

# Alaris® Syringe module\*

## FAQs

### Alaris® Products

**1. Is this Cardinal Health's first syringe pump?**

*No. The original companies (IMED & IVAC) that formed Alaris® Products had a longstanding tradition of building syringe infusion pumps, going back almost 20 years. In fact, the Alaris® Syringe module represents a fourth generation syringe pump technology.*

**2. Where are syringe pumps used most often?**

*Syringe pumps are most commonly used in NICU, PICU and in anesthesia. These environments require the precise delivery of very concentrated drugs.*

**3. For what type of infusions are syringe pumps used?**

*Syringe pumps are routinely used for the precise delivery of very concentrated drugs or antibiotics. In NICU's, they are also used for enteral feeding.*

**4. What are the most common problems clinicians encounter with syringe pumps?**

*Hard to setup, difficult to program, not accurate enough, not available, not robust enough.*

**5. What makes the Alaris® Syringe module unique?**

*Unparalleled safety, accuracy, advanced pressure monitoring, ease of use and versatility.*

**6. What are the Alaris® Syringe module dimensions?**

*The Alaris® Syringe module dimensions are 4.5"W x 15.0"H x 7.5"D.*

**7. How much does the Alaris® Syringe module weigh?**

*The Alaris® Syringe module weighs approximately 4.25 lbs.*

**8. What clinical criteria were the Alaris® Syringe module designed to meet?**

*The Alaris® Syringe module was carefully designed to meet the following criteria:*

- Same front panel keys as other modules – common user interface*
- Front loading of syringes – syringe in full open with unobstructed view vs. side loading*
- Easy to transport – handle strong enough to carry an entire Alaris® System with 4 modules attached*
- Plunger drive head protected – extended handle to protect plunger from external physical stress.*

**9. What syringe brands will the Alaris® Syringe module accept?**

*BD, Monoject, Terumo, IVAC and AstraZeneca.*

**10. What syringe sizes and applicable re-order numbers will the Alaris® Syringe module accept?**

*BD 1cc, 3cc, 5cc, 10cc, 20cc, 30cc, 50cc and 60cc (all luer lock)*

*Monoject 3cc, 6cc, 12cc, 20cc, 35cc and 60cc (all luer lock)*

*Terumo 3cc, 5cc, 10cc, 20cc, 30cc, 50cc and 60cc (all luer lock)*

*AstraZeneca 50cc Pre-filled Diprivan*

*IVAC 50cc*

*approved syringe (see list of approved syringe sizes and brands in Question 10). The user, however, needs to specify the brand of syringe being used.*

**12. How does the Alaris® Syringe module recognize a syringe size?**

*The syringe clamp or "hugger" assesses the syringe outer diameter and compares it to syringe profiles/configurations stored in memory.*

**13. Why can't the Alaris® Syringe module recognize the syringe brand?**

*The variance in outer diameters between syringes of the same size but different manufacturers is often too slight to accurately and reliably identify the syringe brand.*

**As of August, 2005**

Luer-lock syringe size	Manufacturer			
	BD	Tyco/Kendall/Monoject	Terumo	IVAC
1 cc	309628	n/a	n/a	n/a
3cc	309585	SoftPack only: 1180300777	SS-03L	n/a
5cc	309603	n/a	SS-05L	n/a
6cc	n/a	SoftPack: 1180600777; Regular: 8881516937	Use 5cc syringe	n/a
10cc	309604	n/a	SS-10L	n/a
12cc	n/a	SoftPack: 1181200777; Regular: 8881512878	Use 10cc syringe	n/a
20cc	309661	SoftPack: 1182000777; Regular: 8881520657	SS-20L	
30cc	309650	n/a	SS-30L	
35cc	n/a	SoftPack: 1183500777; Regular: 8881535762	n/a	n/a
50cc	n/a	n/a	n/a	30602N
60cc	309653	SoftPack: 1186000777; Regular: 8881560125	SS-60L	n/a

**14. What are the differences between the BD 1cc and BD 3cc syringes?**

*The BD 1cc luer lock syringe has an identical external barrel diameter to the BD 3cc syringe. However, the size and content of the internal barrel chamber is smaller with the 1cc syringe. The Alaris® Syringe module will not be able to differentiate between these two different syringe types. The clinician must carefully identify the correct syringe size and brand when starting an infusion.*

