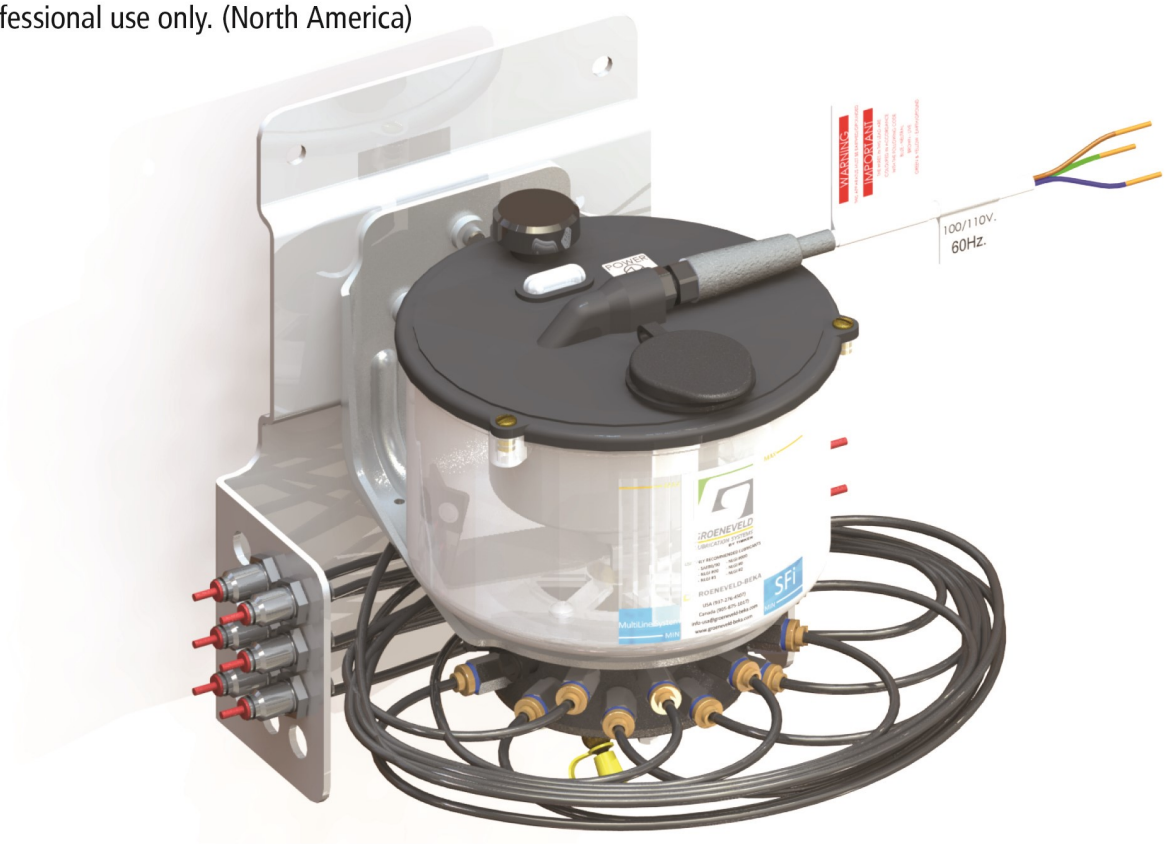
Groeneveld®

MultiLine SFi

MSFi Operation & Maintenance Manual

This Manual is applicable to the MSFi lubrication kits only.
For professional use only. (North America)



Applies to:

Applicable Pumps:
AC15XXL-2-A, AC25XXL-2-A, AX13XXL-A, AX23XXL-A

Applicable Kits:
MSFI-XLXXX-XXXX

- *Maximum working pressure: 1740 psi (120 bar, 12 MPa)*
- *Maximum operating temperature: 140°F/60°C (Note that operating close to maximum temperature will effect life of the pump)**
- *Minimum operating temperature: -31°F/-35°C (with grade 000 grease), 10°F/-12°C (with grade 2 grease).*
- *Power rating: IP66*
- *Voltage: 24 VDC, 110V/220 VAC (50/60Hz)*
- *Power rating: 4VA*
- *Fuse rating: 1A*

**Max pumpability distance: 35ft (10.7m)*
**Temperature and lubricant dependent*

GROENEVELD-BEKA
LUBRICATION SYSTEMS BY TIMKEN

Installation Warning

WARNING

Failure to observe the following warnings could create a risk of death or serious injury.

INSTALLATION

Only install the Groeneveld MultiLine SFi Kit if you are suitably qualified. Read installation instructions before commencing installation. If in doubt contact Groeneveld-BEKA at 937-276-4507.

PERSONAL PROTECTIVE CLOTHING

You must wear appropriate protective equipment when operating and servicing the equipment, this is to protect you from serious injury. This equipment includes but is not limited to:

Protective eyewear.

Respirators, protective clothing and gloves as recommended by the lubricant manufacturer.

PLASTIC PART CLEANING SOLVENT HAZARD

Many solvents can damage plastic parts and cause them to fail, which could cause serious injury or property damage. Use only compatible cleaning products.

ENVIRONMENT

Ensure that all lubricants are responsibly disposed of in accordance with the manufacturer's MSDS sheets and local regulations. Groeneveld-BEKA UK Ltd operate an equipment take back scheme, please contact us for further details.

Please retain this document for reference and future use.

EC Declaration of Conformity

In accordance with ISO/IEC 17050-1:2010

We Groeneveld-Beka UK Ltd

Of 85a St Modwen Rd, Parkway Industrial Estate, Plymouth, Devon, United Kingdom, PL6 8LH.

I hereby declare that:

Equipment: MultiLine SFi Automatic Lubrication Systems

In accordance with the following Directive (s):

2004/108/EC	The Electromagnetic Compatibility Directive
2006/42/EC	Machinery Directive
2011/65/EC	Restriction of Certain Hazardous Substances

Has been designed and manufactured to the following specifications:

BS EN 61000-6-2:2005, BS EN 61000-6-4:200, EN 60204-1

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all essential requirements of the Directives.

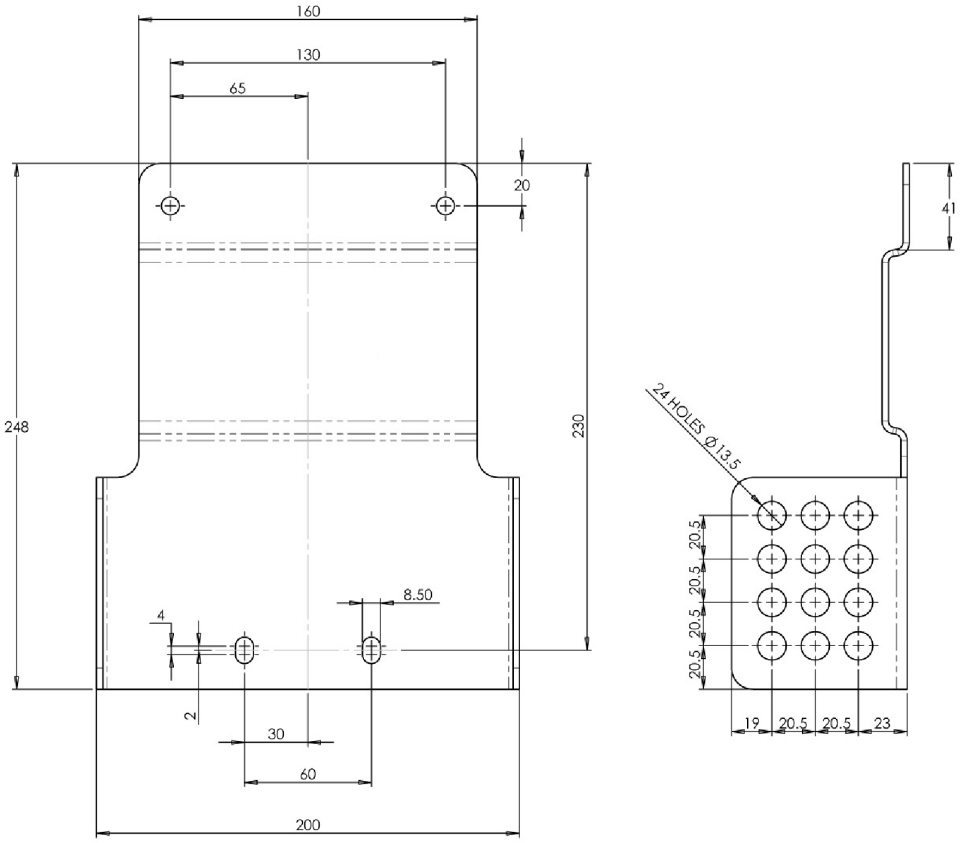
Signed:

