

General

The MEMOLUB® HPS (High Pressure System) is both an advanced design, highly accurate, single point automatic lubricator and a low cost miniature central lubricating system. It operates as a battery powered self-contained lubricator. Models are also available that use an external 4.5, 12 or 24DC volt power source. MEMOLUB® can operate under its own program control, under control of the machine being lubricated or a PLC.

The MEMOLUB® Multi-Point System can be used to lubricate between 2 and 12 lubrication points. Using pipe or tubing, the MEMOLUB® HPS can be mounted remote from the bearing being lubricated (see page 4 for details). This feature is valuable when it is necessary to lubricate hard to reach bearings, to avoid extremely high temperatures, harsh or hazardous environments or when mounting the MEMOLUB® HPS away from excessive vibration.

When operating as a self-contained lubricator the MEMO programming system controls the frequency of lubricant ejection cycles. The MEMO also controls the volume of lubricant ejected on each output cycle when the MEMOLUB® is operating as either a self contained lubricator or under external control.

Installation

On first installation, use a hand grease gun and the same type of lubricant to pre-charge all fittings, lines, the bearings. The MEMOLUB® HPS positive displacement pump has been primed before shipment and is ready for use. If, however, the pump becomes unprimed due to running the lubricator without an empty lubricant cartridge, or operating the lubricator without a cartridge in place, it should be primed

before installing the new lubricant cartridge. This step does not need to be repeated when changing the MEMOLUB® HPS lubricant cartridge. To prime the pump, using a hand grease gun, pump grease through the upper valve of the MEMOLUB® HPS until grease comes out of the bottom outlet. Two pumps of grease is generally sufficient. The "Check Function" (page 2) can be used to insure that the pump is primed.

The MEMO has a 1/4" NPT thread. It can be adapted to other thread sizes using standard adapters. Commonly used adapters are listed on the Installation Parts and Accessories sheet.

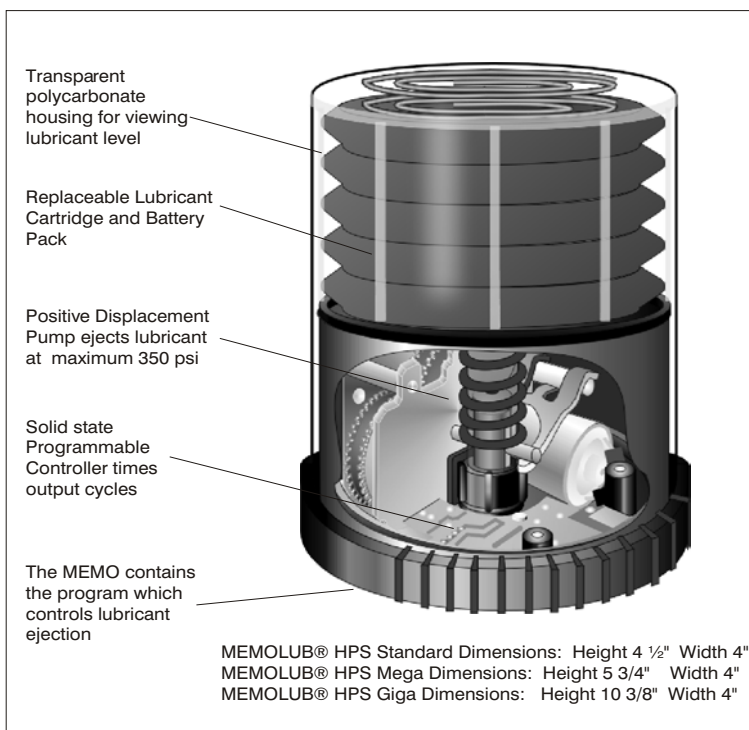
Batteries

MEMOLUB® HPS will operate successfully at temperatures up to 120°F (49°C). Areas of high temperatures can often be serviced by remote mounting the MEMOLUB® HPS using pipe or tubing. If constant low temperatures (i.e. -4°F (-20°C) or lower) are encountered, low temperature approved greases and MEMOLUB Cold Weather Battery Packs should be used. The Cold Weather Battery Pack should always be used when using the MEMOLUB® HPS Giga (Model 480) at temperatures lower than 32°F (0°C).

