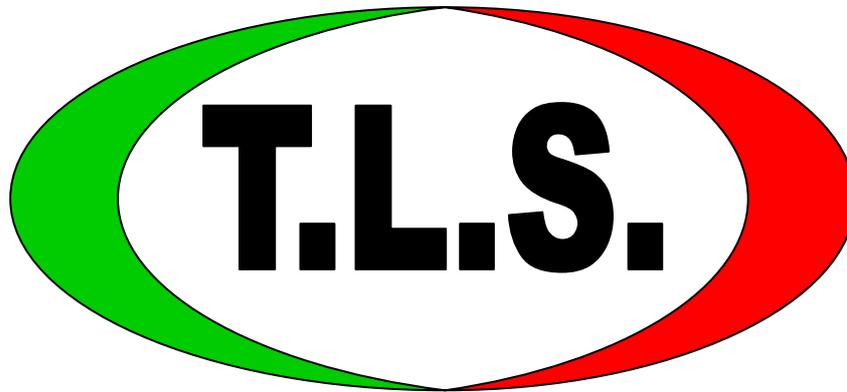


Tecno Lubri System



Automatic progressive lubrication system



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THE BUILDER'S DECLARATION

With the present one we declare that the groups and the pumps with the containers of the series of construction TP-LP is predisposed, according to the directives CE for the cars 97/37/CE enclosures B, for the installation in to car / or the assemblage with other cars in to car.

The use and the final test are forbidden until it has been established that the vehicle in which the system or component is mounted, corresponds to the European legislations regulation 98/37/CE.

The rules harmonized here apply in particular to DIN EN809, EN 292 part1 and EN 292 part 2.

In reference to the rules CE 97/23/CE concerning the under pressure device, according to the dispositions and accordingly to the indications of the documentation they can be used.

To such respect you must be lends particular attention to the following notes:

The products TLS are not protected and they are therefore not authorized for the employment in combination with the fluids of the group 1 (dangerous fluid), definition according to article 2, paragraph 2 of the directives 67, 548, CEE of June 27th 1967.

The products TLS are not projected and they are not authorized for the employment in combination with liquefied gas, pressurized gas, liquid vapours and where the pressure of the vapour exceeds the allowed maximum temperatures in more than 0,5 bar above atmospheric pressure.

The products supplied by T.L.S. are manufactured in accordance to the dispositions and the values recorded in article 3,

Paragraph 1, number 1.1 up to 1.3 and paragraph 2 of the directive 97/23 US. They macaws are not subject therefore, to the applications of the enclosure of the directive, and are therefore does not require to be countersigned by us by reference to the directive 97/23 us.

They macaws from us are classified according to article 3, paragraph 3 to the directive.

Declaration of conformity' CE

For the TLS product denominated piston motor pump of the serious TP-LP 1-2-3 we declare that the pumps correspond to the principal applications of protection that have been fixed in the directive followings of the suggestion for comparison of the juridical norms of the countries members.

Compatibility' electromagnetic 95/54/EEC

Electromagnetic troubles 70/156/EEC

Immunity' electromagnetic 70/156/EEC

APPROVAL REFERENCE NUMBER: 24 10R-020223

Test report EMC.TR.05.1000A



Automatic progressive lubrication system

The system of centralized automatic lubrication is adopted in the industrial sector, finding greater application on:

- Trucks, Tractors, Road sweepers, Compactors, Towing.
- Cars I enliven in general earth (Excavators, Pale.ecc.).
- Reach stackers, straddle carriers.
- Agricultural machine.

The system of centralized lubrication guarantees the constant lubrication of the machine in every component of his, thanks to the system progressive of distribution that exploits the principle of the series of feeders.

With this principle we can distribute the desired quantity of lubricant to every single point of greasing, assuring so an excellent resistance to the usury due to a correct and continuous lubrication of the machine.



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Applications:

T.L.S. automatic lubrication systems are ideal for all the types of machinery / vehicles, regardless of whether it is industrial, agricultural or on the road.

A plant provided of progressive distributors, can lubricate up to 300 points with a single pump. (For further points to consult the builder)

General description of in the application of construction machinery:

T.L.S. automatic lubrication systems are different from their competitors for their constructive quality, given from material of first quality, for the simplicity of assemblage and for the adoption of functional devices of control and diagnosis of process.

Automatic lubrication is essential for machines that need to provide high and continuous performance under the toughest of conditions.

The grease, once injected, form a real barrier against damp, dirt and corrosion reducing the usury of the parts in movement; adopting a centralized automatic system is had a constant injection, regular and precise of lubricant, while the machine is in full function.

It achieves an optimal distribution of it on all the surfaces to lubricate and a consumption of grease 50% smaller in comparison to the manual lubrication, thanks to the precision of dosing of the lubricant.

The adoption of the automatic lubrication definitely exonerates the driver, the operators and the mechanical of service from the annoying operations of manual lubrication, avoiding useless losses of time and risks.

The result will be a drastic reduction of the usury with the advantage of a longer economic life of the parts in movement and an elevated residual value in the time of the machine or the plant.

The grease is loaded in the pump through a special connector DIN 71412 (the same used for the manual lubricators), after that it passes through a special filter with 100 microns filtration grade, in order to fill the reservoir with grease that is absolutely free of any impurities or solid particles. The result is a reliable, well-functioning system, less downtime and peace of mind.

The T.L.S. pump is composed from a system of pistons (feeders; from 1 to 4), connected to a cam system and driven by an electric motor.

Through these, the grease is pushed from the reservoir to the principal distributor and subsequently to the secondary distributors through TEKAFLEX pipelines, that withstand an operating pressure of 200 Bar and a burst pressure of 800 Bar.

We use thick-walled RILSAN tubing (operating pressure 100 Bar) from the secondary distributors to the individual greasing points. These tubelines withstand a burst pressure of 300 Bar.



