensioni in mm. con tolleranze secondo EN 735-1995, pesi in kg. non impegnativi.
Schematic drawings - Dimensions in mm. with tolerances according to EN 735-1995, weights in kgs. not binding.

Z = Ingresso liquido di servizio. La posizione indicata è schematica.
Service liquid inlet. The stated position is schematic.

- *For this pump type is available another version with different overall dimensions and identical performances. For more detailed information pls contact our Sales Office.*

TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

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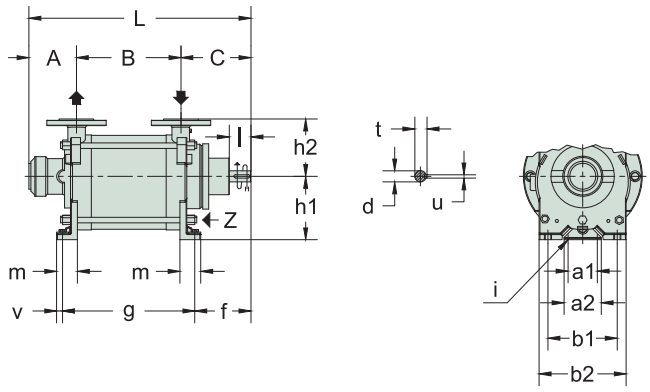
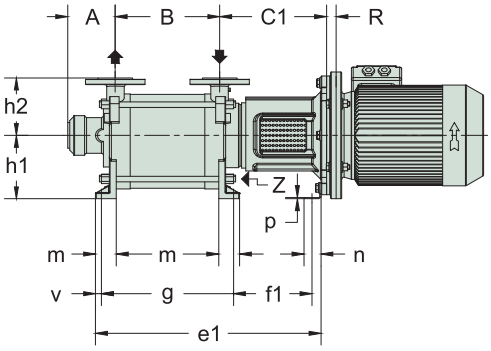
SINGLE STAGE VACUUM PUMPS BARESHAFT DESIGN WITH MECHANICAL SEAL (/C)



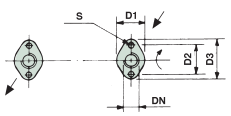
SINGLE STAGE VACUUM PUMPS CLOSE-COUPLED DESIGN WITH MECHANICAL SEALS (/CM)



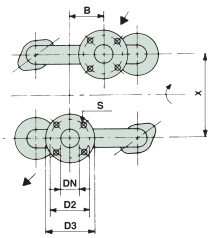
POMPA TIPO *PUMP TYPE*	DN	/ C	/ CM			A	B	C	C1	L	R	a1	a2	b1	b2	d	e	e1	f	f1	g	h1	h2	i	l	m	n	p	t	u	v	z
			MOTORE *MOTOR* UNEL-MEC-B5		PESO ESCLUSO MOTORE *WEIGHT WITHOUT MOTOR ca*																											
		PESO *WEIG.* ca	TIPO *TYPE*	kW																												
TRSE 32-20 •	1 1/4"	15	80 B	1,1	20	75	90	113	172	278	–	90	125	120	160	19	170	302	75	105	144	100	100	12	35	45	33	3	21,5	6	13	3/8"
TRSE 32-50 •		17	90 S	1,5	22		125			313							205	337			179											
TRSE 40-55 •	1 1/2"	34	100 LA	2,2	46	101	110	175	258	365	–	110	175	140	220	24	210	390	104	154	180	160	140	14	45	50	45	4	27	8	15	3/4"
TRSE 40-80 •		37	100 LB	3	49		130			385							230	410			200											
TRSE 40-100 •		39			51		150			405							250	430			220											
TRSE 40-150 •		44	112 M	4	56		180			435							280	460			250											
TRSE 50-220 •	50	74	132 SA	5,5	81	251	100	242	335	527						28	330	550	127	197	300		240		55				31			
TRSB 100-980	100	250	200 L	30	290	370		463	348	833	24	230	310	280	375	42	600	885	163	248	560	225	372	18		70	75	22	45	12	20	1 1/4"
TRSE 125-1250	125	405				375		472		847			330		410	60	645		150		601	315	472	20	90	100			64	18	22	1 1/2"
TRSE 125-1550		470				425		522		947							745				701											
TRSA 200-1950	200	1125	–	–	–	623	–	787	–	1410	–	–	520	–	650	80	830	–	372	–	710	430	632	24	160	150	–	–	85	22	60	2 1/2"
TRSA 200-2500		1225				673		837		1510							930				810											
TRSA 200-3100		1325				723		887		1610							1030				910											