The test function should be used on a regular basis when working under extreme temperature conditions. The shelf life of a battery pack stored at 68°F is 2 years. Only MEMOLUB® battery packs should be used in the MEMOLUB® HPS lubricator.

External Power Source

MEMOLUB® lubricators using an external power source are described in detail on separate product sheets.



How MEMOLUB® HPS Works

MEMOLUB® HPS is a fully self-contained electro-mechanical lubricator utilizing a patented positive displacement pump.

The main components are a motor, gearbox, piston pump, microprocessor. A cam fitted to the outlet gear drives a lever which lifts the hollow piston and simultaneously compresses a spring. When the piston reaches the top of its stroke, the lever is freed from the cam and the piston begins its downward (working) stroke, driven by the spring. Lubricant is drawn into the chamber formed above the piston during its downward ejection stroke preparing it for the next cycle.



Opening & Closing the MEMOLUB®, Mounting

To open the MEMOLUB® HPS, place the pump body on a flat surface, press the transparent housing downward with one hand while the other hand squeezes the “rippled” part of the locking ring, turning it counterclockwise. The ring is now unlocked and the transparent housing will easily lift off. When closing the MEMOLUB® HPS, grasp the rippled part of the locking ring and turn the locking ring clockwise until it clicks into the locked position. **Important:** Always test that the housing is in the locked position by turning the housing counter-clockwise. When installing the MEMOLUB® HPS Lubricator, screw the MEMOLUB® body onto the memo by gripping only on the smooth part of the locking ring.

Lubricant Cartridges

When installing replacement lubricant cartridges always install a new battery pack. Lube cartridges and battery packs are always sold together as a Replacement Kit. Lubricants available for use in the MEMOLUB® HPS have a weight of NLGI 2 or lighter. It is recommended that in cold applications lubricant with an NLGI 1 or lighter be used. MEMOLUB® HPS with oil filled cartridges should be installed with a Check Valve (Part Number CV-2). When placing a grease filled cartridge onto the pump inlet, remove the plug and compress the cartridge slightly until grease appears at the outlet. Please see the Replacement Kit Instruction sheet for step by step instructions for installing both oil and grease cartridges.

Turn on/turn off

The MEMOLUB® HPS is an electromechanical device. Operation begins instantly when it has been turned on. The MEMOLUB® HPS may be turned off and back on later if a machine is taken out of production and put back into use at a later date. To turn off the MEMOLUB® HPS, simply unscrew it 1 turn. To turn it on, screw it back down onto the MEMO (hand tight).

MEMOS - Setting The Output Rate

Memos are the method used to set the output rate of the MEMOLUB® Lubricator. Once programmed, the Memo is screwed into the bearing and remains there until it is decided to change the output rate. The MEMOLUB® Lubricator is screwed onto the Memo. This turns on the lubricator to eject lubricant at the desired rate.

Memos are supplied with 3 colored plastic rings (black, white and red) and a black plastic ring holder. The timing of lubricant ejection cycles is determined by which ring or combination of rings are placed in the ring holder. The number of ejection cycles per day determines the volume of lubricant entering the bearing. With each cycle, 0.63 cc's of lubricant are injected into the bearing. The rates of daily lubricant output using different ring combinations are shown in the following chart.

