

IN-LINE PUMP

3099180

User Operating and Maintenance Manual

Original text translation

Warranty Information

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1. INTRODUCTION

This is the operating and user manual for the Dropsa **3099180** In-line Pump.

It is possible to obtain the latest documentation by visiting our website, www.dropsa.com

This manual contains important operating and safety information for users of this product. It is essential that you carefully read this manual and conserve a copy with the product so that other users may consult it at any time.

2. GENERAL DESCRIPTION

The LINE piston pump is an efficient and economic solution used in centralised systems to satisfy various demands of flow rates and pressures. The LINE pump is assembled using standard modular components.

Its versatility, technical characteristics and solid build base makes the pump an ideal solution in the following industries shown in the table below :

APPLICATION	INDUSTRIAL FIELDS	USING
Compressors	Petrochemical Refineries	Cylinder lubrication and piston lubrication.
	Gas Handling	
	Refrigeration Cells	
	Air Compressor Lubrication	
Rubber & Plastics mixers	Rubber / Plastics.	Dust Seal Lubrication

The LINE pumps are capable of providing the exact flow rate of fluid at high pressures either for lubrication purposes or hydrostatic lubrication. It is particularly suited for centralised lubrication systems. The LINE pump is a piston pump with spring return driven by an eccentric drive shaft. The flow rate of the pump is easily adjustable.

All working components within the pump are protected from contamination, water, impurities and are continuously self-lubricated by the lubricant that is used within the application. It has a robust construction for high pressures and long running times and the piston stroke has a sufficient volume to avoid the risk of aerating the oil without losing suction.

The pump is supplied without accessories. It is the responsibility of the installer to provide necessary accessories to ensure safe and correct functioning of the system. (Such as filters, gauges, relief valves etc...).

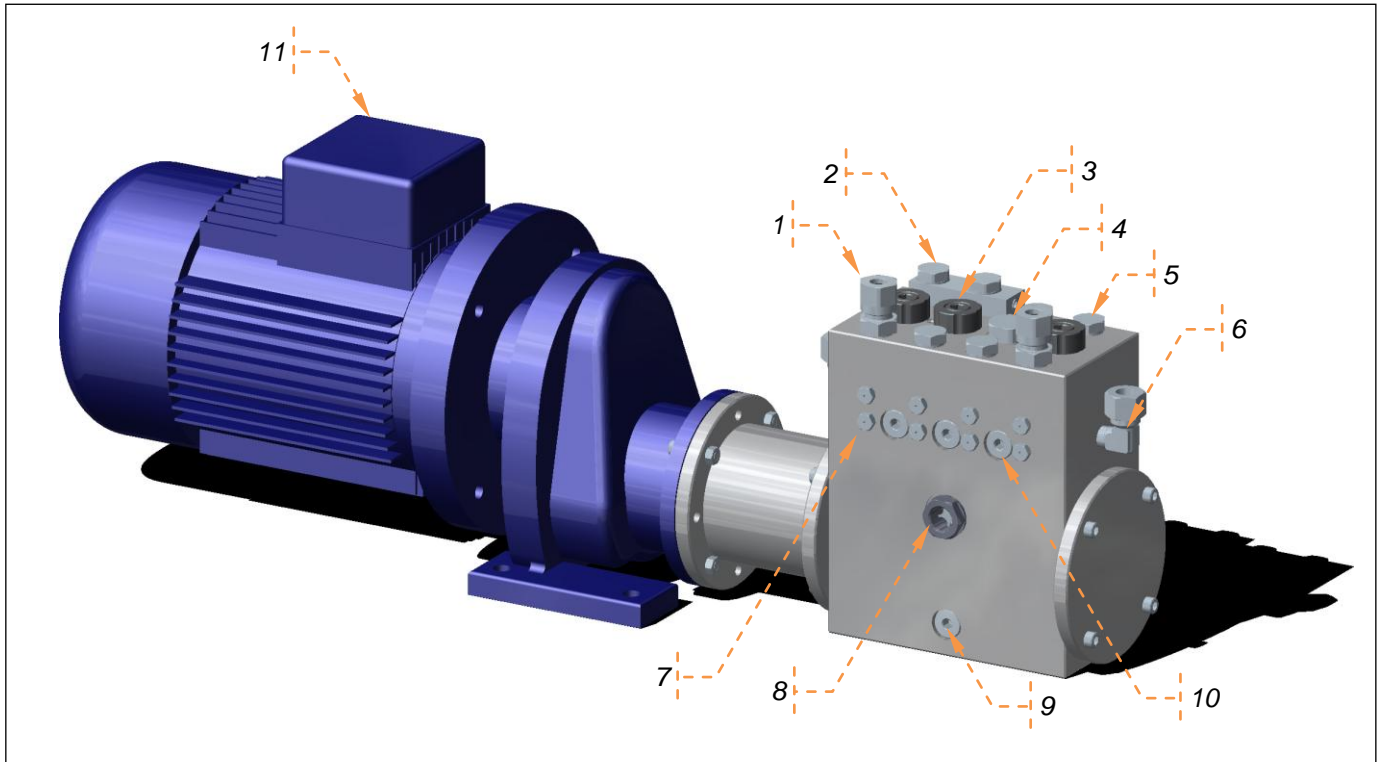
3. IDENTIFICATION OF THE MACHINE

On the pump cover there is a product identification label that indicates the part number and characteristic of the pump, including motor voltage. Always ensure you have the correct product for your application.