Richard Butler FCMI
Divisional Managing Director

Name:	Richard Butler	Position:	Divisional Managing Director
Done at:	Plymouth, UK	Date:	04/01/2016

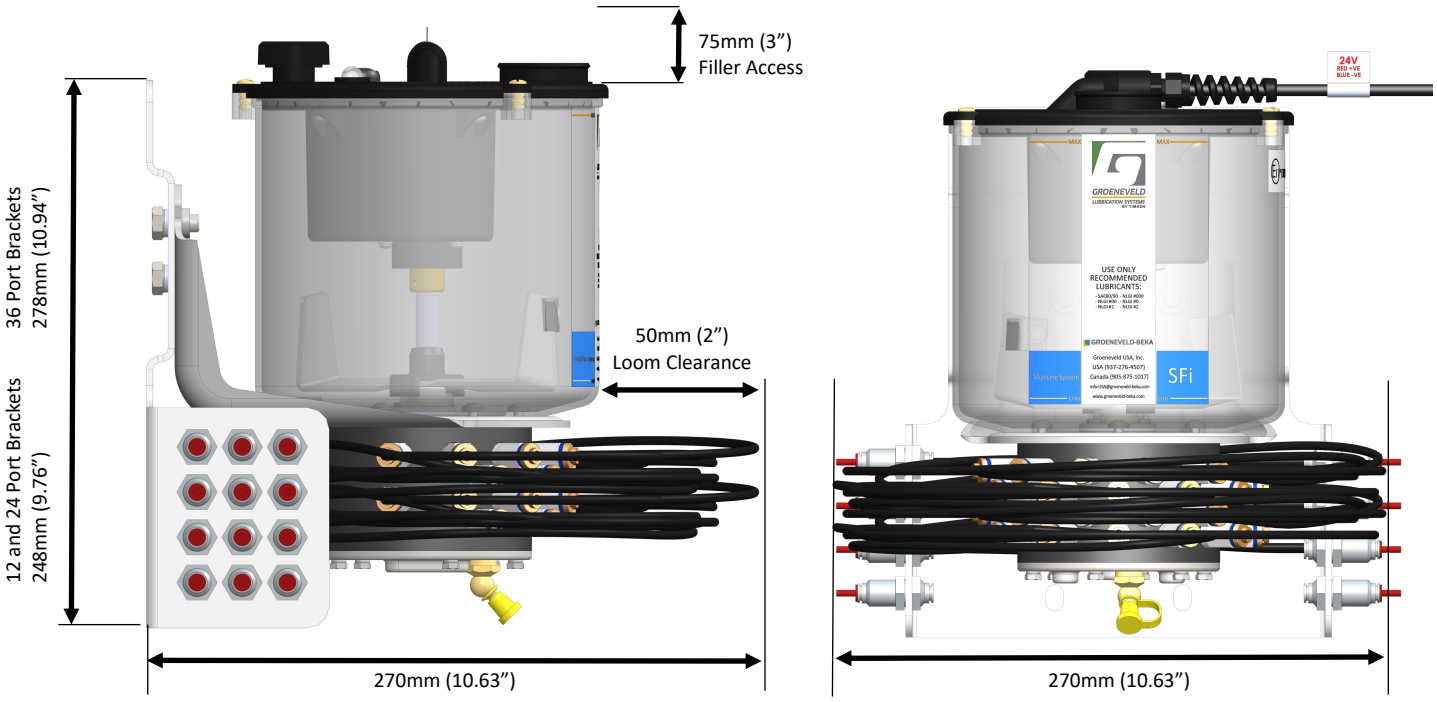
Document Ref: ISF 328 Issue 3

Mounting and Clearance



Select a suitable mounting point for the pump on the machinery, preferably in a position where it is protected from debris. Ensure adequate clearance for the looming and re-filling is provided (see image below for clearance allowances). Do not mount the pump onto ancillary equipment. Using the pump-mounted adhesive template (part number 31867-900), supplied, position and drill the bracket holes (mounting positions and bracket clearances detailed as per the above image). Use bolts, nuts and spring washers supplied to securely mount the pump in position. If your application requires filling from the top-fill cap, be sure to allow at least 75mm clearance for access.

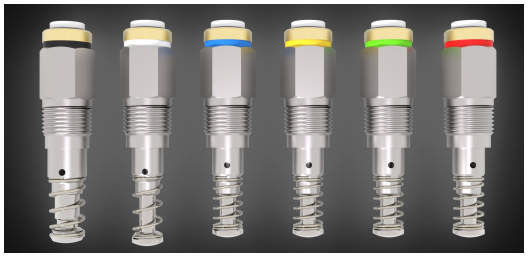
Pump Clearance Requirements



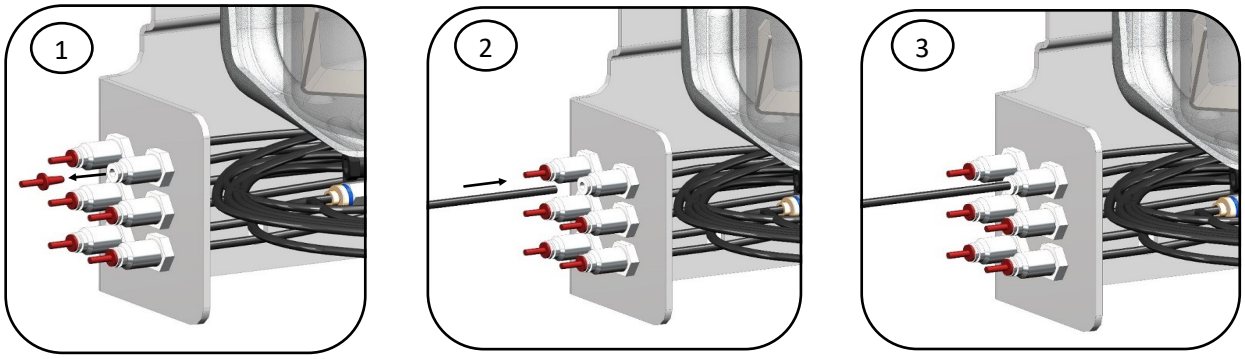
The MultiLine SFi kits are pre-calibrated with MSFI-P-B040, blue, pumping elements (0.04cc output per stroke). The 110/220 VAC pump's integrally adjustable timer is preset to setting #3 (6min run and 30min delay). The 12/24 VDC pump's externally adjustable timer is preset to setting #4 (3min run and 27min delay). A selection of pumping elements with varying outputs are available to suit almost any need:

Standard pump elements for AXL pumps.			
Part No.	**Output/stroke**	**Color**	**Size**
MSF-P-R010	0.010 cc	Red	Ø4mm Push-Lock
MSF-P-G015	0.015 cc	Green	
MSF-P-Y025	0.025 cc	Yellow	
MSF-P-B040	0.040 cc	Blue	
MSF-P-G060	0.060 cc	Grey	
MSF-P-B100	0.10 cc	Black	

Output pressure	
Maximum output pressure from each pumping element	**1740PSI/120 Bar**



Making the Looms and Connections



REMOVE **POSITION LUBRICATION** **INSERT LUBRICATION**

Overview:
The MultiLine SFi kits are pre-loomed from the pumping element to the bulkhead connections on the pump bracket. The push-fit connectors provide an easy installation of the lines to the bulkhead connectors. The lubrication line should be Groeneveld-BEKA ø4mm, semi-rigid, nylon tubing. It is recommended that the tubing is pre-filled with grease to save on the need to prime the system once installed.
From the pump position establish the most convenient route for the lubrication lines. It may be preferred to group the lines into looms depending on pump location and quantity and positioning of the grease points. If grouping the lines into looms, allow sufficient length for connection to the bulkhead outlet connectors and the bearings, making an allowance for movement on the machinery. In conjunction with the 'Installation Record' sheet (see page 18), fit the number identification sleeves to the lines at the pump and bearing ends. The loom should be protected along its length with the conduit/spiral binding/sleeving and/or tape (for part numbers see Accessories on page 16).