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General instructions for assembly:

- To respect all the general safety rules before beginning the jobs, (ex: to prop the arms or other movable parts).
- Disconnect any battery cables before beginning any welding.
- To perform all the jobs of perforation and welding please see the assembly instruction manual.
- Mass of the welding generator must be connected to nearest point of welding.
- Cover the sensitive parts (car windows box, hydraulic pipes, cylinders, etc.) before beginning the jobs with grinding tools.
- Avoid any damage to paintwork. Otherwise after brushing and welding the parts treat the affected parts with a rustproof base and subsequently paint with the original colour.

Before unscrewing any single nipples of the greasing points, check by means of a grease gun /pump that the passage of the grease is free. Where necessary, fill any possible voids of grease in the joints.

Important: Work with clean tools and be vigilant about any dirt / contamination that could affect the components of the centralized lubrication system and any bearings or joints.



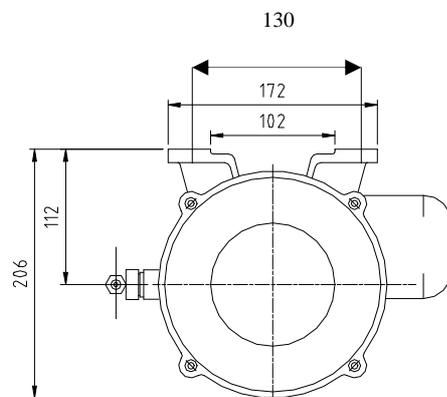
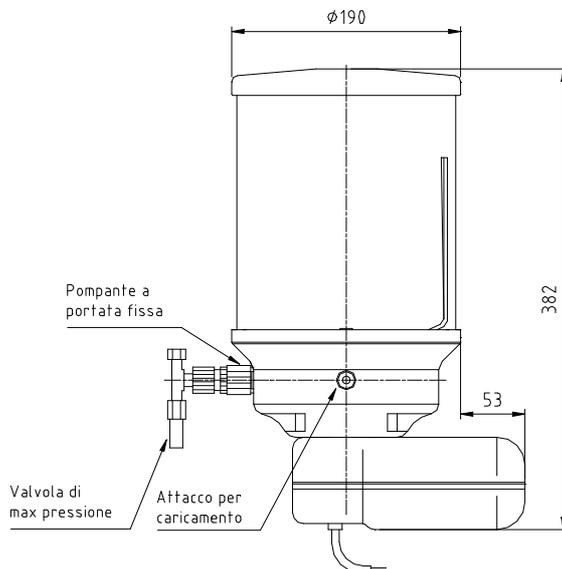
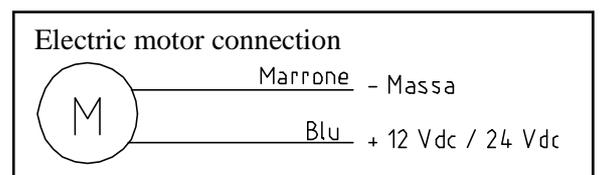
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Technical data sheet for grease motor pump, Standard model.
(Without electronic timer)

Specification

Code	TP 1001....
Motor type	Electric
Power supply	12 VDC or 24 VDC
Rotation speed	20 rpm
Current	1,1 A (at 300 bar and 20° C)
Case protection degree	IP 65
Reservoir	Polycarbonate gloss
Reservoir capacity	3,5 Kg ; 5 Kg ; 7Kg.
Max. working pressure	300 bar
N° of pumping elements	1 to 4
Pumping delivery	0,15 cm ³ /stroke
Grease delivery per Hour	110 cm ³ /h (each element)
Working temperature	-30 +80° C
Refilling nipple	greaser nipple (DIN 71412)
Supply grease connector	tube Ø6
Electric supply cable.	Length = 10 m.
Lubricant	Grease NLGI 2 max



PUMP HEIGHT:
 kg 3.5:mm350
 kg 5.0:mm390
 kg 7.0:mm440



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Technical data sheet for grease motor pump, Electronic timer model.

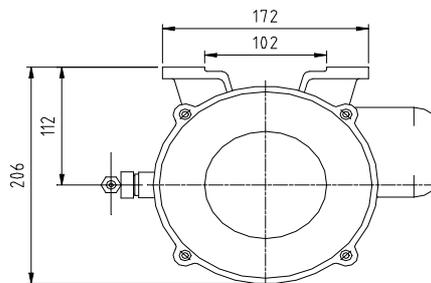
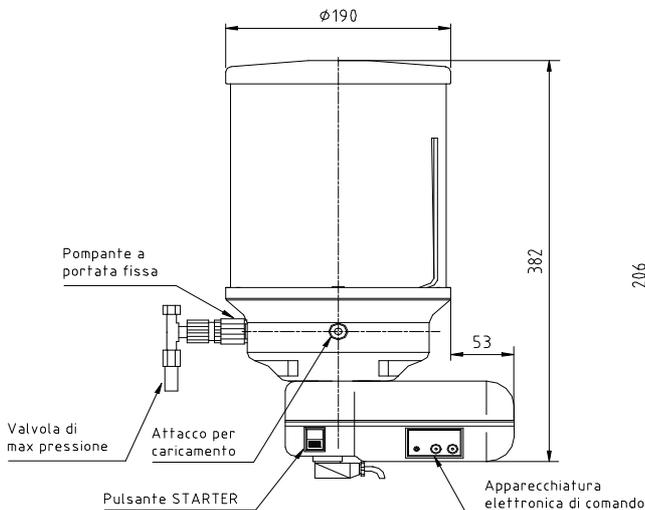
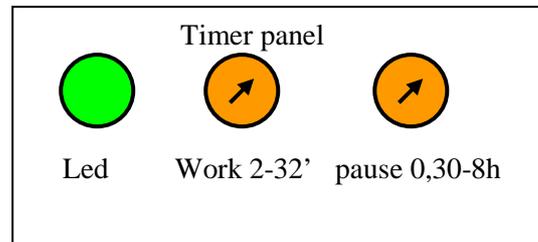
Specification