4. TECHNICAL FEATURES

TECHNICAL FEATURES	
Pump type	Eccentric driven piston pump with spring return
Pumping outlet connection	G 1/4 UNI – ISO 228/1
Reservoir inlet connection	G 1/4 UNI – ISO 228/1
RPM	50 ÷ 1000
Rotation direction	bidirectional
Working temperature	+5°C ÷ +40°C
Pumping delivery	stroke tot. 8mm utile 6,5mm 0,177cm ³ /rev (adjustable)
Outlet pressure	552bar (constant) 690bar (intermittent)
Inlet pressure	0,1bar ÷ 3,44bar
Lubricant	10,5cSt ÷ 462cSt
Storage temperature	-30°C ÷ +80°C
Max relative humidity without working condensation	90%
Sound pressure level	< 70 db (A)
Weight	9Kg (without geared motor)

5. MACHINE COMPONENTS



ITEM	DESCRIPTION
1	Ring Straight Connector for output flow G ¼
2	Bridge Union to combine output flows
3	Pumping
4	Pumping spare plug
5	Outlet exclusion plug
6	90° Ring Connector for G ¼ suction
7	Screw to bleed air
8	Oil inspection relief
9	Oil drainage plug
10	Closing plug for separating suction oil
11	Geared motor from 50 to 1000 RPM

6. UNPACKING AND INSTALLATION

6.1 UNPACKING

Once a suitable installation position has been identified, unpack the pump and prepare for installation. It is important to inspect the pump to ensure that there has been no damage during transportation. The packaging material used does not require any special disposal procedures. You should refer to your regional requirements.

6.2 INSTALLATION

Allow sufficient space for the installation, leaving minimum 100 mm (3.93 in.) around the pump.

Place the pump at shoulder height to avoid an unnatural posture or possibility of sustaining impacts.

Using predisposed holes (see CAP. 12) for a corrected fixing to the base.

The pump should never be used in hazardous environments or immersed in any fluids.

Always use safety gloves and glasses when handling lubricants.

Do not use lubricants that may contain substances incompatible with NBR Rubber. Follow all health and safety rules required by law.

6.3 ELECTRICAL CONNECTIONS

Damage to the power cable and terminal box could imply contact with parts power components and associated dangers of electrocution. Care must be taken when making electrical connection.

- Check the integrity of the terminal box and the pump in general.
- In case of any damage, do not put the unit in operation
- If the power cable has been damaged, replace it immediately.
- Dismantling of the unit must be done by qualified maintenance personnel with electrical and mechanical skills.
- In order to prevent possibility of electrocution due to earthing of live wires a differential trip should be fitted to the power supply to protect the user. Use a Trip device that activates at a differential level of 0,03 Ampere and a maximum of 1 second.



Switching Isolation must equal 10 kA with a nominal current of 4 A

Attention! All electrical components must be earthed. This also includes all sensors. The earth cable should always be approximately 100mm longer than the signal wires and guarantee that if they become undone the earth cable is always the last one to disconnect

6.4 HYDRAULIC CONNECTIONS

- Use only suitable fittings and pipes for the working pressures, the suction and delivery thread are ¼ BSP.
- Be sure that the reservoir is positioned above the pump, also fit a drain on/off valve.
- Be sure that the lubricant contains no impurities and is properly filtered.

7. INSTRUCTIONS FOR USE

Before putting into operation

- Check integrity in the pump.
- Check correct power motor.
- Check the unit is properly cabled.
- Verify the pump is at the correct operating temperature and tubing is free of air.

Pump does not need oil in to the compartment of the camshaft. There may be a leakage from the pump piston into this compartment , this will help lubricate the parts. In case the compartment gets full , which can be seen by the sight glass, it is possible to drain the oil from the drain plug provided.

7.1 Using

- Switch on the pump by pressing the start button on the control system in use
- Check that the pump is running;
- At startup it may be necessary to bleed the suction oil of air in order to prime the pump. This is done by loosening the bleed screw until the air is espelle and then screw the plug back in to its closed position.
- Verify that lubricant is correctly dispensed the lubrication system is functioning correctly (for any doubts, please contact Dropsa Technical department to ask test procedure)

