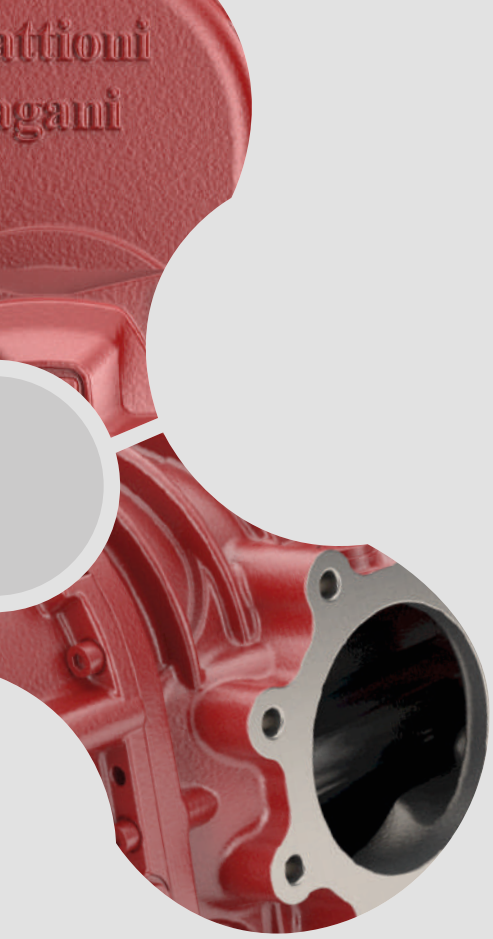
INSTRUCTION MANUAL FOR USE AND MAINTENANCE

EN

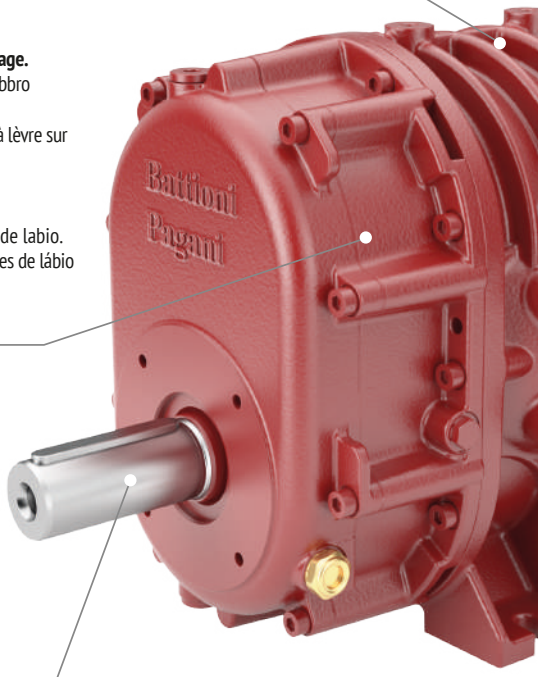


BLC

Battioni ®
Pagani

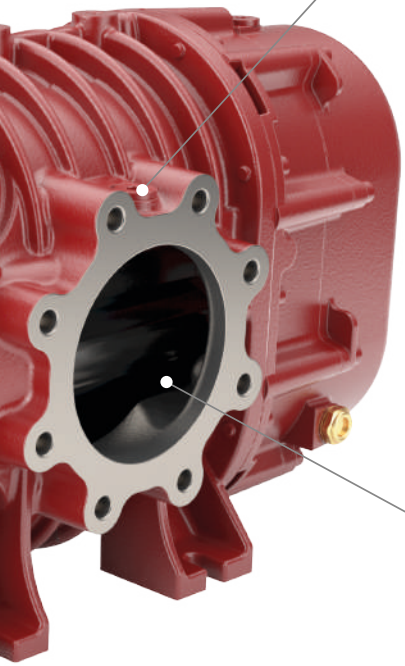
Integrated antishok system.
Sistema antirumore integrato nel corpo.
Système anti-bruit intégré.
Im Körper integriertes Lärmschutzsystem.
Sistema anti-ruido integrado en el cuerpo.
Sistema antichoque integrado.

Piston ring and shaft lip seals to prevent oil leakage.
Le tenute a labirinto con segmenti e la tenuta a labbro sull'albero impediscono la fuoriuscita dell'olio.
Les joints en labyrinthe avec segments et le joint à lèvre sur l'arbre empêchent les fuites d'huile.
Die Labyrinthdichtungen mit Segmenten und die Lippendichtung.
Los sellos de laberinto con segmento y el sello de labio.
Vedantes de labirinto com segmentos e de vedantes de lábio no eixo impedem a fuga do óleo.



Over-sized rotor shafts
Alberi rotori sovradimensionati.
Arbres de rotor surdimensionnés.
Überdimensionierte Rotorwellen.
Ejes rotores sobredimensionados.
Eixos de rotor sobredimensionados.

G1/2" location for temperature switch sensor.
Foro G1/2" per termostato.
Emplacement G1/2" pour thermostat.
G1/2"-Position für Temperaturschaltersensor.
Agujero G1/2" para termostato.
Localização G1/2" para sensor de interruptor de temperatura.

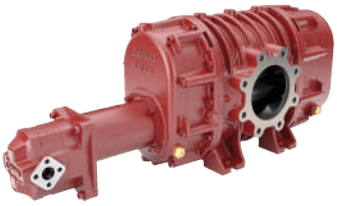


Flow sections designed to minimize load losses and maximize cooling.
Sezioni di passaggio studiate per minimizzare perdite di carico e riscaldamento.
Sections de passage étudiées pour minimiser les pertes de charge et le réchauffement.
Durchlass so konzipiert, dass Druck- und Wärmeverlust minimal gehalten werden.
Secciones de paso estudiadas para minimizar pérdidas de carga y calentamiento.
Secções de fluxo concebidas para minimizar as perdas de carga e maximizar o arrefecimento.

The pictures are only for informative pourpose.

VERSIONS - AUSFÜHRUNGEN

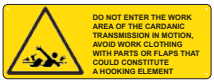
BLC / P



BLC / H

BLC / HC

MANDATORY SAFETY SIGNS THAT THE MANUFACTURER OF THE SYSTEM MUST DISPLAY IN THE WORKPLACE AND AROUND THE BLC VACUUM/PRESSURE LOBE PUMP.

		place safety signs in a visible position and in the vicinity of the pump.
		
	Personal protective equipment that must be used.	
	Important information.	

CONDITIONS AND LIMITS OF USE – LIST OF DANGERS

In the Common Market countries, the installation must comply with directive 2006/42/CE and subsequent modifications, while in the other countries it must comply with the safety regulations of the country.

This is a positive displacement lobe pump, particularly suitable for pressure or low vacuum applications.

Under no circumstances must liquids, dust or any kind of solid matter enter the vacuum/pressure blowers because they could cause it to break.
It is therefore necessary to equip the system with overflow safety valves and an adequate filtration system.
Use of the vacuum/pressure blowers pump for any purpose other than that specified is absolutely forbidden, not provided for by the manufacturer and therefore highly dangerous.
Do not use the vacuum/pressure blowers pump to handle flammable and/or explosive liquids and materials or for materials that give off flammable gasses.
Do not use the vacuum/pressure blowers pump in a potentially explosive atmosphere.
Never remove the guards fitted on the vacuum/pressure blowers pump and always check their efficiency every time the machine is used.
Any intervention must be carried out with the machine stopped and by qualified personnel.
Unqualified personnel are not authorised to work on or near the vacuum/pressure blowers pump.
Battioni Pagani ® shall not be responsible for problems, breakages and accidents due to failure to apply the instructions contained in the manual, non-compliance with current standards and failure to apply due diligence during the manoeuvre, maintenance or repair operations, even if not expressly mentioned in this manual.

