

User manual and maintenance

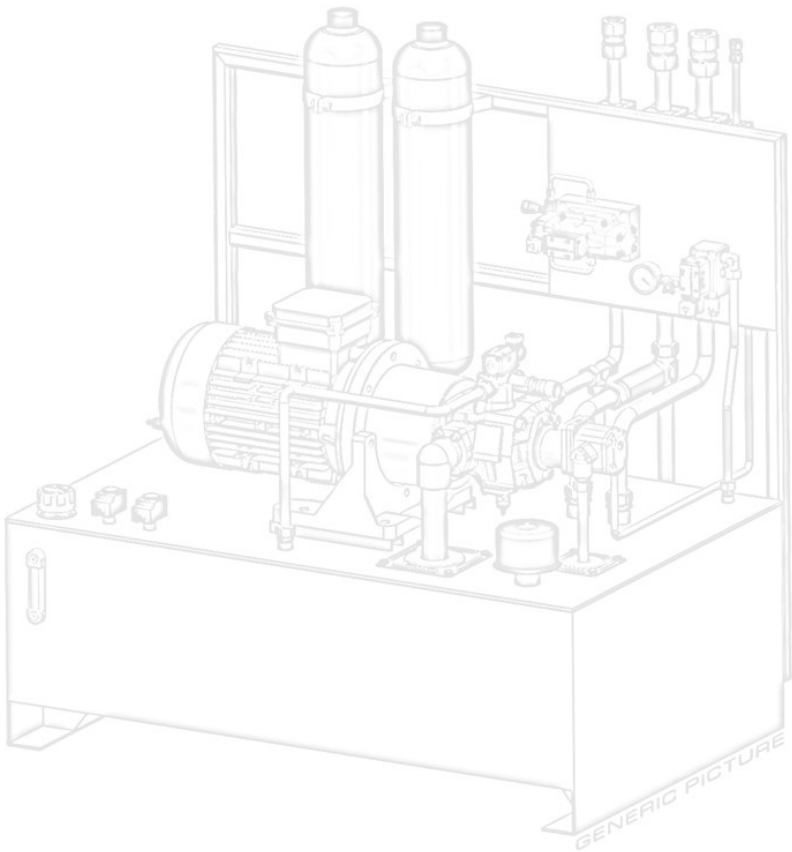
HYDRAULIC POWER UNIT

SUMMARY

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- Sez. D - Handling and Demolition
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ANNEXES

- “HS” Hydraulic diagram
- “PL” Part list
- “TA” Layout drawing
- “DI” Declaration of incorporation



WARNING

DO NOT START THE POWER UNIT AND DO NOT MAKE ANY INTERVENTION, IF FIRST DOES NOT BE ACCURATE READ AND INTEGRALLY UNDERSTAND THIS MANUAL IN ALL OF THEIR PARTS.

The assembly in object is destined to be incorporated inside a machine to which the Machinery Directive 2006/42/CE applies, therefore its starting-up is prohibited before the machine, where it will be incorporated, has been declared in accordance with all provisions of the Directive

In case of alterations or improper use of the power unit, MORELLO s.r.l. will not be held responsible for the basic safety and health requirements related to the supply described in this manual.

The technical data and drawings contained in these assembly instructions may have been revised and modified. Reference should therefore be made to the latest update of the technical drawings or diagrams related to assemblies or systems.

Please contact our technical office if you have any questions about the interpretation of the manual.

Constructor:

TECNICAL DATA

Serial number and year :	3123/2026
Customer reference:	2750
Date and document review:	01/2016 R0
Flow and pressure pump/s :	9 Lt/1' 100 bar
Motor/s :	2,2 KW 80V AC 4Pole
Solenoid valve tension:	24 VDC
Net tank capacity :	30 Litre
Accumulator/s capacity:	(Not Present)
Net weight :	39 Kg
Measures WxDxH :	570x250x597

INTENDED USE, GENERAL WARNINGS AND SAFETY

DESCRIPTION OF POWER UNIT, INTENDED USE AND OPERATION LIMITS

The hydraulic unit described in this manual is to be used for hydraulic automation, as a control component, and was designed for use with hydraulic oil of group II art. 13 directive 2014/68/EU which, in addition to transferring power, guarantees the lubrication and protection of the equipment making up the unit.

By means of one or more motor pump units, the hydraulic unit can draw the oil at ambient pressure contained in a tank and pressurise it to a determined pressure.

The flow and regulation of pressurised fluid by means of special valves, allows the movement of linear or rotary actuators situated on the machine that the unit will be assembled to. The unit can be fitted with a number of accessories such as filters, heat exchangers, level sensors and accumulators, required for a correct and lasting operation, according to the application of the machine.

The control unit is designed to be used within these parameters:

Hydraulic oils are according to DIN 51524 ... 535, ISO6743-4 norms

Oil viscosity at working temperature (40°C) between 35 and 68 mm²/S (ISO VG 35 / 68)

Maximum oil viscosity for cold start of 400 mm²/S

Ambient temperatures allowed -10°C +60°C

Optimal oil temperature between +40°C a +50°C

Maximum oil temperature +60°C

Pressure according to attachment "HS" (Hydraulic diagram)

For applications other than those listed, if not agreed at the time of the order, the performance and safety features may be different from those designed.

Consult the Annexes:

"HS" (hydraulic diagram) for the logic of operation and adjustment.