**15. Can the hospital enable and disable specific syringe sizes and brands?**

*Yes, this feature is available with our Guardrails® Suite MX (V.8) safety software.*

**16. Can the Alaris® Syringe module detect the volume in a syringe?**

*Yes. The Alaris® Syringe module is designed to detect the exact amount of fluid in a syringe once it is loaded. The system will not accept a VTBI that is greater than the volume of fluid detected in the syringe.*

**11. Can the Alaris® Syringe module automatically identify the syringe when it is loaded?**

*The Alaris® Syringe module can automatically identify the size of an*

**17. What is the maximum flow rate of the Alaris® Syringe module?**

Maximum flow rate for the pump is 999 mL/hr but it will be syringe size dependent as listed below:

Syringe size	Flow rate range
50/60 cc	0.1-999 mL/hr
30cc	0.1-650 mL/hr
20cc	0.1-500 mL/hr
10cc	0.1-250 mL/hr
5cc	0.1-150 mL/hr
3cc	0.01-100 mL/hr
1cc	0.01-30 mL/hr

**18. What is the minimum flow rate of the Alaris® Syringe module?**

Minimum flow rate for the pump is 0.01 mL/hr but it will be syringe size dependent as listed above.

**19. What are the Alaris® Syringe module flow rate programming increments?**

Rate range (mL/hr)	Increments (mL/hr)	
	User input rates	Device calculated rates
0.01 - 9.99	0.01	0.01
10 - 99.9	0.1	0.1
100 - 999	1	1

**20. What are the Alaris® Syringe module rate restrictions by syringe size?**

Syringe size	Flow rate range
50/60 cc	0.1-999 mL/hr
30cc	0.1-650 mL/hr
20cc	0.1-500 mL/hr
10cc	0.1-250 mL/hr
5cc	0.1-150 mL/hr
3cc	0.01-100 mL/hr
1cc	0.01-30 mL/hr

**21. Can I use non-dedicated extension sets with the Alaris® Syringe module?**

Yes. The Alaris® Syringe module accepts non-dedicated extension sets but we recommend using the pressure sensing disc.

**22. What extension sets does Cardinal Health offer for use with the Alaris® Syringe module?**

Model Description

Non-dedicated sets:

30910	36" Microbore tubing 0.4mL
30914	60" Microbore tubing 0.55mL

Dedicated sets:

30920	36" Microbore tubing with pressure sensing disc 0.5mL
30924	60" Microbore tubing with pressure sensing disc 0.7mL
30930	36" Microbore tubing with pressure sensing disc 0.2 micron filter 0.8mL
30934	60" Microbore Tubing with pressure sensing disc 0.2 micron filter 1.0mL
30944	60" Smallbore tubing with pressure sensing disc 1.7mL
30954	60" Low sorbing tubing with pressure sensing disc 1.2mL

**23. Do the dedicated disposables for the Alaris® Syringe module contain DEHP?**

The dedicated disposables with a pressure sensing disc will contain DEHP. The DEHP is found in the thin membrane of the pressure sensing disc.

**24. Does the Alaris® Syringe module offer a priming feature?**

Yes. The priming option allows a limited volume of fluid to be delivered in order to prime the administration set prior to being connected to a patient or after changing a syringe. When priming, a single continuous press of the PRIME soft key delivers, by default, up to 2 mL of priming fluid.

**25. What does the pressure sensing disc do?**

The pressure sensing disc is a key component to the Alaris® Syringe module

that enables several important features.

These include:

- *Fast Start*
- *Occlusion Back Off*
- *Numeric pressure display*
- *Auto Pressure*
- *Configurable alarm limits between 25mmHg and 1,000 mmHg in increments of 1 mmHg*

Together, these features offer the following benefits:

- *Accurately monitor line pressure*
- *Reduce delays upon startup*
- *Shorten time to alarm*
- *Help prevent inadvertent bolus during occlusion*

#### **26. How is the pressure sensing disc loaded/inserted?**

*Slide the pressure sensing disc upwards into the pressure transducer with the transparent disc membrane facing the pump. Remove the pressure sensing disc by sliding the disc downward using a thumb or a finger nail in the round cavity.*