FLANGE DIMENSIONS

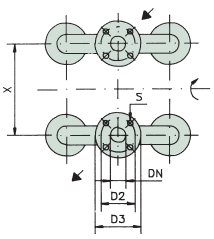
TRSE 32-20 •
TRSE 32-50 •
TRSE 40-55 •
TRSE 40-80 •
TRSE 40-100 •
TRSE 40-150 •



TRSE 50-220 •



TRSB 100-980
TRSE 125-1250
TRSE 125-1550
TRSA 200-1950
TRSA 200-2500
TRSA 200-3100



WARNING!!: Informative drawings
FOR POSITIONING OF THE PORTS AGAINST THE REST OF THE PUMP SEE DIMENSIONS "A" - "B" - "C"

POMPA TIPO *PUMP TYPE*	DN	D1	D2	D3	X	S
TRSE 32-20 • TRSE 32-50 •	1 1/4"	85	90	118	–	2x14
TRSE 40-55 • TRSE 40-80 • TRSE 40-100 • TRSE 40-150 •	1 1/2"	95	100	132		
TRSE 50-220 •	50	–	125	165	140	4x18
TRSB 100-980	100		180	220	230	8x18
TRSE 125-1250 TRSE 125-1550	125		210	250	270	
TRSA 200-1950 TRSA 200-2500 TRSA 200-3100	200		295	340	500	8x22

TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

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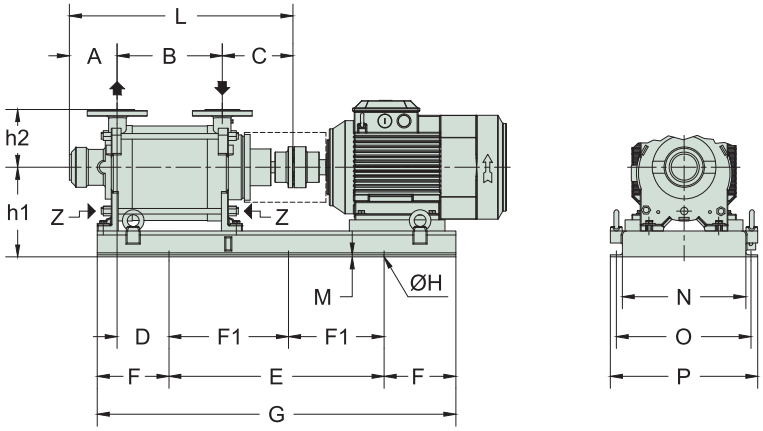
SINGLE STAGE VACUUM PUMPS
BASE-MOUNTED COUPLED CONSTRUCTION WITH MECHANICAL SEALS (/CM)



POMPA TIPO *PUMP TYPE*	DN	MOTORE *MOTOR* UNEL-MEC-B3		PESO ESCLUSO MOTORE *WEIGHT WITHOUT MOTOR*	BASE N°	A	B	C	D	E	F	F1	G	H	L	M	N	O	P	h2	h4	z
		TIPO *TYPE*	kW																			
TRSE 32-20 •	1 1/4"	80B - 90S	1,1 - 1,5	31	902	75	90	118	30	370	120		610		283							
TRSE 32-50 •		90S-L	1,5 - 2,2	33			125		45						318		210	240	270	100	150	3/8"
TRSE 40-55 •	1 1/2"	100LA - LB	2,2 - 3	59	901	101	110	154	65	420	175	–	770	14	365	5	290	320	350	140	220	3/4"
TRSE 40-80 •		100LB - 112M	3 - 4	62			130		80						385							
TRSE 40-100 •				64			165		90						405							
TRSE 40-150 •		112M	4	69			180		100						435							
		132SA	5,5	82	900				45	600	180		960				310	340	370	240	225	
TRSE 50-220 •	50	132SA - MA	5,5 - 7,5	110		185	100	242	20						527							
TRSB 100-980	100	200L - 225S	30 - 37	385	034	370		463	230	1100	300		1700		833		450	540	590	372		1 1/4"
TRSE 125-1250	125	250M	37	596	042	375		472	220	1400	200	700	1800	18	847	7	500	590	640	472	445	1 1/2"
		280S	45	608	039				420	1600	275	800	2150				540	630	680			
TRSE 125-1550		280S - 315S	45 - 75	634		425		522	360						947							
TRSA 200-1950	200	315MA - MB	75 - 90	1600	60F	623	–	787	350	1800	300	900	2400	22	1410	60	750	850	930	632	680	2 1/2"
TRSA 200-2500		315MB	75 - 90	1700		673		837	340						1510							
		315L	110						190													
TRSA 200-3100				1800		723		887	200						1610							
		355MB	160	1940	61F				230	1900	450	950	2800									