Code	TP 1011.....
Motor type	Electric
Power Supply	12 VDC or 24 VDC
Rotation speed	20 rpm
Current	0,8 A (at 300 bar and 20° C)
Case protection degree	IP 65
Reservoir	Gloss Polycarbonate
Reservoir capacity	3,5 kg ; 5 kg ; 7 Kg .
Max. working pressure	300 bar
N° of pumping elements	1 to 4
Pumping delivery	0,15 cm ³ /stroke
Pumping delivery per hour	110 cm ³ /h (each element)
Working temperature	-30 +80° C
Refilling nipple	Greaser nipple (DIN 71412)
Suppli grease connector	Ø6 Tube
Electric supply cable	Length = 10 m.
Lubricant	Grease NLGI 2 max



Electronic timer

Voltage supply	10 – 30 Vdc
Maximum load Current	6 A (max)
Working temperature	-30 +70° C
Timer function	Pause – Working
Working time	Adjustable from 2 to 32 min.
Pause time	Adjustable from 30 min. to 8 h.



PUMP HEIGHT:
 kg 3.5:mm350
 kg 5.0:mm390
 kg 7.0:mm440



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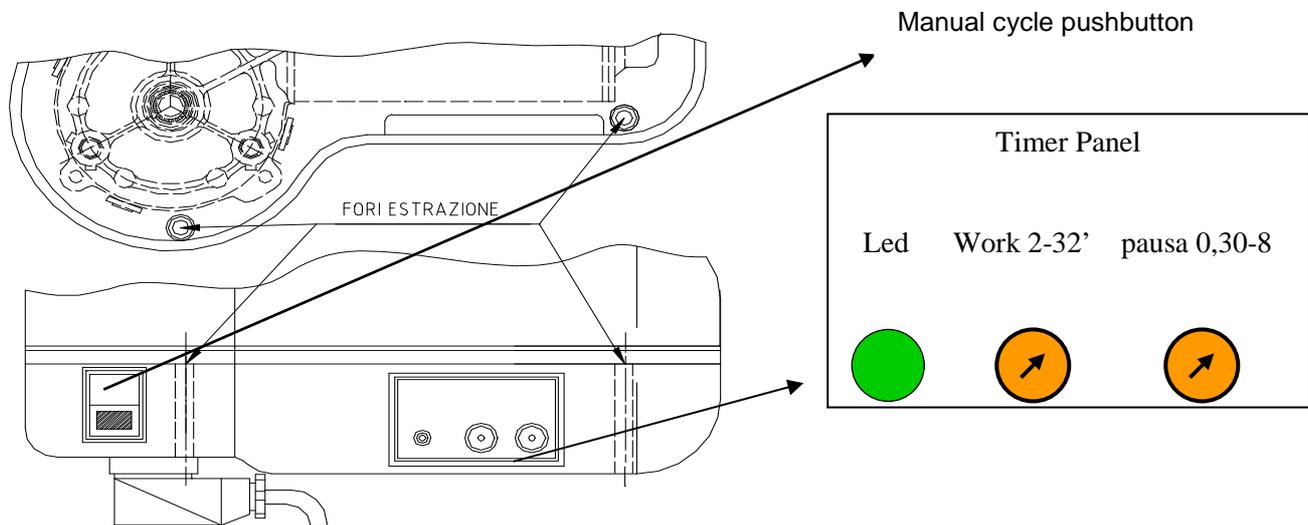
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Electronic timer with memory function.

The electronic timer with memory, called timer, is used in system where is wanted to manually plan the times of work and pause of the pump. The timer is easy to use thanks to the commands positioned inside the inferior carter. When the pump is switched on the Led (of red colour) blinking for around 3 seconds: finished the check of control, if they have not been in relief anomalies, the led becomes green and the pump regularly begins working.

The operation of the pump is so bound by the set-up times of work and pause planned by the operator turning the special selectors. To vehicle in standstill (power switched off) the partial time of break is memorized. The calculation of time starts when the vehicle is switched on adding the partial memorized time. Each switched on of the vehicle the pump starts for two turn in order to make a test.

Holding the button pressed for 10 seconds the pump begins the continuous cycle stopped switched off the vehicle.



Instructions for the dismantling of the inferior housing (Timer Lodging).

To open the inferior housing of the pump where the timer is fitted it is necessary to unscrew the 3 screws M5, and extract the housing, being careful not to damage the inner cables. Before closing again, make sure that all the parts are dry and clean.

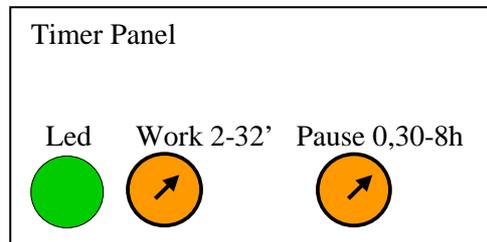


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TWO COLORS LED RED/GREEN

FUNCTION: GREEN LED BLINKING – WORKING TIME (MOTOR IS RUNNING).
 GREEN LED FIXED - PAUSE TIME (MOTOR IS STOPPED)
 RED LED BLINKING - SWITCH ON PUMP TEST



SET-UP ELECTRONIC TIMER

WORKING TIME

- 2 = 2 min.
- 4 = 4 min.
- 6 = 6 min.
- 8 = 8 min.
- 10 = 10 min.
- Ecc..

➡ INCREASE FROM 2 min. UP TO 30 min.