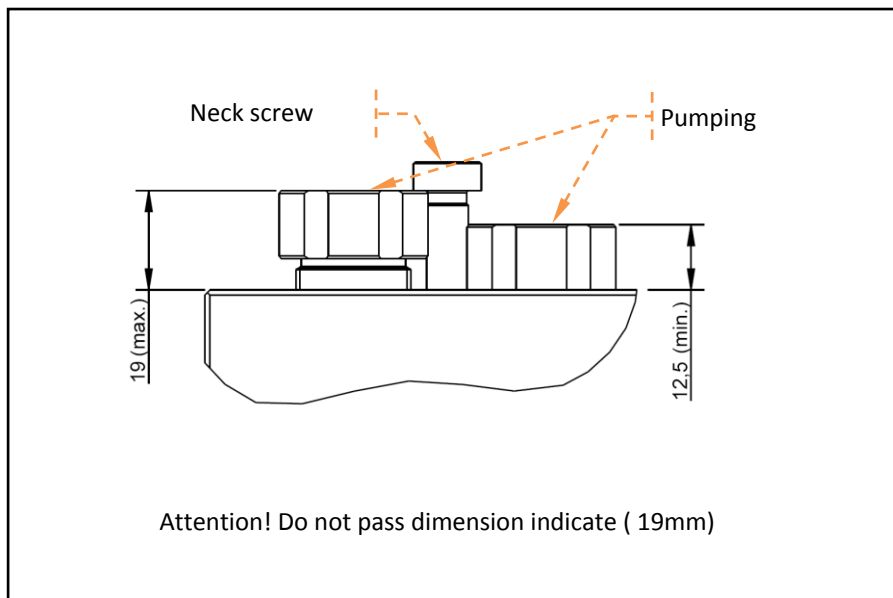
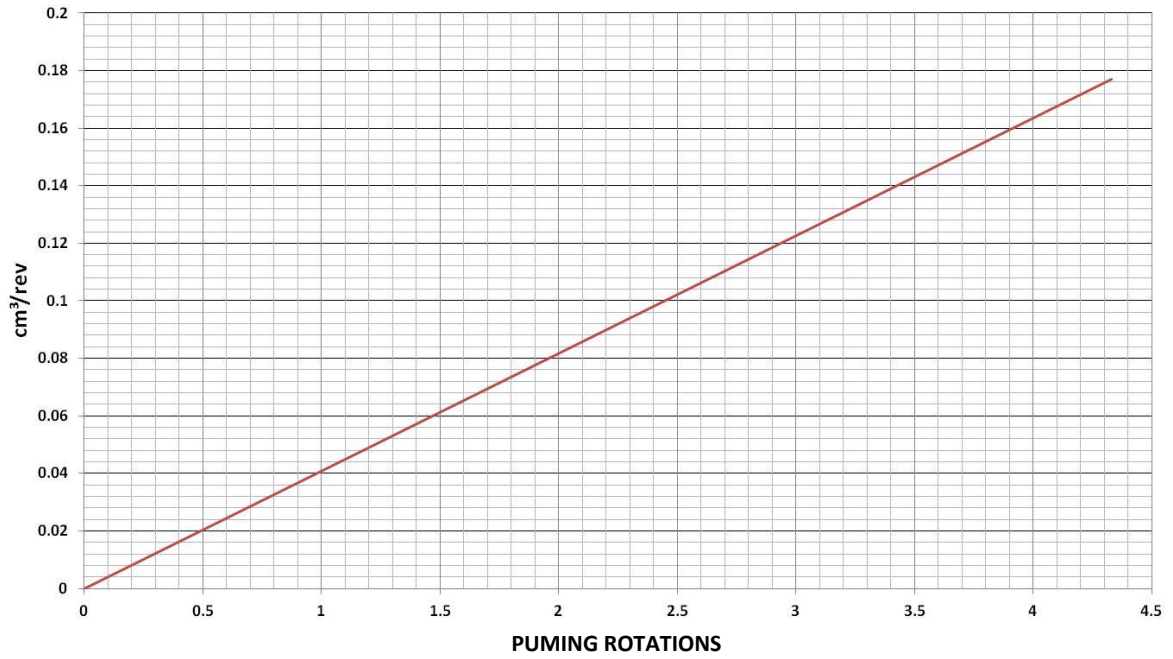
7.2 Adjustment

As standard the pumps should come factory set to meet the customer's requirement. If necessary the pump elements can be adjusted as follows :

- Completely unscrew the neck screw which acts as lock for 2 of the pump elements.
- Rotate the pump clockwise to increase the flow or rotate it anti-clockwise to decrease the flow. Use the graph on the next page to see what adjusting range you will achieve with the pump.
- Align the pump element with the screw under the neck.
- Reinsert the black screw which would maintain the pumps in place.

DELIVERY ADJUSTMENT

— Pumping $\varnothing 6$



8. PROBLEMS AND SOLUTIONS



WARNING: The machine can be opened and repaired only by Dropsa authorized staff.

The following is a diagnostic table showing possible problems, causes and solutions.

Having consulted the following table, if problems still exist you should contact a specialized Dropsa technical support point for assistance in resolving any remaining problems.

DIAGNOSTIC TABLE		
PROBLEM	POSSIBLE CAUSE	SOLUTIONS
The electric motor of the pump is not working	No power at the motor	Check the power supply system, the fuse and the thermal overload switch and the fuse.
	Geared motor is not working.	Replace geared motor
The pump is working, but no lubricant arrives at the lubrication points	Disconnected piping	Check piping and connection to the fittings. Replace worn piping
Pump does not deliver lubricant	Reservoir is empty	Fill the reservoir with clean lubricant
	Air bubbles into the lubricant	Carefully unscrew slightly the air bleed screw and close when oil appear to exit free of air.
	Using not appropriate lubricant	Drain the reservoir and fill it again with correct lubricant
	Suction pumping is blocked	Replace the filter of the plant. Take down pumping and clean aspiration duct
	Pumping piston is worn	Replace pumping
	Pumping outlet valve is blocked	Replace pumping
The pump starts briefly but then stops..	Defective or overheated Motor.	Allow the motor to cool for a few minutes and then try again. If the problem persists the pump may need a service by a Dropsa technician



CAUTION: Make sure the power supply, hydraulics are disconnected before performing any maintenance.

9. MAINTENANCE PROCEDURES

The pumps require only minimal maintenance.