Failure to comply with the instructions provided in this manual may result in the following dangers:

- Crushing hazard caused by the weight of the vacuum/pressure lobe pump during handling and transport;
- Risk of becoming entangled in the shaft transmission parts if the necessary guards are removed (avoid wearing loose clothing, ties, bracelets, necklaces, etc.);
- Thermal hazards due to the high temperatures that can be reached by the vacuum/pressure lobe pump;
- Acoustic hazard due to the noise generated and to failure to use personal protective equipment;
- Shearing hazard for the operator during testing with the suction and delivery pipes disconnected from the vacuum/pressure lobe pump
- Risk of projection of solid and liquid materials following a severe breakage of the vacuum/pressure lobe pump.

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FOREWORD

The Battioni Pagani® vacuum/pressure blowers pumps were designed and constructed in compliance with the EEC safety regulations and were assessed for risks according to the standard **UNI EN ISO 12100:2010**; in particular they are in conformity with directive 2006/42/EC and subsequent modifications and additions. Since the design of this pump complies with the definition of a machine as contained in the Machinery Directive 2006/42/EC, the pump bears the CE mark on its identification plate. However, it must be pointed out that because of its application and the purpose for which it is supplied, which specifies that it be installed by the buyer (without motive power), Battioni Pagani® refuses any and all responsibility if the instructions in this operation and maintenance manual are not followed.
This manual contains the Declaration of CE conformity and all the instructions required by users, and by the manufacturers of plant systems, for using our products safely. As a result, the manual must always be kept near the BLC vacuum/pressure blowers pump. Carefully read the instructions contained in this manual before proceeding with any operation with and on the BLC vacuum/pressure blowers pump.

This danger symbol in the manual means that important instructions relating to safety are being provided. Operators are the first recipients of this information and are responsible for compliance, not only in relation to themselves, but also in relation to other persons exposed to the risks associated with use.

The descriptions and illustrations in this manual are purely indicative. The manufacturer reserves the right to make any type of change to this manual at any time.

WARRANTY

At the moment of receiving the vacuum/pressure blowers pump, check that it is complete with all its parts.
Any anomalies or missing parts must be communicated within 8 days of receipt of the product.
The Supplier guarantees that the product sold is free from defects and undertakes to repair or, by final decision, to replace the faulty parts only if the defects are clearly attributed to the manufacturing process or to the materials used. In any case the costs of labour, travel and transport, and any customs expenses, shall be paid by the Purchaser. The vendor is not obliged to pay damages except in the case of fraud or serious offence.

All parts subject to normal wear are excluded from the warranty.
The warranty will cease to be valid if:

- The faults reported are the result of accidents or obvious carelessness or negligence by the Customer,
- The parts have been modified, repaired or fitted by people not authorised by the vendor,
- The failures and breakages have been caused by improper use or by subjecting the product to stresses exceeding those envisaged by the vendor.
- The Customer has failed to make the payments as agreed in the contract.

The warranty rights of the Purchaser are invalidated where the same does not report to the Vendor any defects within 8 days of discovery, notwithstanding the provisions of art. 1512 of the Italian Civil Code. The Vendor reserves the right to make changes or improvements to its products without any obligation to make such changes or improvements to the units already previously produced and/or delivered.
The Vendor reserves the right to make changes or improvements to his/her products without being obliged to make the same changes or improvements to the units already produced and/or delivered previously.

Thank you for choosing Battioni Pagani®.

1.0 - GENERAL INFORMATION

1.1 - General description

The BLC pump is a vacuum/pressure, trilobe positive displacement pump suitable for pumping air.
Connections: the first to be connected to the vacuum or pressure line, the second to be connected to the atmosphere via a silencer.
Air is pumped by means of two counter-rotating conjugate rotors inside a housing. The intake air is trapped in a chamber consisting of body and rotors, and as a result of the carefully designed accuracy and shape of the latter, it is efficiently conveyed to the discharge with no contact or creep.
No cooling system or lubrication is required in the pumping area, the air discharged into the atmosphere is oil- and pollutant-free.

1.2 - BLC versions

The BLC vacuum/pressure blowers pump is available in the following versions:

BLC / P VERSION | For pulley application

The PTO is driven via a pulley.

The version can be recognised by the identification plate bearing the wording:

P PULLEY TRANSMISSION

BLC / P-AS VERSION | For pulley application with upper shaft

The PTO is driven via a pulley.

The version can be recognised by the identification plate bearing the wording:

P-AS PULLEY TRANSMISSION

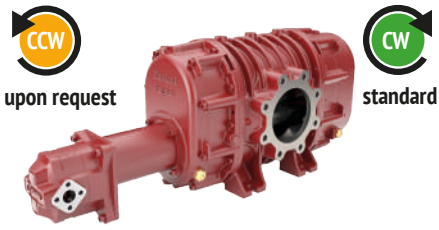
BLC / HC VERSION | With integrated, compact hydraulic piston motor

The PTO is driven by a hydraulic piston motor.

Recognisable by its motor mount at the front and an identification plate with lettering:

HC HYDRAULIC TRANSMISSION COMPACT

BLC / H VERSION | With hydraulic external gear motor and elastic coupling



The PTO is driven by a hydraulic gear motor.

This version can be identified by the hydraulic motor mount located at the front and by the identification plate with the lettering:

H HYDRAULIC TRANSMISSION

1.3 - Technical data

BLC... /P/HC

MODEL	QG*	SPEED (RPM)	VACUUM			
			50%			
			l/min	m^3/h	cfm	kW
BLC 140	840m^3/h 14000l/min 494cfm	2000	2332	140	82	1.8
		2400	3438	206	121	2.2
		2800	4448	267	157	2.7
		3200	5880	353	208	3.0
		3600	7330	440	259	3.4
		4000	8626	518	305	4.0
		4400	10037	602	354	4.7
		4800	11395	684	402	5.1
BLC 210	1582m^3/h 26370l/min 931cfm	2000	7600	456	268	9
		2400	10000	600	353	11
		2800	12000	720	424	13
		3200	13200	792	466	15
		3600	15200	912	537	17
		4000	17080	1025	603	19
		4200	19000	1140	671	20
BLC 270	2060m^3/h 34400l/min 1213cfm	2000	9777	587	345	12
		2400	12500	750	441	14
		2800	14358	861	507	16
		3200	16863	1012	596	19
		3600	20123	1207	711	22
		4000	22122	1327	781	26
		4200	22961	1378	811	28

***QG: volume displacement at maximum speed**
Revision 02 of 26-03-2025

- Conditions not suitable for continuous service.