PAUSE TIME

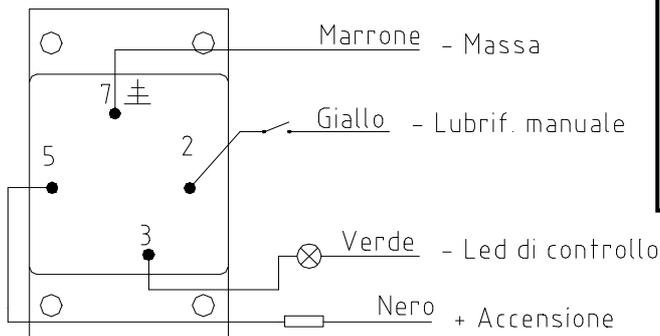
- 0,5 = 30 min.
- 1 = 1 hour
- 1,5 = 1 hour 30min
- 2 = 2 hours
- 2,5 = 2 hours 30 min.
- Ecc..

➡ INCREASE FROM 30 min. UP TO 8 HOURS

Power Supply . 10 – 30 Vdc

Working time increase to 2 min. each step

Pause time increase to 30 min. each step



REV. CONNECTION DRAWING 01-01-07	
BROWN	-GROUND
YELLOW-GREEN	-GROUND PUSHBUTTON
BLU	-GROUND LED
BLACK	+BATTERY



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CYCLE COUNTER MODE

The pump T.L.S. with electronic device it is also available in version cycle counter where through a micro fitted on the last distributor the planned time of job it is excluded.

The pump will regularly begin working and the micro will count the number of passages that the piston effects inside the distributor.

The number of passages of the piston accordingly of the quantity of grease supplied, is planned in according to the client request.

As soon as the piston has completed the last passage, the micro will switch off the pump for the time of break planned on the ctronic timer.

In case of which the micro doesn't actuated for the movements of the piston for once of 5 min. an alarm signal stopped the pump and will blinking on the led.

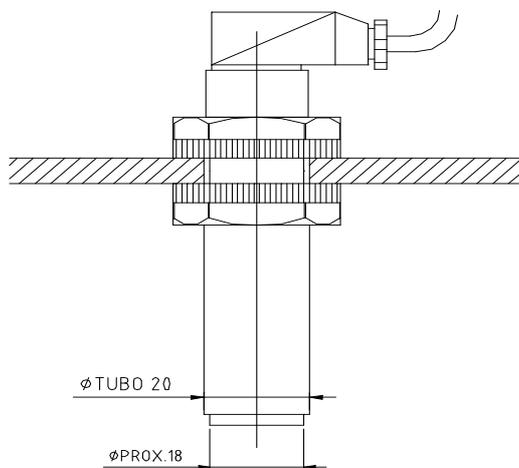


Optional.

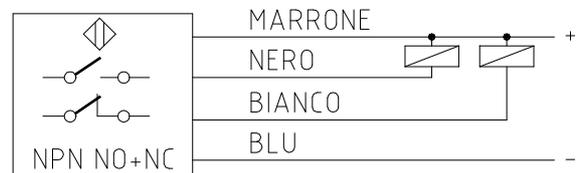
Minimum grease level sensor.

This sensor has the function to signal, through led, the minimum level of grease in the reservoir, so that to be able to restore the optimal level before the reservoir is empty.

This solution prevents the operation to dry of the pump: it will be avoided so the entry of beads of air in plant and accordingly the bad operation of it.



4 wires cable – Logic NPN NO+NC
(Available PNP NO+NC)



Pieno Vuoto

Technical data:

Available logic	NPN NO+NC-PNP NO+NC
Code	TP1.....
Power Supply	10 – 30 Vdc
Switching distance (sn)	0 – 10 mm (adjustable)
Logic	NPN or PNP
Output Signal	NO+NC
Working frequency	10 Hz
Max. Current output	200 mA
Min. Output Current	10 mA
Voltage loss	< 1,8 V
Short circuit protection	Available
Led status	Available
Working temperature	-20° a +70°
IP protection grade	IP - 65
Case material	Polycarbonate
Output connexion	PVC Cable
Weight	100 g.



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Optional.

Pressure gauge with glycerine bath index.

The manometer with glycerine bath index is set, through a special "T" connection o, directly on the over pressure safety valve.

It has the function to display the pressure into the circuit in order to operate immediately in case of breakup of a pipeline.

Technical data :