To facilitate maintenance it is suggested to install the pump in an easily accessible location (see paragraph 6.2).

- Periodically check piping joints to detect possible leaks.
- Periodically check that there is sufficient oil in the gearbox. If necessary top up with ISO VG100 (DIN-51524-2) mineral gear oil.
- Keep the machine unit clear to readily detect possible leaks.

The machine does not require any special tool for checking or maintenance tasks. However, it is recommended the use only of appropriate and in good conditions tooling, protective devices (gloves) and clothing (in according to current regulations) to avoid hazards to equipment or persons.

If it is necessary to change a pump element, add a pump element, add/remove a plug, add/remove a bridging union, it will be necessary to drain the complete pump of oil. This can be done by disconnecting the suction pipe and empty the camshaft compartment of oil.

10. DISPOSAL

The unit does not contain any harmful substances and should be disposed of following local regulations, including any recycling information indicated on the components themselves.

Upon demolition of the machine you must destroy the identification label and any other document.

11. ORDER INFORMATION

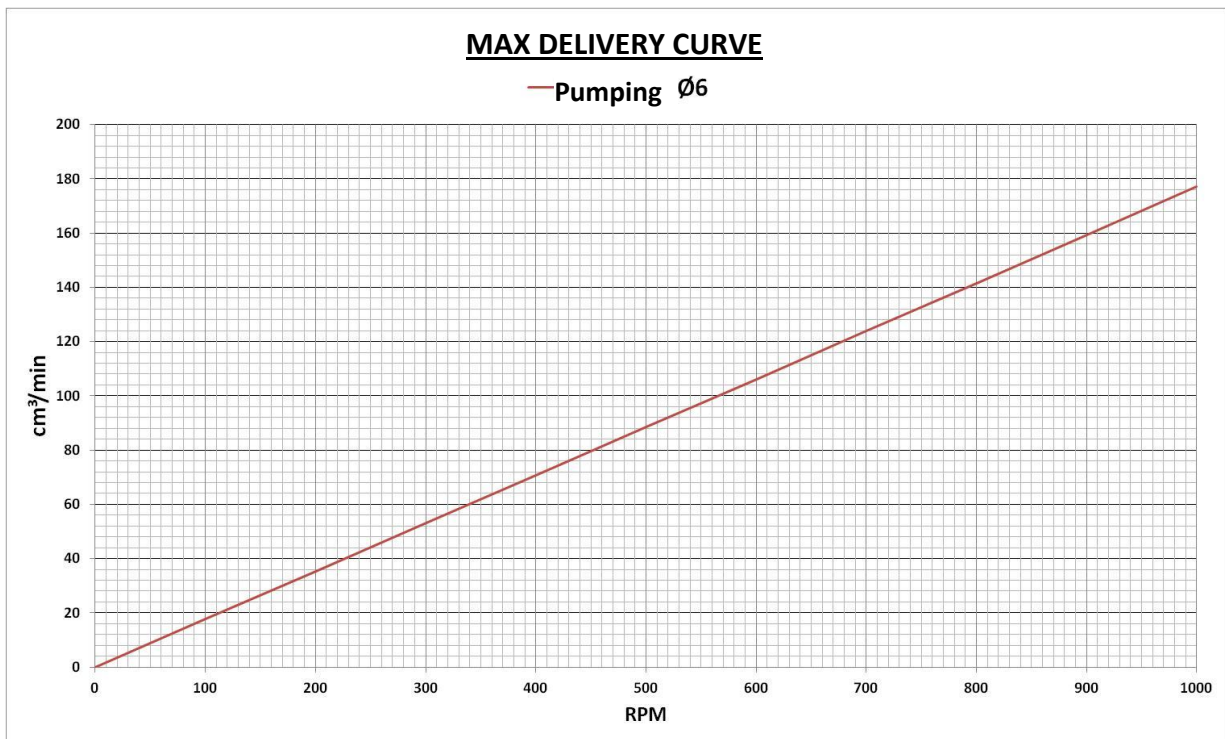
The LINE pump has the possibility to be configured in various configurations allowing the customer to use it in many applications and conditions.

Description of variable configurations:

- Postions **A-B-C-D**

This refers to the position of where the pumps are installed in the unit. You can use all 4 pumps or use less and plug the ones you are not using. The pumps sizes available are $\varnothing 6$ or $\varnothing 10$ and are both adjustable (as shown in section 7.2).

Adjustment of the pump elements is relative to the output required by the custode and the number of RPM of the geared motor. Refer to the following graph for each pump output and always remain under the maximum flow rate achievable by the pump :



Position E

With a purpose built pin inserted in the various positions one can divide the suction oil . Ad esempio con una spina in Position E2 i pompanti A-B possono pompare un fluido e i pompanti C-D un altro fluido senza miscelarsi tra loro.

Position F-G-H

The outputs F1-F2-G1-G2-H1-H2 can be joined with a bridging union allowing the sum of all flows to exit from one threaded output.

Position I-L

If the bridging unions are not used, the output threads must be plugged off with the appropriate plugs. The positioning of the plugs must be done correctly taking into account the number of pumps used. An example of this would be : If using only 1 pump is Position A, with B-C-D plugged, one could choose for the output side I1 or I3 , plugging all other outlets.