REFERENCE CONDITIONS

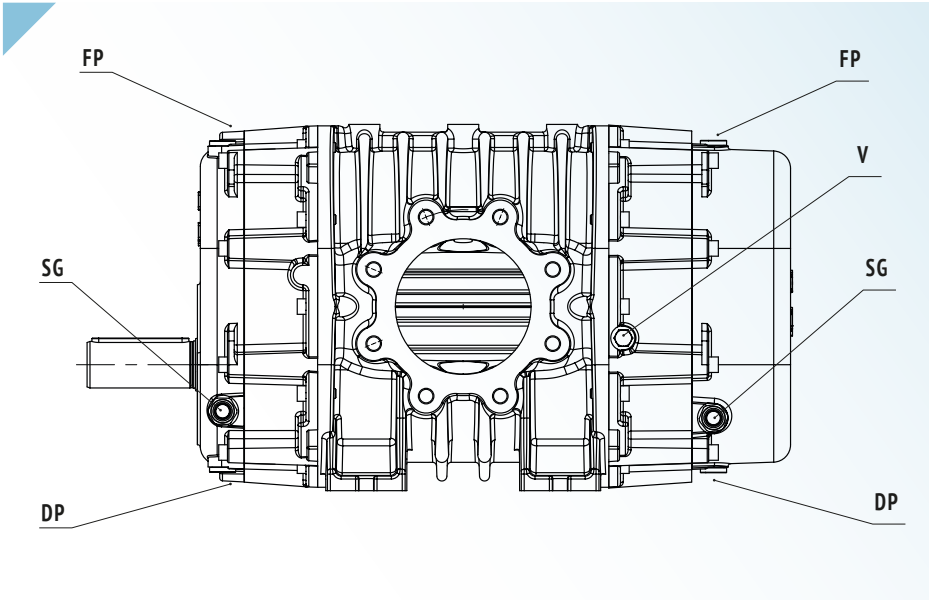
Gas conveyed: Air
Reference temperature 20°C (68°F)
Absolute reference pressure 1013 mbar (14.7 psi)
The data reported in the table are subject to a tolerance of +/- 5%

PRESSURE								WEIGHT (P) (PM)	WEIGHT (H)	WEIGHT (HC)	SPL
	1.5 bar (abs)				2 bar (abs)						
l/min	m³/h	cfm	kW	l/min	m³/h	cfm	kW	Kg	Kg	Kg	dB (A)
3599	216	127	1.7	-	-	-	-	90	100	95	78
4542	272	160	2.1	-	-	-	-				
5548	333	196	2.4	4798	288	169	9.4				
6281	377	222	3.1	5388	323	190	10.9				
7364	442	260	3.5	6764	406	239	12.1				
8402	504	297	3.9	7564	454	267	13.7				
9413	565	332	4.5	8330	500	294	15.4				
10812	649	382	5.5	9929	596	351	16.3				
8200	492	290	9	-	-	-	-	150	170	165	80
10600	636	374	11	10000	600	353	24				
12900	774	456	13	12000	720	424	28				
15500	930	547	15	13200	792	466	32				
17800	1068	629	17	15200	912	537	36				
20500	1230	724	18	19000	1140	671	40				
22125	1328	781	20	20800	1248	735	42				
10775	647	381	11	-	-	-	-	170	190	185	82
13809	829	488	14	11706	702	413	30				
17183	1031	607	17	15483	929	547	36				
20104	1206	710	19	18254	1095	645	41				
23164	1390	818	22	22036	1322	778	46				
25989	1559	918	25	24165	1450	853	53				
27812	1669	982	27	26277	1577	928	56				

SOUND PRESSURE (SPL)

Pump sound pressure with injection silencer and discharge silencer.
Operating conditions: 80% of the maximum speed, vacuum at 60% and distance of 7 metres in open field.

1.4 - Plug positions



FP	FILLING PLUG	FILLING PLUG
V	VENT SYSTEM	VENT SYSTEM
SG	SIGHT GLASS	SIGHT GLASS
DP	DRAIN PLUG	DRAIN PLUG

1.5 - Limitations of use

	P1-P2 (BAR)	P2 (BAR REL.)	T0 (C°)		T1 (C°)		T2 (C°)	T2-T1 (C°)
MODEL	MAX	MAX	MAX	MIN	MAX	MIN	MAX	MAX
ALL	1	1	45	-20	45	-20	150	130

P1 (bar) = intake pressure
P2 (bar) = discharge pressure

T0 (°C) = ambient temperature
T2 (°C) = discharge temperature
T1 (°C) = intake temperature

Maximum torques [Nm] applicable to the machine shaft to generate motion:

- C: maximum torque required by the machine at maximum performance
- Cs: torque applicable during start-up (from standstill) = 2.5C
- Ca: torque applicable during acceleration (to bring the machine up to speed) = 2C

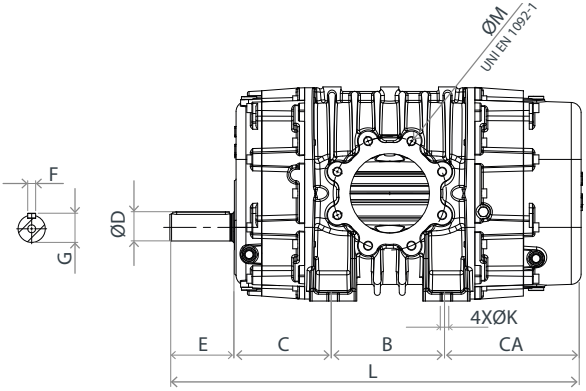
The following table identifies these parameters for each machine family:

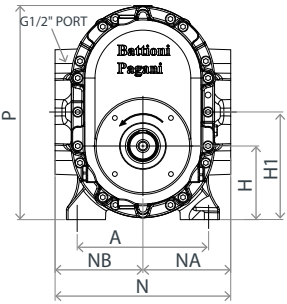
	BLC 140/P	BLC 210-270/P
C [Nm]	55	150
Cs [Nm]	137.5	375
Ca [Nm]	110	300

In any case, it is recommended to:
- Avoid abrupt start-ups with excessively fast clutch engagement.
- Avoid direct drives without a clutch.
- Avoid start-ups under load.

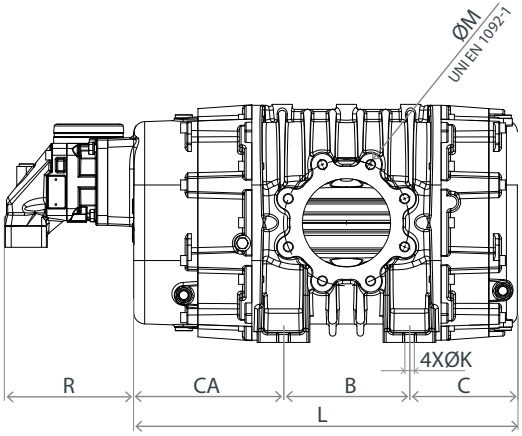
During use, do not exceed the conditions of speed and power established by the manual.
ATTENTION: the BLC is not suitable for conveying toxic, flammable or dangerous gases.
ATTENTION: the BLC is not suitable for working in potentially explosive environments.
ATTENTION: the introduction of solids or liquids will seriously damage the BLC.