Disegni schematici - Dimensioni in mm. con tolleranze secondo EN 735-1995, pesi in kg. non impegnativi.
Schematic drawings - Dimensions in mm. with tolerances according to EN 735-1995, weights in kgs. not binding.

Z = Ingresso liquido di servizio. La posizione indicata è schematica.
Service liquid inlet. The stated position is schematic.

- *For this pump type is available another version with different overall dimensions and identical performances. For more detailed information pls contact our Sales Office.*

TRH-TRS Series

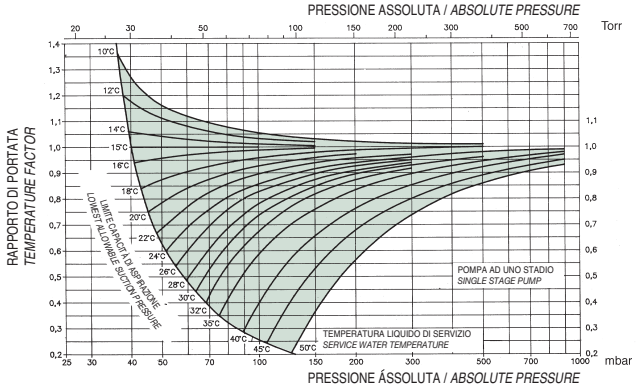
Liquid Ring Pumps and Compressors

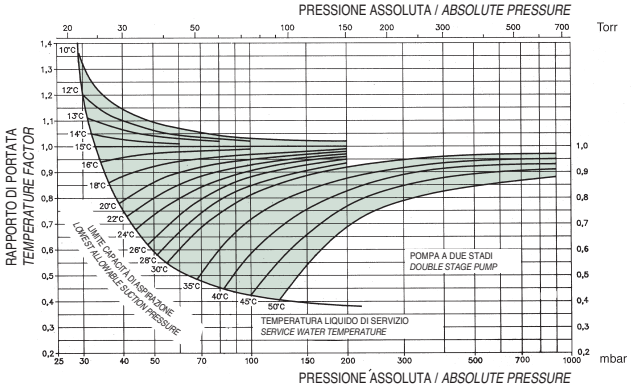
Single (TRS) and two-stage (TRH)

pompetravaini

Effect of service water temperature and saturated air on the capacity of liquid ring vacuum pump.

The performance data published for vacuum pumps is based on using water at 15°C (59°F) as the service liquid. The vapour pressure of the service liquid has a direct influence on pump capacity. The following diagrams allow to make corrections to the published data when using service water at temperatures other than 15°C (59°F).