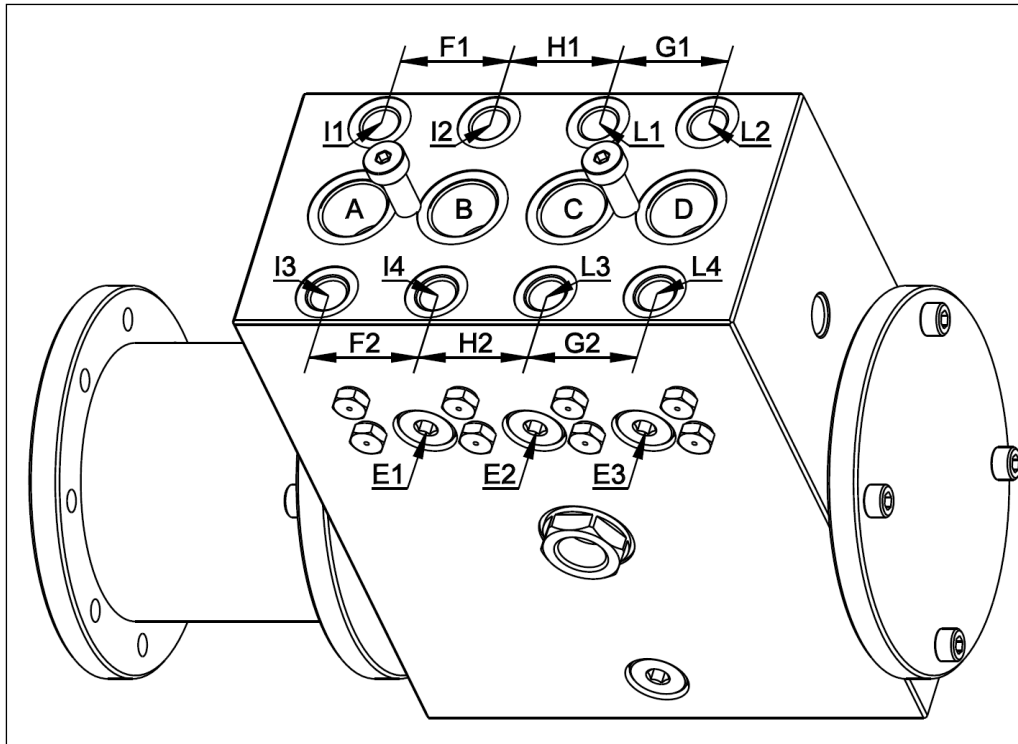
Position M

It's possible to order the pump without the geared motor or you can choose from the ones listed in the table. In the event that a version of geared motor is needed that is not listed it is possible to ask technical department at DropsA to create a new version.

After which they would be listed with the maximum pressure and maximum torque possible.

N. pumping	Pumping position	Nm
1	A – B – C – D	7,5
2	A/C – B/D	7,5
2	A/B – A/D – B/C – C/D	15
3	A/B/C – A/B/D – A/C/D – B/C/D	15
4	A/B/C/D/	15

11.1 Ordering Sequence for LINE pump



	A	B	C	D	E	F	G	H	I	L	M
3099180											

A		B		C		D	
0	PLUG	0	PLUG	0	PLUG	0	PLUG
1	PUMPING Ø6	1	PUMPING Ø6	1	PUMPING	1	PUMPING

E	
0	W/OUT DIVISION
1	DIVISION A-BCD
2	DIVISION AB-CD
3	DIVISION ABC-D

F		G		H	
0	W/OUT BRIDGE	0	W/OUT BRIDGE	0	W/OUT BRIDGE
1	BRIDGE POS. 1	1	BRIDGE POS. 1	1	BRIDGE POS. 1
2	BRIDGE POS. 2	2	BRIDGE POS. 2	2	BRIDGE POS. 2

I	
A	W/OUT PLUGS
B	PLUG IN POS. 1
C	PLUG IN POS. 2
D	PLUG IN POS. 3
E	PLUG IN POS. 4
F	PLUGS IN POS. 1+2
G	PLUGS IN POS. 3+4
H	PLUGS IN POS. 1+4
I	PLUGS IN POS. 2+3
L	PLUGS IN POS. 1+2+3
M	PLUGS IN POS. 1+2+4
N	PLUGS IN POS. 2+3+4
O	PLUGS IN POS. 1+3+4
P	PLUGS IN POS. 1+2+3+4

L	
A	W/OUT PLUGS
B	PLUG IN POS. 1
C	PLUG IN POS. 2
D	PLUG IN POS. 3
E	PLUG IN POS. 4
F	PLUGS IN POS. 1+2
G	PLUGS IN POS. 3+4
H	PLUGS IN POS. 1+4
I	PLUGS IN POS. 2+3
L	PLUGS IN POS. 1+2+3
M	PLUGS IN POS. 1+2+4
N	PLUGS IN POS. 2+3+4
O	PLUGS IN POS. 1+3+4
P	PLUGS IN POS. 1+2+3+4

M	
0	WITHOUT GEARED MOTOR
1	681 RPM - 2,2kW (°) (°°)
2	628 RPM - 1,5kW (°)
3	1025 RPM - 2,2kW (°) (°°)
4	1111 RPM - 1,85kW (°)
5	N/A
6	N/A
7	N/A
8	N/A
9	N/A