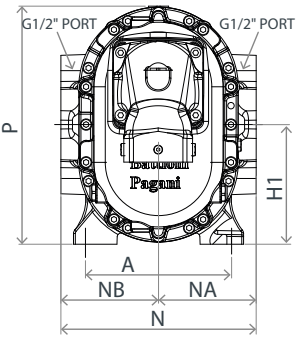
1.6 - Overall dimensions



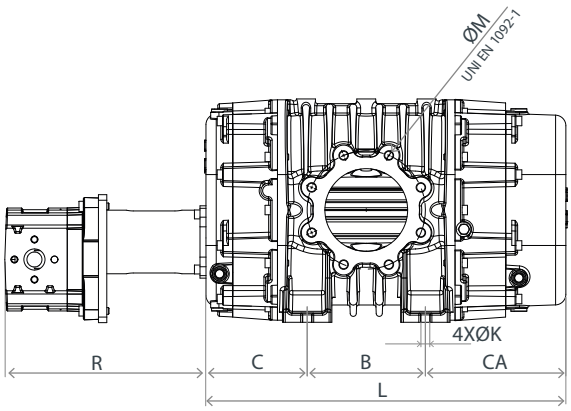


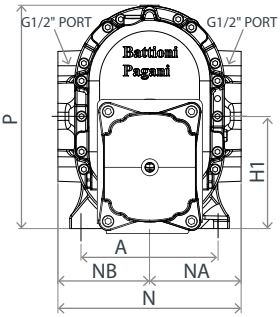
BLC/P																	
MODEL	A	B	C	CA	ØD	E	F	G	H	H1	ØK	L	ØM	N	NA	NB	P
BLC 140	260	278	80	126	38M6	80	10	41	131	173.5	12	568	DN80 PN6 4XM16	225	112	112	323
BLC 210	232	130	178	238	48 M6	110	14	51,5	130	190	15	656	DN100 PN6 4XM16	310	155	155	378
BLC 270	232	200	178	238	48 M6	110	14	51.5	130	190	15	726	DN125 PN6 8XM16	310	155	155	378





BLC/HC													
MODEL	A	B	C	CA	H1	ØK	L	ØM	N	NA	NB	P	R
BLC 210	232	130	178	238	190	15	546	DN100 PN6 4XM16	310	155	155	378	202
BLC 270	232	200	178	238	190	15	616	DN125 PN6 8XM16	310	155	155	378	202



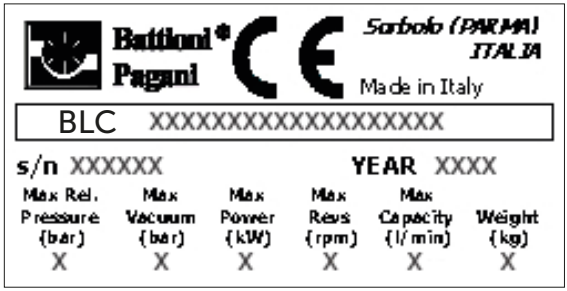


BLC/H													
MODEL	A	B	C	CA	H1	ØK	L	ØM	N	NA	NB	P	R
BLC 140	260	278	80	126	173.5	12	618	DN80 PN6 4XM16	225	112	112	323	247
BLC 210	232	130	178	238	190	15	546	DN100 PN6 4XM16	310	155	155	378	327
BLC 270	232	200	178	238	190	15	616	DN125 PN6 8XM16	310	155	155	378	327

1.7 - Identification label

The BLW vacuum/pressure blowers pump is provided equipped with an identification plate on which are indicated:

- Model name
- Serial number
- Year of manufacture
- Maximum relative pressure
- Maximum vacuum
- Maximum power consumption
- Maximum rpm
- Maximum flow rate
- CE Marking
- Weight



Each identification plate is protected by a special protective film, to remove after painting. This film was introduced to ensure the traceability of the above information and to avoid invalidating the warranty.

2.0 - PACKAGING, STORAGE, HANDLING AND TRANSPORTATION

2.1 - General warnings for the user and operator

Before starting the vacuum/pressure blowers pump, it is essential that the operator knows how to perform all the operations described in this manual and how to apply them each time during use or maintenance of the vacuum/pressure blowers pump. The operator should not perform under their own initiative operations or interventions that are not permitted in this manual. Before carrying out maintenance on or repairing the lobe pump, it is necessary to make sure that it is impossible to start the vacuum/pressure lobe pump, therefore it is mandatory to disconnect the pump from the belts, for the P version, or from the hydraulic system, for the H or HC version. This is to prevent accidental starting that could cause injury to persons and/or damage to the vacuum/pressure blowers pump.
Starting from 70°C the user must install and the operator must use adequate protection devices to prevent direct contact with hot parts of the blowers pump. Before carrying out maintenance or repair operations on the vacuum/pressure blowers pump, wait for it to cool down to at least a temperature of below 40°C.

2.2 - Packaging

The vacuum/pressure blowers pump is supplied unpacked.
Upon request the following packaging types are available:

- Wooden platform and shrink-wrap
- Wooden crates and shrink-wrapping for shipments by sea or air.

2.3 - Storage

In order to preserve the vacuum/pressure blowers pump correctly, it must be stored:
Indoors, sheltered from adverse weather conditions;
Resting horizontally on its four feet.
Climatic storage conditions:

- Temperature -20°C to 40°C.
- Relative humidity 10% to 80%.

For different climatic conditions, contact Battioni Pagani® technical department
The material stored in the warehouse must be protected periodically (every 6 months) with protective oil which must be sprayed on the inside of the pump to protect the rotors and the pump body.

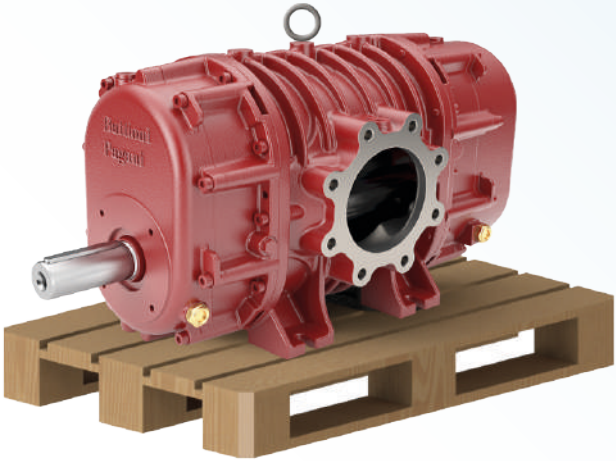
2.4 - Handling and transport

To view the data concerning the mass of the BLC vacuum/pressure blowers pump, consult the technical data annexed to the Technical data paragraph.
The BLC vacuum/pressure blowers pump must be handled:

- Only using equipment with a suitable load and lifting capacity.
- Lifted by forklift truck (if on pallet), bridge crane, crane or hoist.

Loosen the screws that secure the 4 feet of the vacuum/pressure blowers pump to the pallet.
For safety reasons, lift the vacuum/pressure lobe pump by means of the eye-bolt located at the top of the pump.

Do not stand beneath the pump during handling.



3.0 - INSTALLATION

- The BLC pump must be placed on a flat, horizontal surface with a maximum slope of 10° and secured with screws that fasten the feet.
- Make sure that there is enough space for the circulation of cooling air around the pump. Avoid direct exposure to debris or dirt.
- Ensure sufficient space to access oil levels, oil drain plugs, oil filler plugs.
- If the pump is repainted, make sure that the identification plate the sight glasses and the vent plugs are not painted.
- Under no circumstances should liquids or solids enter the pump. It is therefore necessary to provide a shut-off system to prevent them from entering the pumping area.
- Provide a noise reduction system.
- Make sure that the blower shaft rotates freely in the correct direction (check the arrow on the casing). The implemented transmission must have a consistent direction of rotation.