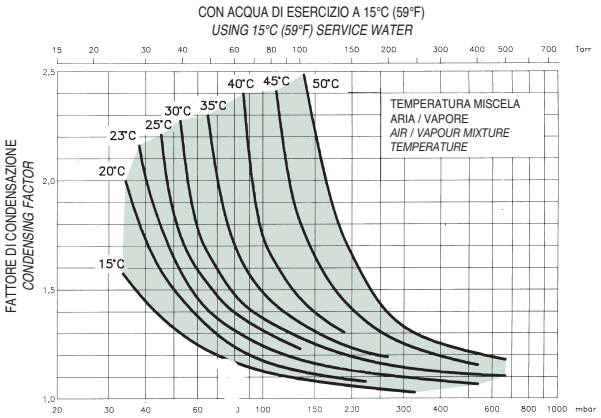


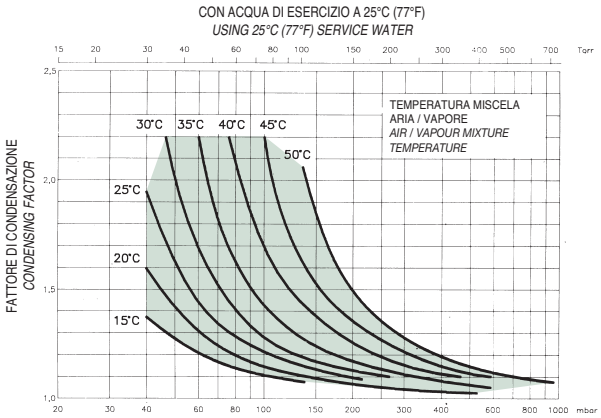
Example of double stage vacuum pump that operates at 50 mbar with 22°C (71°F) service water temperature.

$$\frac{Qty}{0,80}$$

The necessary capacity Q referred to the published data (see page 10) will be:where Qty is the requested capacity and 0,80 the value obtained from diagram.

The performance data published for vacuum pumps are based on handling dry air at 20°C (68°F). When handling mixtures of air and vapour the pump capacity will increase depending upon the air/vapour temperature as well as the service water temperature being used. These diagrams will allow the users to determine the condensing factors when handling saturated air at various temperatures and using service water at 15°C (59°F) or 25°C (77°F). For more detailed informations pls contact our Sales Office.





Example of double stage vacuum pump that operates at 80 mbar with 40°C (104°F) saturated air and 25°C (77°F) service water temperature.

$$\frac{Qty}{2,1x0,85}$$

The capacity Q referred to the published data (see page 10) will be:Where Qty is the requested capacity, 2,1 the con-densing factor and 0,85 the temperature factor (values obtained from diagrams).

TRH-TRS Series

Liquid Ring Pumps and Compressors

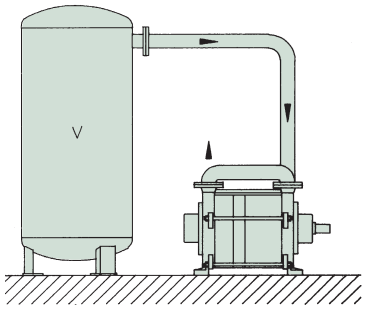
Single (TRS) and two-stage (TRH)

pompetravaini

EVACUATION FROM A CLOSED VESSEL

To determine necessary time to change the absolute pressure inside a closed vessel of rated volume (V) from P2 to P1 the following formula has to be used:

$$t = \frac{V}{Q} \times 60 \times \ln \frac{P2}{P1} \qquad \text{oppure / } or \qquad Q = \frac{V}{t} \times 60 \times \ln \frac{P2}{P1}$$



dove / *where:*

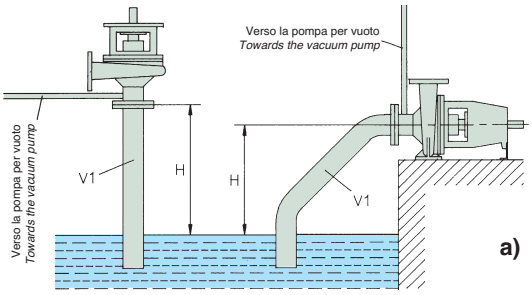
t = Tempo richiesto (minuti) / *Requested time (minutes)*
V = Volume totale da evacuare (m^3) / *Total volume to evacuate (m^3)*
Q = Portata della pompa per vuoto (m^3/h) / *Capacity of the vacuum pump (m^3/h)*
P1 = Pressione finale (mbar) / *Final pressure (mbar)*
P2 = Pressione iniziale (mbar) / *Starting pressure (mbar)*
$\ln\left(\frac{P2}{P1}\right)$ = Vedi tabella sottostante / *See below table*

PRIMING OF CENTRIFUGAL PUMPS

Le pompe per vuoto ad anello di liquido sono utilizzate anche per l'adescamento delle pompe centrifughe o simili. Secondo come è predisposto l'impianto si utilizzano le seguenti formule:
The liquid ring vacuum pumps are used also for the priming of centrifugal pumps or similar. According to plant design the following formulas are to be used:

