



Technical Specifications



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Intelli-C system

Intelli-C takes multipurpose to a new level with wide projection flexibility and innovative features that enhance user ergonomics and patient comfort.

Model



Intelli-C is a multipurpose tilt-C X-ray system that enables a multitude of diagnostic and interventional procedures.

It performs a broad variety of examinations such as R/F, specialized applications, interventional radiology, vascular and non-vascular procedures and angiographic studies, including DSA.

Intelli-C consists of a floor-mounted unit with a tiltable patient table. The C-arm supporting the detector and X-ray tube can travel along and around the patient table.

Due to a small footprint, minimum install space is required, while the design maximizes the work area around the patient table. Intuitive use and easy access around the table improves efficiency and workflow.

Depending on the clinical requirements – could be the need to perform ERCP examinations – or examination room constraints, the Intelli-C is available in two basic versions with either left side or right side suspended table

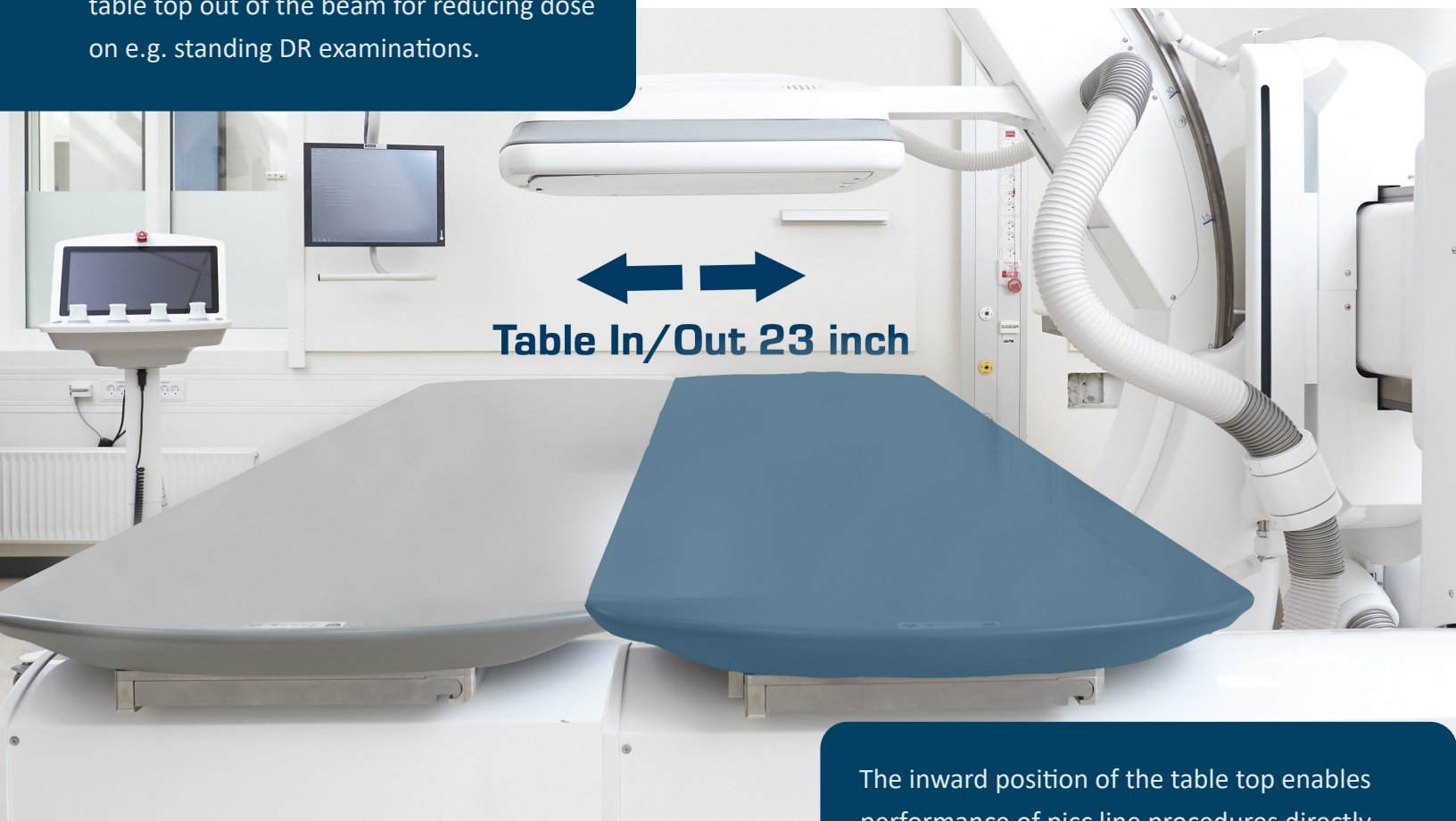
Positioning

With its extensive movement ranges, Intelli-C is capable of performing almost any position you can imagine. In addition, it is possible to save up to 999 different auto-positions and any position can be saved for standard procedures.

The built-in **inMotion** auto-positioning technology enables direct, automatic positioning of the detector and tube to any saved position with all examination parameters pre-set.

Save and restore any position – permanently or on-the-fly. Preferred positions can be saved and recalled at any time, for fast and fully automatic positioning.

Intelli-C side arm design allows placing the table top out of the beam for reducing dose on e.g. standing DR examinations.



The inward position of the table top enables performance of picc line procedures directly on outer arm of the patient.

AP/PA position

The movement controls automatically adapt to whether the tube is under or over the table (AP and PA position).

Switch between these two positions at the press of a button.



