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Power Injectors for Diagnostic Imaging

Contrast under Control



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A resource for all your contrast delivery needs

Contrast under Control

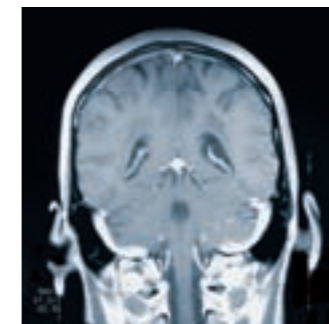
Covidien provides contrast delivery systems for Computed Tomography (CT) Magnetic Resonance Imaging (MRI) and Angiography. Our range of injectors has been developed from a heritage of innovation and technology.

Providing valuable assistance to contrast delivery, each injector features integrated technological advancements, all designed to enhance ease of set up, operation and procedural time efficiencies.

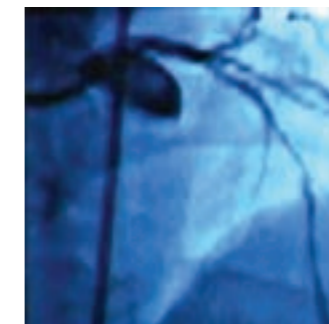
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- 1 Computed Tomography
- 2 Magnetic Resonance Imaging
- 3 Angiography

Optivantage™ DH

Dual Head Contrast Delivery System in CT

The advanced dual head CT injector

Dual Head Versatility

- Performs up to 6 phases.
- Can perform a single phase injection.
- Faceplates for both pre-filled and empty syringes.

Fully Programmable Powerhead

- Enables you to select and amend protocols whilst remaining at the patients side.
- Intuitive user interface.
- Designed for ergonomic convenience and available in table, pedestal or ceiling mounted configurations.
- Step by step set up to help prevent air embolus.

Patency Check™

- Perform a saline flush first to check for patent veins, and correct placement of the cannula, prior to contrast injection.
- Stay at patient's side while testing.

Timing Bolus™

- Perform a Timing Bolus injection of contrast medium followed by a saline flush to determine ideal scan delay for optimum image quality.

Tilt Enable

- Enable button will not be active until enabling sequence has been properly followed and the powerhead is tilted downward.



Ceiling Mount

- The Optivantage DH is available in a ceiling mounted version.

Manual Flow Knob

- Calibrated for easy quarter-turn priming, and colour coded for saline and contrast.

Intuitive User Interface

- Easy to use menu allows you to quickly change protocols, flow rates and injection volumes.

Display Orientation

- With just the touch of a powerhead key, the display graphics flip 180° to provide proper orientation for easy reading.

Built-In Heater Blanket

- Faceplate options for both pre-filled syringes and empty syringes are quick and easy to change.
- Pre-filled syringe faceplate has an integrated heater blanket to maintain contrast medium viscosity.

Optistar™ LE

Dual Head Contrast Delivery System in MRI

Quick and simple operation

Battery Free Operation

- The first AC powered injector for the MR suite.
- Reduces time required for battery and equipment maintenance.

Independent Dual Syringe Powerhead

- Allows timed contrast injection and provides saline flush delivery.
- Single bolus and dual phase injections of contrast media can be performed.
- Drop in syringe loading reduces preparation time.
- Automatic syringe size detection.
- Large keys on the powerhead ensure ease of use.

Touchscreen

- Full colour touchscreen for greater visibility.
- Simple and reliable, featuring an operator intuitive user interface.
- Ability to start and stop the injection outside the magnet room.

Non-ferrous

- No ferrous parts.

Safety

- 'Check for air' safety check feature.



Powerhead Keys

- Large keys on the powerhead ensure ease of use.
- The injector can be enabled, started and stopped directly from the powerhead.

Check For Air Feature

- System will not enable until steps have been followed and the operator has confirmed that they have 'checked for air'.

Automatic Syringe Size Detection

- Illuminated indicators display syringe size on the powerhead.

Easy Drop-In Syringe Loading

- Results in faster procedures.
- Syringe filling can be performed in either the control room or the scan room.
- Powerhead is designed to accept empty or pre-filled syringes.