#### **27. How much priming volume does the pressure sensing disc account for?**

*The pressure sensing disc accounts for approximately 0.2 mL of fluid.*

#### **28. Why shouldn't one prime with the pressure sensing disc installed?**

*The pressure sensing disc, if left installed, can trap air that may not be totally expelled. To ensure entrapped air is eliminated, it is recommended that the pressure sensing disc be removed prior to priming and the membrane gently massaged during priming.*

#### **29. What is the recommended procedure for priming an extension set with a pressure sensing disc?**

*When priming a dedicated extension set, the pressure sensing disc should be removed from the pressure transducer. While manually priming, depress the pressure sensing disc between two fingers and prime uphill (i.e., distal end pointing*

*up). After priming is completed, the user should gently massage the pressure sensing disc membrane with a thumb to release any stored fluid before inserting into the pressure transducer. Failing to remove stored fluid volume in the pressure sensing disc could result in an inadvertent bolus to the patient when inserting the disc into the pressure transducer.*

#### **30. What is Fast Start?**

*It is not uncommon for ordinary syringe devices to take anywhere from 2 minutes to as much as an hour before delivering IV fluid at the desired rate (based on programmed rate). Fast Start is a pressure sensing disc enabled feature that minimizes the delay in medication delivery following syringe setup and the start of an infusion. This feature rapidly takes up the mechanical slack in the system and returns to the programmed flow rate when fluid movement is detected in the pressure sensing disc.*

#### **31. What is Occlusion Back Off?**

*When an occlusion in an infusion line occurs (e.g., kink in the line or stopcock is left closed), fluid accumulates in the line raising the pressure. Depending on the pressure alarm setting (typically Low, Med or High for a syringe pump without a pressure sensing disc in use) and the type of extension set used, a significant amount of fluid can get stored in the line. Removing the source of the occlusion (e.g., opening the stopcock) can rapidly release stored volume, creating an unintentional bolus to the patient. Occlusion Back Off is a feature, only available with use of a pressure sensing disc, which greatly reduces the potential for unintentional boluses. When enabled, the motor reverses plunger movement during an occlusion until the pressure in the line returns to pre-occlusion levels. This feature is especially valuable in a NICU and PICU setting where small amounts of powerful drugs are routinely administered via syringe pumps.*

**32. What is Auto Pressure?**

*When enabled, and a pressure sensing disc is in use, Auto Pressure automatically sets the pressure alarm limit for a shorter time to alarm. If current pressure is 100mmHg or less, Auto Pressure adds 30mmHg to the current pressure. (e.g., 57mmHg current line pressure + 30mmHg = 87mmHg new alarm limit). If current pressure is above 100mmHg, auto-pressure adds 30% to the current line pressure to create the new pressure alarm limit.*

**33. What is the maximum infusion pressure with the pressure sensing disc?**

*The maximum infusion pressure with the disc is 1,000 mmHg.*

**34. What are the Alaris® Syringe module occlusion alarm thresholds?**

*With the pressure sensing disc, the Alaris® Syringe module alarm thresholds can be set anywhere between 25 mmHg and 1,000 mmHg, in increments of 1 mmHg.*

**35. How quickly will the occlusion alarm sound when using a 50cc syringe at 1mL/hr?**

*With regards to the time to occlusion alarm for a 50/60cc syringe running at 1mL/hr and with a pressure sensing disc installed, the system can alarm in as little as 3-5 minutes. (pressure setting dependent and syringe type dependent)*

**36. Will a fast bolus trigger a pressure alarm limit?**

*This is most unlikely since the pressure alarm limits are automatically and temporarily raised to the maximum limit during a bolus delivery. (NOTE: Triggering a pressure alarm during a bolus infusion will depend on several factors including viscosity of the fluid, bolus flow rate and internal diameter of the extension set.)*

**37. How will the Alaris® Syringe module pressure bar on the Alaris® PC point-of-care unit main screen differ from the Alaris® Pump module?**

*Although identical in length to the Alaris®*

*Pump module pressure bar, the Alaris® Syringe module pressure bar will represent pressure on a scale of 1 mmHg to 1,000 mmHg (versus 1 mmHg to 525 mmHg with the Alaris® Pump module).*

**38. How is the dynamic pressure display different between the Alaris® Syringe module the Alaris® Pump module?**

*Although the dynamic pressure display bars for the Alaris® Pump module and Alaris® Syringe module both use the full width of the screen for display, they each represent different ranges. The Alaris® Syringe module range is 0 mmHg to 1,000 mmHg. The Alaris® Pump module range is 50 to 525 mmHg.*