(°) 230/400V – 240/415V - 50Hz – 3Ph
280/480V – 60Hz – 3Ph

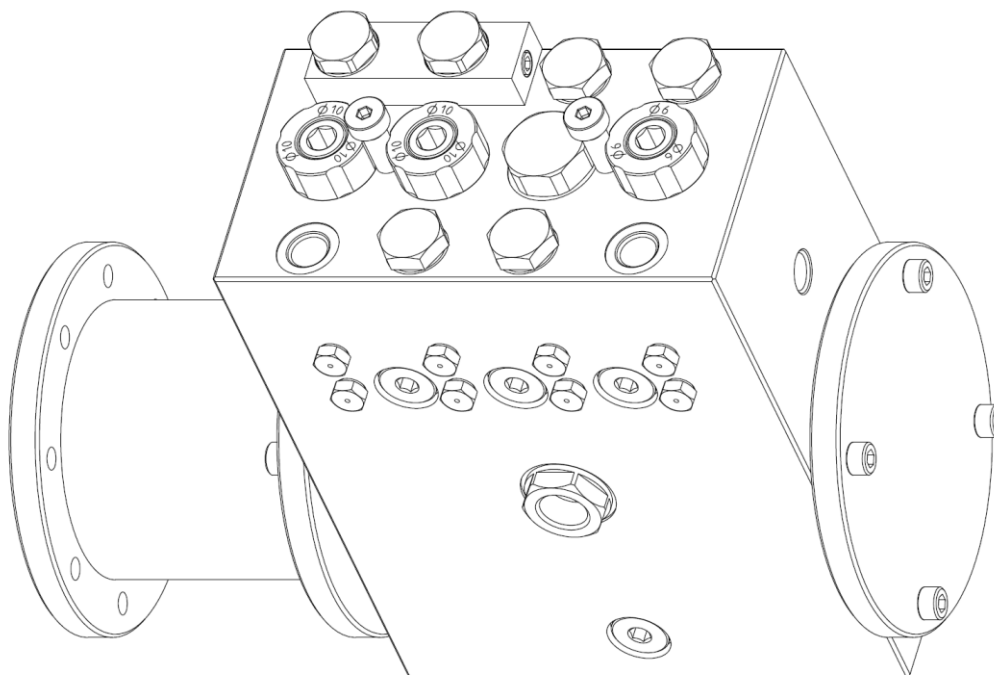
(°°) With Anti condensation
240V – 50Hz – 1Ph

Ordering example for a LINE pump with following characteristics:

- Pump in Position **A,B** and **D**.
- Plug needed in Position **C**.
- Division **E** for oil suction between AB and CD.
- Combining flow outputs (in Position **F1**) of the pump in Position A e B.
- Closure Plug **I** in Position **4**
- Closure Plugs **L** in positions **1, 2** and **3**.

Ordering code is:

3099180	1	1	0	1	2	1	0	0	E	L
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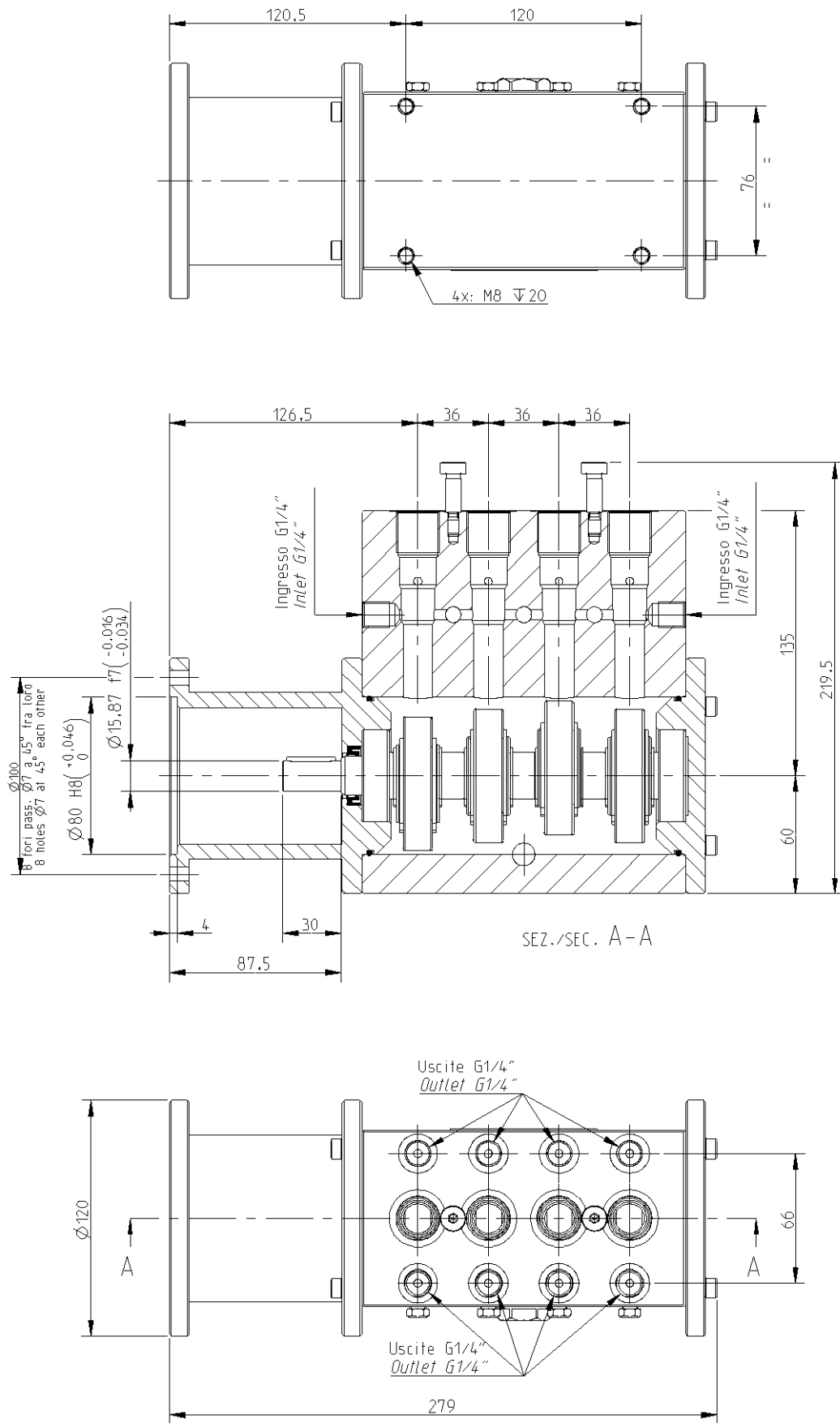