Drip Mode

- Allows to switch from injection to drip mode at any time, ensuring IV line patency throughout the procedure.
- Variable and programmable, allowing the user to change the drip rate, volume, and duration from the control room.

CT 9000™ ADV

Single Head Contrast Delivery System in CT



Simplicity – for single head delivery

Touchscreen

- New easy to read colour touchscreen.
- Requires only 3 simple key strokes to activate injection.
- Programme up to four phases with inject or scan delay features.
- Protocol manager to store and recall up to 12 user defined protocols.

Syringes

- The system accommodates both front loading 200ml disposable syringes and pre-filled syringes.

Powerhead

- The powerhead LED display provides a highly visible indication of remaining volume.
- The programmable Auto-Fill feature automatically moves the syringe to the selected volume.

Angiomat™ Illumena™

Contrast Delivery System for Cardiology, Angiography and CT



Reliable and functional performance

Digital Powerhead Display

- The LED display automatically “flips” as the powerhead is rotated – ensuring proper orientation for viewing.
- Indicates programmed protocol and volume remaining in the syringe.

Fill Control Bar

- Allows easy, one finger operation.
- Drives the plunger for syringe filling, pull-back, or infusion.

Syringes

- The latex free and transparent syringes provide a crystal clear view of the contrast medium.
- Compatible with pre-filled syringes.

Air Detection Device

- The optional Air Detection and Warning System (ADAWS) serve as an aid in identifying empty syringes and air bolus.

Touchscreen

- The pressure sensitive touchscreen display makes the injection setup direct and easy.
- Protocol manager to store and recall user-defined protocols.

Multimodality

- With just a touch of a button, switch between Angio and CT modes.

Software Upgrades

Continual development for your changing needs

Contrast enhancement how, when and where you want it.

Optibolus™ Solution for the Optivantage™ DH CT power injector

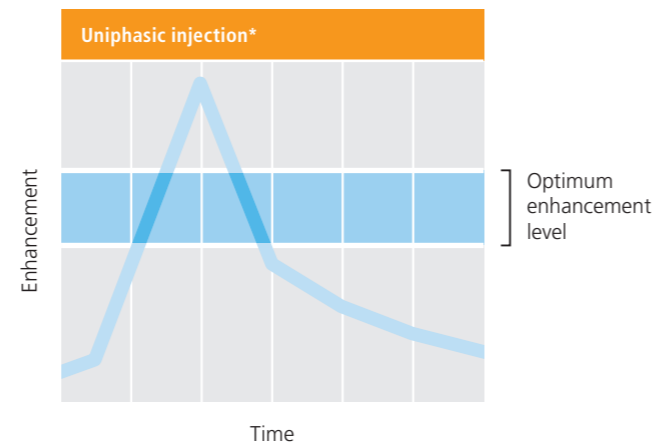
Optibolus bolus shaping software delivers radiographic contrast media at a controlled flow rate and volume to ensure enhanced diagnostic images.

The Optibolus software is used to provide an exponentially decelerating flow rate injection that optimises contrast use and provides an extended period of uniform vascular enhancement. Optibolus software can be turned on or off for any given injection.

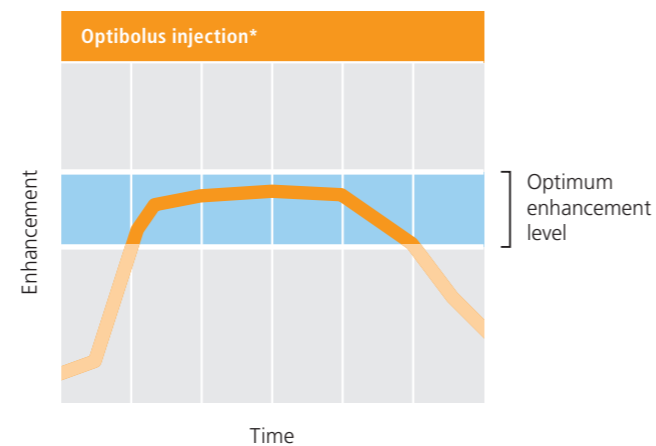
Anatomical areas for Optibolus

These include the following CT examinations

- Cardiac CT
- PE scanning
- Peripheral angio examinations
- Other angiographic procedures



- Shorter enhancement window.
- Potential for unused contrast.
- Non uniform vascular enhancement.



