



BIJUR DELIMON[®]
INTERNATIONAL



SUREFIRE PDI

Centralized Lubricating System

- + SureFire PDI Automatic Lubricator
- + ZEM Injectors
- + Fittings
- + Accessories

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CAPABLE OF
PUMPING
PRECISE
AMOUNTS OF
OIL OR FLUID
GREASE TO AS
MANY
AS 100
LUBRICATION
POINTS

Protect Expensive Machinery

System Description

Whether you work with machine tools, printing equipment or any kind of machinery, you need to maintain a constant level of lubrication to keep things running smoothly, reduce wear and tear and extend equipment life. With multiple lubrication points, it can be a difficult task.

A positive displacement injector (PDI) system from Bijur Delimon is the perfect solution that gives you the ability to apply a precise amount of lubricant exactly where it is needed—to lubrication points and bearings. A major benefit of a PDI system is that points can easily be added to or removed from an existing system, depending on your lubrication requirements. And since Bijur Delimon develops systems, as well as individual parts, you will know everything works together smoothly, improving your productivity and reducing lubrication costs.

The SureFire PDI centralized lubrication system is a reliable PDI system that consists of four basic elements:

- + **SureFire PDI lubricator pump** – stores and pumps lubricant
- + **ZEM Series injector** – discharges a fixed volume of lubricant
- + **Monitoring** – pressure switch and level switch to indicate malfunction

Each part of the SureFire PDI centralized lubrication system is an important piece of the lubrication puzzle.

SureFire PDI Lubricator

The SureFire PDI lubricator provides the central source of oil or fluid grease for the centralized lubrication system. It includes a reservoir to store the lubricant and a pump that pressurizes the lubricant through the system.

Fittings

The SureFire PDI system is compatible with traditional compression fittings or new push-to-connect fittings that let you easily install and change tubing without using tools.

There is also an extensive accessory catalog available to support the SureFire PDI centralized lubrication system. Everything from tubing and junctions to adapters and connection hardware can be ordered with the SureFire PDI system, or ordered from a Bijur Delimon representative when the need arises.

SureFire PDI helps lubricate many industrial applications:

- + Machine Tools
- + Mobile
- + Automotive
- + Printing
- + Packaging
- + Injection Molding

Note!

SureFire Lubricator is also available for use with Single Line Resistance (SLR) applications. Refer to *Brochure #262: SureFire SLR* for more information.

SureFire PDI Lubricator

The heart of the SureFire PDI centralized lubrication system is the robust and durable SureFire PDI Lubricator, capable of handling oil and fluid greases. Available in four reservoir capacities to fit your space requirements and lubrication demands, the SureFire PDI lubricator is a self-contained electric motor-driven gear pump that can adapt to a broad range of production machinery. It can handle single injectors or injector groups serving up to 100 lubrication points. Its versatility also allows it to perform with other lubrication systems and applications.

Benefits

The SureFire PDI Lubricator is designed with the user in mind. It has a unique and flexible modular construction that makes it user-friendly.

- + Multiple voltage options:
 - + Single phase: 100 VAC, 115 VAC, 200 VAC, 230 VAC, 24 VDC
 - + Three phase: 230/480 VAC
- + Outlet connections on both sides facilitate quick installations
- + Quick-snap reservoir release clips let you quickly remove the unit for service and provide easy access for servicing and replacement of key components
- + Large fill cap and built-in strainer allows for faster filling and fewer spills
- + Liquid level, pressure switch (single phase only), pressure relief valve and pressure gauge included
- + Two controller versions available
- + For oil and liquid grease
- + 1.8; 2.7; 6 or 12 liters available

SUREFIRE PDI SINGLE PHASE



SUREFIRE PDI THREE PHASE



Figure 1: Hydraulic Schematic
Standard Single Phase SureFire PDI

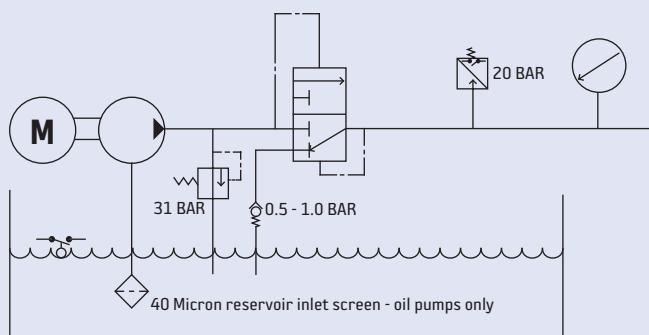
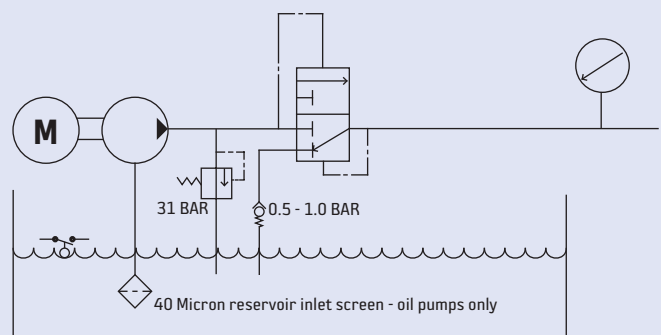


Figure 2: Hydraulic Schematic
Standard Three Phase SureFire PDI



How it Works

As the motorized gear pump pulls lubricant in from the reservoir and delivers lubricant to the distribution system, the PDIs in the system discharge a fixed amount of lubricant to the lubrication points. After the injectors are fired, the pressure in the network continues to rise until the limit in the pressure switch is reached. Once the limit is reached, the pressure switch signals the motor to stop. When the momentary pressure in the distribution network becomes greater than the gear pump pressure, the pressure differential actuates a quick release valve which relieves the distribution line pressure back into the reservoir. This causes each PDI in the distribution network to reset and refill for the next cycle.

Technical Data

Max Output Volume – 100 VAC, 115 VAC, 200 VAC, 230 VAC	200cc/min @ 60 Hz (167cc/min @ 50 Hz)
Max Output Volume – 24 VDC	250cc/min
Max Output Volume – Three phase	200 or 500cc/min @ 60 Hz; 167 or 415cc/min @ 50 Hz
Max Output Pressure	450 psi (31 bar)
Pressure Switch Setting^{1,2}	Normally open, closes at 290 psi (20 bar)
Lubricant Viscosity	Oil: 20 to 1500 cSt at operating temperature
Soft Greases³	NLGI 000, NLGI 00 (40,000 cSt max)
Reservoir Fill Screen (oil only)	40 mesh, removable
Reservoir Volume	1.8 liter, 2.7 liter, 6.0 liter, 12.0 liter
Reservoir Material	Clear Terlux Plastic for 1.8, 2.7 and 6.0 liter, Steel for 12.0 liter
Motor Voltage Options	Single Phase 100 VAC, 115 VAC, 200 VAC, 230 VAC 50/60 Hz, 24 VDC
	Three Phase 230/415 VAC 50 Hz, 260/480 VAC 60 Hz
Motor Power Requirements^{4,5}	Approximately 140 watts
Operating Temperature Range	5°C through 40°C (40°F through 105°F)
IP Enclosure Rating	IP-54
Electrical Fitting	Liquid tight
Output Connection	G 1/4 BSPP
Single (main) Feed Line	6mm O.D. minimum recommended

¹ Pressure switch is standard on single phase models. Not available on three phase models.

² External end-of-line pressure switch also available (part #26772-2; 225 psi).

³ Please contact a Bijur Delimon representative for applications using soft grease.

⁴ Only applies to SureFire PDI single phase models.

⁵ Motor Overload Protection needs to be provided by the host machine and/or its control system.



IMPORTANT!

The electrical circuit for the level switch for oil must not exceed 10 watts.

How to Order

The SureFire PDI Lubricator features a smart part number ordering system, where you can tailor the pump to meet your needs. First, choose the reservoir capacity, distribution system, options, controller type, voltage and wiring you need. Then, put the numbers into the corresponding squares in the easy-to-use grid. You now have the customized part number.

Example: To order a 1.8 liter reservoir with a volumetric/PDI distribution system, standard options, terminal block controller and a 115 VAC motor, you would use Part #SF2BNAC.