MEMOLUB® HPS Lubricator Basic Settings (The Simple Approach)

Note: B = Black Ring / W = White Ring / R = Red Ring

| Memo Program | | | | Model 120 HPS | Model 240 HPS | Model 480 HPS |
|---------------|-----------------|----------------|----------------------|-----------------|-----------------|-----------------|
| Rings (color) | Strokes Per Day | CC's Per Cycle | Daily Output in CC's | Months To Empty | Months To Empty | Months To Empty |
| RWB | 24 | 0.63 | 15.1 | — | 0.5 | 1 |
| RW | 12 | 0.63 | 7.6 | 0.5 | 1 | 2 |
| RB | 4 | 0.63 | 2.5 | 1.5 | 3 | 6 |
| R | 2 | 0.63 | 1.3 | 3 | 6 | 12 |
| BW | 1.5 | 0.63 | 1.0 | 4 | 8 | 16 |
| W | 1 | 0.63 | 0.6 | 6 | 12 | 24 |
| B | 0.5* | 0.63 | 0.3 | 12 | 24 | — |

*Ejection cycle every other day (48 hours)

"Check Function"

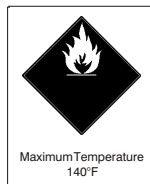
The operation of the MEMOLUB® HPS can be tested using the "Check Function". Simply back off the MEMOLUB® HPS ¾ turn from the MEMO and then turn it back down, hand tight. The MEMOLUB® HPS will immediately go through an output cycle.

Corrosive Environment

The MEMOLUB® HPS is a complete miniature machine with electronics, electrical motor, gear box and piston pump. Corrosive, wet environments will damage the MEMOLUB® HPS even though it is sealed. Hostile environments can be easily identified as machines are corroded and rusty and electrical or electronic equipment will generally not be found installed in the area. The MEMOLUB® HPS must be protected from corrosive, wet or aggressive environments. It should be placed in a protected environment (use piping) or enclosed in a protective cover.

Vibrations

The MEMOLUB® HPS gearbox is a relatively heavy unit and is fitted to the plastic housing. Vibrations will cause it to oscillate in the housing (similar to fretting) and this, with time, will generate play and failure. In cases of vibrations, especially high frequency, remote mount the MEMOLUB® HPS with flexible tubing or install on the application using a Vibration Mount Adapter.

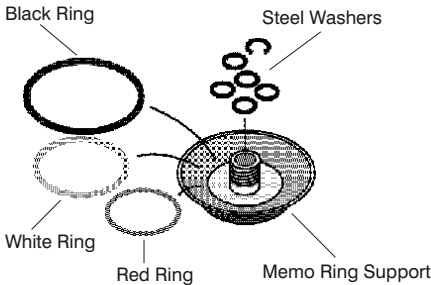


MEMO Programming

The MEMO fitting is permanently screwed into the grease inlet, mounting bracket or progressive distribution block. Its upper bore is an extension of the MEMOLUB® HPS piston cylinder. Adding special MEMOLUB® HPS washers into this bore shortens the working stroke of the piston and thus reduces lubricant output.

One, two or all of the colored timer rings are selected and placed in the black MEMO timing ring holder. This controls the micro switches on the base of the unit, thus selecting the frequency of the lubrication cycle.

The MEMOLUB® HPS Output Chart shows the timing ring and number of washers required to program any of the 50 available output rates. The output rates that are outlined in boxes are those most frequently used.



The locking washer counts as one washer. Always install the locking washer in the MEMO last where multiple washers are required. If only one washer is called for, use the locking washer. The programmed output rate may be changed at any time by pushing the washers back out of the MEMO and changing the number of washers used.

The MEMO normally remains on the lube point when the MEMOLUB® HPS is removed for replacement of the lubricant cartridge and battery pack.

In relating the output of the MEMOLUB® HPS to manual lubrication practice, generally one stroke from a hand grease gun is equal to 1cc of grease.

Fine Tuning the Output Program

In many lubrication situations, the lubricant output rates available using the timing rings alone will meet the application requirement. In applications where you want to "fine tune" lubricant output, it is possible to adjust the volume of lubricant ejected on each cycle.