"PL" (part list) for the list of installed components.

"TA" (layout drawing) for the layout of the components and for the overall dimensions.

GENERAL WARNINGS



All activities of installation of the assembly must be conducted by competent and qualified staff.

The assembly instructions for the partly complete machine must be considered as an integrant part of the partly complete machine and must be kept for future reference until final demolition of the machine.

The content of this manual is exclusively referred to the assembly made by MORELLO srl and it does not provide for eventual risks which can be derived after the incorporation into the machine. It is the machine manufacturer's responsibility to provide for suitable guards in the vicinity of flexible and rigid pipes, accumulators and parts of the plant under particularly high pressure, or wherever a risk of explosion exists.

These instructions represent the intended directions for use, in order to operate the machine in safe conditions for the personnel, for the equipment and for the environment.

Before leaving the factory, the assembly has been carefully checked and tested in all its functions. The only allowed operations are the settings described in the "Plant start-up" and "Maintenance" sections.

The partly complete machine has been designed to operate in automatic mode only after it has been connected to another machine. In manual mode, the safety instructions included in this manual must be strictly followed.

The hydraulic unit can NEVER be used:

- For applications other than those described in annex "HS" (Hydraulic diagram).
- With operating limits different from those described above.
- In environments with potentially explosive, aggressive atmosphere or high concentration of dust or oily substances suspended in the air.
- If the pipes or other components have not be correctly connected.
- Changing the pressures indicated in annex HS (Hydraulic diagram).
- With unplanned oils by type and density.
- With temperature of the fluid exceed 60 ° C inside the tank.
- Before checking the correct fluid level into the tank with proper visual indicator.

SAFETY

If access to the working area of the unit is required, the operators must wear suitable protective equipment for the operations to be carried out.

Clothes must be tight-fitting.

Avoid wearing ties, necklaces or belts that may get tangled or caught in moving parts.

Approved individual protection devices required: **Goggles, Mask, Shoes, Gloves.**

Main safety regulations

- Protective goggles must be worn whenever compressed air must be used (not recommended) during the cleaning operation.
- During maintenance operations, the areas being worked on must be cleaned. Never use flammable and toxic solvents: Gasoline, Benzene, Ether, Alcohol, Turpentine, Ammonia or other similar products. Use exclusively authorised substances.
- Protective goggles and gloves must be worn at all time. No not dispose of rags or paper used for cleaning in the environment but throw them in the designated containers distributed in the plant.
- In case of fire, never direct water jets to the equipment. Switch off all power supplies and use suitable CO₂ fire extinguishers.
- Do not work on energised electric equipment. Start working only after the safety measures have been implemented.
- It is forbidden to unscrew screws and fittings with the pressurized system.
- Any operation carried out incorrectly will void the warranty and exclude any safety liability as per the declaration of incorporation related to Machinery Directive 2006/42/EC.

EXISTING RISKS AND RESIDUAL RISKS

EXISTING RISKS

During the designing stage have been evaluated all the components' compatibility with the pressure and consequently all necessary precautions have been taken to avoid risks to the persons and damage to the plant components, including the scrapping operation. The evaluation also took into account the fact that the safety devices used in the system have all the quality and safety certifications, and their failure is therefore highly improbable. Other factors have not been taken into account, such as the work organisation, the operators' capacities and, consequently, their tendency not to comply with the normal safety requirements.

Summary of the main existing risks:

Hydraulic	Pressurised accumulator (if present)
Electric	400V voltage
Thermal	High temperature of metallic parts
Substances used	Contact with hydraulic oil
Power supply	Pressurised elements
Mechanical	Crushing, impact (during transport and assembly)

RESIDUAL RISKS

After a careful evaluation of all possible risks related to the use and maintenance of the unit and after implementing all the solutions required to remove the risks and limit possible hazards to exposed persons, the following residual risks remain, and can be removed or reduced with the corresponding measures. Any non authorised modification could compromise the operator's safety during the machine operation, with serious risks for the operator.

Residual risks mainly concern:

- The presence of a pressurised oil accumulator (if present), the pressure is not automatically released when the machine is switched off, since the accumulator is used as a power reserve in lack of power supply; if necessary, release the pressure by operating the appropriate manual valve.
- the presence of energised electric equipment – RISK OF ELECTRIC SHOCK
- the obligation to wear eye protection in case of compressed air cleaning – RISK OF DUST AND/OIL PROJECTION.

Hydraulic oil is used during the authorised operation of the machine. This hydraulic oil is not classified as dangerous, including for the environment, according to the criteria established by the European Union, however, care is recommended as a minor risk of explosion exists. It may form flammable mixtures or burn only if heated at temperatures higher than the flash point. Repeated and lasting contact, if combined with poor personal hygiene, may cause reddening of the skin, irritations and contact dermatitis by degreasing effect. Accidental ingestion of small quantities may cause nausea, indisposition and gastric disorders. Considering the product organoleptic properties, ingestion of large quantities is deemed improbable.



WARNING – In case of incidents with pressurised pipe work or similar, any substance may be accidentally injected in the subcutaneous tissues, with no apparent external lesion. In this case, the injured person must be immediately taken to hospital for the necessary treatment.