3.1 - Vacuum/pressure line

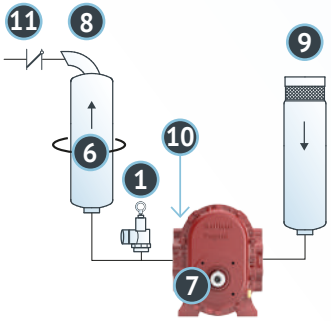
- Make sure that the pipe diameter is suitable for the pump flow rate (indicative average speed 15÷45m/s). See table of recommended minimum pipe sizes.
- Avoid constrictions or narrow bends.
- Ensure that the weight of the pipes does not put a strain on the pump. Use Heat-resistant flexible sleeves for the connection, to compensate for any expansion and vibrations to which the body may be subjected.

Recommended minimum pipe sizes

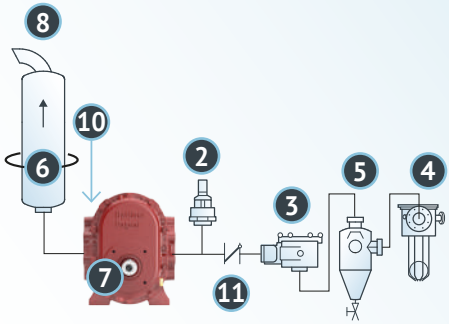
MODEL	Ø PIPE
BLC 140	Ø 88.9 (42")
BLC 210	Ø 114.3
BLC 270	Ø 139.7 (5")

3.2 - Installation diagram

Pressure operation/ Funzionamento in pressione



Vacuum operation/ Funzionamento in vuoto



1	pressure relief valve
2	vacuum relief valve
3	air filter
4	primary shut-off valve
5	cyclone valve
6	silencer sliding support
7	pulley with pneumatic clutch
8	discharge silencer
9	silencer with integrated filter
10	temperature switch sensor
11	non return valve

All installation operations must be carried out with the utmost care by suitably trained personnel and with the power take-off disconnected. During installation operations, it is advisable to use the personal protection equipment listed to the side.

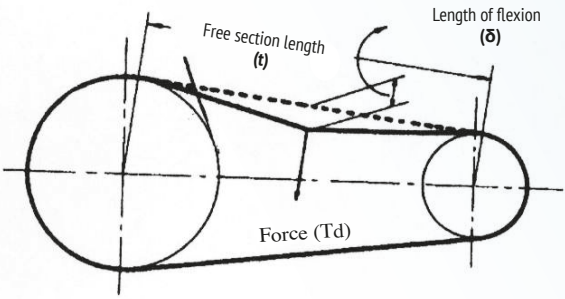
3.3 - Installation procedure

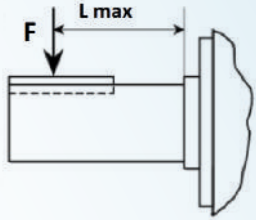
The vacuum/pressure blowers pump should be assembled and installed using the following procedure:

1 - Assemble the vacuum/pressure blowers pump horizontally with its feet facing downwards.

2 - Bolt the vacuum/pressure blowers pump via passing screws and nuts in the appropriate slots or holes provided in the feet.

3 - P) To install the BLC vacuum/pressure pump version .../P, it is necessary to install / secure a driven pulley on the shaft; the driven pulley must be installed as close as possible to the drive element, trying to limit the length of the free section (see diagram below). Never transfer axial loads. Then connect the driven pulley to the driving pulley with the correct length of driving belts. The number and type of belts must be calculated based on the power to be transmitted to the BLC vacuum/pressure blowers pump.
When this operation has been completed, the necessary guard must be installed to isolate the driving parts (pulleys and belts) and prevent access to them by the operators.
The best tension is the lower one where the belt does not slide under max loading conditions.
Check the voltage frequently during the first 24/48 hours.
Over-tensioning reduces the life of the belt and bearing.
Keep the belts free from foreign materials that may cause slippage.
By keeping the gear ratio low, the life of belts and bearings is extended.
The diameter shown in the table is the minimum diameter of the smallest pulley.
When possible, use pulleys with a primary diameter larger than those indicated in the tables.
Use PTOs with a rotation speed as close as possible to that of the pump.
Check the transmission periodically. Set it when sliding.





SECTION	FORCE	
	MIN.	MAX
	Kg	Kg
A	0.68	1.02
B	1.58	2.38
C	2.93	4.75

Belt tension (only for P version)

MODEL	F.MAX (N)	Ø PULLEY MIN. (mm)	L MAX. (MM)	BELT TYPE	NO.
BLC140-P	1500	160	40	XPB	3
BLC210-P	3100	160	55	XPB	3
BLC270-P	4000	160	55	XPB	3

To check the tension on a normal transmission, proceed as follows:

Measure the length of free stretch, t.
In the middle of the free stretch of the belt (t) apply a force (perpendicular to the free stretch) sufficient to bend the belt 1.6 mm per 100 mm in length of the free stretch. For example, the bending of a free stretch of 1000 mm is 16 mm.
Compare the force you applied and measured with a tensiometer with the values given in the table. If the force is included between "minimum force" data, it means that the belt is not enough stretched. If the force exceeds "max force" data, it means that the belt is too stretched. However, a new transmission can initially be tensioned to twice the "min. force" value to allow for normal tension adjustment during operation.

Do not use the BLC pump with a direction of rotation other than that indicated by the arrow.

H) To install the BLC /H vacuum/pressure blowers pump, it is necessary to install a hydraulic motor on the support located at the front (if not supplied already installed), secure it using appropriate screws and connect the hydraulic pump pipes to the hydraulic motor. If the motor is bi-directional, also connect a drainage pipe.

HC) To install the BLC/HC vacuum/pressure blowers pump, it is necessary to secure it using screws and connect the hydraulic hoses from the hydraulic pump to the hydraulic motor. If the motor is bi-directional, also connect a drainage pipe.

Then connect the intake/pressure hose to the tank to the BLC vacuum/pressure blowers pump, tightening it to the sleeve by means of a metal clamp in proportion to the hose diameter.

3.4 - BLC / H / HC hydraulic diagram

The typical hydraulic system for a BLC/H/HC vacuum/pressure pump is schematically shown in the version with a bi-directional, fixed-displacement motor below.
The technical specifications of the hydraulic motors are given in the tables below.