Spring pressure gauge

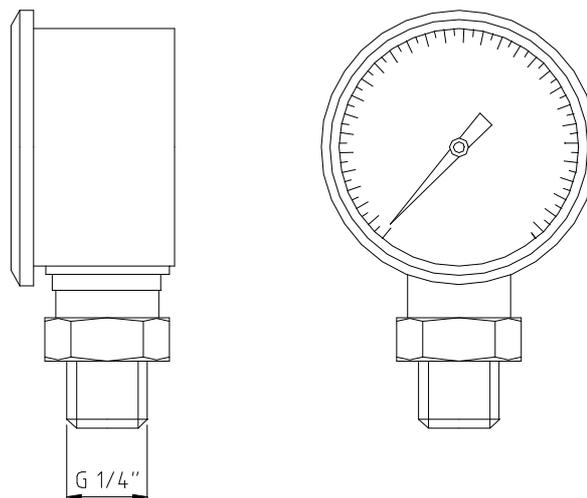
Body DN-63 stainless steel

Body IP grade protection IP-65

Element of measure in copper alloy in bath of glycerine

Executions: radial or back connector

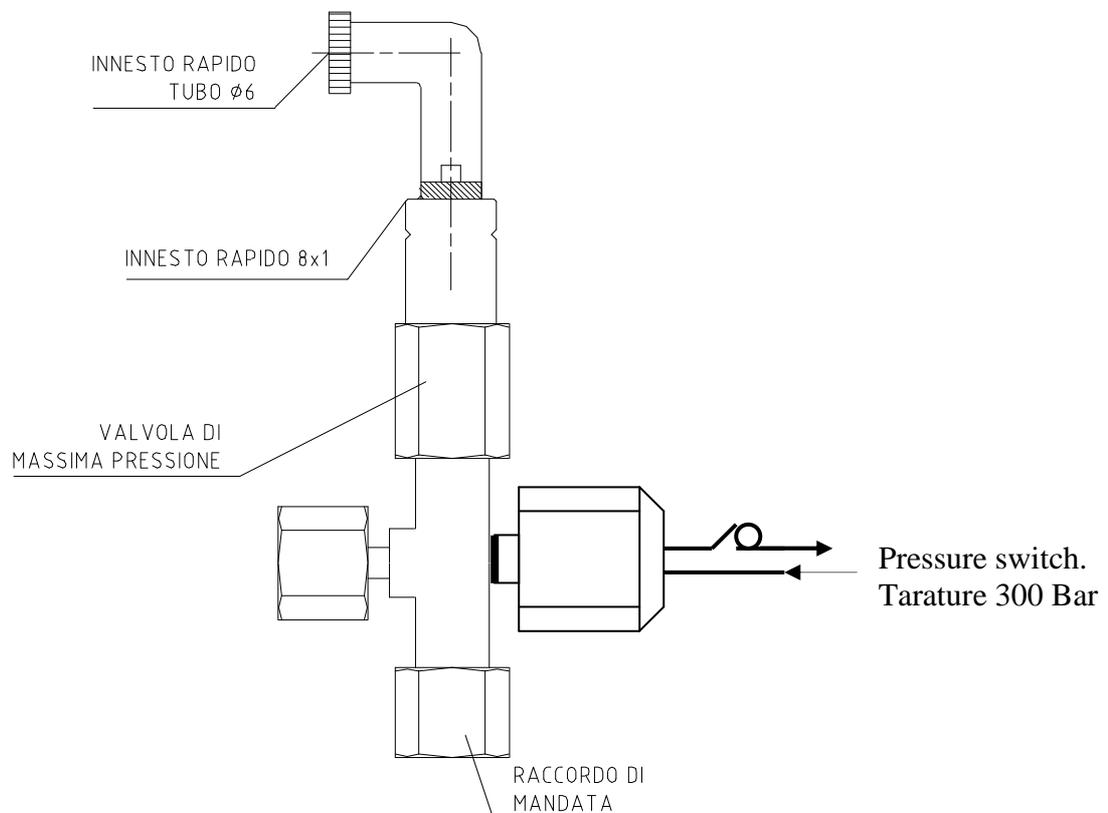
connector dimension: G 1/4"



Optional.

Safety device:

Electrical alarm of circuit blocked installed on the safety valve



The indicator of block circuit is active in the case that one or more lubrication points are not working.

At the moment in which it occurs, an increase of pressure in the circuit that makes to operate the valve of maximum pressure, the electric pressure switch sends a signal to a led positioned according to the demands of the client in order to visualize the anomaly of lubrication.

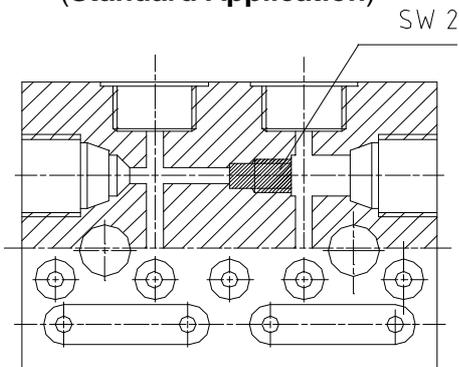
PROGRESSIVE FEEDERS

Operating Principle.

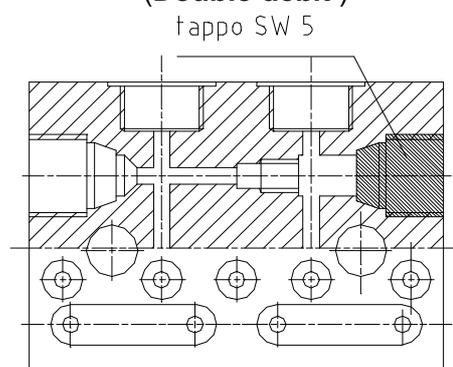
A progressive feeder is constituted by an initial element, from two or more intermediary feeder elements, and from a final feeder element. The feeder blocks are fixed together by means of a threaded rod. The pressure among the various elements is guaranteed by a high resistance O-Ring

Single elements and mixing.

2 Output for each element
(Standard Application)

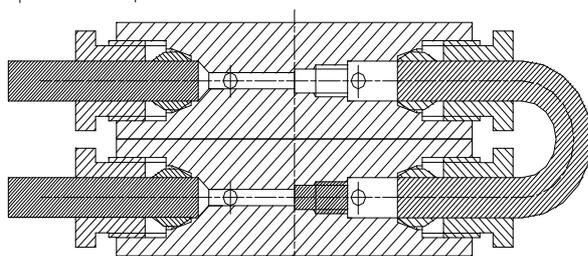


1 Output for each elements
(Double debit)



3 Output connected together

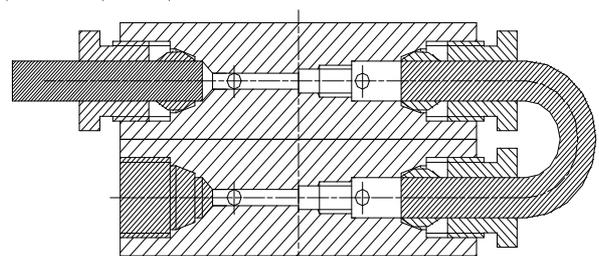
portata tripla



singola

4 Output connected together

portata quadrupla



The global capacity of the output is equal to the sum of the single capacity of the feeders element combined, when bridge connected.

