

# Technical Sheet

## Type AA & AB Mechanical Pump Conversion



### General & Background

The BIJUR brand mechanical pumps were developed in the 1940's and evolved before electric driven lubricators were available. They are known for their durability, in providing oil to a BIJUR Single Line Resistance system. By the 1980's the pumps were gradually phased out for more popular electric and pneumatic operated pumps, using the same BIJUR SLR resistance distribution system. As mechanical usage tapered off the ability to manufacture them became difficult to the point where we had to make the hard decision of not investing further into their production. Industry moved on to competitive electric controlled systems that allowed more monitoring features and flexibility.

### Scope of Replacement

This document offers suggestions on replacing the obsolete "AA & AB" mechanical pumps with a Surefire II electric pump designed to charge and release a fixed oil volume. The output is controlled by the number of pump actuations, using an internal timer. With each pump cycle the single ZEM39 oil injector will discharge 1.5 cc's or ~45 drops. The discharge volume is divided by the existing "Meter-Units" to proportion oil to the bearings. With numerous machines produced in the last 50 years, it is important that the Surefire settings used allow system oil pressure to rise to 10 P.S.I., this will allow the Meter Units to open their internal check valve (5 P.S.I) and flow. IF the system pressure cannot be achieved, contact Bijur Delimon International applications engineering. After checking for obvious leaks other solutions are possible including adding a second ZEM39 manifold or going to a direct feed by removing the ZEM39. The SureFire II includes the pump and drive motor in single phase AC or DC voltages. Reservoir options include new clear plastic or sheet metal reservoirs, all with a low oil level switch. The existing AA/AB cast metal tank is no longer utilized. The lubricator has a unique feature to limit and relieve oil pressure between time cycles. With each cycle internal oil pressure on the pump gauge will rapidly rise to 450 P.S.I. (30 bar) and drop to 10~15 P.S.I (1 bar) between cycles. This allows for the ZEM39 to actuate one time. The SLR resistance system pressure will be maintained at the low pressure if no leaks exist. With each pump cycle, pump pressure will quickly rise, and need only to be held at this pressure for a few seconds. No additional oil is delivered if the pump runs longer, it must lower to reset. Total system oil flow is limited to 1.5 cc's per cycle for a single ZEM39 oil injector. The purpose of the existing system Meter-Units is to provide a ratio and proportion the total oil flow. The oil film can be calculated for individual bearings or the entire system using area calculations. Contact application engineering for help if embarking on a new system design. (Oil viscosity and indirectly temperature affect flow rate (but not with a PDI )



SureFire II-ZEM Combo

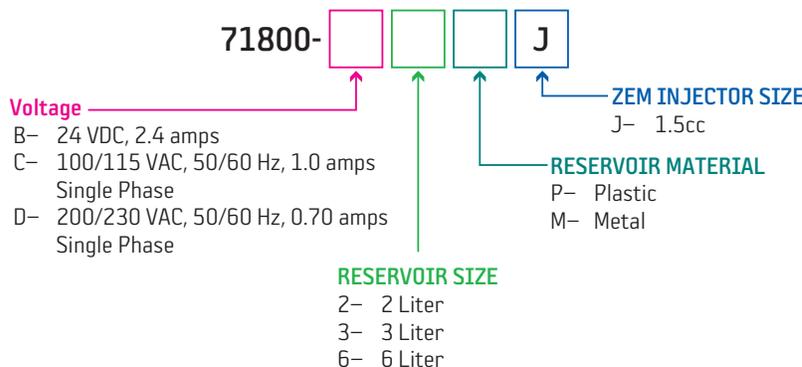


AA Mechanical Pump

### Replacement of Mechanical Pumps

For replacing any of the AA & AB mechanical Bijur pumps operated by belt, chain or hydraulic it is important to determine the part number on the cover. The metal tag will have a letter D followed by 4-digits for the exact model. The next 2 letters are the date code and not needed. To calculate pump interval and output per hour, follow the chart on pages 2-3 for the Lubricator model for the desired output. The SureFire II is used in conjunction with a single positive displacement injector ZEM39. The injector is connected to the pump outlet with an thread adapter. The ZEM39 will limit oil volume precisely.

### How to Order



#### Note:

See Meter Unit Flow ratings see Bijur Manual #258.

See SureFire II operation, see Datasheet # 36410 & Operators Manual #36412 for programming the timer.