Reservoir capacity—

- 2— 1.8 liter (ABS Terlux plastic)
- 3— 2.7 liter (ABS Terlux plastic)
- 6— 6.0 liter (ABS Terlux plastic)
- 12— 12.0 liter (Painted steel)

Distribution system—

- B— Volumetric/PDI

Options—

- N— Standard oil version
- B— Standard grease version (grease level switch, no fill screen)
- A— Quick connect grease version (grease level switch and quick connect style reservoir fill fitting for grease/no fill screen)
- C— Quick connect oil version (quick connect style reservoir fill fitting for oil/no fill screen)
- D— Standard oil version (2 position oil level switch, required for type "C" Controller type)
- F— Standard oil version for thin oils (10 - 1500 cSt)
- G— Standard oil version for thin oils (10 - 1500 cSt) + quick connect style reservoir fill fitting
- H— Standard oil version for thin oils (10 - 1500 cSt) + 2 position oil level switch (required for type "C" Controller type)

SF

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Required wiring
(if controller type C is selected)
A— M12

Voltage

- B— 24 VDC, 2.4 amps
- C— 115 VAC, 50/60 Hz, 1.9 amps
- D— 230 VAC, 50/60 Hz, 1.0 amps
- E— 230/480 VAC, three phase, 50/60 Hz, 0.5 amps (416/500cc/min, 50/60 Hz)
- F— 230/480 VAC, three phase, 50/60 Hz, 0.5 amps (167/200cc/min, 50/60 Hz)
- G— 100 VAC, 50/60Hz, 2.6 amps
- H— 200 VAC, 50/60Hz, 1.8 amps

Controller type

- A— Terminal block*
- B— ON/OFF timer* (not available on 1.8 liter Or 3-Phase models)
- C— CDA Programmable Controller/monitor (not available on 3-Phase)
- D— Direct connect to three phase motor (This code is required and only used with voltages E and F. 3-Phase not available in 2 liter)
- E— Lite Programmable Controller (for motor voltages C, D, G and H only, not available on 1.8 liter models; use w/Option N)

*CE approved

Standard versions include: pressure relief valve 31 bar, quick dump valve, low level switch, filler plug, pressure switch 20 bar (only for single phase voltage).

On-board Controller/Monitor

SureFire with Standard Controller/Monitor

Features

The on-board controller/monitor is available on single phase models of SureFire and is designed to precisely control the lubrication to a piece of equipment. It does this by controlling the pump's cycle time, monitoring both internal and external inputs or switches, detecting and reporting faults and offering visual feedback that can be continuously updated and improved to enhance the user's experience with the product. Four languages are available on the screen for global use (English, German, French, Spanish).

The microprocessor-based controller allows users to:

- + Manage the on-times and the off-times of the pump.
- + Provide prelube functionality on start up.
- + Detect and respond to various input signals.
- + Display in real time the status of the pump at any time.
- + Monitor for faults in the system.
- + Provide output signals for feedback to the controlling machine.

The controller also features the protection of settings, through password-based security, protection of motors with limited duty cycles and restoration of default settings if required.

Operation

The SureFire PDI lubricator with on-board controller/monitor may be operated in two modes – TIMER mode and CONTROLLER mode. In TIMER mode, the user sets the pump on-time and the pump off-time. In CONTROLLER mode, the pump on-time is dependent on the pressure hold time, while the pump off-time may either be time-based or event-based. Both modes are subject to the non-disabling WARNING LEVEL fault and the disabling LOW LEVEL and AIR PRESSURE faults. In addition, CONTROLLER mode monitors the function of the OIL PRESSURE switch and will fault if necessary.

Parameters are set using the five key switches mounted on the front of the pump.

By following the on-screen prompts, the user may navigate through menus, set various parameters, enable/disable various switches and select fault monitoring output schemes. Left and right arrow keys are typically used to navigate through screens, forwards and backwards, while up and down arrow keys are used to increase and decrease particular values or to enable/disable functions. The asterisk key is used mainly to save settings and to move on to the next screen.

The controller software has been written specifically to enable the user to navigate through screens without the help of a manual as it provides on-screen prompts on all screens. The controller is equipped with a backup battery and may be configured in various ways to deal with a power outage and subsequent power restoration.

SUREFIRE PDI SINGLE PHASE WITH
STANDARD CONTROLLER



Refer to *Operators Manual*
#35462: *Controller* for more
detailed operating instructions.

SureFire Lite Controller/Monitor

Features

The SureFire Lite Controller is a multi-purpose programmable controller only available on single phase units. Controller settings are saved whenever power is interrupted. Up to four operating modes can be selected which allows the controller to be used with various lubrication system designs.

- + Digital status display on front cover for easy programming
- + System monitoring capabilities
- + Data memory function initiated at power down
- + Compact design

SUREFIRE PDI SINGLE PHASE WITH LITE CONTROLLER



Select



Enter and reset



Step selection



Adjustment

Operation

Description of the Keys

With the controller energized:

- + Press keys **S** and **R** simultaneously and release to enter control mode.
- + The display panel will now show a fixed letter for the selected mode and a flashing number (1-4).
- + To select the required mode press the **▲** key.
- + Press the **S** key to advance to the next parameter of the selected mode.
- + Repeat steps 3 and 4 above using the **◀▶** key to move across the digits and the **▲** key to change the value of the selected flashing digit.
- + On completion, press the **R** key to save the data and initiate a lubrication cycle.

Manual Override

- + With the controller energized press the **R** key to initiate a lubrication cycle.

Program Review

- + To review the preset data, press the **S** key repeatedly with the controller energized.
- + To return to operating condition display, release **S** key or depress **S** key for 5 seconds.

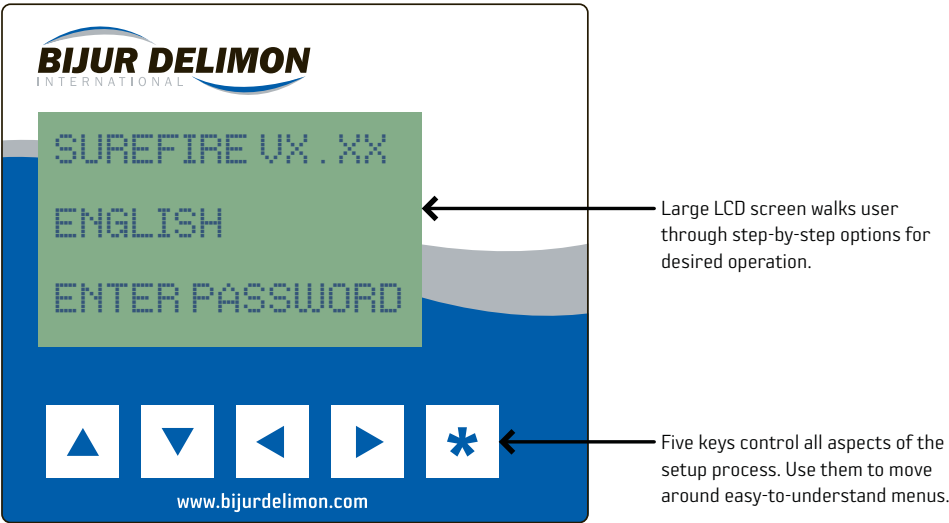
Fault Alarm

- + In any alarm condition, e.g. low level, low pressure etc., the pump will not be able to operate and the alarm lamp will illuminate. The fault condition must be rectified to cancel the alarm and reactivate the system.

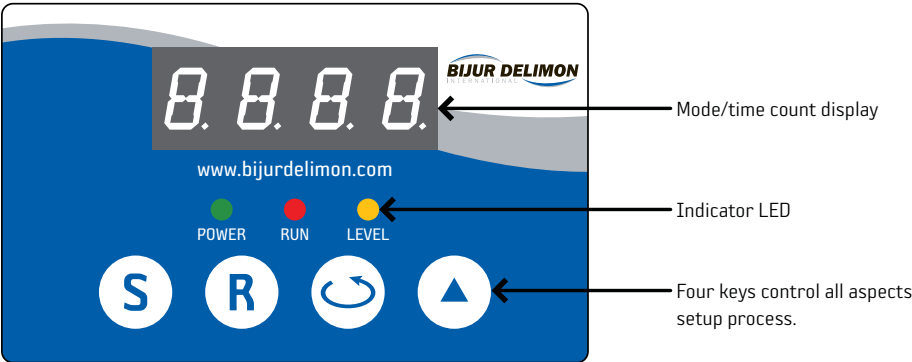
Refer to *Supplement #35989: SureFire Lite Controller* for more detailed operating instructions.