Diagram of hydraulic system with unidirectional motor

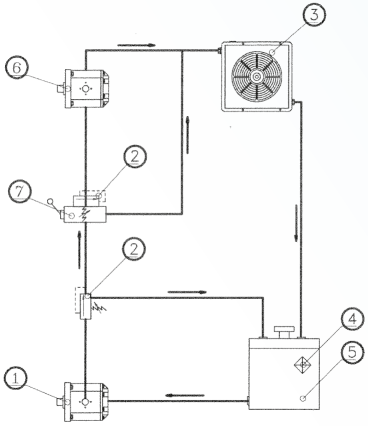
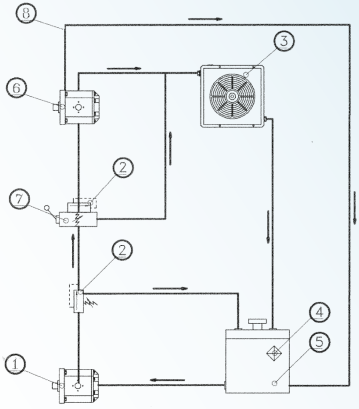


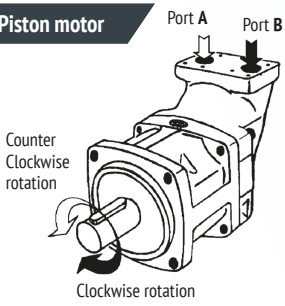
Diagram of hydraulic system with bidirectional motor



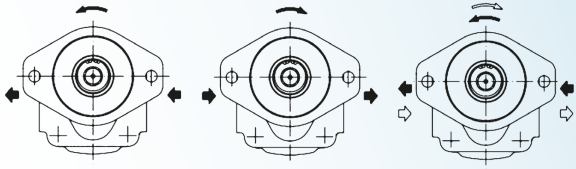
1	Hydraulic pump	**5**	Oil tank
2	Pressure relief valve	**6**	Hydraulic motor
3	Radiator	**7**	Dealer/PCT
4	Oil filter	**8**	Drainage

Ensure that the direction of rotation of the motor matches the direction of rotation of the pump as indicated by the arrow near the hydraulic motor.

Piston motor



External gear motor



The manufacturer of the vehicle or system is responsible for the dimensioning of the hydraulic system.

3.5 - Operating and maintenance instructions for the hydraulic motor

TANK - The tank capacity must be in line with the operating conditions of the system. A heat exchanger should be installed if necessary. The intake and return lines in the tank must be spaced apart (by inserting a vertical divider) to prevent the return-line oil from being taken up again immediately.

PIPELINES - Pipes must have a rated diameter of no less than that of the motor ports and be perfectly watertight. A length of flexible tubing is recommended to reduce the transmission of vibrations. All return lines must end below the minimum oil level, to prevent foaming.

FILTRATION - We recommend filtration class 20/18/13 ISO 4406 or higher.

HYDRAULIC FLUID - Piston motor, use mineral hydraulic oils type HLP (DIN 51524). Gear motor, use mineral hydraulic oils in accordance with ISO/DIN standards. Avoid using mixtures of different oils which could result in decomposition and reduction of the oil's lubricating power.

DRAINAGE HOLE - In bi-directional motors with a drain hole, the hole must be connected to the oil tank with a pipe. To avoid foaming inside the tank, the pipe must be connected below the minimum level.

COMMISSIONING - Ensure that all circuit connections are correct and that the system has been thoroughly cleaned. Insert the oil in the tank, using a filter. Bleed the circuit to assist in filling. Set the pressure relief valves to the lowest possible setting. Turn on the system for a few moments at minimum speed, then bleed the circuit again and check the level of oil in the tank. If the temperature difference between the motor and the fluid exceeds 10° C, start and stop the system for short periods in order to allow it to heat up gradually. Then gradually increase the pressure and speed of rotation until the pre-set operating levels as specified in the catalogue are attained.

PERIODIC CHECKS - MAINTENANCE - Keep the outer surface clean. Replace filters regularly to keep the fluid clean. The oil level must be checked and replaced periodically depending on the system's operating conditions.

RESOLUTION OF PROBLEMS: If the circuit is open (i.e. downstream of the engine there is the oil tank and not the pump) where the motor continues to rotate with the motor off, this is not a case of overpressure but of cavitation. To solve the problem, install a uni-directional valve which would convey the oil, or part of it via calibration, from the motor delivery to its inlet in order to prevent the motor pumping air.
- If the circuit is closed, overpressure may occur. To resolve the problem either install an overpressure relief valve, as we recommend in the attached system diagram, or a calibrated uni-directional valve that partly bypasses the motor. Compared to the first case, the last option is more affordable and less invasive on a system that already exists as it does not require an additional hole in the tank.

MOTOR MODEL	MAX DRAIN. PRESSURE	FILTRATION CLASS	RECOM-MENDED VISCOSITY	MAX. VISCOSITY	MAX. OIL T °C
PLM/KM VERSIONS	1 BAR	20/18/15 ISO4406	12-30CST	750CST	80
HC VERSIONS PISTON	1-3 BAR	20/18/13 ISO4406	15-30CST	1000CST	80

BLC.../HC - Hydraulic Motor (PISTON)

PUMP	MOTOR	DISPLACE-MENT (cm^3/rev)	WORKING PRESSURE (bar)	MAX CON-TINUOUS P (bar)	MAX RPM (bar)	L or R DIRECTION	FLANGE IN/OUT
BLC 210/HC	F12-030	30	230	450	3600	L & R	3/4" ISO 6162-2
BLC 270/HC	F12-030	30	320	450	3600	L & R	3/4" ISO 6162-2

BLC.../H - Hydraulic Motor (GEAR)

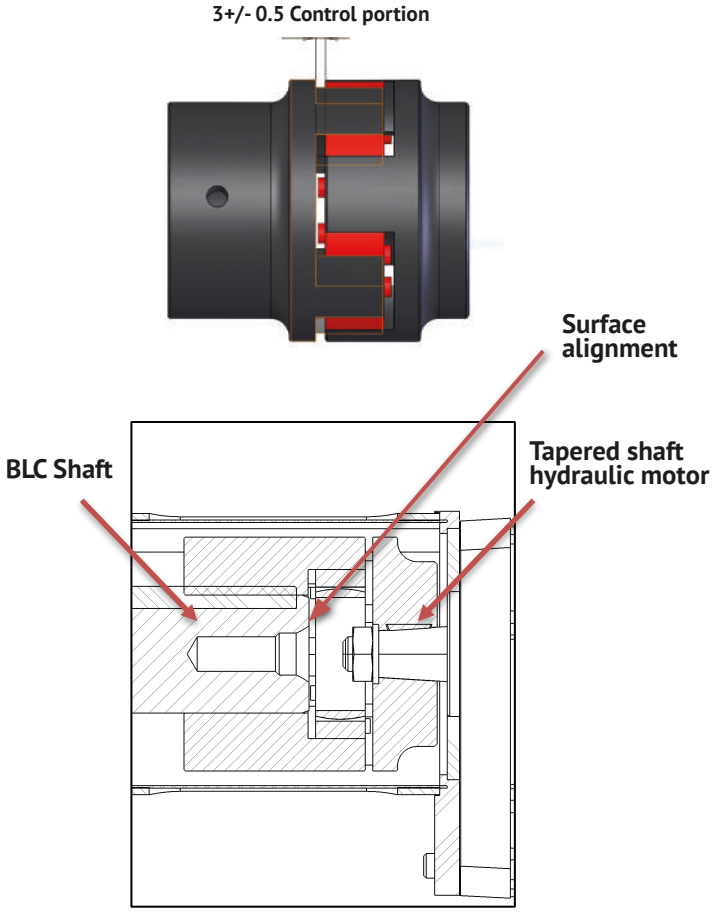
PUMP	MOTOR	DISPLACE-MENT (cm^3/rev)	WORKING PRESSURE (bar)	MAX CON-TINUOUS P (bar)	MAX RPM (bar)	L or R DIRECTION	FLANGE IN/OUT
BLC 140/H	PLM 20.16	16.85	180	250	4000	L & R	G 1/2" - G 3/4"
BLC 210/H	KM 30.43	43.98	170	250	3000	R	G1" - G1"
BLC 270/H	KM 30.43	43.98	220	250	3000	R	G1" - G1"

Clockwise/ counter-clockwise pump rotation - Left/Right

3.6 - Elastic coupling /hydraulic motor connection

Only BLC-H blower pumps are supplied with the elastic coupling kit and hydraulic motor installed.