Summary of residual risks

Mechanical/ Hydraulic	(impacts / pressurised accumulator)
Materials/Substances	(hydraulic oil used)
Electric	(400V voltage)

Risks resulting from forbidden operations

- All the planned and programmed operations of the partly complete machine must be performed only with the safety protections activated.
- The utmost care is recommended when operating pressure accumulation devices: they must be pre-charged exclusively with **nitrogen**, under no circumstances should oxygen be used as it may cause violent explosions if it comes in contact with hydraulic oil.
- It is strictly forbidden to carry out the working cycle with personnel or foreign objects in the vicinity of the unit,
- Under no circumstances should the partly complete machine be operated with the guards removed, opened or tampered.
- Do not operate the energised electric panel.
- During adjustment and/or maintenance operations, the operator must not get his face too close to the components on which he is working.
- It is strictly forbidden to carry out maintenance, cleaning and lubrication operations on moving parts.
- Do not smoke and do not approach flames during the fluid filling, replacement or top-up operations.
- Do not weld with the assembly full of fluid.
- Strictly follow all the recommendations of the chosen hydraulic fluid contained in the relevant security schedule.
- Use proper containers for the exhaust fluid.
- After the maintenance operations or in case of fluid leakages, immediately remove the fluid stains from the surfaces on which people walk.



WARNING – Systems that require one or more accumulators must be de-pressurized prior to maintenance even if the control unit is inactive.

- With automatic drain systems, check the pressure gauges, if necessary open the pressure gauge, that the pressure is actually zero.
- With systems without automatic drain system, de-pressurize through the manual drain valve.

HANDLING AND DISPOSAL

TRANSPORT

The machine must be transported on a truck suited to the weight of the machine, and wooden boards must be interposed between the truck platform and the unit to avoid sliding. The machine must be securely anchored to the truck with cables of suitable strength.

The edges and parts on which the cables are resting must be protected with suitable guards to avoid damage to the machine due to dragging or sudden impacts.

It is forbidden to superimpose any other object above the present packaging.

On receipt, make sure there is no visible damage.

LIFTING

If the weight of the unit is not significant, therefore the lifting operation can be carried out with a standard forklift truck but a cable harness may be needed, if are present lifting eye bolt connect them to the lifting ones.



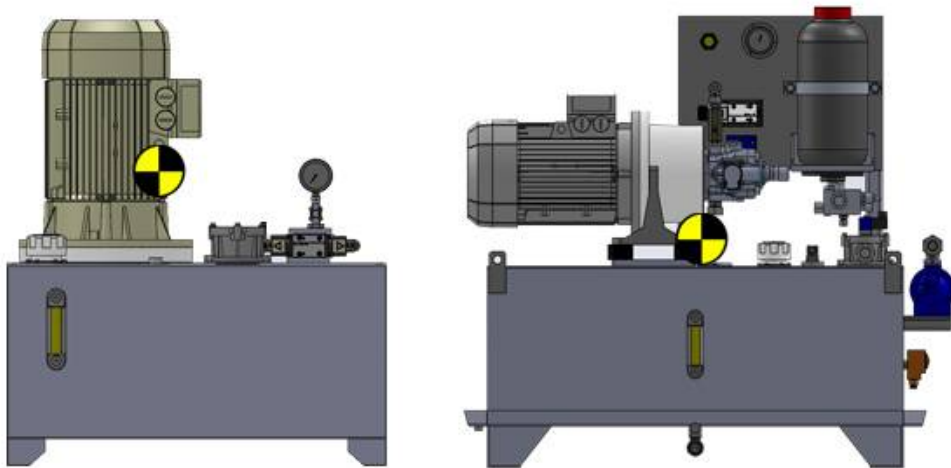
WARNING – During the handling and lifting operations, make sure nobody crosses or stands within the operating range of the lifting equipment.

-The indications about the operations to be performed must be only given by the person responsible for the lifting.



WARNING – The overturning of the unit may cause severe injury or death. The center of gravity of a empty power unit is positioned much higher than it looks, very often placed above the level of the lid, paying particular attention to the presence of large engines, accumulators and valves.

Generic examples for locating the center of gravity:



PACKAGING

Before packing the power unit for transport empty the tank and, if necessary, all interlocking power sources (electric current, hydraulic power) must be disconnected. Unprotected openings of hydraulic systems/components must be sealed and tapped threads must be protected during transport. These seals must be removed only when the machine is reassembled.

It is important that this operation is controlled/directed by qualified personnel.

The parts of the machine and/or aggregates that are likely to move when handled with lifting equipment, should be secured in the position offering the smallest dimensions, and the most vulnerable parts should be suitably protected against possible impacts.

Cable channels, flexible and rigid pipes, and electric cables must be marked before being disconnected, then suitably codified to be reassembled and gathered around the machine or aggregate, included in the package or packed separately according to the dimensions.

The type of packaging, if necessary, must be compliant with the regulations set by the legislation and/or by the specific standards of the country where the machine will be shipped.

STORAGE

The storage of the partly complete machine and its components can take place in packaging conditions, for short periods of time (3 to 4 weeks), always in a covered area, even if packed.

The stocking must be provided into a room without humidity and dust. The ambient temperature must be within -10° to +70°C and the relative humidity must be lower than 65%.

DISPOSAL AND DEMOLITION

General precautionary measures:

-The machine, systems and aggregates consist of metal, plastic and rubber material.