This adjustment is made by placing from 1 to 8 specially designed steel "stop washers" in the bore of the MEMO. These serve to restrict the distance of travel of the pump piston, thus adjusting the output. Over 50 output rates are available for selection.

| MEMOLUB® HPS | | | | Fine Tuning Your Lubrication Program | | | | | | | | |
|---------------------------------|--------------|-----------------|----------------------|--------------------------------------|----------------|-----------------|----------------------------------|----------------|-----------------|----------------------------------|----------------|-----------------|
| Program | | | | Model 120 HPS 120 cc Capacity | | | Model 240 HPS 240 cc Capacity | | | Model 480 HPS 480 cc Capacity | | |
| Timing Rings | # Of Washers | CC's Per Stroke | Daily Output in CC's | Days To Empty | Weeks To Empty | Months To Empty | Days To Empty | Weeks To Empty | Months To Empty | Days To Empty | Weeks To Empty | Months To Empty |
| RWB 24 Strokes Per Day | | | | | | | | | | | | |
| | 0 | 0.63 | 15.12 | 7.9 | 1 | | 15.9 | 2 | 0.5 | 31.7 | 4 | 1 |
| | 1 | 0.59 | 14.16 | 8.5 | 1 | | 16.9 | 2 | | 33.9 | 4 | |
| | 2 | 0.55 | 13.20 | 9.1 | 1 | | 18.2 | 3 | | 36.4 | 5 | |
| | 3 | 0.51 | 12.24 | 9.8 | 1 | | 19.6 | 3 | | 39.2 | 5 | |
| | 4 | 0.47 | 11.28 | 10.6 | 1 | | 21.3 | 3 | | 42.6 | 6 | |
| | 5 | 0.43 | 10.32 | 11.6 | 1 | | 23.3 | 3 | | 46.5 | 6 | |
| | 6 | 0.39 | 9.36 | 12.8 | 1 | | 25.6 | 4 | | 51.3 | 7 | |
| | 7 | 0.35 | 8.40 | 14.3 | 2 | | 28.6 | 4 | | 57.1 | 8 | |
| RW 12 Strokes Per Day | | | | | | | | | | | | |
| | 0 | 0.63 | 7.56 | 15.9 | 2 | 0.5 | 31.7 | 5 | 1 | 63.5 | 9 | 2 |
| | 1 | 0.59 | 7.08 | 16.9 | 2 | | 33.9 | 5 | | 67.8 | 9 | |
| | 2 | 0.55 | 6.60 | 18.2 | 2 | | 36.4 | 5 | | 72.7 | 10 | |
| | 3 | 0.51 | 6.12 | 19.6 | 2 | | 39.2 | 6 | | 78.4 | 11 | |
| | 4 | 0.47 | 5.64 | 21.3 | 3 | | 42.6 | 6 | | 85.1 | 12 | |
| | 5 | 0.43 | 5.16 | 23.3 | 3 | | 46.5 | 7 | | 93.0 | 13 | 3 |
| | 6 | 0.39 | 4.68 | 25.6 | 3 | | 51.3 | 7 | | 102.6 | 14 | |
| | 7 | 0.35 | 4.20 | 28.6 | 4 | | 57.1 | 8 | | 114.3 | 16 | |
| | 8 | 0.31 | 3.72 | 32.3 | 4 | 1 | 64.5 | 9 | 2 | 129.0 | 18 | 4 |
| RB 4 Strokes Per Day | | | | | | | | | | | | |
| | 0 | 0.63 | 2.52 | 47.6 | 6 | 1.5 | 95.2 | 12 | 3 | 190.5 | 27 | 6 |