Installation:
Working from the furthest point from the pump, feed the lubrication lines through the machine following existing machine services where possible. Ensure that the lubrication lines are positioned to fit the bearing fittings. Where a bearing is on a moving part, ensure that the line is sufficient to allow for full movement. To avoid rubbing or friction with moving parts, grommets or protective sleeving should be used. Also, depending on the severity of movement, compression fittings may be preferred at the bearing points.

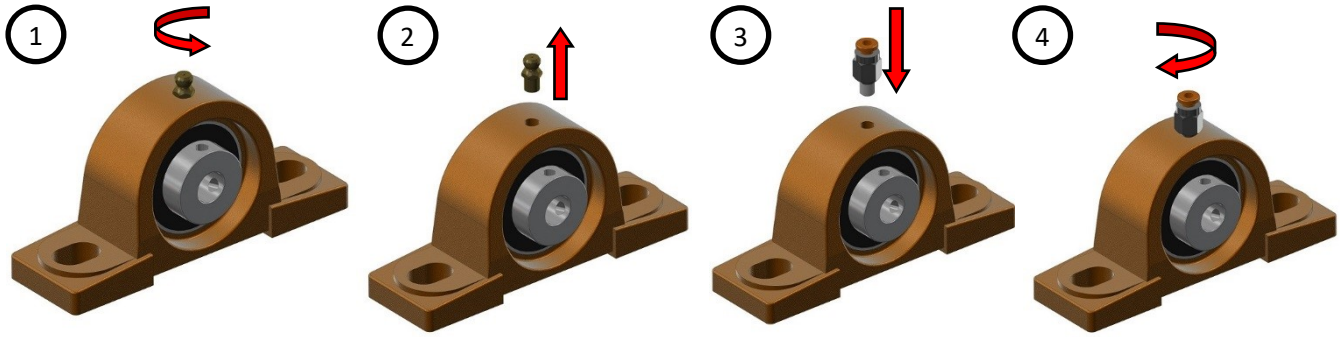
Connecting the lines:
Cut each lubrication line to length ensuring a clean, square cut is achieved and connect to the bearing using push fit or compression connectors. Ensure tubing is pushed firmly into connector. Test the assembly by pulling firmly on the line after installation.

To connect to bulkhead fittings on the pump bracket follow steps 1-3 as shown above. Remove plug from bulkhead and push the line firmly into the bulkhead. Again, ensure tubing is pushed firmly into connector. Test the assembly by pulling firmly on the line after installation. Using the 'Installation Record' sheet (see page 18) connect the lines to the corresponding numbered pumping elements.
Note: All damaged lubrication lines should be replaced using genuine spare parts, failure to do so can cause system malfunctions and major safety issues.

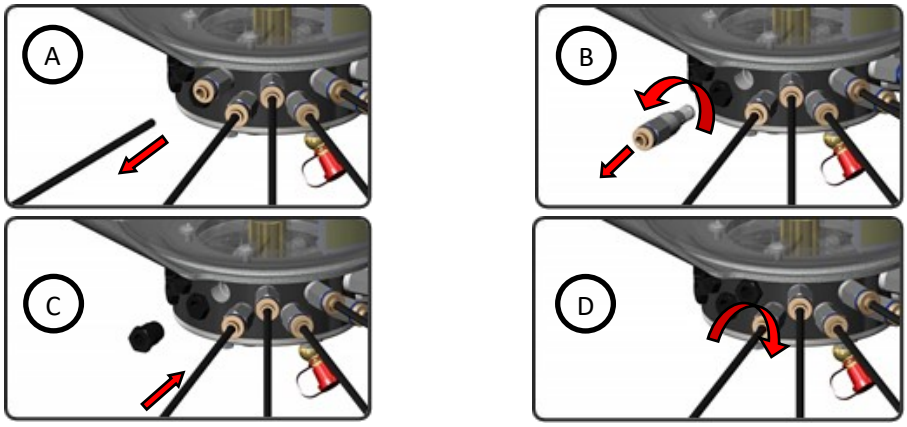
Installation

Typical System Installation Methods

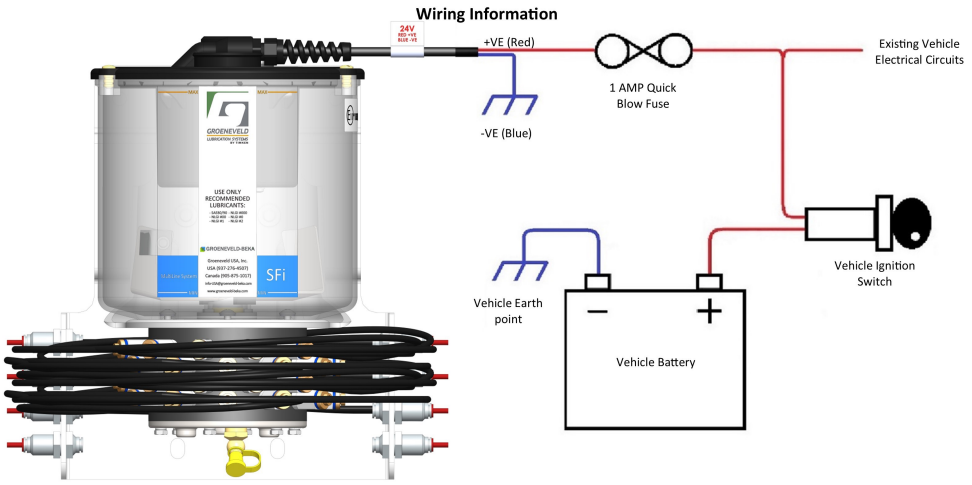
To connect the lubricant distribution lines to the bearing, as detailed on the previous page, remove the existing zerk fitting(s) (see images 1 and 2, below) and replace with the preferred push-fit or compression fitting(s) (see images 3 and 4, below). A choice of fittings are available to suit all requirements (see page 16—**Accessories**).



If a lubrication distribution line is not required, simply remove the line (securing loose end with a cable tie around the rest of the loom), remove the pumping unit and replace with a blanking plug (part number MSF-A-BP10). See steps A-D below:



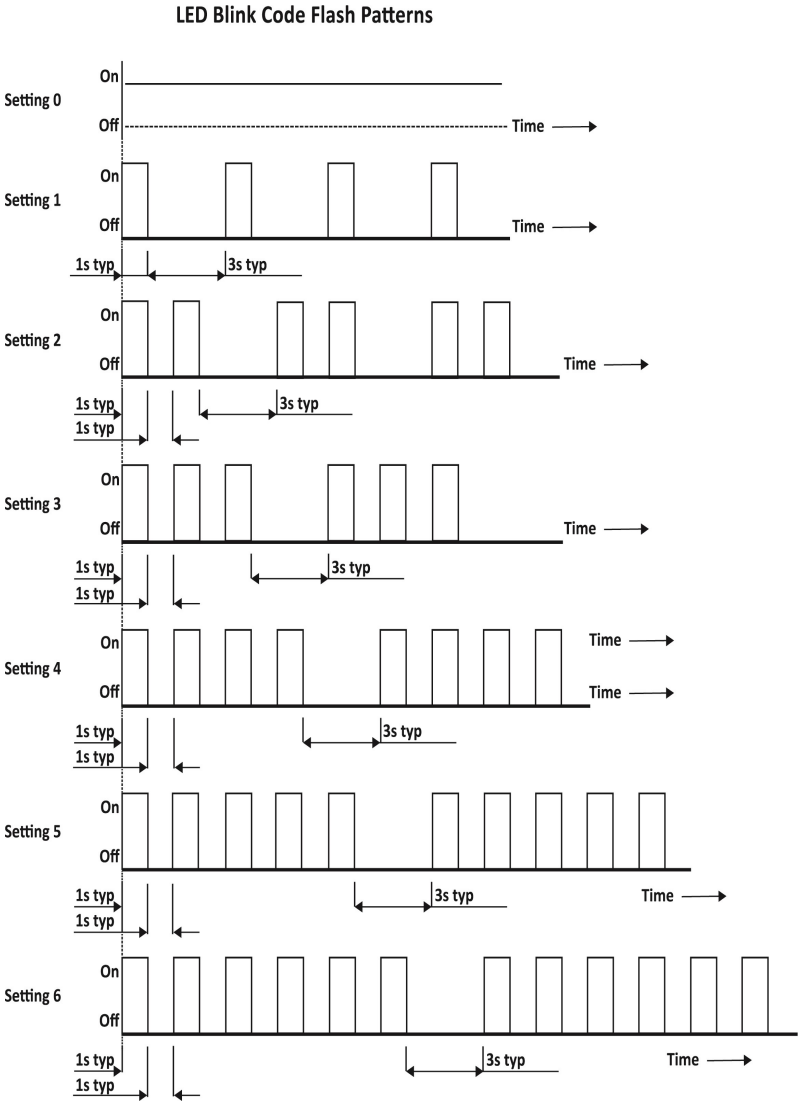
The MSFi systems are suitable for use with most bearing types. Brushes are available for chain lubrication or sliding parts.



Installation of the AC range of pumps should ideally incorporate direct connections to the vehicle ignition system. This provides automatic lubrication whenever the ignition is switched on.

A memory, built into the pump's printed circuit board, removes the possibility of over-lubrication on a short trip/multi-drop operation as the pump will continue operation of the programming from when the ignition was last switched off (i.e. if power was lost to the pump during the delay/dwell time, the pump will continue with the remaining delay/dwell when power is resumed back to the pump).

Programming



The programmable AC15/AC25 has the following settings available:

SETTING	RUN TIME	DELAY TIME	TOTAL CYCLE TIME
0	CONTINUOUS		
1	3 MIN	6 MIN	9 MIN
2	3 MIN	9 MIN	12 MIN
3	3 MIN	12 MIN	15 MIN
4	3 MIN	27 MIN	30 MIN
5	3 MIN	42 MIN	45 MIN
6	3 MIN	57 MIN	60 MIN

The AC15/AC25 can be programmed by pressing and holding the manual override button, located on the top of the pump.

If the button is pressed for 10 seconds the programming mode will be selected and the LED will either flash red or be continuously lit red (depending on the current programming setting). The red illumination or flashing of the LED indicates that the pump is in the programming mode and is showing the current programming setting.

If the LED is continuously lit red this indicates setting '0' is selected (continuous run mode). If the button is not pressed again within 30 seconds the program will store this setting and revert to operating mode and the pump will 'Run' or operate on this setting.

However, if the button *is* pressed and released within the 30 second window, the next setting will be selected. See table above for setting details and timings.

For each setting, the number of flashes from the red LED indicates the setting selected. For example, for setting 1 the LED flashes red once and delays for 3 seconds, until flashing once again. For setting 6 the LED will flash red six times before a 3 second delay and it will continue doing this for 30 seconds. The setting will then be stored and the pump starts to operate, or if the manual override button is pressed (within 30 seconds) the next setting will be selected.

Each time the manual override button is pressed while in the programming mode, the program will scroll through the selectable settings (0-6). After setting '6' the program will loop back to setting '0' (continuous run mode).

MSFi 12/24 VDC Pump: Overview and Operation

The lubrication process starts after either the ignition is switched on (if set to continuous run mode and the pump is only powered when the ignition is on) or after the allotted dwell time (of the already programmed pump) has elapsed. The pump will run for 3 minutes and dwell for the allotted remaining time as programmed (6 minutes dwell, if 9-minute program, 9 minutes dwell if 12-minute program and 12 minutes dwell if 15-minute program).

If at any time the power drops out to the pump, the dwell counter will be stopped and will retain its value, thus remembering its position within the dwell cycle. The system will then continue from that point when the power/run signal resumes.

An indicator light is located on the top of the pump, within a viewing window (see below image 'A'). The indicator light will be lit when there is a continuous power supply to the circuit and pump. The indicator light will flash green when the motor is in operation and is lit red when in the programming mode.

Pressing the manual override button ('B'), for between 1 and 5 seconds, will operate the pump for one complete cycle (3 minutes).

Pressing the manual override button ('B') for 10 seconds will enter the programming mode. See page 7 for more details.

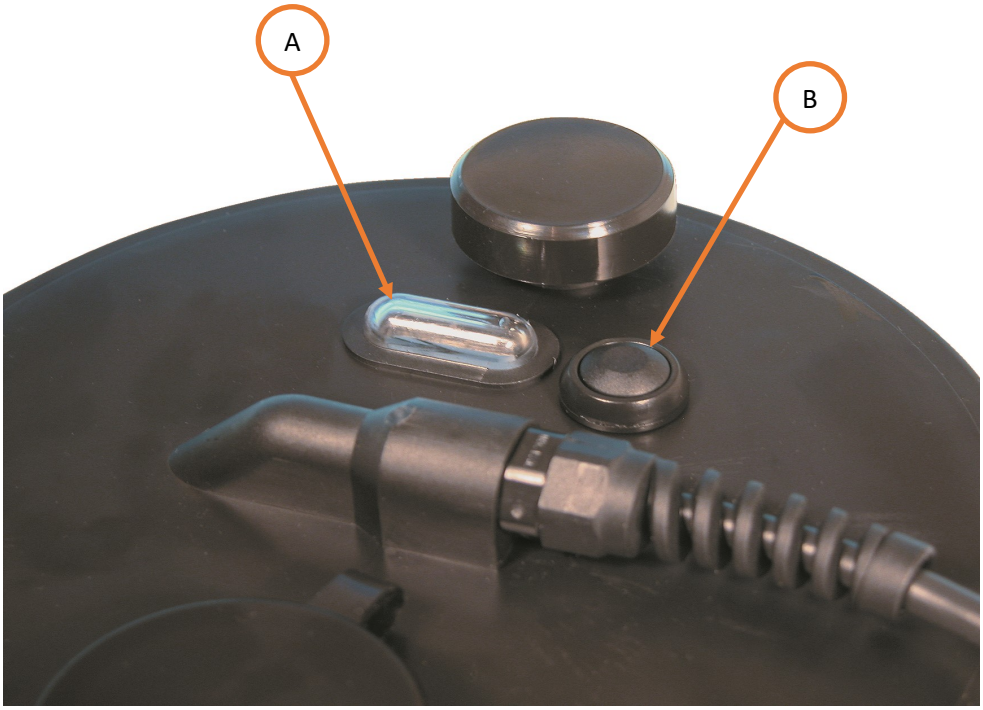
The following inspection procedures are recommended to help ensure proper operation of the AC chassis lubrication system. Once the reservoir refill has been determined—every 3 days, once a week, once a month, etc.—make certain that the interval is part of your scheduled maintenance.

A. Inspect all lubrication points for signs of FRESH grease.

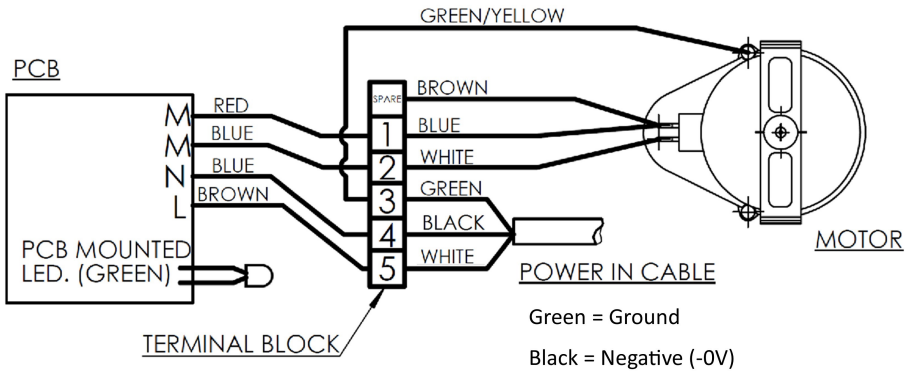
B. Check the condition of all fittings and connections. Tighten or replace loose or damaged fittings.