-For a safe demolition process, electric cables, rubber pipes and plastic and polymer components must be carefully separated from metal components.

Remember that the disposal of any substance must be carried out in compliance with D.P.R. 691/82 and D.L. 95 - 27/01/1992.

Taking out of service and scrapping of the hydraulic unit must be carried out by technical personnel suitably instructed, informed and trained on the residual risks existing on the machine, even after it has been disabled.

At the end of the unit operating life, the components of the hydraulic unit must not be disposed of as common waste but must be scrapped in special containers for proper recycling.

INSTALLATION AND CONNECTION

INSTALLATION



WARNING – All activities of installation of the assembly must be conducted by competent and qualified staff.

The positioning of the machine does not require any special foundation, however the installation must be carried out on a smooth, compact, level ground and can support the sum of the weight of the control unit and the oil it may contain.

For a correct and safe operation, the hydraulic unit must always be anchored to the ground; avoid locations exposed to impacts; avoid locations that may generate vibrations and do not expose the unit to severe weather conditions.

Position the unit in such a way as to facilitate the installation and maintenance operations, allowing easy access to all controls and/or devices.

If mobile parts of the machine are present close to the assembly, suitable protections (carters) must be provided to avoid dangerous situations for the maintenance operators.

The machine is supplied without any start, stop, operating and emergency stop device, therefore the machine manufacturer must insert them, positioning them in an accessible and safe position without compromising their operation.

The machine must be designed and manufactured in such a way that the shutdown controls, including the emergency stop devices, can shut down not only the machine but also the unit and the components supplied by MORELLO s.r.l.

If not otherwise indicated, the following conditions must be respected:

- altitude within 0 to 1000 m sea level;
- relative humidity lower than 65%;
- electrical voltage supply tolerance $V_{nom} \pm 10\%$;
- ambient temperature between 0° to 40°C ;

ELECTRICAL CONNECTION



WARNING – The terminal box contains metallic connectors which can be under voltage, after carried out the connections always close the terminal box.
The electrical installation and connection must be performed by qualified personnel.

The electric connection of all the required components (electric motor, pressure switches, level gauges, etc.) is the machine manufacturer's responsibility, refer to *Annex "HS"* (Hydraulic diagram) and the data sheet of the electrical component manufacturer, in case of any doubt contact our technical service.

Verify that the power unit source of potentially dangerous electrostatic charges, has been correctly connected to the ground circuit.

The electrical power supply must be the same as specified on the motor nameplate data.

HYDRAULIC CONNECTION



WARNING – Carefully observe the connection shown in the "HS" (Hydraulic diagram), paying attention not to invert P and T and to comply with the connection of the A and B uses with the respective cylinder bottom and bottom sides.

Hydraulic connections must be made with appropriate fittings and pipes of good quality, make sure that the pressure range are higher than those indicated in the Annex "HS" (Hydraulic diagram), suitably dimensioned to avoid pressure loss or obstructions.

Before assembly, the pipes must be carefully cleaned from the dirties and burrs, the pipes with welded end must be pickled.

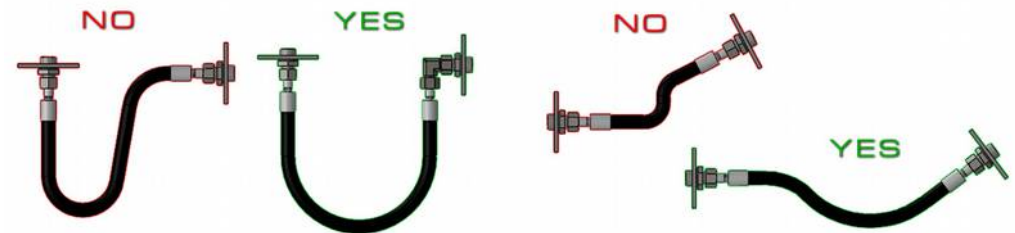
Sealing materials (i.e. hemp) are not allowed because they can produce impurities causing functional problems. The steel pipes have to be held with proper supports, equally distanced; they never have to be forced or modified after their installation. The use of steel pipes without welding, according to EN 10305-4, DIN 2391 is recommended. The fittings must be assembled according to the manufacturer recommendations.

The flexible pipes must be assembled according to the manufacturer recommendations, pay attention to their length because if too short, mechanical stress may occur at the pipe ends, they have to be locked and protect with a suitable carter depending to their dangerous level for the operators.

For the hydraulic connections between the assembly and the machine it is preferable that a section is made with flexible pipes to reduce transmitted vibrations and noise. Keep user connection closed with suitable plugs in order to avoid the entry of dust and dirties.

In the case of pipes longer than 5 meters, we recommend using pipes with a one size larger and two size for length over 20 meters.

Examples of bad/proper mounting of flexible hoses



WARNING – When supplying a separate tank and motopump, provide a suction hose of generous size and length not more than one meter, do not use elbow joint or curves too tightly, place the pump unit under oil level.

PLANT STARTUP



WARNING – All activities of plant startup must be conducted by competent and qualified staff.

PRELIMINARY OPERATIONS

Before proceeding with the startup, do the following:

- Check that all the components of the hydraulic circuit are correctly installed and ready for use.
- Check that all pipes are correctly connected and the fittings are correctly locked.
- Check the accumulator pre-charge pressure. For the charge only NITROGEN must be used.
- Before proceeding to the tank filling, ensure that the tank has not been contaminated by external particles or dirties. In this case a new internal cleaning has to be performed.
- Fill the tank with good quality oil in according to the table below, preferably using a filtration and filling unit with an in-line filter with a filtration degree of at least 25 microns or 10 microns in the presence of proportional valves.