If the hydraulic kit to be installed on the BLC-P version is purchased, attach the conical coupling half to the hydraulic motor and secure with the appropriate nut until it reaches the stop. Position the BLC shaft-side coupling half by aligning the inner surfaces of the shaft and coupling. Secure the coupling half with the grub screw provided.



Caution: use a rubber mallet to insert the half-couplings.
Alignment errors cause premature wear of the bearings and of the elastic connecting coupling

4.0 - TESTING

4.1 - Testing

All the Battioni Pagani® vacuum/pressure blowers pump are tested at our factory before delivery.

CAUTION: do not operate the vacuum/pressure blowers pump in the opposite direction of rotation.

5.0 - START-UP AND OPERATION

5.1 - Start

Operations to be performed before each start-up:

- Check front and rear oil level.
- Check that all guards of the moving parts are in place and efficient.
- Check the direction of rotation of the pump at low speed by opening all the system valves.
- Check that the vacuum/pressure line and the air injection line are free from obstructions.
- Check for vibrations or abnormal metallic noises.

During operations of start-up, operation and shutdown, it is advisable to use the personal protective equipment listed below.

Before starting the vacuum/pressure blowers pump, ensure that the guards on all the moving parts are in place and in good working order. Any damaged or missing components must be replaced and installed correctly.

5.2 - Daily checks to be carried out

CHECK	INTERVAL
PRESSURE	DAILY
TEMPERATURE	
ABNORMAL NOISES	
OIL LEVEL (FRONT AND REAR)	

During the first few hours of operation, check that there are no abnormal vibrations or noises. If there are any faults, stop the vacuum/pressure pump immediately and contact Battioni Pagani® Service.

6.0 - MAINTENANCE

During operations of start-up, operation and shutdown, it is advisable to use the personal protective equipment listed below.

All maintenance operations, inspections, checks and repairs should be carried out with the greatest care and with the power take-off disconnected.

Before proceeding with maintenance operations, it is advisable to wait for the BLC pump to cool down and to return to a temperature of below 40°C.

Before performing maintenance, remove the differential pressure from the system and restore it to atmospheric pressure.

6.1 - Routine maintenance/intervals

The following table shows the maintenance required to keep the machine in perfect working order.

MAINTENANCE TYPE	INTERVALS
Oil level inspection	daily
Clean filter and check integrity of basket	daily
Oil top-up	where required
Oil replacement	1000 work hours or 12 months
Seal replacement	when necessary or each time the parts that contain the seals open
Replace seals	when necessary or in the event of non-routine maintenance operations
Cleaning of seal vent plugs	where required

6.2 - Recommended lubricants

For the lubrication of the vacuum/pressure lobe pump, it is advisable to use a synthetic ISO VG 220 PAO oil.
If the ambient temperature is always below 0°C, it is advisable to use a synthetic ISO VG 100 PAO oil.

Do not use mineral oil with EP additives or synthetic oil based on silicones or diesters.

6.3- OIL LEVEL INSPECTION

- Whenever the pump is used, check the oil level via the oil level inspection points.
- Repeat the operation both on the front casing and the rear casing.
- The oil level must be checked with the pump stopped and cold

6.4 - OIL TOP-UP

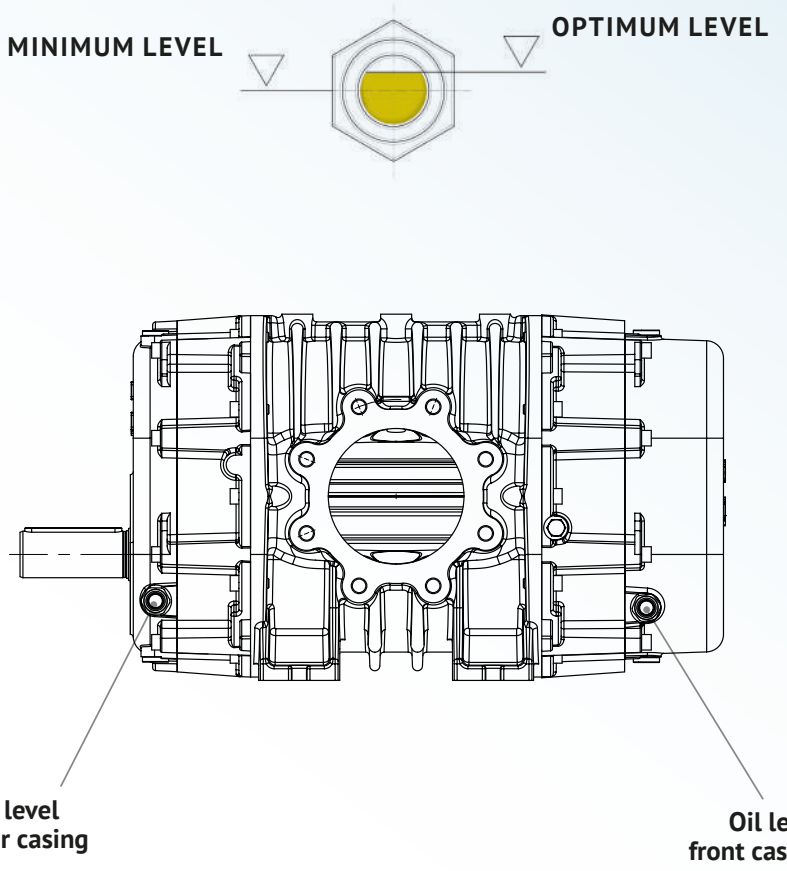
If, at the end of a periodic inspection, the oil level proves to be low, top up.

- Unscrew and remove the oil filler cap.
- Top up with the correct amount of oil, checking the level via the oil level inspection points.
- Tighten the filler cap.
- Repeat the operation both on the front casing and the rear casing.

6.5 - OIL REPLACEMENT

Every 1000 hours of work or 12 months, replace the oil in both the front casing and in the rear casing.

- Place a container suitable to recover the spent oil beneath the oil drain plug.
- Unscrew and remove the oil drain plug.
- To facilitate the emptying process, unscrew and remove the oil filler cap.
- Before filling the casings with oil, make sure that the oil drain plugs are properly closed.
- Open the oil drain plugs and fill with oil up to the specified level using a completely synthetic PAO ISO VG 220 oil.
- Repeat the operation both on the front casing and the rear casing.
- Tighten the oil filler caps.