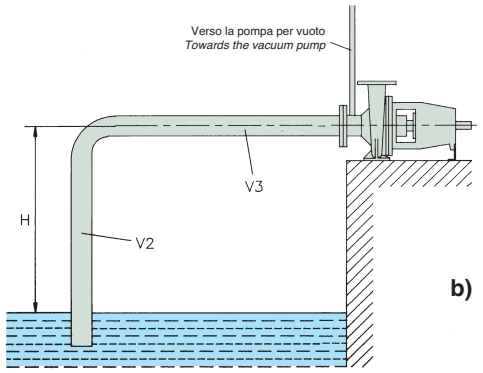
a) $$t = \frac{V1}{Q} \times 60 \times \left(2 - \frac{P1}{P1 - P2} \times \ln \frac{P2}{P1}\right)$$

b) $$t = \frac{V2}{Q} \times 60 \times \left(2 - \frac{P1}{P1 - P2} \times \ln \frac{P2}{P1}\right) + \frac{V3}{Q} \left(\ln \frac{P2}{P1} 1\right)$$



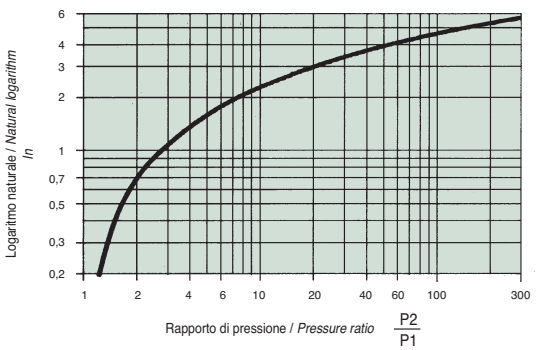
dove / *where:*

t = Tempo richiesto (minuti) / *Requested time (minutes)*
V1 = Volume totale della tubazione (m^3) / *Total volume of piping (m^3)*
V2 = Volume totale della tubazione verticale (m^3) / *Total volume of vertical piping (m^3)*
V3 = Volume totale della tubazione orizzontale (m^3)
Total volume of horizontal piping (m^3)
P1 = Pressione assoluta (mbar) all'aspirazione della pompa quando la tubazione è piena (in generale per l'acqua è: ~ pressione barometrica (mbar) - H (m) x 98)
Absolute pressure (mbar) at the suction of the pump when the piping is full (generally using water is: ~ barometric pressure [mbar] - H [m] x 98)
P2 = Pressione assoluta (mbar) iniziale all'interno della tubazione prima dell'adescamento (in generale è la pressione barometrica)
Starting absolute pressure (mbar) inside the piping before priming (generally is the barometric pressure)
Q = Portata della pompa per vuoto (m^3/h) / *Capacity of vacuum pump (m^3/h)*
$\ln\left(\frac{P2}{P1}\right)$ = Vedi tabella sottostante /*See below table*

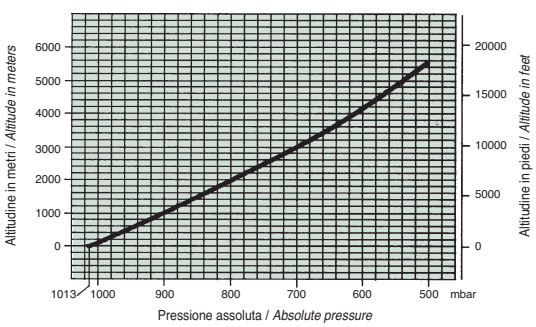


N.B.: Le formule sopra esposte si applicano se la portata (Q) della pompa per vuoto nel tratto P2 → P1 è costante: qualora ciò non è possibile occorre frazionare il calcolo in più passaggi di pressione intermedi dove la portata (Q) potrà essere considerata costante.
Note: The above mentioned formulas are applied when the capacity (Q) of vacuum pump between P2 → P1 is constant: if this is not possible, it is necessary to split calculation in more steps where the capacity (Q) could be considered constant.