N.B.: Pump Generally comes unpainted , if necessary , it may be possible to have it painted. Please contact Dropsa S.p.A for further information.

11.2 SPARE PARTS AND ACCESSORIES

Part Number	Description	Part Number	Description
0299654	Pumping Ø6	0092243	Straight Ring Connector for tube Ø10
3234309	Pumping spare plug	0093485	90° Ring Connector for tube Ø12
0017144	Plug dividing the suction outlets	0622167	Plug for excluding output
0641321	Bridge Union for combining flow	3230149	Air bleed screw
0265037	Oil inspection relief	3301550	geared motor 681 RPM - 2,2kW (M1)
3234253	Oil drainage plug	3301553	geared motor 628 RPM - 1,5kW (M2)
0010513	Neck screw	3301554	geared motor 1025 RPM - 2,2kW (M3)
3200164	Pump /geared motor coupling	3301555	geared motor 1111 RPM - 1,85kW (M4)

12. DIMENSIONS



13. HANDLING AND TRANSPORT

Prior to shipping, the equipment is carefully packed in cardboard package. During transportation and storage, always maintain the pump the right way up as indicated on the box. On receipt check that package has not been damaged. Then, storage the machine in a dry location.



Lift the packaging taking note of the orientation of the pump.

The product can withstand a storage temperature between -30 to + 80 °C; however it is necessary to ensure that the product has stabilized at a minimum temperature of +5 °C before putting it into operation.

14. PRECAUTIONS FOR USE

It is necessary to read with due care all instructions regarding the use of this product.

The operator must know how to correct operate the product and all associated risks of having lubricants under pressure.

Therefore it is recommended:

- Verify chemical compatibility of the lubricant with the pump and the entire lubrication system (see cap. 4). Ensure that all lubricant safety data is taken into consideration.
- Never exceed the maximum operating pressure or any characteristic of the pump. Check the product identification label.
- Only ever use original spare parts.
- Whenever a part is replaced anywhere in a lubrication system, ensure that it is rating and operating mode compatible with all other parts of the system.



WARNING!

Never attempt to stop or divert any leaks with hands or other body parts.

Note: It is important that all operators and maintenance personnel follow their local safety information. In particular always use personal protection equipment (gloves, safety glasses and protective clothing as a minimum) when handling this equipment or any lubricant. Lubricants can often cause skin irritations and therefore appropriate safety measures must be adopted.



WARNING: It's necessary read carefully the warnings about the risks involving the use of a pump for lubricants. The user must know the operation through the User Manual and Maintenance.

Power supply

Any type of intervention must not be carried out before the unplugging of the machine from power supply.

Make sure that no one can start it up again during the intervention.

All the installed electric and electronic equipment, reservoirs and basic components must be grounded.

Flammability

The lubricant generally used in lubrication systems is not normally flammable.

However, it is advised to avoid contact with extremely hot substances or naked flames.

Pressure

Prior to any intervention, check the absence of residual pressure in any branch of the lubricant circuit as it may cause oil sprays when disassembling components or fittings.

After long periods of inactivity required to check all the pressure parts.

Do not subject to violent shocks of the fittings, pipes and parts under pressure.

A hose connection or a damaged are DANGEROUS, arrange for their replacement.

We recommend only the use of original spare parts.

Noise

During normal operating conditions the pump does not produce excessive noise (less than 70 dB(A)) at the distance of 1 m (39.3 inches) from the pump.

For more information on technical and security measures, see the Security tab of the Product (Directive 93/112/EEC) relating to the type of lubricant chosen and supplied by the manufacturer.

15. OPERATIONAL HAZARDS

Verification and assessment relative to machine safety have been carried out according to the guidelines set out within the European Machine Directive using a matrix evaluation schematic with the generation of technical file as required by the directive.

The lists used are of two types:

- Risk evaluation (UNI EN ISO 14121-1).
- Conformity to essential safety requisites (Machine Directive –CE 06/42).

The following hazards have been identified as a result and must be considered during operation.