**39. What is the maximum infusion pressure without the pressure sensing disc?**

*The maximum infusion pressure without the disc is approximately 800 mmHg (pressure alarm setting: HIGH).*

**40. What are the pressure alarm settings without a pressure sensing disc?**

*The settings Low, Medium and High range from approximately "Low" 200mmHg, "Medium" 500 mmHg, and "High" 800 mmHg. Actual pressure thresholds may vary for smaller syringes (1cc, 3cc & 5cc) in order to reduce nuisance alarms.*

**41. Will the Alaris® Syringe module allow for different drugs and concentrations in the dataset?**

*Yes. Syringe infusions are often given for highly concentrated drugs with very small diluent volumes.*

**42. What is the Alaris® Syringe module critical volume?**

*The maximum over-infusion that can occur in the event of a single fault condition will not exceed 1.2 mL during syringe loading and 0.6 mL after syringe loading.*

**43. Does the Alaris® Syringe module offer air-in-line detection capabilities as with the Alaris® Pump module?**

*No. All syringe pumps in the US or abroad*

do not include air-in-line detection capabilities. If the syringe is purged of air and the disposable primed properly, there is no need for air-in-line detection.

**44. How can the Alaris® Syringe module help prevent free-flow or siphoning?**

If the syringe plunger head is not captured by the pump's plunger grippers within 30 seconds of loading, the system will indicate a potential siphoning condition and a bitmap message will come up guiding the user to load the syringe properly.

**45. How many Alaris® Syringe modules can be attached to one Alaris® PC point-of-care unit?**

Anywhere from one to four modules in any configuration (i.e. all on one side of the Alaris® PC point-of-care unit or two on each side, etc...).

**46. Can I lift the entire Alaris® System using the Alaris® Syringe module handle?**

The Alaris® Syringe module handle was designed to hold and lift a complete Alaris® System with four modules. However, it is highly recommended that the Alaris® PC point-of-care unit handle be used instead when lifting or carrying the entire system.

**47. What type of motor does the Alaris® Syringe module use?**

A stepper motor.

**48. Does the Alaris® Syringe module have a battery?**

No. The Alaris® Syringe module requires an Alaris® PC point-of-care unit for power and operation.

**49. What is the Alaris® Syringe module's accuracy?**

The Alaris® Syringe module instrument accuracy is +/- 2% of full scale plunger travel (not including syringe variation).

**50. What is the flow continuity for the Alaris® Syringe module?**

Flow continuity is driven by the

mechanism step size of the syringe pump. In other words, every time a signal is sent to the motor to move, the head moves by a "set" distance. For the Alaris® Syringe module this average "set" distance is 2.5 millionths of an inch (0.0000025 in).

Thinking of it in terms of fluid delivered from an actual syringe gives us an idea of how great the flow continuity is.

BD 1cc luer lock at 0.01 mL/hr:

– At this very low rate, our mechanism is making 2.5 steps (of 0.0000025 inches) every second

– For this syringe we have 908,000 steps/mL

BD 60cc syringe at 0.1 mL/hr:

– At this very low rate, our mechanism is making 1 step (of 0.0000025 inches) every 1.25 seconds

– For this syringe we have 28,333 steps/mL

For a given flow rate, the greater the number of steps per mL, the closer together in time each step will occur. No formal industry standards exist specifying a particular time interval, however the Emergency Care Research Institute (ECRI) recently asserted that "no more than a 20 second interval" between steps was deemed "excellent" in flow continuity.

**51. What is the flow uniformity for the Alaris® Syringe module?**

Flow uniformity is mainly driven by the mechanical accuracy of the entire mechanism. In other words, the average "set" distance is not a perfect 0.0000025 inches every time. A good tool to "visualize" or quantify flow uniformity is the trumpet curve and the associated start-up curve. For the trumpet curve, the "tighter" that trumpet shape is, the better. For the start-up curve, the more steady the line is or the smaller fluctuations are, the better. Please review the trumpet and start up curves located in the back of the DFU.