C. Check all lubrication lines; make certain that there are not any breaks. Check for wear or chafing that may lead to leakage.

D. Confirm pump operation by pressing Manual Override button ('B') and checking the indicator light flashes ('A').



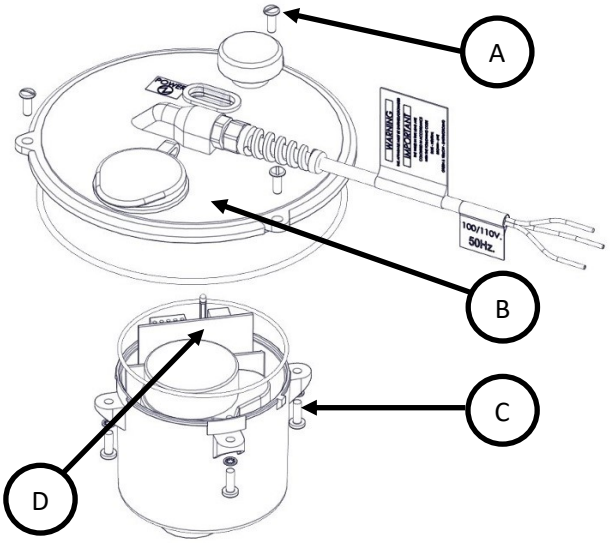
Wiring Information



Green = Ground

Black = Negative (-0V)

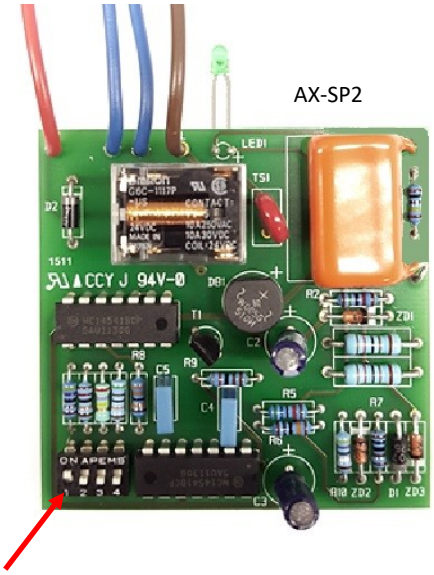
White = Positive (+110V)



To access the internal PCB and adjust the run settings via the dip switch:

1) Disconnect power to the pump.
2) Remove lid screws x3 (see 'A'), (Torqued to 0.6Nm).
3) Remove lid (see 'B'), making sure to retain the O-ring.
4) Remove motor housing screws x4 (see 'C'), (Torqued to 1.2Nm). Make sure to retain the O-ring.
5) Access PCB ('D') and adjust dip switch as required (see PCB 83344-426 image at the bottom of this page for the location of the dip switch).
6) Re-assemble, ensuring the drive adaptor locates on the paddle and the O-rings are correctly fitted.

PCB Adjustments



SUFFIX	TOTAL CYCLE TIME (mins.)	PCB SWITCH POSITION					
		1	2	3	4	Run time (mins.)	Delay (mins.)
1	12 MINS	ON	-	-	-	6	6
2	21 MINS	-	ON	-	-	6	15
3	36 MINS	-	-	ON	-	6	30
4	66 MINS	-	-	-	ON	6	60
5	126 MINS	SPECIAL ORDER					

The pump cycle time can be changed from the factory set option (#3) if required. The above table shows the settings available via setting of the dip switch on the PCB (see left hand image).

- Switch positions '1-4' cycle times are based on the delay period. Pump runs for 6-minute cycles before the specified dwell time then repeats.
- Note that only 1 switch can be in 'on' position at a time.

MSFi 110/220 VAC Pump: Overview and Operation

The SFi range has been designed to provide reliable and virtually maintenance free service in the most demanding applications. The system is an electrically operated (110/220V) pump with integral controller and one or more lubricant distribution lines which connect each bearing directly to the respective pumping element via a bulkhead fitting situated on the sides of the mounting bracket.

Each bearing is fed independently, meaning that the lubrication amounts distributed to the respective points can vary depending on the specific pumping element selected. It also means that damage to one lubricant distribution line does not affect the rest of the system.

The motor drives the paddle blade, which pushes grease into the pumping chamber and provides a visual indication of the pump's operation. The motor also drives the camshaft which operates the individual pumping elements and feeds the grease into the lubricant distribution lines. Each lubricant injector is actuated by its cam once every 360° revolution.

The lubrication process starts after the power to the pump is switched on and after the allotted dwell time (of the already programmed pump) has elapsed. The pump will run for 6 minutes and dwell for the allotted time as programmed (6 minutes dwell if 6-minute program, 15 minutes dwell if 15-minute program, etcetera).

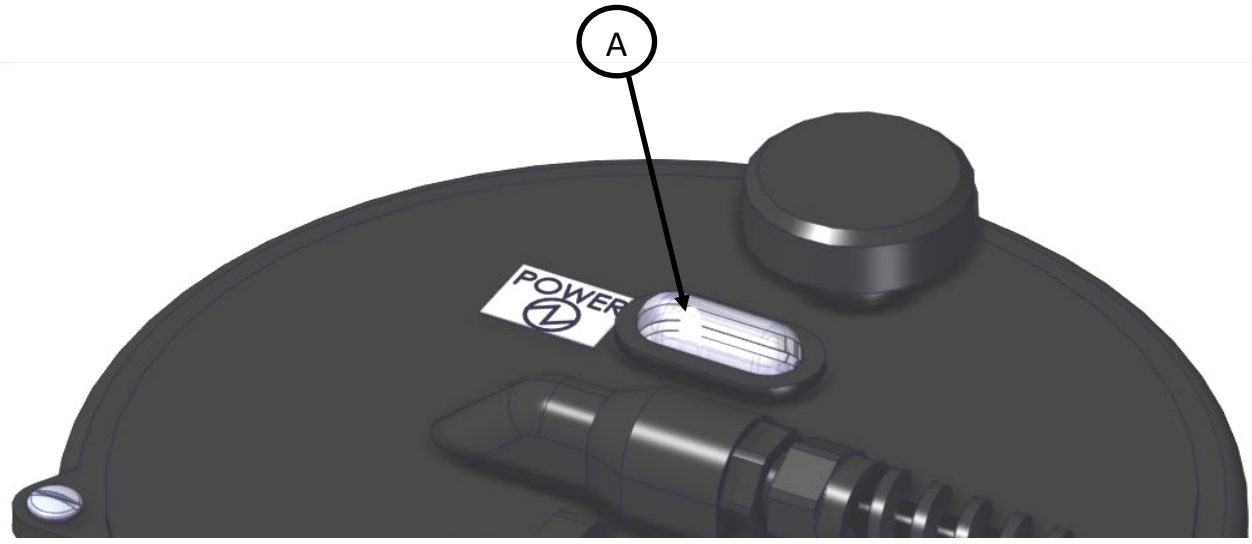
If at any time the power drops out to the pump, the counter will be stopped and the program will restart when the power resumes.

An indicator light is located on the top of the pump (marked 'A' below) within a viewing window. The indicator light will be lit when there is a continuous supply to the circuit and pump.

The following inspection procedures are recommended to help ensure proper operation of the AXL industrial lubrication system.

- Once the reservoir refill period has been determined (see page 11, Typical Refill Periods), make certain that the interval is part of your scheduled maintenance.
- Inspect all lubrication points for signs of FRESH grease.
- Check the condition of all fittings and connections. Tighten or replace loose or damaged fittings.
- Check all lubrication lines; make certain that there are not any breaks. Check for wear or chafing that may lead to leakage.