SureFire Controller/Monitor Screen

Standard Version



Lite Version



Accessories

Field-wireable M12 Connectors

Configuration	Pins (qty)	Part #
Straight	5	23694
Angled (90°)	5	23694-1
Straight	8	23837
Angled (90°)	8	23842

Cable + M12 Connectors (Assembled)

Description	Part #
Cable power, 5-pin, 2 meters long, 90° plug	M125A02U75
Cable power, 5-pin, 2 meters long, straight plug	M125S02U75
Cable signal, 8-pin, 2 meters long, 90° plug	M128A02U25
Cable signal, 8-pin, 2 meters long, straight plug	M128S02U25

Note: 3, 5 and 10 meter cable lengths are also available.

ATTENTION

Accessories for Standard Controller version only.



Timer

SureFire with Timer

The SureFire PDI lubricator is also available with an ON/OFF timer to provide basic timing functions, as detailed below:

- + ON time range = 0.1 seconds to 100 hours
- + OFF time range = 0.1 seconds to 100 hours
- + ON and OFF time settings are adjusted with dials, using a screwdriver
- + Upon power up, timer begins with ON time settings
- + Timer is wired at the factory in series with each motor and will handle the maximum amp draw of each motor used (no fusing is required)
- + Customer simply connects (+) and (-) power to the lubricator terminal block



Refer to **Supplement #35144: SureFire On/Off Timer** for more detailed operating instructions.

ZEM Series Injectors

The ZEM Series injectors are positive displacement injectors (PDIs) that deliver precise and controlled lubrication outputs, meeting exact requirements for diverse applications. They are pre-fixed volumetric injectors that ensure each lubrication point receives the proper amount of lubricant. Which means you won't have to worry about over- or under- lubrication.

Benefits

ZEM Series injectors are built to effectively function with the SureFire PDI lubricator, as well as other pumps that can support a PDI system.

- + Handles oil and fluid greases
- + Injector endcaps that can be quickly replaced within a manifold to change discharge settings
- + Ten output volumes available for diverse application types and points (0.01cc/cycle to 1.5cc/cycle)
- + Flexible design allows you to choose from output volumes for each outlet
- + Can be used in the same system with other ZEM Series injectors
- + Optional push-to-connect fittings help lower installation labor costs

At a Glance

Name	Description	Discharge Volumes (cc)
Series 32	Screw-in injector (requires manifold bar)	0.01, 0.03, 0.06, 0.1, 0.16
Series 33	Screw-in injector (requires manifold bar)	0.01, 0.03, 0.06, 0.1, 0.16
Series 34	Built-in cast manifold construction	0.01, 0.03, 0.06, 0.1, 0.16, 0.0 (plug)
Series 35	Built-in cast manifold construction	0.06, 0.1, 0.2, 0.4, 0.6, 0.0 (plug)
Series 39	Built-in cast manifold construction	0.2, 0.4, 0.6, 1.0, 1.5, 0.0 (plug)

How it Works

ZEM Series injectors are classic PDIs. Reliable. Accurate. As pressure builds in the manifold, the piston in the injector fires forward, discharging a set amount of lubricant to the application point.

As the pressure is relieved, a compression spring returns the piston to its original position. This movement recharges the injector with more lubricant. The injector is now ready to be fired again.

ZEM COMPRESSION OUTLETS



ZEM PUSH-TO-CONNECT OUTLETS



System Requirements

It is important to note that the lubricating pump used in the ZEM Series injectors system must build pressure to 220 psi (15 bar) at the injector in order to actuate injector discharge. The recommended operating pressure is 300 psi (21 bar). Also, a pressure relief valve is required to quickly drop the line pressure to the 5 to 11 psi (0.3 to 0.7 bar) range between lubrication cycles. This allows the injectors to be fully recharged.

ZEM 32 and 33 Series injectors are used in conjunction with manifolds or tee fittings (see page 22). Other ZEM Series injectors are manufactured with multiple outlet manifolds. All ZEM injectors are available with either a compression style or push-to-connect outlet fitting.

Technical Data

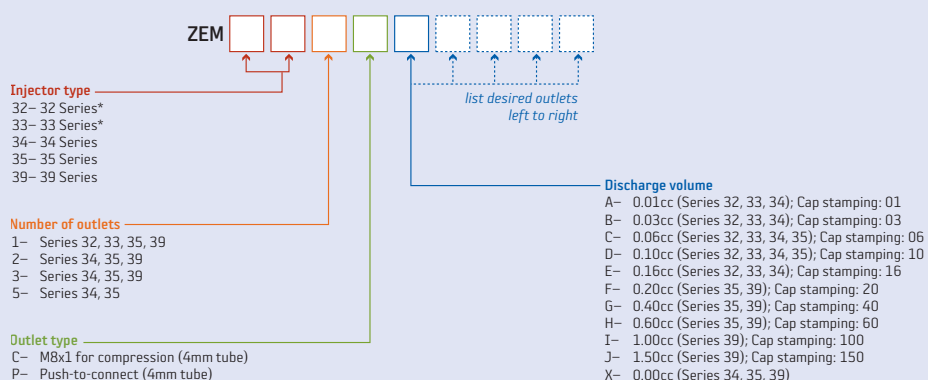
Lubricants	Oil viscosity range	20 to 1500 cSt at operating temperature
	Soft greases ¹	NLGI 000
Pressure	Operating maximum	650 psi (45 bar)
	Operating minimum	220 psi (15 bar)
	Relieving	11 psi (0.7 bar)
	Seals	Viton
Threads	Inlet	M8x1 (ZEM 32), M10x1 (ZEM 33, 34, 35), M12x1 (ZEM 39)
	Outlet	M8x1, push-to-connect

¹ Please contact a Bijur Delimon representative for applications using soft grease.

How to Order

The ZEM injectors use a smart part numbering system that allows you to tailor the injector to meet your needs. First, choose the injector type, number of outlets, outlet type and the discharge volume for each outlet. Then, put the numbers into the corresponding squares in the easy-to-use grid.

Example: To order a three outlet, 35 Series injector, with push-to-connect fittings, where the discharge volumes are 0.1cc, 0.2cc and 0.6cc, you would use Part #ZEM353PDFH.



* Requires a manifold or tee fitting (sold separately).

Replacements & Spare Parts

SureFire Parts

SureFire PDI model number:	SF2Bxxx	SF3Bxxx	SF6Bxxx	SF12Bxxx
Part Description	Part #	Part #	Part #	Part #
Reservoir assembly - Standard: Terluxe ABS Plastic ⁴	34794 ¹	34795 ¹	34796 ¹	N/A
Reservoir assembly - Alternate: Polycarbonate	34794-1 ¹	34795-1 ¹	34796-1 ¹	N/A
Reservoir assembly - Alternate: Metal	N/A	60281 ¹	N/A	35153 ²
Reservoir inlet strainer assembly (w/ screws)	35150	35150	35150	35150
Automotive quick connector assembly, for grease applications (w/ O-ring)	35151	35151	35151	35151
Automotive quick connector assembly, for oil applications (w/ O-ring)	35152	35152	35152	35152
Motor cover, O-ring, screw ³	34791	34792	34793	34793
Level switch (standard for oil versions), Level switch stem (single-phase)	34797	34797	34798	34798
Level switch for oil (three-phase)	N/A	AC368-4	AC368-3	AC368
2 position level switch for oil	39161-4793-1	39161-4793-1	39161-4793-2	39161-4793-2
Level switch for grease(NPN) ⁵	23470	23470	23470	23470
Level switch for grease(PNP) ⁵	23838	23838	23838	23838
Pressure gauge (single-phase)	23411	23411	23411	23411
Pressure gauge (three-phase)	24541	24541	24541	24541
Pressure switch [normally open, closes at 290 psi (20 bar)]	23472	23472	23472	23472
On-off timer (optional)	35074	35074	35074	35074
Motor (24 VDC)	27632	27632	27632	27632
Motor (115/230 VAC), motor & fan	34876	34876	34876	34876
Motor (230/480 VAC three phase)	23233	23233	23233	23233
Motor (100/200 VAC)	23970	23970	23970	23970
Electrical connector fitting	34681	34681	34681	34681
Gear Pump - Standard (20-1500 cSt)	25937-1	25937-1	25937-1	25937-1
Gear Pump - Special, Light Oil (10-1500 cSt)	25937-2	25937-2	25937-2	25937-2
Dump valve kit (w/ rubber disc, stem, check valve & copper seal)	60007	60007	60007	60007
Relief valve	19139	19139	19139	19139

¹ O-ring, clasp, clasp plate and clasp plate screws ² Assembly, gasket bolts and washers ³ For SureFire Single Phase, terminal block model (w/o controller)

⁴ Surefire is shipped with Terluxe plastic reservoirs as standard (1.8-6 liter), metal is standard on 12 liter. Alternate materials kits listed in ABS & Metal above.