T°environment	<20 °C avg.	>20 °C avg.	>40 °C avg.
DIN51524/Part.2	H-LP 32	H-LP 46	H-LP 68
ISO VG ref	32	46	68
AGIP	OSO 32	OSO 46	OSO 68
IP	Hydrus 32	Hydrus 46	Hydrus 68
BP	Energol HPL32	Energol HPL46	Energol HPL68
CASTROL	Hyspin AWS 32	Hyspin AWS 46	Hyspin AWS 68
ESSO	Nuto H 32	Nuto H 46	Nuto H 68
MOBIL	DTE 24	DTE 25	DTE 26
SHELL	Tellus 32	Tellus 46	Tellus 68
CHEVRON	EP Hydraulic Oil 32	EP Hydraulic Oil 46	EP Hydraulic Oil 68

- In the case of pumps outside the tank, fill in the suction hose and the pump body with the fluid used in the circuit through the outlet pipe and in the pumps that provide it from the drain hose, tighten the fittings again after filling.
- If large cylinders have been provided in the circuit, manually provide their first filling.
- Temporarily loosen the pressure regulating valve to prevent the initial start from taking place under high load.
- Make sure the rotation direction of the electric motor is "CLOCKWISE" looking at the motor fan, while it is powered for a short time, never remove the fan protection from the electrical motor and do not introduce objects in contact with the fan.



WARNING – Do not start the unit before the fluid inlet and outlet pipes have been correctly connected, as these conditions could cause risks for the operator and for the environment.

FIRST START



WARNING – The unit startup and the oil pressure involves the movement of the interlocked moving parts. It is the machine manufacturer's responsibility to implement all necessary measures to avoid damage to persons and objects.

- During the first startup, the pump must start in neutral, without pressure generation, with flow free in delivery, so that it can be triggered correctly.
- For fixed-flow pumps, such as gear pumps, simply start the engine by leaving the solenoid valve de-energized.
 - In the case of variable flow pumps such as piston or vane pumps, it is necessary temporarily to short-circuit the "P" output pipe to the "T" return pipe, after a few seconds of flushing turn off the electric motor and reset the circuit. If present high/low pressure solenoid it must be kept de-energized.
- Refer to the annex "HS" e "PL" to identify the type.
- During the start-up and adjustment phases completely open the pressure gauge shut-off to correctly display the pressure of the system, utilities and accumulators if present.



WARNING – After the end of the adjustment phase close the pressure gauge shut-off, a pressure gauge breakage may cause the entire system fluid to leak, with relative fire risk in hot working environments.

- The control valves and utilities must be operated at reduced pressure and, whenever possible, also at reduced capacity, to prevent damages due to errors made during the hydraulic and electric connection of the unit.
- start the electric motor with intermittent pulses in order to facilitate the pump suction.
- During the filling phase of the circuit, provide air purge by temporarily loosening the fittings of the higher parts of the circuit. Take several cycles back and forth on each cylinder until the bottom of the stroke to remove air bags. At this initial stage, it is likely that an air / oil emulsion will be formed, it is recommended to turn off the system and leave the oil to decant for several hours.
- After performing the filling and the air bleeding operations, check the fluid level into the tank and eventually re-fill it.
- then progressively pressurize the circuit and proceed with the setting of the pressure relief valves according to the values shown in the hydraulic scheme. Complete the valves settings and lock their regulations
- Check the eventual presence of foam in the tank, this would witnesses the presence of air income into the pump suction line.
- The calibration and adjustment phase of the valves should be carried out at a temperature of between 40° and 50°.

MAINTENANCE

ORDINARY MAINTENANCE OPERATIONS

The hydraulic system requires periodic preventive maintenance. It is therefore very important that all the check-up operations, even if simple, are programmed and reported on specific maintenance program schedules (maintenance handbook).



WARNING – Do not perform maintenance with the power unit functioning. In case of maintenance and/or adjustment, make sure the power supply has been switched off and the residual pressure has been released.



WARNING – Systems that require one or more accumulators must be de-pressurized prior to maintenance even if the control unit is inactive.

- With automatic drain systems, check the pressure gauges, if necessary open the pressure gauge, that the pressure is actually zero.
- With systems without automatic drain system, de-pressurize through the manual drain valve.

Filling level and Fluid replacing

Every time the fluid level falls below the minimum it is necessary to refill the fluid of the same type only, the oil level must neither exceed the upper mark.

Fluid replacing has to be performed in as average every 2000-3000 working hours or, in case of seldom using, once a year, if a high degree of pollution is detected, it must be accompanied by a flush of the whole plant.

Replacing filters

Check the clogging indicators on the return and pressure filters (if any), if they are clogged to replace them.

Check the air filter, normally placed inside the filling port, and replace if dirty or clogged, pay particular attention to very dusty environments.

Annually check and clean, replace if necessary, the suction filter inside the tank in the power units that provide it.

A clogged filter, in addition to creating anomalies, may collapse and damage the whole system.