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### AA - Cam Setting, Cycle Time and Discharge of Mechanical Pumps

See below chart for settings of the mechanical pumps. Note, discharge figures below are with a normal drive speed and with the Bypass valve closed. The Bypass valve could be opened to reduce discharge to any desired amount down to 50% of the figures below. (If this is the case, then adjust the Surefire II Timer off time.)

AA Pump Settings with Bypass Valve Closed							SureFire II Pump Settings with 1.5cc ZEM		
Type	P.N.	R.P.M.	Shaft Speed	Cam Setting No.	Cycle Time	Discharge per Cycle	SureFire II On Time	SureFire II Off Time	
AAA-L3 AAA-R3	D2230 D2231	45	Min	1	37 Min.	8cc	3 Sec.	6:56	
				2				11cc	5:01
AAB-L3 AAB-R3	D2232 D2221	100		3				14cc	3:56
				4				21cc	2:36
AAD-L3 AAD-R3	D2233 D2234	400		5	9.3 Min.	10cc		1:21	
AAE-L3 AAE-R3	D2235 D2236	650		6				14cc	0:57
				7				21cc	0:37
AAC-L3 AAC-R3	D2237 D2238	1200		8				32cc	0:23
AAA-L3 AAA-R3	D2230 D2231	67	Normal	1	25 Min.	8cc	3 Sec.	4:38	
				2				11cc	3:22
AAB-L3 AAB-R3	D2232 D2221	150		3				14cc	2:38
				4				21cc	1:44
AAD-L3 AAD-R3	D2233 D2234	600		5	6.25 Min.	10cc		0:53	
AAE-L3 AAE-R3	D2235 D2236	1000		6				14cc	0:37
				7				21cc	0:24
AAC-L3 AAC-R3	D2237 D2238	1800		8				32cc	0:15
AAA-L3 AAA-R3	D2230 D2231	110	Max	1	15 Min.	8cc	3 Sec.	2:48	
				2				11cc	2:02
AAB-L3 AAB-R3	D2232 D2221	250		3				14cc	1:35
				4				21cc	1:02
AAD-L3 AAD-R3	D2233 D2234	1000		5	3.75 Min.	10cc		0:31	
AAE-L3 AAE-R3	D2235 D2236	1650		6				14cc	0:22
				7				21cc	0:13
AAC-L3 AAC-R3	D2237 D2238	3000		8				32cc	0:08*

\*For cycle of 0:08 seconds 24VDC SureFire II model has to be used.  
115/230VAC has a minimum off time of 0:12 seconds due to duty cycle of motor.

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### AB - Cam Setting, Cycle Time and Discharge of Mechanical Pumps

See below chart for settings of the mechanical pumps. Note, discharge figures below are with a normal drive speed and with the Bypass valve closed. The Bypass valve could be opened to reduce discharge to any desired amount down to 50% of the figures below. (If this is the case, then adjust the Surefire II Timer off time.)

AB Pump Settings with Bypass Valve Closed							SureFire II Pump Settings with 1.5cc ZEM	
Type	P.N.	R.P.M.	Shaft Speed	Cam Setting No.	Cycle Time	Discharge per Cycle	SureFire II On Time	SureFire II Off Time
ABA-L3 ABA-R3	D2239 D2240	45	Min	1	335 Min.	8cc	3 Sec.	1:02:02
ABB-L3 ABB-R3	D2241 D2242	100		2		14cc		35:51
ABD-L3 ABD-R3	D2243 D2244	400		3	167.5 Min.	14cc		17:54
ABE-L3 ABE-R3	D2245 D2246	650		4		32cc		7:48
ABC-L3 ABC-R3	D2247 D2248	1200						
ABA-L3 ABA-R3	D2239 D2240	67	Normal	1	225 Min.	8cc	3 Sec.	42:08
ABB-L3 ABB-R3	D2241 D2242	150		2		14cc		24:03
ABD-L3 ABD-R3	D2243 D2244	600		3	112.5 Min.	14cc		12:00
ABE-L3 ABE-R3	D2245 D2246	1000		4		32cc		5:13
ABC-L3 ABC-R3	D2247 D2248	1800						
ABA-L3 ABA-R3	D2239 D2240	110	Max	1	137 Min.	8cc	3 Sec.	25:39
ABB-L3 ABB-R3	D2241 D2242	250		2		14cc		14:39
ABD-L3 ABD-R3	D2243 D2244	1000		3	68.5 Min.	14cc		7:17
ABE-L3 ABE-R3	D2245 D2246	1650		4		32cc		3:10
ABC-L3 ABC-R3	D2247 D2248	3000						