⁵ NPN type is for use with all Surefire pumps with the CDA type controllers, PNP type is used on all other Surefire versions.

RESERVOIR ASSEMBLY (PART #34794)



PRESSURE SWITCH (PART #23472)



24 VDC MOTOR (PART #27632)



ZEM Parts

	Kit Description	Push-to-connect		Compression	
		Discharge	Part #	Discharge	Part #
32, 33, 34 Series	ZEM 32, 33, 34 replacement kit	0.01cc	23332	0.01cc	23353
		0.03cc	23333	0.03cc	23354
		0.06cc	23334	0.06cc	23355
		0.10cc	23335	0.10cc	23356
		0.16cc	23336	0.16cc	23357
		0.00cc (plug)	23388	0.00cc (plug)	23388
35 Series	ZEM 35 replacement kit	0.06cc	23934	0.10cc	23933
		0.10cc	23342	0.10cc	23363
		0.20cc	23343	0.20cc	23364
		0.40cc	23344	0.40cc	23365
		0.60cc	23345	0.60cc	23366
		0.00cc (plug)	23389	0.00cc (plug)	23389
39 Series	ZEM 39 replacement kit	0.40cc	23347	0.20cc	23367
		0.60cc	23348	0.40cc	23368
		1.00cc	23349	0.60cc	23369
		1.50cc	23350	0.00cc (plug)	23390
		0.00cc (plug)	23390	1.00cc	23370
		--	--	1.50cc	23371

Note: Each kit comes with (1) end cap, (1) o-ring and (1) spring.

REPLACEMENT KIT (PART #23334)



REPLACEMENT KIT (PART #23355)



Lubricator Fittings

The third part of the SureFire PDI system is the fittings. Whether you choose the flexibility of push-to-connect fittings or the traditional route with compression fittings, you can be sure everything works together. Bijur Delimon stands behind the quality of its fittings and accessories.

Compression Fittings

The SureFire PDI centralized lubrication system also features many compression fittings and accessories that let you maximize the effectiveness of the system. From straight connectors to bushings, these options also meet the highest manufacturing standards. If compression is your fitting of choice, just choose the appropriate part number from the chart on this page.

Technical Data

Maximum Operating Pressure	3000 psi (207 bar) at 20°C (68°F)
Seals	Metal
Recommended Tubing	Metal or Nylon

Note: Each fitting requires 1 copper sealing washer to complete connection.

COMPRESSION FITTINGS



Part Numbers

	Fitting Size & Type	Part #	ZEM 32	ZEM 33	ZEM 34	ZEM 35	ZEM 39	Sure-Fire
Tube fittings ³	4mm double tapered ring ¹	735112624	X	X	X	X	X	
	4mm sleeve ¹	735115133	X	X	X	X	X	
	4mm tapered ring ²	735112711	X	X	X	X	X	
	4mm sleeve ²	735115781	X	X	X	X	X	
	4mm compression bushing ²	AR629	X	X	X	X	X	
	6mm double tapered ring ¹	735112644	X	X	X	X	X	X
	6mm sleeve ¹	735115153	X	X	X	X	X	X
	6mm tapered ring ²	735112721	X	X	X	X	X	X
	6mm sleeve ²	735115781	X	X	X	X	X	X
	6mm compression bushing ²	AR1094	X	X	X	X	X	X
	8mm double tapered ring ¹	735112654	X	X	X	X	X	X
	8mm sleeve ¹	735115163	X	X	X	X	X	X
	8mm tapered ring ²	AR548	X	X	X	X	X	X
	8mm sleeve ²	34837	X	X	X	X	X	X
	8mm compression bushing ²	735115223	X	X	X	X	X	X
M10x1	6 mm tubing, straight	AR426	X	X	X			
	6 mm tubing - 90°	AR904	X	X	X			
	6 mm tubing - 90° swivel	AR1021	X	X	X			
	8 mm tubing, straight	AR1028	X	X	X			
	8 mm tubing - 90°	AR617	X	X	X			
	8 mm tubing - 90° swivel	AR1029	X	X	X			
M12x1	6 mm tubing, straight	FB1098				X	X	
	8 mm tubing, straight	AR5004				X	X	
	8 mm tubing - 90° swivel	AR1023				X	X	
M 14x1,5	8 mm tubing, straight	AR1280	X					
	8 mm tubing - 90° swivel	AR1033	X					
	10 mm tubing, straight	AR1417	X					
	10 mm tubing - 90° swivel	AR553	X					
Pump outlet G1/4"	6 mm tubing, straight (G1/4)	AR397						X
	6 mm tubing - 90° (R1/4)	AR961						X
	6 mm tubing - 90° swivel	AR1032						X
	8 mm tubing, straight (G1/4)	AR384						X
	8 mm tubing - 90° (R1/4)	AR794						X
	8 mm tubing - 90° swivel	AR982						X
	10 mm tubing, straight (G1/4)	AR385						X
	10 mm tubing - 90° (R1/4)	AR157						X
	10 mm tubing - 90° swivel	AR983						X
CU-sealing	M 8	20913-9	X					
	M10	20913-1	X	X	X			
	M12	20913-3				X	X	
	M14 and G1/4	35010	X					X
T piece	6x6x6 tubing	35004						
	8x8x8 tubing	35005						
	10x10x10 tubing	AR181						
Lube point connection 4mm	M6x1 - straight	73442V258	X	X	X	X	X	
	M6x1 - 90° swivel	73443V107	X	X	X	X	X	
	M8x1 - straight	734421084	X	X	X	X	X	
	M8x1 - 90° swivel	73443V108	X	X	X	X	X	
	M10x1 - straight	73442V259	X	X	X	X	X	
	M10x1 - 90° swivel	73443V109	X	X	X	X	X	
	R1/8 - straight	734421114	X	X	X	X	X	
	G1/8 - 90° swivel	734427113	X	X	X	X	X	

¹ for steel tube, ² for plastics tube, ³ max. 45 bar

Push-to-connect Fittings

When you need to install or change a piece of tubing, push-to-connect fittings let you do it quickly and easily. Push-to-connect fittings let you remove tubing with a simple click. Then, just push the new tubing into the fitting. The new tubing stays securely in the fitting. If push-to-connect is your fitting of choice, just choose the appropriate part number from the chart on this page.

Technical Data

Maximum Operating Pressure	350 psi (24 bar) at 20°C (68°F) ¹
Seals	Viton
Recommended Tubing	Nylon

¹ Push-to-connect fittings are supplied with tubing support inserts. They must be used to achieve the rated maximum pressure.

Note: Each fitting requires 1 copper sealing washer to complete connection (see chart on page 14 for appropriate part #).

ATTENTION: When using steel tubes the pipe ends have to be equipped with grooves to avoid dismantling of the quick-connection fittings.