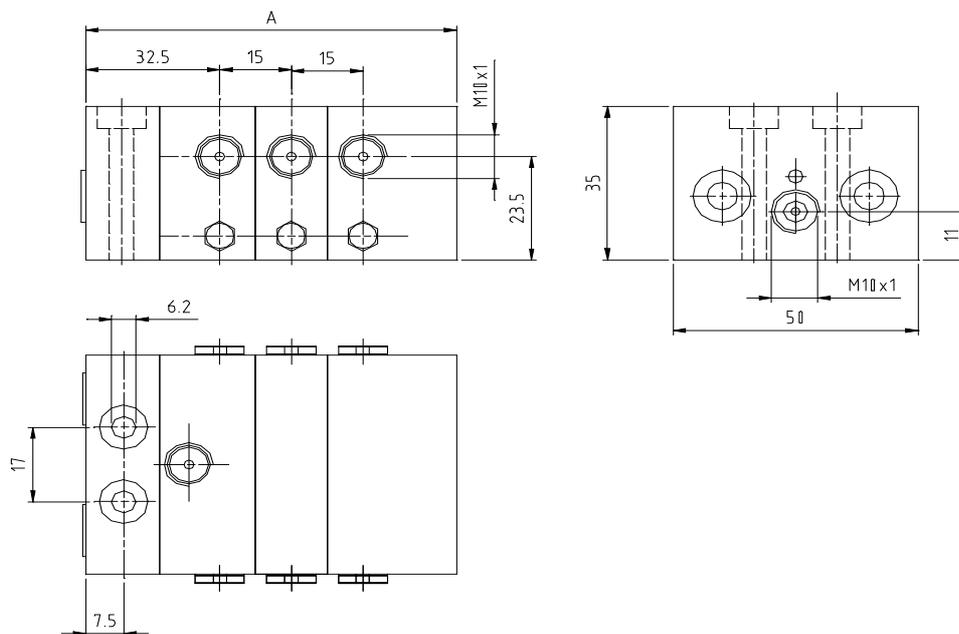
ATTENTION: BEFORE CLOSING AN EXIT REMOVE THE SCREW SW2 IN ORDER TO DISABLE THE BLOCK OF FEEDER.

Technical data and dimensions.

The modular feeders for the progressive system are made of steel and the inside piston in tempered steel. The feeder elements are available with single stroke grease capacity from 0,045 - 0,075 - 0,110 - and 0,165 cm³ for single exit. The seal among the various elements is guarantee by high resistance O-Ring. They can be used both in oil system plant and grease system plant. The principle of operation in "series" allows, with an only control, to verify the correct operation of the plant in all the points of lubrication.

Specification

Working pressure	da 15 a 300 bar
Working temperature	da -20° a +80° C
N° stroke per minute	300 max.
Input connection	M10x1
Output connection	M10x1
Max. elements per feeder	12



N° ELEMENTS	DIMENSIONS		N° ELEMENTS	DIMENSIONS	
	(mm.)			(mm.)	
3	80		8	155	
4	95		9	170	
5	110		10	185	
6	125		11	200	
7	140		12	215	



LUBRICANT GREASE

The general classification has been compiled by NGLI (National Lubricating Grease Institute). The lubricating greases have been gathered according to their ability of penetration measured in tenth of millimetre that the grease suffers at 25° C, after a standard test of job (60 hits) from a cone normalized by the well defined weight (ASTM D 217-67 T).

NLGI GRADE	000	00	0	1	2	3
ASTM Penetration index Tenth of millimetres at 25°C	445-475	400-430	355-385	310-340	265-295	220-250

RECCOMENDEED GREASES

Manufacturer	Lubricant code	Dropping point °C	Penetration Index	Composition
AGIP	Agip GRMU / EP0	180	350 / 370	Lithium+EP additives
	Agip GRMU / EP1	180	310 / 340	Lithium+EP additives
API	Apigrease PGX0	180	355 / 385	Lithium+EP additives
	Apigrease PGX1	190	300 / 340	Lithium+EP additives
BP	Bpgrease LTX/EP0	180	350 / 370	Lithium+EP additives
	Bpgrease LTX/EP1	180	310 / 340	Lithium+EP additives
CASTROL	Spheerol APT1	183	310 / 340	Lithium
	Spheerol EPL0	175	350 / 360	Lithium+EP additives
	Spheerol EPL1	183	310 / 340	Lithium+EP additives
ELF	Traslube LI grease EP0	180	350 / 360	Lithium+EP additives
	Traslube LI grease EP1	180	310 / 340	Lithium+EP additives
ESSO	Beacon EP0	180	355 / 385	Lithium+EP additives
	Beacon EP1	180	310 / 340	Lithium+EP additives
FINA	Finamarson EPL0	180	355 / 385	Lithium+EP additives
	Finamarson EPL1	180	320 / 330	Lithium+EP additives
IP	Athesia EP0	175	355 / 385	Lithium+EP additives
	Athesia EP1	180	310 / 340	Lithium+EP additives
	Silisgrease HTL	infusib.	310 / 340	
KLUBER	KR 380 AA MF	Infusib.	320	Synthetic bisulphide
	Straburags B15/A	280	400	Mo Sodium
MOBIL	Mobilux EP0	190	350 / 390	Lithium+EP additives
	Mobilux EP1	190	305 / 345	Lithium+EP additives
	Mobilplex 46	260	310 / 340	Complex
	Mobiltempe 78	260	295 / 340	Infusible ispes. soap.
ROLOIL	Litex grease EP0	185	355 / 375	Lithium+EP additives
	Litex grease EP1	185	310 / 340	Lithium+EP additives
SHELL	Supergrease EP0	170	400 / 430	Ca+lithium+ EP add.
	Supergrease EP1	180	310 / 340	Ca+lithium+ EP add.
TOTAL	Multis EP00	180	400 / 430	Lithium+EP additives
	Multis EP1	180	310 / 340	Lithium+EP additives
VANGUARD	Liko EP0	180	365 / 385	Lithium+EP additives
	Liko EP1	180	310 / 340	Lithium+EP additives
	LMP 180/0	191	355 / 385	Lithium + Mo S ₂
	LMP 180/1	191	310 / 340	Lithium + Mo S ₂
VISCOL	Signal gren EP0	180	355 / 385	Lithium+EP additives
	Signal gren EP1	185	310 / 340	Lithium+EP additives