External cleaning

Check that there are no deposits of foreign bodies, workpieces or dust that may hinder the cooling of the electric motor or the air vent of the tank through the filler cap. Good cleaning allows easy localization of any leaks and immediate intervention.

Pressure check

Check the pressure values on the pressure gauges and close the shut-off valves to prevent their continuous stress with possible breakage.

Accumulator check

The preload pressure Po must match the design pressure, improper preload means premature rupture of the bag, use the dedicated control device.

Accumulator must be preloaded solely with nitrogen.

Fluid temperature check

The fluid deterioration due to the temperature is one of the causes of the system degradation. The formation of deterioration products is influenced by the temperature.

The oxidation rate can be considered constant up to 60°C; starting from this point it doubles for each 10°C of temperature increment.

Piping check and Leakages removing

A six-monthly check on fittings, piping, flow regulators and all secondary components ensures it's efficiency and durability while safeguarding the original safety conditions.

The leakages from pipes are usually removed by tightening the fittings that could self-unlock due to the vibrations and/or system temperatures. In case of leakages from the mounting surfaces, the relevant seals must be replaced with new ones.

Check the integrity of the hoses if they are cracks, bulges and/or leaks near the rubber/fitting junction replaced immediately.

Heat exchanger check

The heat exchangers have to be cleaned about every six months, the maintenance frequency depends from the quality of the used water in case of water/fluid exchangers and to the environmental conditions (high density of dust) in case of the air/fluid exchangers.

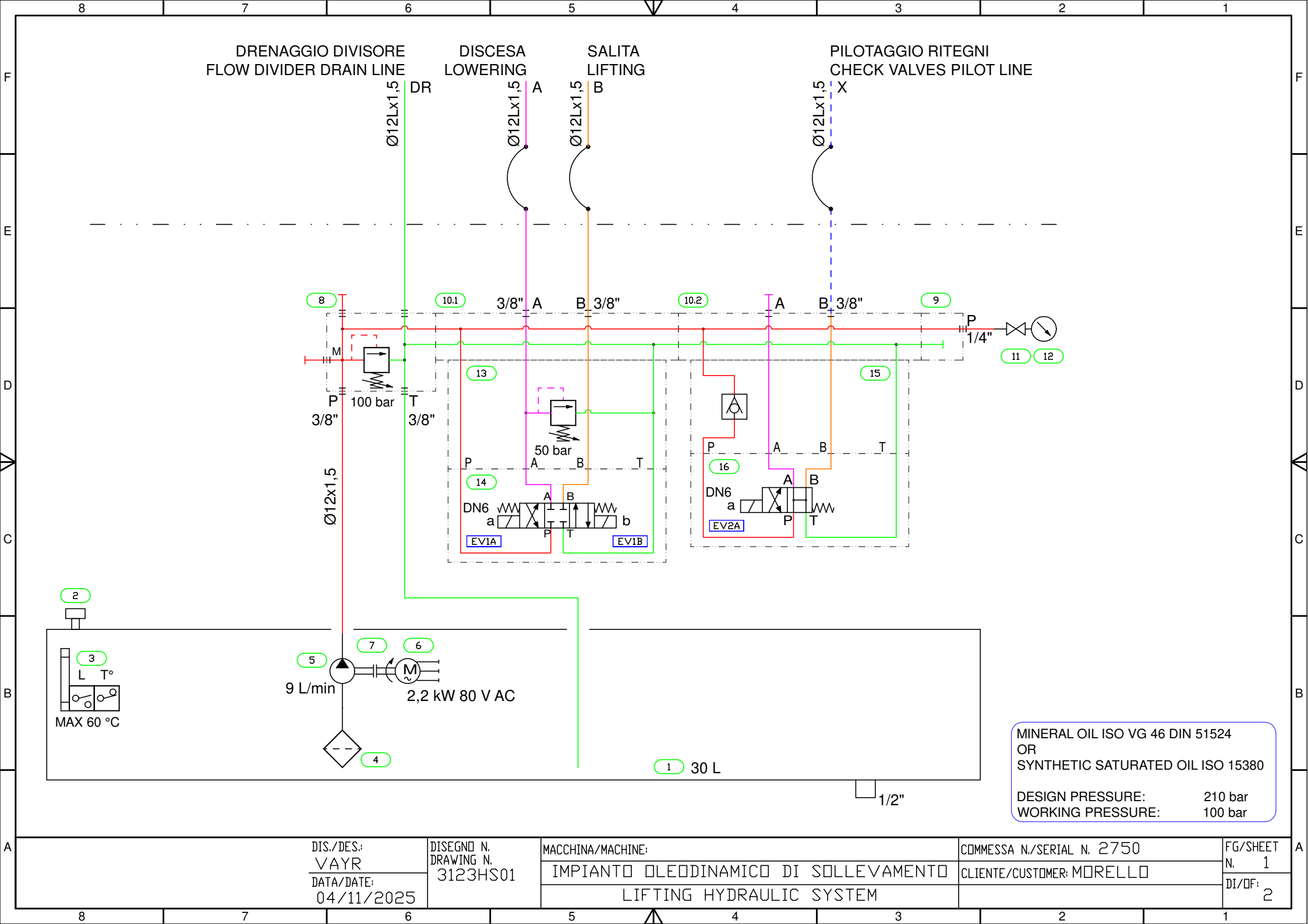
The daily check of the fluid temperature is useful to put in evidence the progressive deterioration of the thermal exchange and the consequent necessity of maintenance.