LOGARITHMIC TABLE



BAROMETRIC PRESSURE VARIATION RELATED TO ALTITUDE



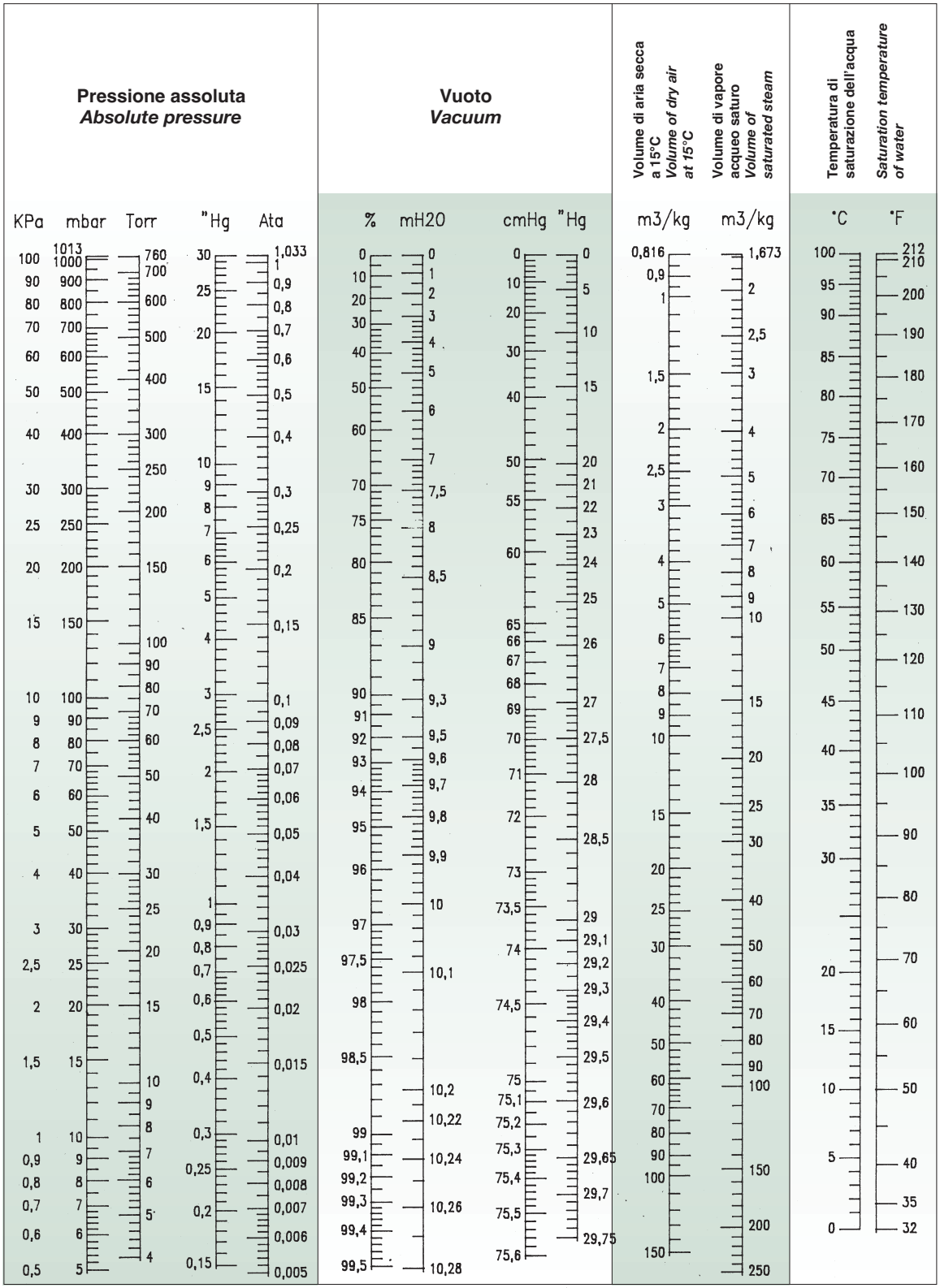
TRH-TRS Series

Liquid Ring Pumps and Compressors

Single (TRS) and two-stage (TRH)

pompetravaini

UNIT CONVERSION AND TECHNICAL DATA FOR VACUUM



TRH-TRS Series

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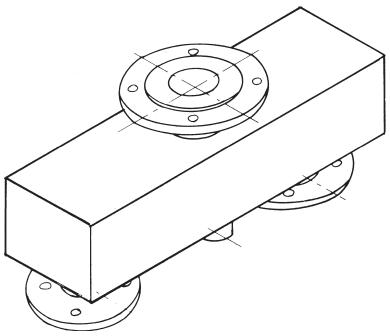
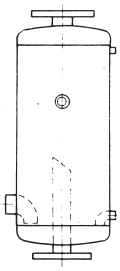