| | 1 | 0.59 | 2.36 | 50.8 | 7 | | 101.7 | 14 | | 203.4 | 29 | |
| | 2 | 0.55 | 2.20 | 54.5 | 8 | | 109.1 | 15 | | 218.2 | 31 | |
| | 3 | 0.51 | 2.04 | 58.8 | 8 | | 117.6 | 17 | | 235.3 | 33 | |
| | 4 | 0.47 | 1.88 | 63.8 | 9 | | 127.7 | 18 | | 255.3 | 36 | |
| | 5 | 0.43 | 1.72 | 69.8 | 10 | | 139.5 | 20 | | 279.1 | 39 | |
| | 6 | 0.39 | 1.56 | 76.9 | 11 | | 153.8 | 22 | | 307.7 | 43 | |
| | 7 | 0.35 | 1.40 | 85.7 | 12 | | 171.4 | 24 | | 342.9 | 49 | |
| R 2 Strokes Per Day | | | | | | | | | | | | |
| | 0 | 0.63 | 1.26 | 95.2 | 13 | 3 | 190.5 | 26 | 6 | 381.0 | 54 | 12 |
| | 1 | 0.59 | 1.18 | 101.7 | 14 | | 203.4 | 28 | | 406.8 | 58 | |
| | 2 | 0.55 | 1.10 | 109.1 | 15 | | 218.2 | 30 | | 436.4 | 62 | |
| | 3 | 0.51 | 1.02 | 117.6 | 16 | | 235.3 | 32 | | 470.6 | 67 | |
| BW 1.5 Strokes Per Day** | | | | | | | | | | | | |
| | 0 | 0.63 | 0.95 | 127.0 | 18 | 4 | 254.0 | 36 | 8 | 507.9 | 72 | 16 |
| | 1 | 0.59 | 0.89 | 135.6 | 19 | | 271.2 | 38 | | 542.4 | 77 | |
| | 2 | 0.55 | 0.83 | 145.5 | 20 | | 290.9 | 40 | | 581.8 | 83 | |
| | 3 | 0.51 | 0.77 | 156.9 | 22 | | 313.7 | 44 | | 627.5 | 89 | |
| | 4 | 0.47 | 0.71 | 170.2 | 24 | | 340.4 | 48 | | 680.9 | 97 | |
| | 5 | 0.43 | 0.65 | 186.0 | 26 | | 372.1 | 52 | | 744.2 | 106 | |
| W 1 Strokes Per Day | | | | | | | | | | | | |
| | 0 | 0.63 | 0.63 | 190.5 | 27 | 6 | 381.0 | 54 | 12 | 761.9 | 108 | 24 |
| | 1 | 0.59 | 0.59 | 203.4 | 29 | | 406.8 | 58 | | | | |
| | 2 | 0.55 | 0.55 | 218.2 | 31 | | 436.4 | 62 | | | | |
| | 3 | 0.51 | 0.51 | 235.3 | 33 | | 470.6 | 66 | | | | |
| | 4 | 0.47 | 0.47 | 255.3 | 36 | | 510.6 | 72 | | | | |
| | 5 | 0.43 | 0.43 | 279.1 | 39 | 9 | 558.1 | 78 | 18 | | | |
| | 6 | 0.39 | 0.39 | 307.7 | 44 | | 615.4 | 88 | | | | |
| | 7 | 0.35 | 0.35 | 342.9 | 49 | | 685.7 | 98 | | | | |
| B 0.5 Strokes Per Day*** | | | | | | | | | | | | |
| | 0 | 0.63 | 0.32 | 381.0 | 54 | 12 | 761.9 | 108 | 24 | | | |
| | 1 | 0.59 | 0.30 | 406.8 | 58 | | | | | | | |
| | 2 | 0.55 | 0.28 | 436.4 | 62 | | | | | | | |
| | 3 | 0.51 | 0.26 | 470.6 | 67 | | | | | | | |
| | 4 | 0.47 | 0.24 | 510.6 | 73 | | | | | | | |
| | 5 | 0.43 | 0.22 | 558.1 | 79 | 18 | | | | | | |
| | 6 | 0.39 | 0.20 | 615.4 | 87 | | | | | | | |
| | 7 | 0.35 | 0.18 | 685.7 | 97 | | | | | | | |
| | 8 | 0.31 | 0.16 | 774.2 | 110 | 24 | | | | | | |