Part Numbers

	Fitting Size & Type	Part #	ZEM 32	ZEM 33	ZEM 34	ZEM 35	ZEM 39	Sure-Fire
Divider inlet M10x1	6 mm tubing, straight	AR1995	X	X	X			
	6 mm tubing - 90° swivel	AR2113	X	X	X			
	6 mm tubing - 90° swivel	AR2141	X	X	X			
	8 mm tubing, straight	AR2158	X	X	X			
	8 mm tubing - 90° swivel	AR2114	X	X	X			
	8 mm tubing - 90° swivel	AR2145	X	X	X			
Divider outlet M12x1	6 mm tubing, straight	AR2052				X	X	
	6 mm tubing - 90°	AR1988				X	X	
	6 mm tubing - 90° swivel	AR2142				X	X	
	8 mm tubing, straight	AR2019				X	X	
	8 mm tubing - 90°	AR2115				X	X	
	8 mm tubing - 90° swivel	AR2146				X	X	
	10 mm tubing - 90°	AR2117				X	X	
Pump outlet G1/4"	6 mm tubing, straight	AR1983						X
	6 mm tubing - 90° swivel	AR2089						X
	8 mm tubing, straight	AR2013						X
	8 mm tubing - 90° swivel	AR2091						X
	10 mm tubing, straight	AR1725						X
	10 mm tubing - 90° swivel	AR2093						X
T piece	6x6x6 tubing	AR2134	X	X	X	X	X	
	8x8x8 tubing	AR2135	X	X	X	X	X	
	10x10x10 tubing	AR2136	X	X	X	X	X	
Tube connection	4x4	AR2059						
	6x6	AR2061						
	8x8	AR2062						
	10x10	AR2063						
Lube point connection 4mm	M6x1 - straight*	AR1849	X	X	X	X	X	
	M6x1 - 90° swivel*	AR2120	X	X	X	X	X	
	M8x1 - straight*	AR1851	X	X	X	X	X	
	M8x1 - 90° swivel*	AR2121	X	X	X	X	X	
	M10x1 - straight*	AR1995	X	X	X	X	X	
	M10x1 - 90° swivel*	AR2113	X	X	X	X	X	
	G1/8 - straight*	AR1854	X	X	X	X	X	
	G1/8 - 90° swivel*	AR2099	X	X	X	X	X	
	*with O-ring							

PUSH-TO-CONNECT FITTINGS



Tubing & Accessories

	Fitting Size and Type	Part #	ZEM 32	ZEM 33	ZEM 34	ZEM 35	ZEM 39	SureFire
Nylon tubing	4mm O.D. (2.7mm I.D.), 300 psi (21 bar) working pressure at 20°C	5N25	X	X	X	X	X	X
	6mm O.D. (4mm I.D.), 500 psi (35 bar) working pressure at 20°C	35006	X	X	X	X	X	X
	8mm O.D. (5mm I.D.), 500 psi (35 bar) working pressure at 20°C	35007	X	X	X	X	X	X
	10mm O.D. (7.5mm I.D.), 400 psi (28 bar) working pressure at 20°C	34825	X	X	X	X	X	X
Copper tubing	4mm O.D. (2mm I.D.)	5C25	X					
	6mm O.D. (4mm I.D.)	21431-6	X	X	X	X	X	X
	8mm O.D. (6mm I.D.)	10C8	X	X	X	X	X	X
	10mm O.D. (8mm I.D.)	21431-10	X	X	X	X	X	X
Closure plug	M8x1 ¹	15322	X					
	M10x1 ¹	27450	X	X	X			
	M12x1 ¹	35008				X	X	
	M14x1.5 ¹	34773	X					
	1/4 BSP ²	35009						X
Tubing clip	4mm O.D., 1 tube	A2435	X	X	X	X	X	X
	4mm O.D., 2 tubes	B3539	X	X	X	X	X	X
	4mm O.D., 3-5 tubes	B7535	X	X	X	X	X	X
	6mm O.D., 1 tube	B6537	X	X	X	X	X	X
	8mm O.D., 1 tube	35011	X	X	X	X	X	X
	10mm O.D., 1 tube	B6508	X	X	X	X	X	X
	12mm O.D., 1 tube	U301E1	X	X	X	X	X	X
Tubing inserts	Insert for nylon tubing with 4mm O.D. (2.7mm I.D.)	19268	X	X	X	X	X	
	Insert for nylon tubing with 6mm O.D. (4mm I.D.)	34836	X	X	X	X	X	
	Insert for nylon tubing with 8mm O.D. (5mm I.D.)	34837	X	X	X	X	X	
	Insert for nylon tubing with 10mm O.D. (7.5mm I.D.)	34838	X	X	X	X	X	
	Insert for nylon tubing with 12mm O.D. (9mm I.D.)	34839	X	X	X	X	X	
Straight nipple	M8x1 ¹ (close [no hex])	34957	X	X	X	X	X	
	M8x1 ¹ (with hex)	15822	X	X	X	X	X	
	M10x1 ¹ (close [no hex])	34958	X	X	X	X	X	
	M12x1 ¹ (close [no hex])	34959	X	X	X	X	X	
¹ Requires copper washer - see page 14								

Flexible Hose Assemblies

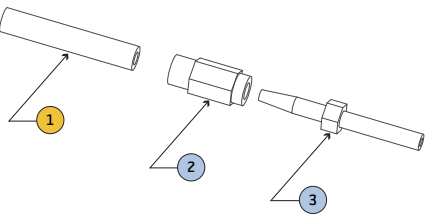
Used in high pressure PDI systems, these flexible hose assemblies are made of braided polyester hose with zinc plated tube ends. Available in 6mm O.D. and 8mm O.D. tube ends.

To assemble the hose coupling to the flexible hose refer to the illustration below and use the following procedure:

1. Thread **item 2** onto the outside diameter of **item 1** (flex hose) by holding the hose with pliers and turning **item 2** counterclockwise. Assembly may be easier by initially applying some lubricant to the outside of the hose. Turn **item 2** until it bottoms out on the tube end. Be careful not to damage the hose with the pliers.
2. Holding **item 2** with a wrench on the hex flats, thread **item 3** into the hole of **item 2** by turning **item 3** clockwise. Turn **item 3** until it bottoms out tight on **item 2**.

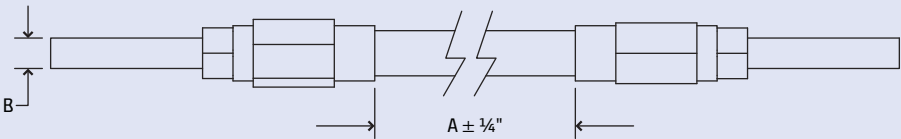
IMPORTANT!

In PDI systems going to 25-35 bar, tubing inserts should be used at every nylon tube connection.



Technical Data

Material	Braided polyester hose with zinc plated steel tube ends
Burst Pressure	6mm Tubing: 12180 psi (840 bar) 8mm Tubing: 8412 psi (580 bar)
Max Operating Pressure	2900 psi (200 bar)
Allowable Temperatures	-40 °F to 212 °F (-40 °C to 100 °C)
Minimum Bend Radius	50mm (2")
* Tube ends to be used with compression fittings, not recommended for use with push-to-connect fittings.	
* Special hose assemblies available upon request. Hose and tube ends can be ordered separately.	



How to Order

	6mm O.D. (Tube End – B)	8mm O.D. (Tube End – B)
Hose Length (A)	Part #	Part #
203mm (8")	34971-8	34972-8
254mm (10")	34971-10	34972-10
304mm (12")	34971-12	34972-12
355mm (14")	34971-14	34972-14
406mm (16")	34971-16	34972-16
457mm (18")	34971-18	34972-18
508mm (20")	34971-20	34972-20
558mm (22")	34971-22	34972-22
609mm (24")	34971-24	34972-24
660mm (26")	34971-26	34972-26
711mm (28")	34971-28	34972-28

Spare Parts

Item #	Description	Part #
1	Hose - 4.1mm I.D. X 8.75mm O.D. ¹	34962
1	Hose - 6.4mm I.D. X 14.4mm O.D. ¹ (for 8mm tube ends)	34964
2 & 3	6mm tube end ²	34963
2 & 3	6mm tube end, 90° ²	AR1736
2 & 3	8mm tube end ²	34965 ³
2 & 3	1/4" tube end ²	29117
2 & 3	1/4" tube end, 90° ²	29220
2 & 3	3/16" tube end	29116
2 & 3	4mm tube end	29587
2 & 3	4mm tube end, 90°	29585

¹ Order by the foot, minimum hose length is 10 feet.

² Items 2 & 3 come together as a set when ordered as Part #34963 (6mm dia end) or #34965 (8mm dia end).

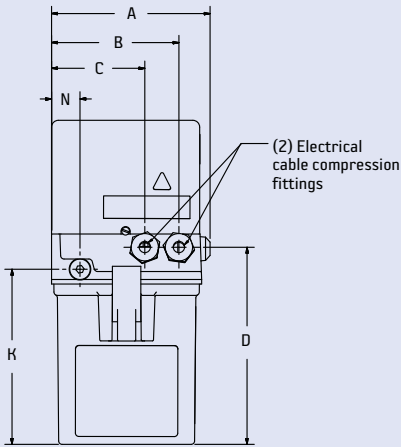
³ Used with part #34963 only.