Optibolus™ bolus shaping software offers:

- Prolonged imaging window.
- Improved contrast utility.
- Uniform vascular enhancement.

* Graph is intended as a visual aid and is not drawn to scale. Contrast volumes are approximated for graphical purposes only.

Technical specifications

Optivantage™ DH injector	Optistar™ LE injector	CT 9000™ ADV injector	Angiomat™ Illumena™ injector
Page 2	Page 4	Page 6	Page 7
<p>Flow Rate 0.1 - 10.0 ml/sec</p> <p>Pressure Limit 50 - 325 psi</p> <p>Syringe Sizes 200 ml empty syringes</p> <p>50, 75, 100, 125 ml high pressure pre-filled syringes</p> <p>Syringe Heater 37° C nominal. Minimises the loss of heat from preheated contrast</p> <p>Volume 0.1 ml to volume in syringe</p> <p>Scan Delay 0-600 seconds</p> <p>Inject Delay 0-600 seconds</p> <p>Phase Delay 0-600 seconds</p> <p>Number of Phases 6</p> <p>Protocol Memory 40</p> <p>Inject Results Last 24 injected protocols</p>	<p>Flow Rate A Side 60 ml empty syringes: 0.1 -10.0 ml/sec</p> <p>10, 15, 20, 30 ml pre-filled syringes: 0.1 - 8.0 ml/sec</p> <p>B Side 60 ml empty syringes: 0.1 - 8.0 ml/sec</p> <p>Pressure Limit A Side 60 ml empty syringes: 150 psi</p> <p>10, 15, 20, 30 ml pre- filled syringes: 200 psi</p> <p>B Side 60 ml empty syringes: fixed at 150 psi</p> <p>Syringe Sizes 60 ml empty syringes</p> <p>10, 15, 20, 30 ml pre-filled syringes</p> <p>Volume 1 ml to volume in syringe</p> <p>Scan Delay 0-60 seconds</p> <p>Number of Phases 2</p> <p>Protocol Memory 20 protocols</p> <p>Inject Results Last 12 injected protocols</p>	<p>Flow Rate 125 ml / 200 ml syringes: 0.1 - 9.9 ml/sec</p> <p>30 ml / 50 ml syringes: 0.1 -7.0 ml/sec</p> <p>Pressure Limit 300 psi</p> <p>Syringe Sizes 200 ml empty syringes</p> <p>50, 75, 100, 125 ml high pressure pre-filled syringes</p> <p>30 ml / 50 ml handheld pre-filled syringes</p> <p>Syringe Heater (optional) 37° C nominal. Minimises the loss of heat from preheated contrast</p> <p>Volume 0.1 ml to volume in syringe</p> <p>Scan Delay 0-500 seconds</p> <p>Inject Delay 0- 255 seconds</p> <p>Number of Phases 4</p> <p>Protocol Memory 12 protocols</p>	<p>Flow Rate Angio-Cardiac and Angio-Peripheral Modes: 0.1 - 40.0 ml/sec, CT Mode: 0.1 - 10.0 ml/sec</p> <p>Pressure Limit Angio-Cardiac and Angio-Peripheral Modes: 75 - 1200 psi</p> <p>CT Mode: 75 -300 psi</p> <p>Syringe Sizes 150 ml / 200 ml empty syringes</p> <p>50, 75, 100, 125 ml pre-filled syringes</p> <p>Syringe Heater (optional) 37° C nominal. Minimises the loss of heat from preheated contrast</p> <p>Inject Delay 0-300 seconds</p> <p>X-ray Delay 0-300 seconds</p> <p>Scan Delay (CT-Mode) 0-300 seconds</p> <p>Rate Rise 0-10 seconds</p> <p>Phase Delay 0-300 seconds</p> <p>Number of Phases 1, 2 or 3-4 (available in all modes except Auto- Repeat and ECG)</p> <p>Protocol Memory Angio and CT modes store each up to 45 protocols</p>