- During Maintenance oil may be discharged at low pressures (oil squirt). To counter this, maintenance must be carried wearing appropriate personal protective clothing and glasses.
- Electrocutation: This can occur if the user does not securely connected the wires inside the terminal box. Electrical connections must therefore be carried out only by a competent electrician.
- Physical Strain due to poor positioning of the unit. Detailed Dimensional information is given in this manual to avoid poor positioning.
- Use of incorrect lubricant or fluids. Lubricant information is contained in this manual (**for any doubts, please contact the Dropsa Technical Department**)

FLUIDS NOT ALLOWED	
FLUIDS	DANGERS
Lubricants with abrasive additives	wear of pump internal components
Lubricants with silicone lubricant additives	Seizure of pumping element
Petrol - solvents - flammable liquid	Fire - explosion - damage to seals
Corrosive products	Corrosion of the pump - damage to people
Water	Oxidation of the pump
Food	Contamination

16. WARRANTY

All products manufactured and marketed by Dropsa are warranted to be free of defects in material or workmanship for a period of at least 12 months from date of delivery.

Extended warranty coverage applies as follows:

Complete system installation by Dropsa: 24 Months.

All other components: 12 months from date of installation; if installed 6 months or more after ship date, warranty shall be maximum of 18 months from ship date.

If a fault develops, notify Dropsa giving:

- ✓ A complete description of the alleged malfunction
- ✓ The part number(s)
- ✓ Test record number where available (format xxxxxx-xxxxxx)
- ✓ Date of delivery
- ✓ Date of installation
- ✓ Operating conditions of subject product(s)

We will subsequently review this information and supply you with either servicing data or shipping instruction and returned materials authorization (RMA) which will have instructions on how to prepare the product for return.

Upon prepaid receipt of subject product to an authorized Dropsa Sales & Service location, we will then either repair or replace such product(s), at our option, and if determined to be a warranted defect, we will perform such necessary product repairs or replace such product(s) at our expense. Dropsa reserves the right to charge an administration fee if the product(s) returned are found to be not defective.

This limited warranty does not cover any products, damages or injuries resulting from misuse, neglect, normal expected wear, chemically caused corrosion, improper installation or operation contrary to factory recommendation. Nor does it cover equipment that has been modified, tampered with or altered without authorization.

Consumables and perishable products are excluded from this or any other warranty.

No other extended liabilities are stated or implied and this warranty in no event covers incidental or consequential damages, injuries or costs resulting from any such defective product(s).

The use of Dropsa product(s) implies the acceptance of our warranty conditions. Modifications to our standard warranty must be in writing and approved by Dropsa.

17. DECLARATION OF COMPLIANCE WITH STANDARDS

Dropsa

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E-mail: sales@dropsa.it
Web site: <http://www.dropsa.com>



DICHIARAZIONE **CE** DI CONFORMITÀ/DECLARATION OF COMPLIANCE WITH STANDARDS/ DECLARATION DE CONFORMITE/ KONFORMITÄTSEKLRÄRUNG DES STANDARDS /DECLARACIÓN DE CONFORMIDAD/ DECLARAÇÃO DE CONFORMIDADE

La società Dropsa S.p.A., con sede legale in Milano, Via Besana,5/ Dropsa S.p.A., registered office in Milan, Via Besana,5 / Dropsa S.p.A. au Siège Social à Milan, Via Besana,5/ Dropsa S.p.A., Sitz in Milano, Via Besana 5/ La sociedad Dropsa S.p.a., con sede legal en Milán, Via Besana,5/ A Dropsa S.p.A, com sede em Milão, via Besana, nº 5

DICHIARA /CERTIFIES / CERTIFIE/ ZERTIFIZIERT, DASS/ DECLARA/ CERTIFICA:

che il prodotto denominato/that the product called/ le produit appellè/ das Produkt mit dem Namen/ el producto que se llama/ o produto chamado:

Descrizione/ Description/ Description/ Beschreibung/ Descripción/ Descrição:	Pompa a pistonni in linea Line piston pump
Nome Commerciale/ Product Name/ Dénomination/ Handelsname/ Denominación/ Denominação:	-
Versioni/ Versions/ Versions/ Versionen/ Versiones/ Versões:	Tutte
Codici/ Codes/ Códigos/:	Serie 3099180****

è conforme alle condizioni previste dalle Direttive CEE /has been constructed in conformity with the Directives Of The Council Of The European Community on the standardization of the legislations of member states/ a été construite en conformité avec les Directives Du Conseil Des Communautés Europeennes/ Entsprechend den Richtlinien des Rates Der Europäischen Union, für die Standarisierung der Legislative der Mitgliederstaaten, konstruiert wurde/ cumple con las condiciones establecidas por las directivas comunitarias/ foi construído em conformidade com as diretivas do Conselho das Comunidades Europeias:

- 2006/42 CE Direttiva macchine /Machinery Directive/ Directive machines/ Maschinenrichtlinien/Maquinaria / Directiva Máquinas;
- 2006/95 CE Bassa tensione / Low Voltage Directive / Directive Basse Tension/ Niedrigspannungsrichtlinien/ Directiva de baja tensión/ Directiva de Baixa Tensão;



La persona autorizzata a costituire il Fascicolo Tecnico c/presso Dropsa S.P.A.
The person authorized to compile the Technical File care of Dropsa S.P.A.


Technical Director:
Maurizio Greco

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ivilena Gavazzi


Vimodrone (MI), Gennaio 2012

18. DROPSA LOCATIONS


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