**52. What display resolution does the Alaris® Syringe module offer?**

*The display resolution for the Alaris® Syringe module is to the hundredth of a milliliter or two decimal points (e.g. 2.22 mL/hr).*

**53. How will the Alaris® Syringe module respond when downward force is applied to the plunger during operation?**

*We measure two different characteristics of how mechanically "solid" the syringe pump is. The two characteristics are compliance and slack.*

*Compliance is the small amount the head moves, when the split nut is engaged, as a load is applied (by a hand on the head or by backpressure from a syringe). The Alaris® Syringe module moves about 0.05 inches when 20 lb is applied to the head (this is about 0.9 mL with a 60cc syringe when 20 lbs is applied).*

*Slack is the small amount the head wiggles, when the split nut is engaged, with a very small amount of load applied. We believe that we are at par or better than our competitors in this mechanical measurement. Our Alaris® Syringe module has about 0.014 inches of slack at the head. This is equivalent to about 0.25mL with a 60cc syringe.*

**54. What are the Alaris® Syringe module configurable settings that are shared with the Alaris® Pump module?**

*Configurable settings that will be shared with the Alaris® Pump module include:*

- *Delay options*
- *Drug calculation*
- *Drug calculation bolus mode*
- *Multidose*
- *Pressure dynamic*
- *Priming*
- *Volume/duration*

**55. Does the Alaris® Syringe module offer delay options?**

*Yes, an infusion can be delayed for a minimum of 1 minute up to 120 minutes or delayed until for a minimum of 1 minute up to 23 hours 59 minutes.*

**56. Does the Alaris® Syringe module offer multidose capabilities?**

*Yes. When enabled, the multidose mode allows 2-24 doses to be programmed at equally spaced intervals on the same Alaris® Syringe module over a 24-hour period.*

**57. What are the configurable settings for the Alaris® Syringe module?**

*Configurable settings for the Alaris® Syringe module include:*

- *ALL mode*
- *Auto Pressure*
- *Back Off after occlusion*
- *Current pressure display*
- *Fast Start*
- *KVO*
- *KVO rate adjust*
- *KVO volume adjust*
- *NEOI*
- *NEOI alert time*
- *Occlusion pressure set point– no disc*
- *Occlusion pressure set point– with disc*
- *Prime Disposable*

**58. What is ALL mode?**

*When ALL is selected as the VTBI, the entire contents of the syringe will be delivered.*

**59. What is NEOI?**

*Near End Of Infusion. When enabled, the NEOI alert can be set to occur anywhere from 1 to 60 minutes before the infusion completes or when 25% of remaining volume to be infused remains, whichever comes later.*

**60. Does the Alaris® Syringe module offer a KVO option?**

*Yes. When enabled, some infusions will automatically switch into KVO mode upon completion. The KVO rate is configurable between 0.01 and 2.5 mL/hr. Near the completion of an infusion, the KVO Volume is an established amount from 0.5 – 5% remaining in the syringe which will trigger the device to go into KVO.*

**Note:** 0.01–0.09 rate only available with 1 and 3cc syringes. For syringes larger than 3cc, the lower rate limit adjusts to the 0.1 mL/hr.

**61. What is the Alaris® Syringe module KVO Rate?**

*The Alaris® Syringe module KVO rate is configurable between 0.01 – 2.5 mL/hr.*

**62. Does the Alaris® Syringe module work with anesthesia mode?**

*Yes. Anesthesia mode is available with the Alaris® Syringe module.*

**63. What anesthesia drugs are delivered via syringe?**

*Anesthesia drugs are generally broken into three major categories: hypnotics (e.g. propofol), analgesics (e.g. fentanyl) and muscle relaxants (e.g. rocuronium). While almost all of these drugs are delivered via syringe, propofol is most commonly used with a syringe pump.*

**64. Can the Alaris® Syringe module be used during MRI?**

*No.*

**65. Can the Alaris® Syringe module be turned upside down?**

*Yes. Although not recommended, orientation of the pump will not affect performance.*

\*Alaris® Syringe module formerly known as Medley® Syringe Module.

Alaris® is a registered trademark of Cardinal Health, Inc. or one of its subsidiaries.

©2005 Cardinal Health, Inc. or one of its subsidiaries. All rights reserved.  
3PCP0190-01 (1205/2M)

♻️ Printed on recycled paper with 10% post-consumer fiber.



Cardinal Health  
Alaris® Products  
10221 Wateridge Circle  
San Diego, CA 92121

[www.cardinalhealth.com/alaris](http://www.cardinalhealth.com/alaris)