If during these checks any issues are found, use the **Lubrication Troubleshooting Chart** on page 17 to help resolve them.



Refill Periods

The SFi 1L and 2L refill periods range greatly, dependent on the number of pumping elements as well as output quantities and cycle times. Due to the accuracy of output quantities and the reliability of pump functionality, refill periods can be simply calculated to ensure that the pump and the bearing points don't run dry. Use the following to calculate refill periods:

Key:

N = Number of Pumping Elements (P.E.) 1-36.

O_1= Red P.E. with Output 0.01cc

O_2= Green P.E. with Output 0.015cc

O_3= Yellow P.E. with Output 0.025cc

O_4= Blue P.E. with Output 0.04cc

O_5= Grey P.E. with Output 0.06cc

O_6= Black P.E. with Output 0.10cc

A = Total Output Amount per 1 revolution

E = Number of revolutions until Empty

R_1= 1250cc SFI 1-liter Reservoir

R_2= 2000cc SFI 2-liter Reservoir

} Select only one

P_{VAC} = Programmed cycle time (12, 21, 36 or 66 minutes).

P_{VDC} = Programmed cycle time (9, 12, 15, 30, 45, 60 minutes).

NOTE: *12/24VDC pump motors run time (unless in continuous mode is 3min for 1 revolution.*

Calculation:

$$(NxO_1) + (NxO_2) + (NxO_3) + (NxO_4) + (NxO_5) + (NxO_6) = A$$

$$E = \frac{R_1 \text{ or } R_2}{A}$$

E x P = Total Runtime in minutes (T) until empty

T / 60 = Total Runtime in hours (H) until empty

H/24 = Total Runtime in days (D) until empty

Example:

A VDC Pump (R1) calibrated with 2 Red P.E. (O_1), 4 Yellow P.E. (O_3) & 6 Grey P.E. (O_5) programmed for a 15 minute cycle time.

(2x0.01)+(4x0.025)+(6x0.06)=0.48cc

1250cc/0.48cc = 2604.16 Revs

2604.16 x 15 = 39017.4 minutes until empty

19531.25 / 60 = 650.3 hours until empty

325.52/24 = 27 days between refills

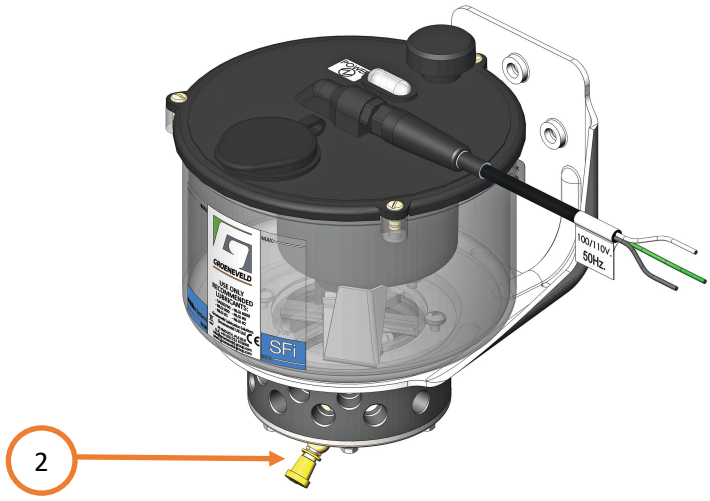
NOTE: *This calculation is based on the pump having an uninterrupted power supply and being used 24 hours a day, seven days a week.*

Pump Refill Procedure

All SFi kit pumps are fitted with both a bulk fill cap (see image 1 below), which is suitable for oil and fluid grease up to NGLI '000' and a bottom fill, grease nipple, adaptor (see image 2 below, right) for filling with grease up to NGLI Grade 2. Using the grease nipple adaptor for grease fill avoids the possibility of air entrapment and cavitation.
Bulk fill adaptors (Part# MSF-A-QF) are also available on special request, which can be fitted instead of the grease nipple as shown on the examples below. **DO NOT FILL FROM TOP FILL WITH NLGI 0, 1, 2 GRADE GREASE UNLESS INSTRUCTED BY GROENEVELD-BEKA.**

IMPORTANT NOTES:

- If the reservoir is filled through the reservoir bulk fill cap, ensure that the cap is firmly secured to the reservoir lid when finished.
- If the reservoir is filled through the grease nipple, ensure that it is cleaned first. Place the dust cap back on the nipple when finished.
- **Do not overfill the reservoir.** Fill only to the MAX Level Label.



Recommended Lubricants

Recommended Lubricants

The AX Pump has been developed specifically to run with NLGI Grade 000, 1, 2 grease and FG3,0 fluid grease. Oils to a minimum viscosity of SAE80 are also acceptable. **Do not use heavy, tackified greases, greases containing bentone/bentonite or greases containing molybdenum and/or graphite.**

NOTE: *To ensure proper operation of the lubrication system, only fill with clean lubricant that has been in a sealed container and correctly stored. Failure to use clean lubricant can result in premature system or bearing failures.*

Recommended Lubricants Operational Temperatures

(Based on maximum lubricant distribution line length of 35ft/10.7m*)

**Maximum line length dependent upon environmental temperature and lubricant being used.*

Pump Type	Recommended Lubricants					
	Oils SAE 80/90	NLGI# 000	NLGI# 00	NLGI# 0	NLGI# 1	NLGI# 2
MSFi	-40°F (-40°C)	-29°F (-34°C)	-8°C (-23°C)	2°F (-17°C)	9°F (-13°C)	14°F (-10°C)
Upper Temp Limit	+40°C (+104°F) for all pumps					

System Output Combinations

MultiLine AXL Kits incorporate modular functionality which allows the user to increase or decrease system output by changing pumping elements, adjusting timer settings or both. Combinations shown below.

AC Pumps

The preferred method to increase or decrease system output is through the use of the externally programmable PCB (see pages 7-8). Alternatively, the blue pumping elements can be replaced with pumping elements of varying outputs (see page 5).

AX Pumps

The preferred method to increase or decrease system output is by replacing the blue pumping elements with pumping elements of varying outputs (see page 5). Alternatively, the timer setting can be adjusted by accessing the switches on the PCB (see pages 9-10).

12/24 VDC Pump Output Combinations*

Pump Element	Timer Setting (Delay Cycle)						
	#0 - 1.8rpm	#1 - 6min	#2 - 9min	#3 - 12min	#4 - 27min	#5 - 42min	#6 - 57min
Red	0.240	0.067	0.050	0.040	0.020	0.013	0.010
Green	0.360	0.101	0.075	0.060	0.030	0.020	0.015
Yellow	0.600	0.168	0.125	0.100	0.050	0.033	0.025
Blue	**0.960**	**0.268**	**0.200**	**0.160**	**0.080**	**0.052**	**0.040**
Grey	1.440	0.402	0.300	0.240	0.120	0.078	0.060
Black	2.400	0.670	0.500	0.400	0.200	0.130	0.100

Output shown in cc's (grams) per hour.
All AC pumps come standard with blue pumping elements set at the #4 setting.
All other pumping elements sold separately.

110/220 VAC Pump Output Combinations*

Pump Element	Timer Setting (Delay Cycle)			
	#1 - 6min	#2 - 15min	#3 - 30min	#4 - 60min
Red	0.05	0.03	0.018	0.01
Green	0.075	0.044	0.025	0.014
Yellow	0.125	0.073	0.042	0.023
Blue	**0.200**	**0.116**	**0.067**	**0.036**
Grey	0.300	0.174	0.100	0.055
Black	0.500	0.290	0.167	0.091

Output shown in cc's (grams) per hour.
All AX pumps come standard with blue pumping elements set at the #3 setting. All other pumping elements sold separately.