PREVENTIVE MAINTENANCE PROGRAM (working cycles 24 hours a day)

Intervention for control / replacement	Daily	Weekly	Monthly	Semiannual	Yearly
Fluid level	Check				
Fluid temperature		Check			
Fluid Contamination			Check		
Clogging indicators		Check			
Suction filters					Replace
Pressure Filter's cartridges					Replace
Return Filter's cartridges					Replace
Air Filters			Check		Replace
Calibration of working pressures			Check		
Calibration of pump's flow					Check
Accumulators Pre-Charge pressure (if present)			Check		
Pipes (Leakage or damage)				Check	
Flexible Pipes (Leakage or damage)				Check	
Elastic insert junction motor/pump				Check	Replace

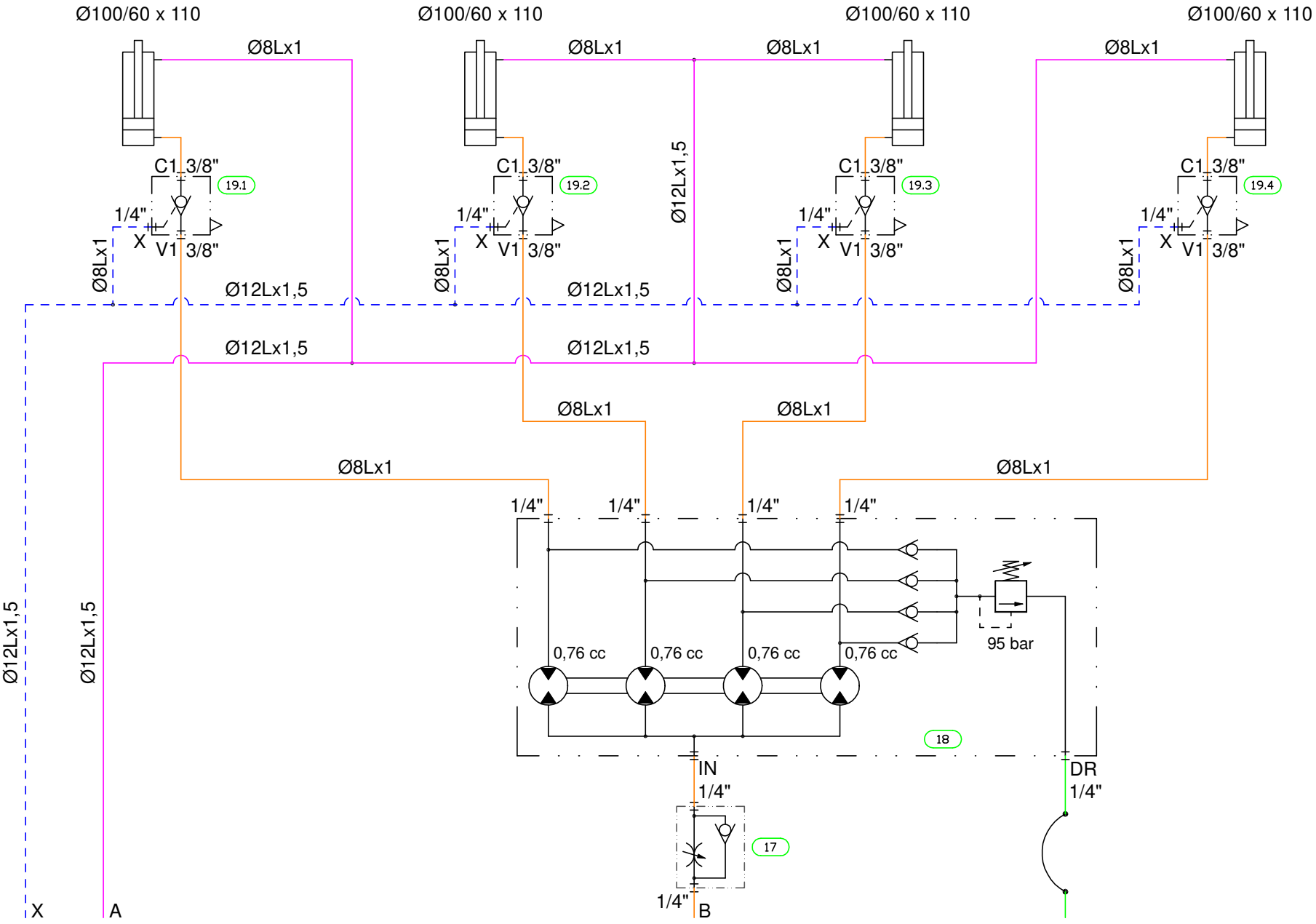
TROUBLESHOOTING

MALFUNCTION	POSSIBLE CAUSES	REMEDY
PRESSURE TOO LOW	1) pressure relief valve half open	a) setting pressure too low b) wear of sealing seats c) contaminant matter under seats d) spring broken
	2) pump faulty	see point 5 to 11
	3) excessive internal leak	a) worn seals in cylinders or in hydraulic motors b) wear of valves and distributors c) too low oil viscosity
	4) excessive pressure drop	a) too high oil viscosity b) poor sizing of oil paths c) oil paths partially stopped
PUMP FAULTY	5) intake throttled	a) intake filter too little or clogged b) intake pipe stopped c) intake pipe too small or wound
	6) air inlet	a) at intake port in the reservoi b) at the seal on the pump shaft c) for intake of oil with foam
	7) reservoir sealproof	air bleed in the reservoir clogged
	8) drive faulty	a) check the coupling b) too high or too low speed
	9) too high oil viscosity	see pump prescriptions
	10) fault inside the pump	a) internal seals broken b) seized vanes, cheekplates or pistons c) pump head not tightened
	11) pump worn out	pump to be replaced
PUMP NOISY	12) cavitation	a) intake throttled: see point 5 b) high viscosity: see point 9
	13) air inlet	see point 6
	14) internal wear	too high backlash in the supports and cheekplates
WARMING OVER 50/60 °	15) maximum pressure too high	valve setting too high
	16) useless engaged power	a) cutoff valve operation faulty b) shutting at cycle end not operating c) hydraulic circuit to be modified
	17) excessive internal leak	see point 3
	18) excessive pressure drop	see point 4
	19) oil capacity not enough	make oil capacity bigger
	20) cooling not enough	a) add more cooling b) cooling media not efficient
	21) excessive friction	a) faulty internal assembly of the pump b) lack of lubricating where required c) poorly lubricating oil