Dimensional Schematics

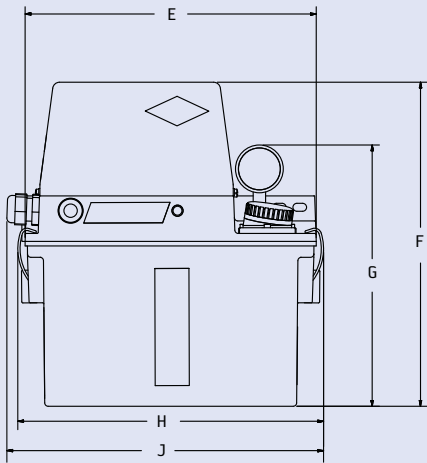
Note: All dimensions shown in millimeters.

SureFire PDI 1.8, 2.7 & 6.0 Liter
100 VAC, 115 VAC, 200 VAC, 230 VAC and 24 VDC Single Phase

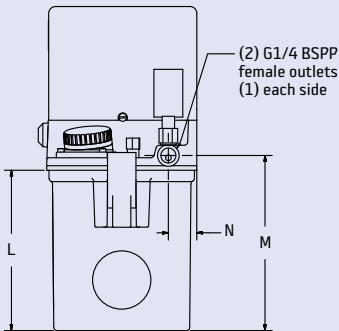
Left View



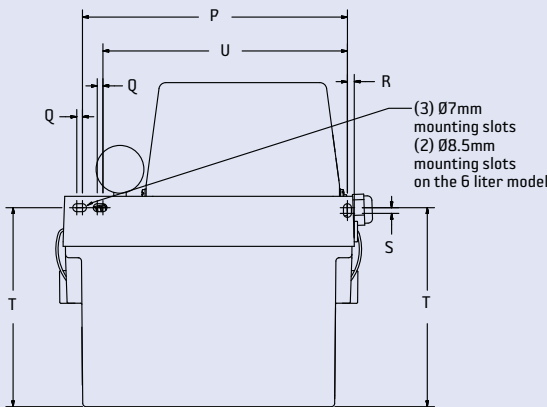
Front View



Right View



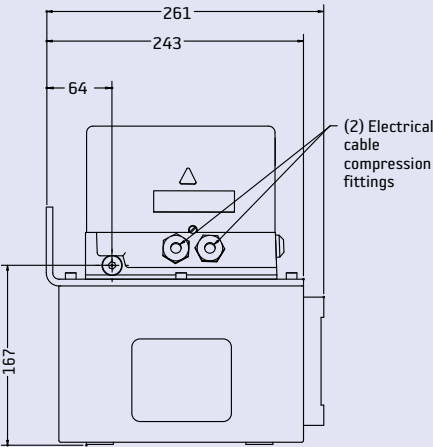
Back View



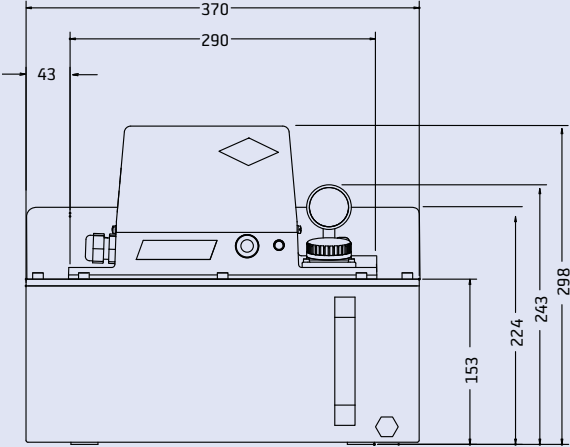
Reference	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
1.8 liter	136	114	82	174	170	285	230	183	204	154	141	154	25	153	5	6	5	175	N/A
2.7 liter	139	114	82	174	256	285	230	269	279	154	141	154	25	233	5	6	5	175	215
6.0 liter	186	117	85	204	290	318	264	303	N/A	187	174	187	25	220	5	35	5	209	N/A

SureFire PDI 12.0 Liter
100 VAC, 115 VAC, 200 VAC, 230 VAC and 24 VDC Single Phase

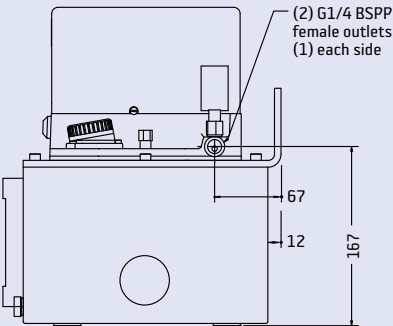
Left View



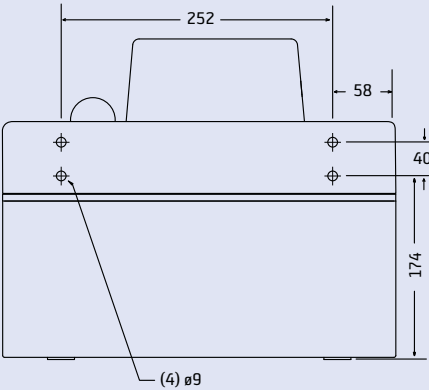
Front View



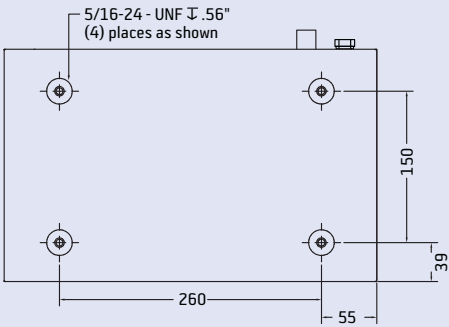
Right View



Back View



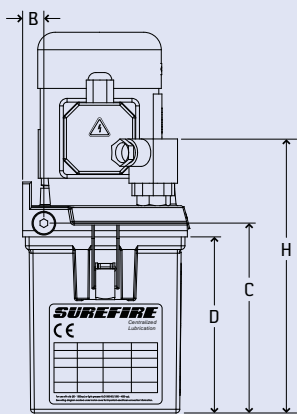
Bottom View



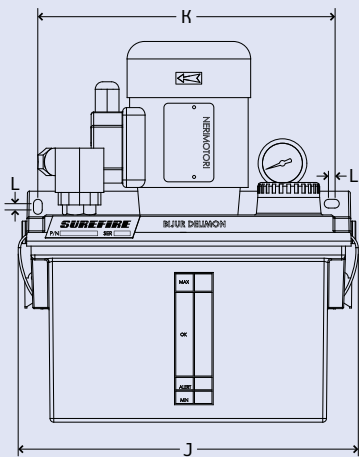
Note: All dimensions shown in millimeters.

SureFire PDI 2.7 & 6.0 Liter
230/480 VAC Three Phase

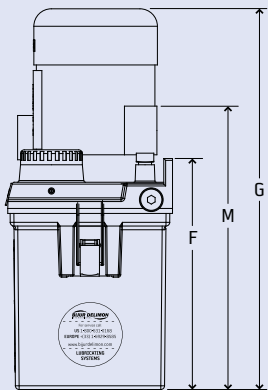
Left View



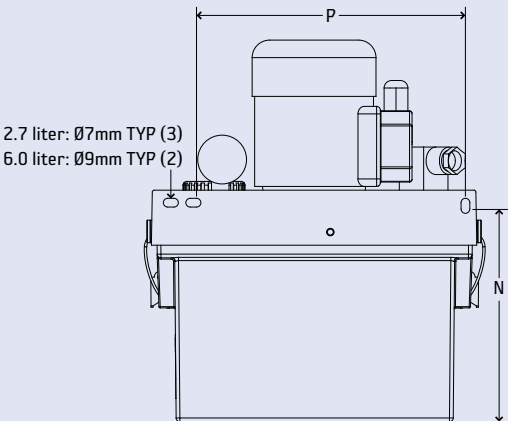
Front View



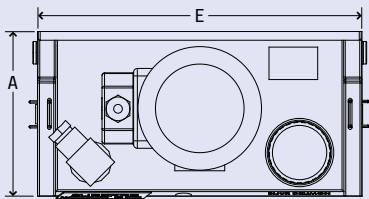
Right View



Back View



Top View

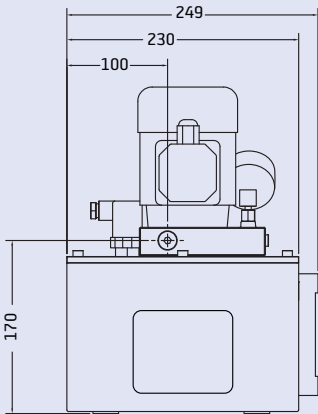


Reference	A	B	C	D	E	F	G	H	J	K	L	M	N	P
2.7 liter	132	17	152	141	260	184	305	220	272	238	5	227	170	215
6.0 liter	180	22	185	174	290	218	338	253	306	N/A	N/A	262	209	225