**All outputs above are approximate. The type of lubricant, line length, and environmental conditions (temperature) may affect system output.*

AC Pump Nomenclature

Pump	Reservoir		Timer (Delay)		Voltage		Lube Points		Config.	-	Top Fill	
AC	X		X		X		X		L	-	2	
	1	1.25L	5	Blink Code	1	12VDC	1	12-Port			2	Yes
	2	2.0L	Programmable 0, 6, 9, 12, 27, 42, 57mins		2	24VDC	2	24-Port				
							3	36-Port				

- All variants come with externally programmable blink code timer (continuous, 6, 9, 12, 27, 42, and 57min delay options)
- All variants come with 5ft pump wire (male AMP Superseal) and a matching 30ft wire harness (female AMP Superseal)
- All variants come with zerk-fill coupling

AX Pump Nomenclature

Pump	Reservoir		Timer (Delay)		Voltage		Lube Points		Config.	-	A
AX	X		X		X		X		L	-	A
	1	1.25L	1	6min	3	110VAC	1	12-Port			
	2	2.0L	2	15min	4	220VAC	2	24-Port			
			3	30min			3	36-Port			
			4	60min							

- All variants come pre-set to #3 - 30min delay timer setting, 23ft (7m) wire lead, and top-fill cap.
- All variants come with zerk-fill coupling

AX Pumps (110/220 VAC)

Part No.	Reservoir	Timer	Voltage	Points
AX1331L-A	1.25 Liter	30min	110 VAC	12
AX2332L-A	2 Liter	30min	110 VAC	24
AX2333L-A	2 Liter	30min	110 VAC	36
AX1341L-A	1.25 Liter	30min	220 VAC	12
AX2342L-A	2 Liter	30min	220 VAC	24
AX2343L-A	2 Liter	30min	220 VAC	36

AC Pumps (24 VDC)

Part No.	Reservoir	Voltage	Lube Points
AC1521L-2-A	1.25 Liter	24VDC	12
AC2522L-2-A	2 Liter	24VDC	24
AC2523L-2-A	2 Liter	24VDC	12

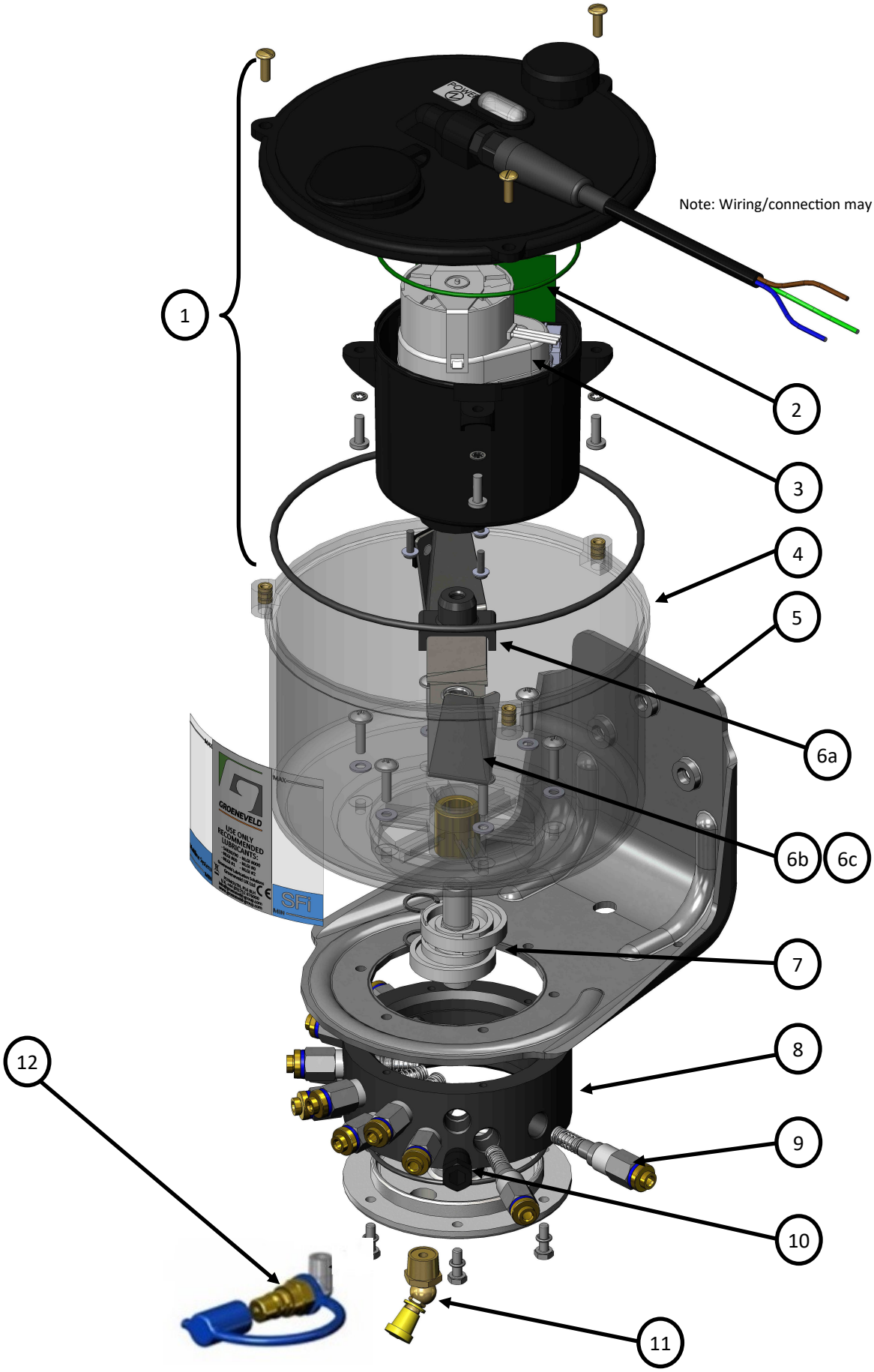
AX Pump Spare Lids (110/220VAC)

Part No.	Voltage
MSF-L-110V	110 VAC
MSF-L-220V	220 VAC

AC Pump Spare Lids (12/24VDC)

Part No.	Voltage
MSF-L-12DC	12VDC
MSF-L-24DC	24VDC

AC and AX Pump Spares			
Item No.	**Part No.**	**Description**	**Qty.**
1	MSF-L-12DC MSF-L-24DC MSF-L-110V MSF-L-220V	SPARE LID ASSEMBLY - 12 VDC SPARE LID ASSEMBLY - 24 VDC SPARE LID ASSEMBLY - 110 VAC SPARE LID ASSEMBLY - 220 VAC *Includes motor, circuit boards, drive adapters and wire harnesses.*	1
2	AC-SP34 AX-SP2	CIRCUIT BOARD - 12/24 VDC CIRCUIT BOARD - 110/220 VAC	1
3	AC-SP8-24VDC AX-SP3-110VAC AX-SP3-220VAC	MOTOR - 24 VDC MOTOR - 110 VAC MOTOR - 220 VAC	1
4	MSF-R-SFI1L MSF-R-SFI2L	1.0-LITER RESERVOIR ASSEMBLY 2.0-LITER RESERVOIR ASSEMBLY *Includes product labels, O-rings, and necessary hardware.*	1
5	83341-803	PUMP MOUNTING BRACKET	1
6a **6b** **6c**	AC-SP6 AC-SP7 AC2-SP10	DRIVE ADAPTER (1.25L) PADDLE ASSEMBLY PADDLE ASSEMBLY WITH DRIVE ADAPTER (2L)	1
7	32814-624 32814-763 32814-764	CAMSHAFT ASSEMBLY (12 PORT) CAMSHAFT ASSEMBLY (24 PORT) CAMSHAFT ASSEMBLY (36 PORT)	1
8	32478-312 32478-328 32478-336	MANIFOLD RING (12 OUTPUTS) MANIFOLD RING (24 OUTPUTS) MANIFOLD RING (36 OUTPUTS)	1
9	MSF-P-R010 MSF-P-G015 MSF-P-Y025 MSF-P-B040 MSF-P-G060 MSF-P-B100	RED PUMPING ELEMENT - 0.010cc (3-Pack) GREEN PUMPING ELEMENT - 0.015cc (3-Pack) YELLOW PUMPING ELEMENT - 0.025cc (3-Pack) BLUE PUMPING ELEMENT - 0.040cc (3-Pack) GREY PUMPING ELEMENT - 0.060cc (3-Pack) BLACK PUMPING ELEMENT - 0.100cc (3-Pack)	1-36
10	MSF-A-BP10	BLANKING PLUG (10-Pack)	1-36
11	MSF-A-ZF	ZERK FILL COUPLER G1/4	1
12	MSF-A-QF	QUICK FILL ASSEMBLY	1
*	LE 60525-PC	BULKHEAD UNION (12-POINT KITS)	1-12
*	25487-072	BULKHEAD UNION (24 & 36-POINT KITS)	13-36
*	83410-221 83409-038	FEMALE WIRE HARNESS ASSEMBLY - 30FT FEMALE WIRE HARNESS ASSEMBLY - 55FT *For 12/24 VDC systems only.*	1