*We recommend that Battery Packs and Lubricant Cartridges be changed at no more than 12 month intervals
 Ejection cycle every 16 hours / * Ejection cycle every other day

Preprogrammed Memos

Preprogrammed MEMOs may be specified at time of order. When ordering the part number (i.e. RWB3 would indicate the Red, White and Black rings with 3 preprogrammed MEMOs, please indicate washers) and output rate desired.

Lubricants

MEMOLUB® HPS cartridges are available with standard or premium lubricants. Please see the MEMOLUB® Replacement Kit Price List for details. If a lubricant is required that is not on the price list, please call for a quotation.

Remote Installation - Pipe & Tubing

Pipe or tubing may be used with the MEMOLUB® HPS to reach remotely located lubrication points or those in high temperature, dangerous or hazardous areas. The maximum length of piping that should be used is shown in the chart. When using greases with heavy base oils, the piping length should be reduced. If there is a question about the base oil viscosity (ISO) of a particular lubricant, PLI will provide this information upon request.

This chart assumes that an NLGI #2 grease is being used and that the application is operating in an ambient temperature of 68°F or warmer. At colder temperatures, pipe length should be reduced.

In all cases, pipe, tube, fittings and distribution blocks (if used) should be filled with the correct lubricant before installing the MEMOLUB® HPS. The best rule for remote installation is not to over do it, but to mount the MEMOLUB® HPS using the shortest route possible.

SPECIFICATIONS

MEMOLUB® HPS

| | |
|-------------------------------|---|
| Applications | 1 to 12 Lube Points (with distribution block) |
| Operating Pressure | 350 psi |
| Pressure Build-up | Immediate |
| Check Function | Yes |
| Stop/Start | Immediate |
| Temperature Range | +5°F and +120°F |
| Electronic Controls | Quartz Timer, Microprocessor |
| Lubricants | Oils & Greases to NLGI 2 |
| Battery Pack | 4.5v Alkaline or 4.5v Lithium Cold Temp |
| Housing | Translucent Polycarbonate |
| Installation Thread | 1/4" npt |
| Remote Installation | Up to 40 feet |
| Reusable | Yes |

Installation Parts and Accessories

A variety of parts and accessories are available for convenient installation of the MEMOLUB® HPS. Dust/Rain Covers keep the MEMOLUB® HPS dry and clean in dirty, damp and outdoor applications. Other parts and accessories include Adapters, Mounting Brackets, Multi-Point Systems, tubing and fittings. See the Installation Parts and Accessories Price Sheet for details.

Pipe & Tubing Length

| Base Oil-Viscosity of Lubricant | Maximum Length | Remote Installation Pipe or Tubing Diameter | | When Using Distribution Block Pipe or Tubing Diameter | |
|---------------------------------|----------------|---|----------------|---|----------------|
| | | 1/4" OD | 5/16" OD (8mm) | 1/4" OD | 5/16" OD (8mm) |
| ISO 100 | Feet | 20 | 39 | 13 | 33 |
| | Meters | 6 | 12 | 4 | 10 |
| ISO 700 | Feet | 13 | 26 | 7 | 20 |
| | Meters | 4 | 8 | 2 | 6 |
| ISO 1500 | Feet | 10 | 20 | 3 | 13 |
| | Meters | 3 | 6 | 1 | 4 |

Dimensions:

| | |
|----------------------------------|--------------|
| Standard Model 120 HPS | 4 1/2" x 4" |
| Mega Model 240 HPS | 5 3/4" x 4" |
| Giga Model 480 HPS | 10 3/8" x 4" |

Cartridge Capacity:

| | |
|------------------------------|-----------------------|
| Standard Model 120 | 120cc (approx 4 oz) |
| Mega Model 240 | 240cc (approx 1/2 lb) |
| Giga Model 480 | 480cc (approx 1 lb) |

MEMO:

| | |
|-------------------------------------|--------------------------------|
| Output Adjustment | 52 Settings |
| Frequencies/Ejection | |
| Cycles per 24 hour period | 24, 12, 4, 2, 1.5*, 1 and .5** |

* One Cycle every 16 hours

**Ejection cycle every other day

MEMOLUB® HPS carries a 2 year limited warranty from date of purchase for defects in parts and labor. Disassembly of drive unit or use of batteries other than MEMOLUB battery packs voids warranty. Not responsible for consequential damages beyond replacement of product or refund of amount paid. MEMOLUB® HPS is a registered Trademark of Memolub International.



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