WRONG MOVEMENTS	22) air in the circuit	a) vent air bubbles in higher located parts b) eliminate air inlet see point 6
	23) valves blocked	a) valves blocked at closing by rubbers or other matter b) valves halfopen due to contaminant matter
	24) cylinders blocked	a) cylinders internal assembly faulty b) loads perpendicular to the axis not allowed c) seizing of connecting pivots
	25) pressure drops too high	see point 4
	26) variable pressure in the accumulators	a) accumulators capacity poor b) higher request by the circuit owing to internal leakage
EXCESSIVE WEAR IN RELATION TO USE	27) oil containing wear agents	a) oil too old b) filters not efficient
	28) poor lubrication	a) oil of poor quality b) oil too fluid at the operation temperature
	29) high operation pressure	in relation to the maximum permissible for the pumps and valves
	30) faulty couplings	unnormal loads on shafts or on rods



TEMPO CORSA COMPLETA CILINDRI: 20 [sec]
COMPLETE CILINDERS STROKE TIME: 20 [sec]

CILINDRI SOLLEVAMENTO
LIFTING CYLINDERS



DIS./DES.:
VAYR
DATA/DATE:
04/11/2025

DISEGNO N.
DRAWING N.
3123HS01

MACCHINA/MACHINE:
IMPIANTO IDRODINAMICO DI SOLLEVAMENTO
LIFTING HYDRAULIC SYSTEM

COMMESSA N./SERIAL N. 2750
CLIENTE/CUSTOMER: MORELLO

FG/SHEET
N. 2
DI/OF: 2

HYDRAULIC PLANT BILL OF MATERIALS**DWG N.** 3123HS01 + 3123TA01**CUSTOMER:** MORELLO SRL **JOB N.** 2750

<i>Item</i>	<i>Code</i>	<i>Description</i>	<i>Quantity</i>	<i>Supplier</i>
1	3123TA02	RESEVOIR 30L	1	CPAFLUID
2	TAP50B10A01P01	FILLING PORT	1	MP
3	TL/E-127-B3B0A102	VISUAL-ELECTRIC LEVEL INDICATOR WITH THERMOSTA	1	GIACOMELL
4	STR0502SG1M250P01	SUCTION FILTER	1	MP
5	ALP1-D-9	PUMP	1	MARZOCCHI
5	RP1-038-M	FITTING 3/8"X30	1	OMT
5	RP1-012-M	FITTING 1/2"X30	1	OMT
6	2,2KW-80VAC-B5/90	ELECTRIC MOTOR 2,2 kW 2000 rpm	1	CFR
7	SGE-A01-FS1M0	HALF COUPLING	1	MP
7	LMG200MFS1M04E	BELL HOUSING 30 ex LMC200M-FS1M0-4E	1	MP
7	SGE-A01-M04-048-FG	HALF COUPLING 24-8	1	MP
7	EGE0	ELASTIC COUPLING SPIDER	1	MP
8	EC2AH3X2F	SUBPLATE	1	EUROFLUID
9	EC2A33	CLOSING PLATE	1	EUROFLUID
10	EC2A1338	INTERMEDIATE PLATE	2	EUROFLUID
11	FT-290-14	SHUT OFF VALVE	1	TOGNELLA
12	MGR-63-250	RADIAL PRESSURE GAUGE	1	NUOVA FIMA
13	HMP-013/210	VALVE	1	ATOS
14	SDHE-0711-X-24DC	SOLENOID VALVE 2 SOL.	1	ATOS
15	HR-011	VALVE	1	ATOS
16	SDHE-0610-X-24DC	SOLENOID VALVE	1	ATOS
17	FT-257/5-14	VALVE	1	TOGNELLA
18	RV-0S-0,76X4	FLOW DIVIDER (single valve) 9RS04E06	1	VIVOIL

<i>Item</i>	<i>Code</i>	<i>Description</i>	<i>Quantity</i>	<i>Supplier</i>
19	VBS-L-PS-38	PILOT OPERATED CHECK VALVE	4	CBF
20	G1NU2000	CONNECTOR PG9/PG11, black, 2 pole+earth	3	HTP