TROUBLESHOOTING.

EFFECT	CAUSE	HOW TO OPERATE
Excess of grease on one or more points of greasing.	- feeder with excessive capacity	Change capacity of element
Excess of grease on all points of greasing.	- Excessive working time. - Pause time too short.	Decrease working time or increase pause time by means of knob of electronic timer
Pump not working (Wiper not turn) but led is blinking	- Failure of electric motor. - Plunger incorrectly mounted	Replace pump. Verify correct positioning of plunger(see instruction manual for how to)
Pump not working (wiper not turn) Led is off.	- Power supply pump switched off. - Failure of electronic timer.	Verify that power and polarity are correctly connected. Replace electronic timer.
Pump working but grease is not feeding.	- Empty reservoir. - Air bubble near aspiration zone. - Plunger failure.	Refill of grease reservoir by means refilling connector. Loosen max. pressure valve until grease exit and circuit is purged of air. Replace failed plunger.
Maximum pressure valve activated by circuit point failure.	- One or more points of circuit are obstructed - Feeder obstructed. - Crushed pipeline or obstructed.	Verify the integrity of the pipelines and the feeders and in case is damaged handle the replacement. free the greasing points through a high pressure lever lubricator.
Absence of collar of grease in a point of lubrication.	-Relative lubrication pipe damaged or not hermetic. -Loosen thread connection.	Replace pipeline. Shut the threaded connections and in the case is damaged handle the replacement.
Absence of collar of grease in all points of lubrication.	- Working time too short. - Pause time too long. - Circuit jammed. - Main pipeline crushed.	Increase working time and decrease pause time by means of knob of electronic timer Verify status of main pipeline Verify that maximum pressure valve is not alarmed.



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EFFECTS	CAUSE	HOW TO OPERATE
Spillage of the indicator of block of the valve of maximum pressure.	- Excessive pressure in circuit. - Maximum pressure valve spring jammed. - Feeder jammed.	Check the regular working of all feeders If the circuit is all ok replace maximum pressure valve

BLINKING LED CODE

- When the pump is switched on, the electronic circuit make a test after that, if it's all OK the led of the pump will become of Fixed Green colour: this means that the pump is ready to operate according to the times of work and pause planned. To start the pump press the red start button.
- During the phases of work the led of the pump flashes Green.
- When the pump detects a generic failure the led of the pump flashes Red:
- if the failure is not reset in brief times the led becomes Red Fixed, and the pump is stopped.si interviene in tempi brevi il led diventa ROSSO FISSO, e la pompa si blocca.

PLUNGER REPLACEMENT

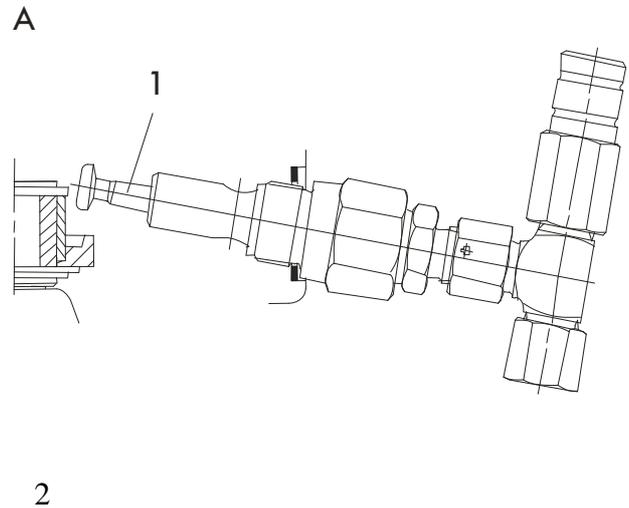
(Pict. A)

To replace the plunger:

Slightly unthread the plunger (pict.1)

Insert the plunger slightly tilted with the point of the piston turns up.

Try to hook the plunger in the eccentric bowl pushing the plunger down after having touched the eccentric with the head of the piston (pict.2)

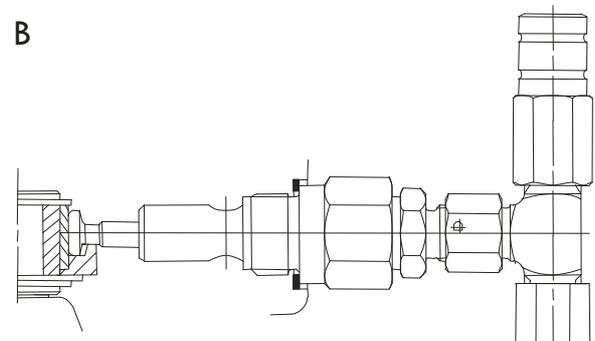


PLUNGER INSERTION

(Pict. B)

After having hooked screw the plunger with a 24mm key in clockwise sense taking care to screw in correct direction.