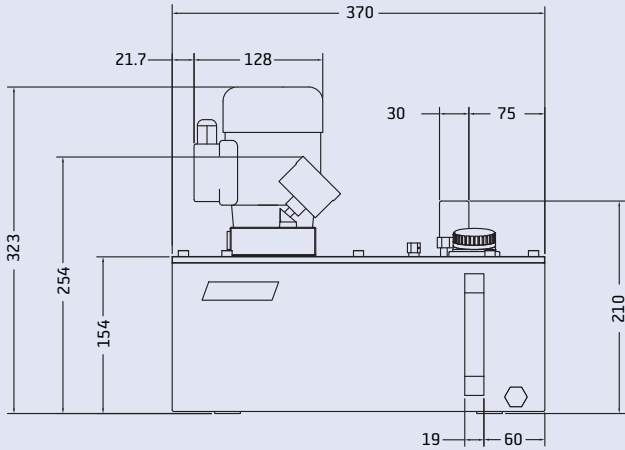
Note: All dimensions shown in millimeters.

SureFire PDI 12.0 Liter
230/480 VAC Three Phase

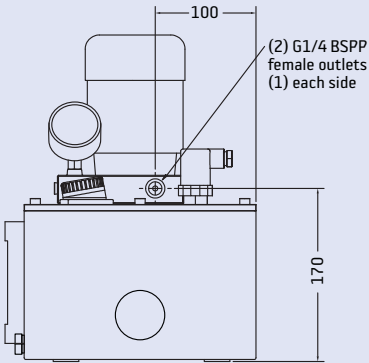
Left View



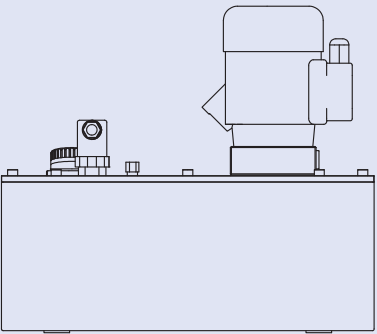
Front View



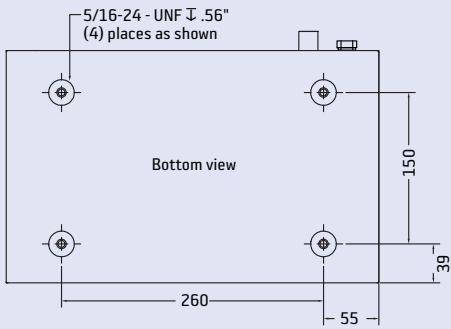
Right View



Back View



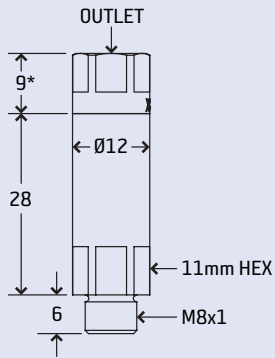
Bottom View



Note: All dimensions shown in millimeters.

ZEM 32 Series Injectors

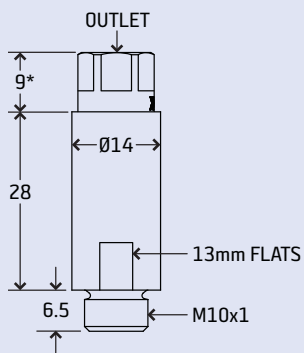
Note: ZEM 32 Series injectors can be used with manifolds (see page 24) or tee fittings (part # 22564).



* 13 for push-to-connect outlets

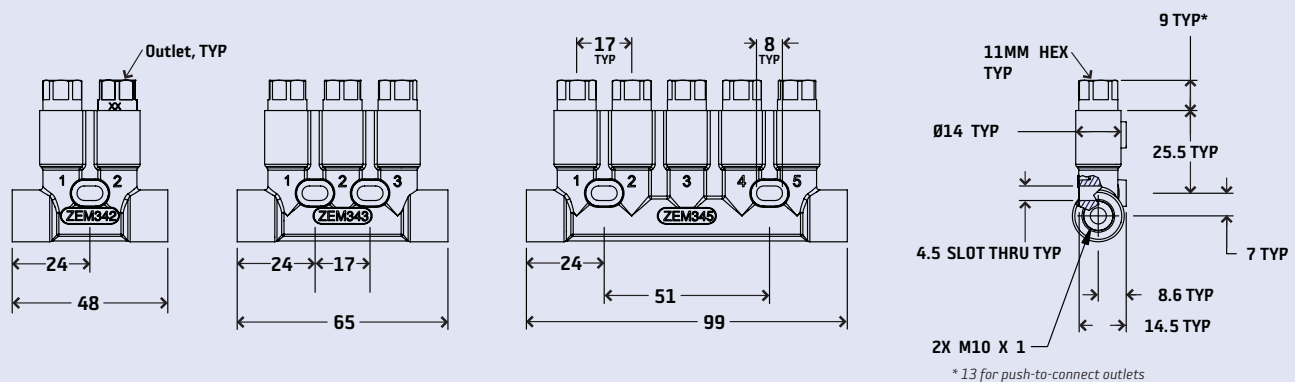
ZEM 33 Series Injectors

Note: ZEM 33 Series injectors can be used with manifolds (see page 25) or tee fittings (part # 73462-3443).



* 13 for push-to-connect outlets

ZEM 34 Series Injectors

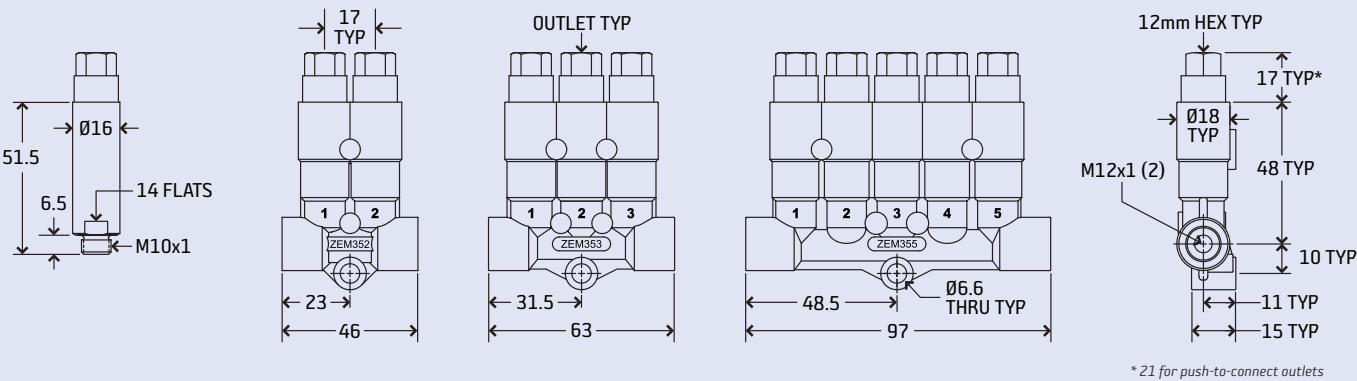


* 13 for push-to-connect outlets

Note: All dimensions shown in millimeters.