MODEL	QUANTITY		
	FRONT CASING	REAR CASING	TOTAL
BLC 140 P-H	0.25 LITRES	0.35 LITRES	0.6 LITRES
BLC 210-270 P-H-HC	0.30 LITRES	0.80 LITRES	1.1 LITRES

6.6 – Non-routine maintenance

This type of maintenance is usually carried out when 10,000 hours of operation have been reached. Non-routine maintenance includes complete disassembly of the pump and replacement of all static and dynamic seals and bearings.

Non-routine maintenance tasks must be carried out by qualified personnel authorised by Battioni Pagani.

Spare parts tables for all pumps can be downloaded from www.bapag.it

6.7 - Recommended spare parts

Battioni Pagani® has identified two types of overhaul kits for each pump.
A standard one recommended for 2 years of operation and a full one recommended for 5 years of operation.
The standard overhaul kit contains:

- All seals.
- Oil seal ring fitted to PTO.
- Fill, drain and oil level plugs.

The complete overhaul kit contains the parts from the standard kit and the following:

- All bearings
- Segmented seals

Battioni Pagani® shall not be held liable for breakages or accidents resulting from the use of non-original spare parts.

6.8 - BLC pump uninstallation

The BLC vacuum/pressure blowers pump must be uninstalled using the following procedure:

	BLC / H / HC		BLC / P
1	Stop the hydraulic system.	1	Stop the pulley transmission.
2	Discharge the pressure from the system and disconnect the hydraulic connections to the motor.	2	Remove the transmission belts.
3	Open all shutters to relieve system pressure.	3	Open all shutters to relieve system pressure.
4	Remove the connection pipe that joins the system to the BLC pump, unscrewing the metal clamp and removing the pipe from the sleeve.	4	Remove the connection pipe that joins the system to the BLC pump, unscrewing the metal clamp and removing the pipe from the sleeve.
5	Remove any hydraulic or pneumatic connections.	5	Remove any hydraulic or pneumatic connections.
6	Remove the fixing screws and uninstall the BLC vacuum/pressure blowers pump.	6	Remove the fixing screws and uninstall the BLC vacuum/pressure blowers pump.

7.0 - CLEANING

7.1- body washing

Battioni Pagani® recommends the use of Battioni Pagani Flushing Fluid, a fluid for the cleaning and protection of pumps, designed for maintenance of the Battioni Pagani® vacuum/pressure pumps.
Carry out internal washing with the Flushing Fluid and whenever material enters the pump.
To correctly preserve the vacuum/pressure blowers pump, its body must be washed before any lengthy period of inactivity.

ATTENTION: Do not use water to wash the body to avoid the formation of rust.

8.0 - DISASSEMBLY AND REASSEMBLY

It is not permitted to disassemble the BLC vacuum/pressure blowers pump during the warranty period, otherwise it will be forfeited. In the event of disassembly, any repairs and reassembly must only be performed by qualified and authorised personnel. Only the instructions for routine maintenance are provided in this manual. Damage caused by incorrect operations performed during the disassembly and reassembly of the BLC is not covered by the warranty.

8.1- Disassembly

During disassembly and reassembly, it is recommended that the listed personal protective equipment be used.

All disassembly operations must be carried out with the utmost care and with the power take-off disconnected.

Before proceeding with the disassembly, remove the differential pressure from the system and restore it to atmospheric pressure.

Before proceeding with disassembly operations, it is advisable to wait for the BLW pump to cool down and to return to a temperature of below 40°C.

8.2 Disassembling the front casing

- Empty the front casing oil.
- Unscrew the casing fixing screws.

8.3 Disassembling the rear casing

- Empty the rear casing oil.
- Unscrew the casing fixing screws.

8.4 - Reassembly

Before refitting the front casing or the rear casing, thoroughly clean all the parts and dampen with oil any parts that will be sliding against one another.

8.5 - Reassembling the front casing

- Fit the front casing with a new seal.
- Secure the front casing with the screws.
- Lubricate the sealing lip and the sliding housing on the shaft with grease.
- Fit the oil seal to the front casing using a suitable pad so as not to damage the lip of the oil seal.
- Return the oil to the correct level.

8.6 - Reassembling the rear casing

- Fit the rear casing with a new seal.
- Secure the casing with the screws.
- Return the oil to the correct level.

9.0 - MALFUNCTIONS / FAULTS / FAILURE

PROBLEMS	CAUSES	SOLUTIONS
Little or no vacuum or pressure	Air ingress or egress from the system.	Check the system.
	The pump is running in reverse.	Reverse direction of rotation.
	The pipes are poorly applied.	Check the system.
	Filter clogged.	Clean filter.
Overheating of the vacuum/pressure lobe pump	Excessive pressure.	Reduce pressure.
	Excessive vacuum.	Reduce vacuum.
	Excessive operating time.	Rotate pump in freeblowing mode.
	Filter clogged.	Clean the filter.
Pumped liquid discharged into tank via silencer	Primary and secondary valve malfunction Secondary valve full.	Check valves Empty secondary valve.
The BLC pump rotates in the opposite direction at the end of the work cycle	Non-functioning check valve.	Fix the check valve.
P.T.O. does not rotate	A foreign body has entered the pumping chamber.	Remove the foreign body.
	Rotors stuck.	Wash with a descaling agent.

10.0 - TECHNICAL SUPPORT

Contact Battioni Pagani® authorised authorised distributors for technical assistance or supply of accessories and spare parts.

11.0 - PUTTING OUT OF SERVICE AND DEMOLITION

Before demolition of the BLC vacuum/pressure blowers pump it is necessary to divide the following materials:

- lubricating oil;
- rubber and plastic parts;
- cast iron and steel parts;
- aluminium parts;
- Once separated, the parts must be disposed of appropriately in accordance current regulations.

Do not discard the vacuum/pressure blowers pump into the environment.
For disposal of the lubricating oil make use of specialised treatment services.

Dispose of spent oil in accordance with the local regulations in force.

	MATERIALS						
BLC	CAST IRON	STEEL	ALUMINIUM	OIL	PAINT	CELLULOSE	RUBBER
	84%	15%	5%	1%	0.10%	0.10%	0.10%

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ISSUES					
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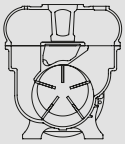
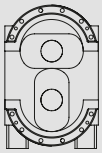
Rev.	Date	Reason	Drafted	Approved	Authorised

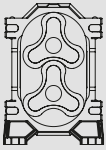


Rotary vanes
vacuum pump

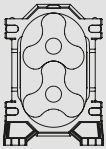
Centrifugal pump



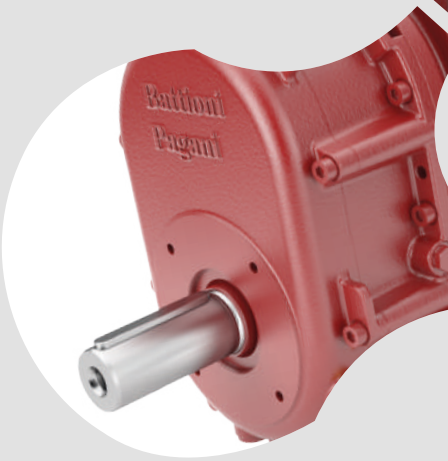
Roray positive displacement
lobes pump



Roray positive displacement
lobes pump



Roray lobes
vacuum pump



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Setting the pace since 1953

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