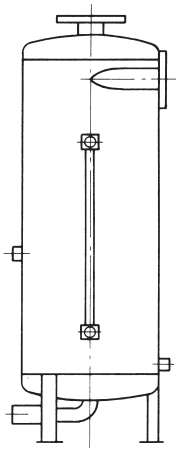
SEPARATOR / MANIFOLD

Installed in place of the discharge manifold to separate the seal liquid from the gas. Supplied with pipes and fittings for partial recycle and drain connection. Available in carbon steel or stainless steel AISI 316.



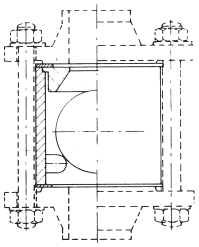
PUMP MOUNTED SEPARATOR "HSF"

Installed on the discharge branch it separates the gas/liquid. Complete with pipes and fittings for partial recycle drain. Available in carbon steel and stainless steel AISI 316.



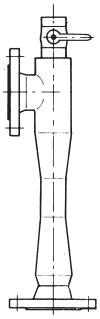
FREE STANDING SEPARATOR FOR TOTAL RECOVERY SYSTEM "HSP"

Affords excellent separation of gas/liquid mixture. Essential when the seal liquid is recycled a close circuit and cooled by a heat exchanger. Supplied complete with level gauge, thermo-meter drain valve, excess liquid drain valve and connection for pressure gauge. Available in carbon steel and stainless steel AISI 316.



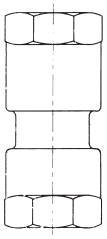
NON-RETURN VALVE WITH LOW PRESSURE DROP

Installed between the suction flange and the counter flange of the suction pipe. Prevents backflow into the system in the event of the pump stopping. It has a very low pressure drop and ideal for higher vacuum conditions. Available in stainless steel AISI 316 with sealing ball in PTFE.



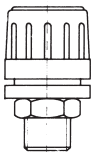
ATMOSPHERIC AIR (or gas) OPERATED EJECTOR

Provided when suction pressure below 33 mbar are required. Will operate down to 8 mbar. Installed on the suction branch and utilises air from the atmosphere as motive air. Available in cast iron with stainless steel AISI 316 nozzle or totally in stainless steel AISI 316.



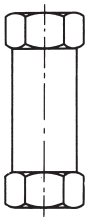
AUTOMATIC DRAIN VALVE

Provided to drain the pump casing down to the centre line when the pump is stopped. Prevents starting the pump with the casing full of seal liquid and avoids heavy starting loads. Available in brass with nitrile seal ring.



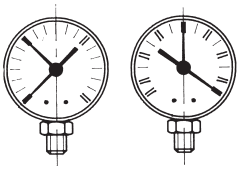
VACUUM RELIEF VALVE

A manually adjustable safety valve. Used to control the degree of vacuum and assist in the prevention of cavitation. Nickel plated brass with steel spring.



CONSTAFLOW VALVE

Installed in the seal liquid supply pipe in the place of regulating valves. Ensures the correct amount of seal liquid is supplied to the pump irrespective of the supply pressure. Effects economies in the quantity of seal liquid. Available in nickel plated brass.



VACUUM GAUGES, PRESSURE GAUGES AND COMPOUND GAUGES

Available in New Zealand from:
Prime Fluid Management

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10 Chesterfield St

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Porirua

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13b Mclaughlins Rd,
Wiri

Christchurch
Unit C1, 198 Springs
Rd, Hornby

Tauranga
43 Poturi Street,
Tauriko

Hawke's Bay
97 Austin Street,
Onekawa, Napier

0800 482 747
info@primefluid.co.nz
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