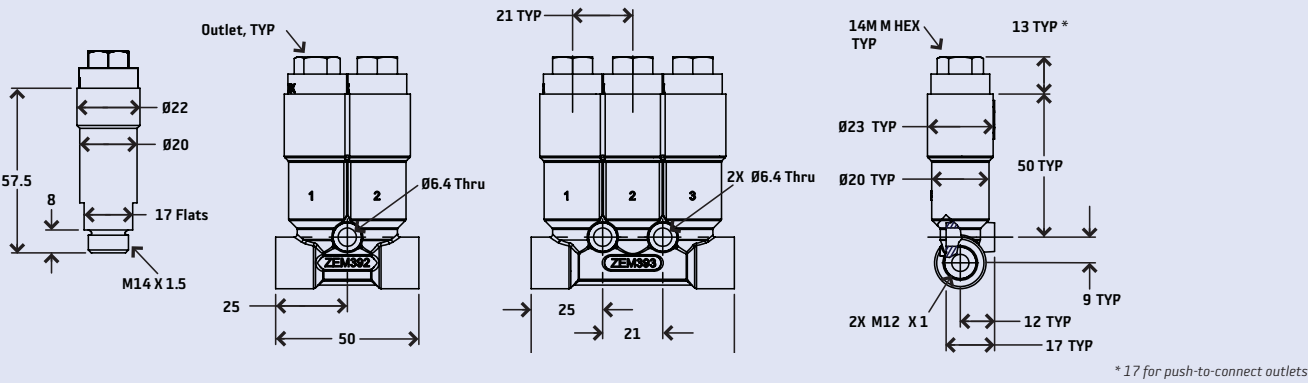
ZEM 35 Series Injectors

NOTE: ZEM 35 Series injectors with one outlet can be used with tee fittings (part #73462-3443).



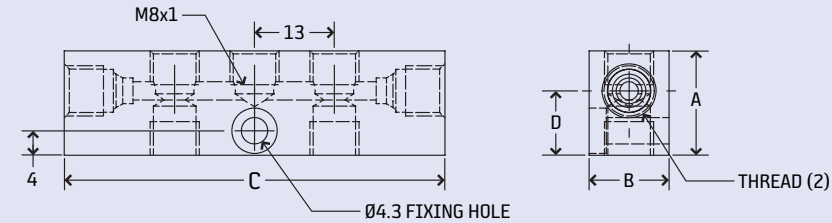
ZEM 39 Series Injectors

NOTE: ZEM 39 Series injectors with one outlet can be used with tee fittings (part #34547).

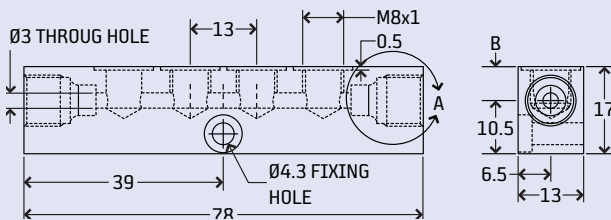


ZEM 32 & 33 Series Manifolds

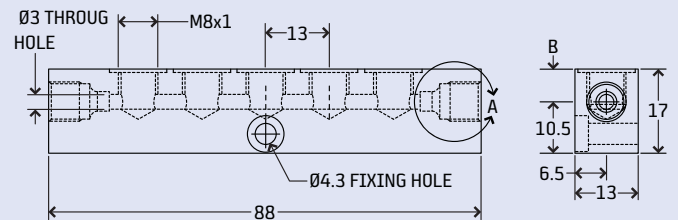
ZEM32: 5-Way Double Manifold



ZEM32 & 33: 4-Way Inline Manifold



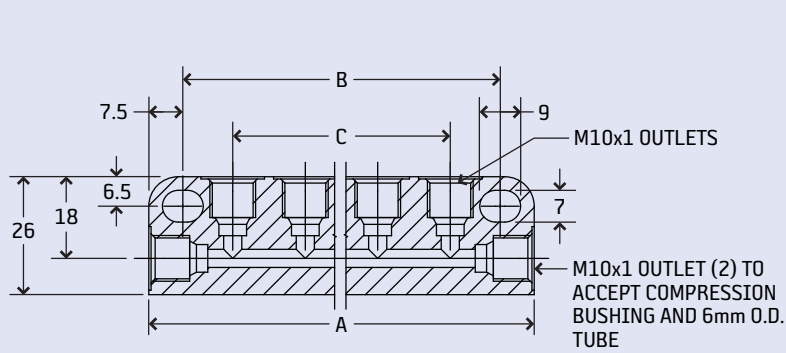
ZEM32 & 33: 5-Way Inline Manifold



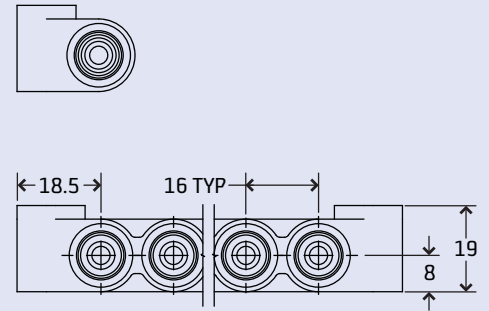
# of Lube Points	Main Line Tube Diameter	Inlet Thread	Outlet Thread	A (mm)	B (mm)	C (mm)	D (mm)	Part #
1 - single	6mm	M10x1	M8x1	17.0	13.0	39.0	10.5	ZEM32M16
1 - single	8mm	M14x1.5	M8x1	20.0	18.0	48.0	11.0	ZEM32M18
2 - single	6mm	M10x1	M8x1	17.0	13.0	52.0	10.5	ZEM32M26
2 - single	8mm	M14x1.5	M8x1	20.0	18.0	61.0	11.0	ZEM32M28
3 - single	6mm	M10x1	M8x1	17.0	13.0	65.0	10.5	ZEM32M36
3 - single	8mm	M14x1.5	M8x1	20.0	18.0	74.0	11.0	ZEM32M38
4 - single	6mm	M10x1	M8x1	17.0	13.0	78.0	10.5	ZEM32M46
4 - single	8mm	M14x1.5	M8x1	20.0	18.0	87.0	11.0	ZEM32M48
5 - single	6mm	M10x1	M8x1	17.0	13.0	91.0	10.5	ZEM32M56
5 - single	8mm	M14x1.5	M8x1	20.0	18.0	100.0	11.0	ZEM32M58
5 - double	6mm	M10x1	M8x1	17.0	13.0	91.0	10.5	34541-2
5 - double	8mm	M14x1.5	M8x1	20.0	18.0	100.0	11.0	ZEM32M58D
6 - single	6mm	M10x1	M8x1	17.0	13.0	104.0	10.5	ZEM32M66
7 - single	6mm	M10x1	M8x1	17.0	13.0	117.0	10.5	ZEM32M76
8 - single	6mm	M10x1	M8x1	17.0	13.0	130.0	10.5	ZEM32M86
9 - single	6mm	M10x1	M8x1	17.0	13.0	143.0	10.5	ZEM32M96
10 - single	6mm	M10x1	M8x1	17.0	13.0	156.0	10.5	ZEM32M106
1 - single	6mm	M10x1	M10x1	20.0	18.0	41.0	11.0	ZEM33M16
2 - single	6mm	M10x1	M10x1	20.0	18.0	58.0	11.0	ZEM33M26
3 - single	6mm	M10x1	M10x1	20.0	18.0	75.0	11.0	ZEM33M36
4 - single	6mm	M10x1	M10x1	20.0	18.0	92.0	11.0	ZEM33M46
6 - single	6mm	M10x1	M10x1	20.0	18.0	126.0	11.0	ZEM33M66
8 - single	6mm	M10x1	M10x1	20.0	18.0	160.0	11.0	ZEM33M86

Note: manifolds with more than 6 outlets have two fixing holes.

ZEM 33 Series Manifolds



Note: Manifolds rated at 500 psi (34.5 bar) max.



# of Lube Points	Main Line Tube Diameter	Inlet Thread	Outlet Thread	A (mm)	B ± 0.3 (mm)	C ± 0.3 (mm)	Part #
2	6mm	M10x1	M10x1	53	38	16	31000-4
3	6mm	M10x1	M10x1	69	54	32	31000-5
4	6mm	M10x1	M10x1	85	70	48	31000-6
5	6mm	M10x1	M10x1	101	86	64	31000-7
6	6mm	M10x1	M10x1	117	102	80	31000-8
7	6mm	M10x1	M10x1	133	118	96	31000-9
8	6mm	M10x1	M10x1	149	134	112	31000-10

Notes

[illegible]

This image shows a full page of blank, lined paper. It features approximately 28 horizontal grey lines spaced evenly apart, typical of standard notebook paper. The lines extend across the entire width of the page, leaving small margins at the top and bottom. There are no vertical lines, text, or other markings present.

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