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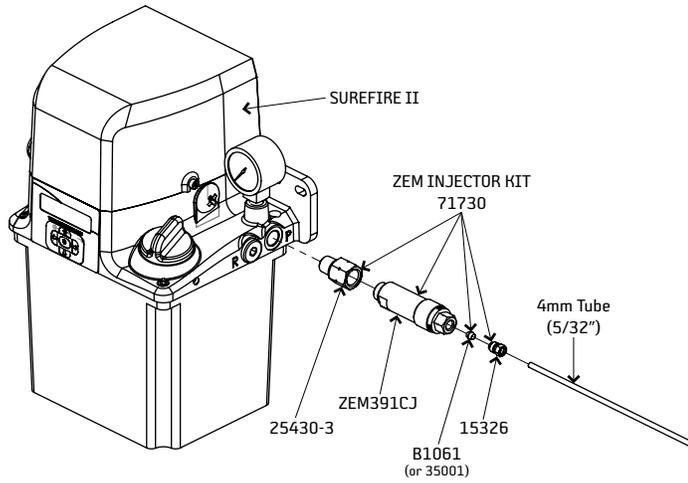
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### Exploded View

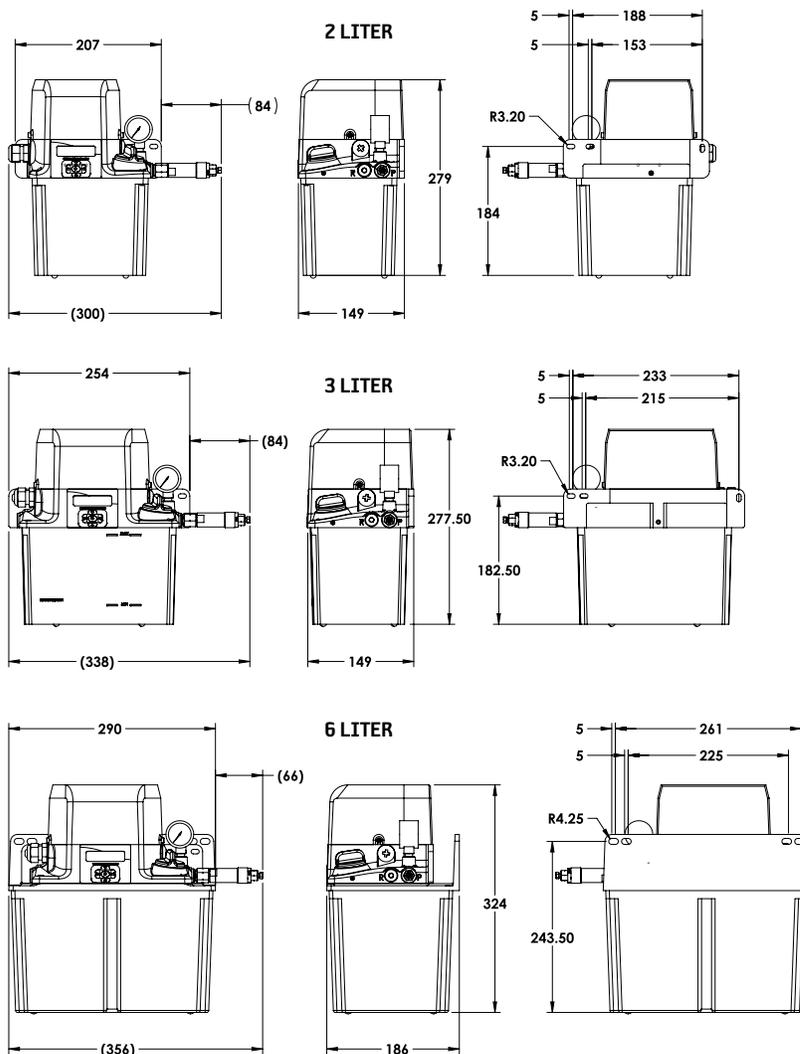


SureFire II Pump



ZEM391CJ Injector

### Dimensions



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