Note: Wiring/connection may differ from that shown.
1
2
3
4
5
6a
6b
6c
7
8
9
10
11
12

Accessories and Components

Ø4mm Elbow Fittings	
Part No.	**Thread Size**
PM90412	1/8NPT
PM90484	1/4-28UNF
PM90485	5/16-24UNF
PM90487	1/8BSPT
PM90489	M6x1
PM90490	M8x1
PM90492	M10x1
38497S1	1/8NPT Swivel
38497S2	1/4-28UNF Swivel

Ø4mm Straight Fittings	
Part No.	**Thread Size**
PM80412	1/8NPT
PM80484	1/4-28UNF
PM80485	5/16-24UNF
PM80487	1/8BSPT
PM80489	M6x1
PM80490	M8x1
PM80492	M10x 1
LE 80512-PL	1/8NPT

Ø4mm - Unions	
Part No.	**Type**
38497L1	Elbow Stem
38497T1	T-Union
38497Y2	Y-Union
LE 505-PCM	Union
LE 60525-PC	Bulkhead (C)
25487-072	Bulkhead (M)

Brushes and Fittings	
Part No.	**Description**
A400	Oil Brush - Ø3/4” - G1/4
A410	Oil Brush - L1.6” x W1.2” - G1/4
A411	Oil Brush - L2.4” x W1.2” - G1/4
A412	Oil Brush - L3.9” x W1.2” - G1/4
0441366	Ø4mm x G1/4 Straight
0442050	Ø4mm x G1/4 Swivel Elbow
38497Y4	Ø4mm 4-Way Inlet x G1/4

Ø4mm Tubing	
Part No.	**Description**
MSF-T-4N50E	Ø4mm Nylon Tubing Un-Primed (15m/50ft)
152057-164	Ø4mm Nylon Tubing Un-Primed (50m/164ft)
MSF-T-4N50G	Ø4mm Nylon Tubing Primed - Grease (15m/50ft)
152823-164	Ø4mm Nylon Tubing Primed - Grease (50m/164ft)
MSF-T-4N50F	Ø4mm Nylon Tubing Primed - Food (15m/50ft)
152823-164FG	Ø4mm Nylon Tubing Primed - Food (50m/164ft)

Line Protection	
Part No.	**Description (ft)**
20030	1/4” Spiral Wrap (Single tube)
20034	3/8” Spiral Wrap (2-4 tubes)
20031	1/2” Spiral Wrap (5-12 tubes)
20035	1” Spiral Wrap (13-35 tubes)
39694A250	1/4” Split Convolute (Single tube)
39694A375	3/8” Spit Convolute (2-4 tubes)
39694A500	1/2” Split Convolute (5-7 tubes)
39694A625	5/8” Split Convolute (13-19 tubes)

Line Labels	
Part No.	**Description**
39257-A1	For up to 12 point system
39257-A2	For up to 24 point system
39257-A3	For up to 36 point system

Contact Groeneveld-BEKA for quotation.

LUBRICATION TROUBLESHOOTING CHART

Problem	Cause	Solution
1. Inoperative pumping element	a) Inoperative pump b) No grease flow	a) Refer to "Problem A" in 'Electrical Troubleshoot' b) Replace pumping element
2. All lubrication points appear dry	a) Empty reservoir b) Inoperative pump c) Time between lube cycles is too long d) Reservoir filled with an unsuitable lubricant e) Inoperative pumping element f) Reservoir vent blocked from over filling	a) Refill the reservoir, using the correct lubricant b) Refer to "Problem A" c) Adjust pump CYCLE TIME setting d) Remove the lubricant and replace with correct grade of lubricant e) Replace pumping element f) Clear vent and only fill to max level
3. Pump is working, but does not supply lubrication	a) Grease level dropped below minimum level b) Defective pumping element	a) Bleed the pump & refill the reservoir b) Replace the pumping element
4. No grease at all points of lubrication	a) Pump does not work b) Dwell time is too long or c) Lubrication quantity is too little d) System is blocked	a) Refer to "Problem A" b) Reduce the system dwell time. c) Change the pumping element with an increased output d) Refer to "Problem A"
5. No grease at some points of lubrication	a) Some pipes are burst or leakage at pumping element unions to pipework b) Blocked or broken pumping element	a) Renew the pipes b) Determine defective pumping element and replace
6. No grease at one point of lubrication	a) The lubrication pipe is burst or leaking b) Leakage at union point	a) Renew the pipe b) Retighten or renew the screwed union
7. Lubrication points are over-lubricated	a) Incorrect pumping element output	a) Re-configure pumping element for lower output quantity
8. Excessive pressure of the system	a) Excessive pressure in the system caused by blockage in the system b) One or more lubrication points are blocked and will not accept grease	a) Check the system b) Remove pipe from fitting and flush bearing through with grease gun
9. All lubrication points are over lubricated	a) Incorrect setting of "on-time" or "Delay Time"	a) Reduce "On Time" or increase "Delay Time" or both

ELECTRICAL TROUBLESHOOTING CHART		
Problem	**Cause**	**Solution**
A.) Pump does not work	a) No input power b) Fuse is blown c) Loose/broken wire connection inside the pump. d) Defective PLC e) Defective motor	a) Check for power to the pump and controller b) Check in-line fuse, replace if necessary c) Check all wires and connections in the pump d) Replace controller assembly e) Replace motor
B.) Reduced pump speed	a) High pressure in the system b) Low ambient temperature	a) Check the system/bearing points b) Not a defect (1 or 2 manual override lubrication cycles may be required)
C.) Override switch does not work (AC pumps only)	a) Bad wiring b) Pump does not work	a) Check all wires and connections to the switch b) Refer to “Problem A”

INSTALLATION RECORD

Pump No_____ **Customer** _____
Voltage _____ **Timer Setting** _____

Unit No.	Bearing Location	Col. Code	Cal. CC	Unit No.	Bearing Location	Col. Code	Cal. CC
1				19			
2				20			
3				21			
4				22			
5				23			
6				24			
7				25			
8				26			
9				27			
10				28			
11				29			
12				30			
13				31			
14				32			
15				33			
16				34			
17				35			
18				36			

NOTES

MultiLine SFi

GROENEVELD USA, INC
4700 Lyons Rd.
Dayton, OH 45342
Phone: 937-276-4507
Email: MSFsupport-dayton@groeneveld-beka.com

GROENEVELD LUBRICATION SOLUTIONS, INC.
8450 Lawson Rd., Unit #5
Milton, ON L9T 0J8
905-875-1017

Follow Groeneveld-BEKA on LinkedIn, Facebook and Twitter.

Visit our website for full production information, downloadable content and videos.

GO TO APP

For quick selection and output calculations, open the mobile web app.
MultiLineSF.com

GROENEVELD-BEKA
LUBRICATION SYSTEMS BY TIMKEN

Groeneveld-BEKA systems and services reduce operational costs for customers, while increasing equipment uptime, productivity, efficiency and safety: this is what it is all about at Groeneveld-BEKA.

www.groeneveld-beka.com/us

MSFI – F801306