To make a control of a correct hooked of the plunger start with a manual greasing cycle and check if the wiper of the grease reservoir turns correctly. In contrary case repeat the operation of assemblage because it means that the plunger is not correctly hooked.



Plunger TLS (A)

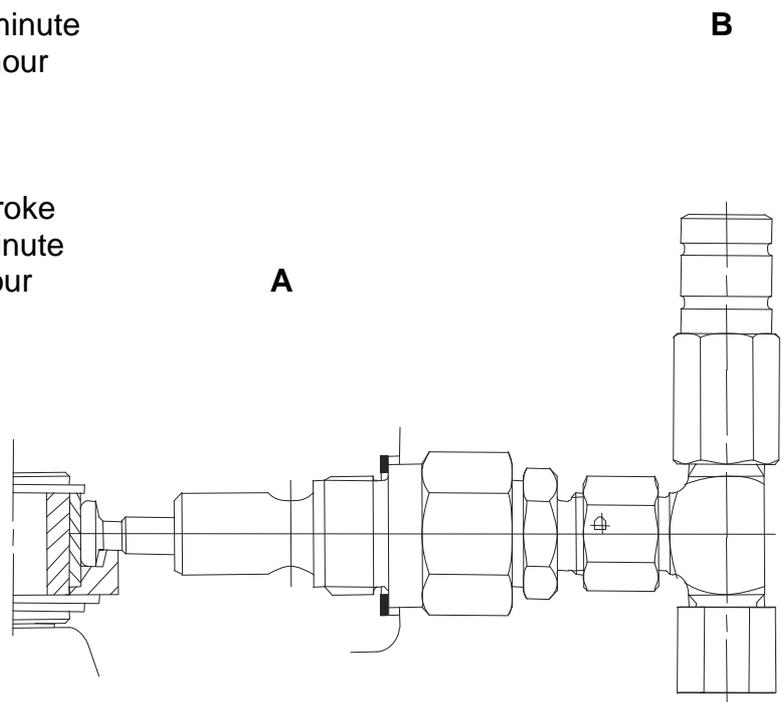
Fixed capacity plunger

Plunger Body : Tempered steel
Plunger : Tempered steel
Plunger diameter : 6,50 mm

Grease debit : 0,23 cm³ per stroke
Grease debit : 4,60 cm³ per minute
Grease debit : 276,00 cm³ per hour

Grease density : 0,98 gr/cm³

Grease debit : 0,217 gr. per stroke
Grease debit : 4,34 gr. per minute
Grease debit : 260,40 gr. per hour



Maximum pressure valve (B)

Pressure set up valve : 250 Bar



System dimensions formula.

Individualized all the points of lubrications of the machine we will calculate the necessary quantity of lubricant for every single point.

Generally the supports to be lubricated are: roller bearings, spheres bearings, bushings, gears, chains and sliding guide. To calculate the necessary quantity of lubricant for every support of the machine considers the following three factors:

DC = Dimensional calculation. It is calculated in function of the dimension of the support or the plain part of machine to be lubricated.

KS = Service factor. Calculate in function of the job conditions of the support.

LB = Type of lubrication request.

DC = Dimensional calculation.

Bearing,bushing	$DC = \frac{D + L}{25}$	D = Shaft diameter in mm. L = Shaft lenght in mm.
Spheres bearing	$DC = \frac{D \times N}{25}$	D = Shaft diameter in mm. N = N° of sphere rows
Gears	$DC = \frac{S}{200}$	S = Projected area in $cm^2 = 3,14 \times$ ext. Diameter in cm. x width in cm.
Chains	$DC = \frac{S}{200}$	S = Projected area in $cm^2 = 3,14 \times$ ext. Diameter in cm. x width in cm.
Sliding guide	$DC = \frac{S}{500}$	S = Contact area in cm^2

KS = Service factor.

Rotation or stroke	Alternate	
	Intermittent	KS = 0,5
	Continuous	KS = 1
Subject parts to heavy jobs with any movement, exposed to elevated temperatures and/or dusty environments, vertical guides or guides without gaskets.		KS = 2



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PERIODIC MAINTENANCE OF THE GREASING SYSTEM

- Check if the green led remains turned on when the pump is waiting for the periodic cycle.
- Periodically check the pump if it correctly turns.
- Periodically check the level of the grease in the reservoir of the pump.
- Periodically check the pipeline if it is without breakups.
- Check the pins, Bushings, slides and anything else if they are correctly lubricated.
- Refill the reservoir of grease before the reserve and not fill it over the maximum level allowed.
- In case of failure of the pump use the lubricator of the main feeders to manually greasing the machine with a manual pump



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REFILLING OF THE PUMP RESERVOIR

To refill the reservoir of the pump with grease needs to use a pump for the grease, manual or better if is pneumatic. With such pumps we need only to hook the output pipe to the head of the lubricator mounted on the body of the pump
Don't refill over the maximum allowed.



Technical data sheet for grease hydraulic pump.
(Drive by flux regulator)
Specification

Code	TP 4001....
Motor	hydraulic 1.350 rpm
Flux regulator	3/8"
RPM pump	from 10 to 22
Oil debit	8 litre/1'
Case protection degree	IP – 55
Reservoir	Gloss Polycarbonate
Reservoir capacity	3,5 Kg ; 5 Kg ; 7Kg.
Max. working pressure	300 bar
N° of pumping element	from 1 to 4
Pumping delivery	0,222 cm ³ /stroke
Pumping delivery per hour	4,44 cm ³ /h (each element)
Working temperature	-30 +80° C
Refilling nipple	greaser nipple (DIN 71412)
Supply grease connector	tubo Ø8
Tube ¼"	2 x mt.3
Lubricant	grease NLGI 2 max- complex paste



Optional: Pump is already available with inox reservoir capacity from kg.7 to kg.10
Refilling inlet on upper cover with integrated filter.