Movement ranges

• Main Centre Up/Down (MCU)	22.8 inch
• Main Arm Tilt (MAT)	+/- 90°
• C-Arm Scan (CAS)	AP: 60 inch, PA: 57 inch
• C-Arm Tilt (CAT)	AP: -68°/45°, PA: 78°/-45°
• C-Arm Rotation (CAR)	45°/-103°
• Patient Table Access Height	AP: 20 inch, PA: 21 inch
• Table Up/Down (TUD)	20 inch
• Table In/Out (TIO)	23 inch
• SID Range	40 - 60 inch

Movement speeds

• Speeds are variable with joystick activation	
• Main Centre Up/Down	1.0 inch/sec
• Main Arm Tilt	5.3°/sec
• C-Arm Scan	4.8 inch/sec
• C-Arm Tilt	5.8°/sec
• C-Arm Rotation	16.0°/sec
• Table Up/Down	1.3 inch/sec
• Table In/Out	1.0 inch/sec

Patient table

The carbon fiber patient table is designed in a way that allows maximum work space around it. Accessing the patient table is easy due to the low access height of only 20 inch (AP) above the floor.

- Detector Position
- Flat carbon fiber table top
- Inherent absorption of table top
- Table Load Capacity

Unique design concept offers best in class SID range of 40 - 60 inch.

Intuitive use and easy access around the patient table leads to improved efficiency and workflow.

AP/PA

95.2 inch (78.7 inch transparent) x 27.5 inch
≤ 1.8 mm Al. Equivalence

660 lbs

Unique design of the carbon fiber composite patient table allows for maximum strength combined with minimum radiation absorption. In addition, this design enables personnel to move freely around the table while keeping complete overview of the patient.

Detachable table

Intelli-C is designed to maximize the work area around the patient table, however the detachable table option enhances user ergonomics, simply by virtue of its flexible design. Use this flexibility to perform exposures on patients who are standing, lying in a patient bed, or sitting in a wheelchair when necessary.

The built-in in**Motion** auto-positioning technology enables direct, automatic positioning of the system to pre-programmed detachable table position.

Designed with end users in mind, the patient table can be detached in just few steps making this feature simple, yet effective. When the system has a detachable table, a convenient trolley is provided for transport and storage of the patient table. The table is attached to the trolley with a locking mechanism for the easy moving within the room.

Generator

• Model	Indico IQ 80 kW
• kV range (Radiography)	40 to 150 kV
• kV range (Fluoroscopy)	40 to 125 kV
• kV steps	Variable in 1 kV steps
• kV accuracy	±5 % + 1 kV over the full kV range, ±2 % + 1 kV from 90 to 110 kV
• Rise time	<0.5 ms
• Time range / steps	1.0 to 6300 milliseconds Variable in ms steps per ISO 497 series R'20
• mAs range	0.1 to 1000 mAs, up to 6300 if time mode selected
• mAs accuracy	± 10% + 0.2 mAs (for exposures > 4 ms)
• mA range	Rad: 10 to 1000 mA, pulsed fluoroscopy: 5 to 99 mA
• Coefficient of linearity	<0.2 for kV and mAs parameters
• Coefficient of reproducibility	<0.05 station-to-station for exp. ≥ 25 mA or 3.2 ms
• Output frequency	up to 400 kHz
• Dimensions (L) x (W) x (H)	41 cm x 51 cm x 105 cm
• Weight	91 kg
• Line Voltage	400 - 480 VAC ± 10%
• Line Frequency	50 or 60 Hz
• Momentary Current	155 Amps/phase at 400 VAC.
• Standby Current	<0.5 Amps
• Pulse rates Fluoro	1, 2, 3, 6, 12, 25
• Multiframe rate Serial	1, 2, 3, 6, 12
• DSA	1, 2, 3, 6, 12 + programmable sequences

X-ray tube

• High capacity X-ray tube	G1592/B180
• Foci	0.6 – 1.2 mm
• Foci loadings	47/112 kW
• Anode heat storage capacity	1.1 MJ (1500 KHU)
• Housing heat storage capacity	1482 kJ (2000 KHU)
• Max. voltage	150 kV
• Cooling	Natural Air Flow
• For optional G1092/B160 x-ray tube specs, see p. 13.	

Collimator

Rectangular field collimator with automatic and manual control designed for digital detector fixed in C-arm system.

The collimator features:

- Rectangular field consisting of two pairs of lead lined (3 mm Pb) shutters positioned midway in the collimator body.
- The shutter displacements are motorized with stepping motors controlled through a serial data bus and monitored by photocells.
- Three filtering shutters
 - 2 x contour vascular/ cardiac filters (synchronous operation selectable)
 - 1 x strip filter
- LED Light Field Intensity at 1 m:>200 lux

Designed to facilitate:

- Each filtering shutter control independently in both horizontal displacement and rotary motion ($\pm 360^\circ$), by automatic or manual positioning.
- Any shutter position to be stored with an auto position and anatomical program.
- Electronically controlled pre-set field sizes; the field sizes track automatically with Source - Image Distance (SID) variations



Filtration/absorption

Component	Al. equivalence
X-ray tube assembly total filtration	3.1 mm Al. eq
Patient table	1.8 mm Al. eq
Detector housing cover	0.6 mm Al. eq
Mattress	0.3 mm Al. eq
Soft filter blades	1.0 mm Cu
Added filtration	
1 mm Al + 0.1 mm Cu	3.7 mm Al. eq
1 mm Al + 0.2 mm Cu	6.2 mm Al. eq
2 mm Al.	2.0 mm Al. eq

DAP meter

- Model: VacuDAP 2004
- The measuring chamber is placed in the X-ray beam just after the collimator.
- The ionization chamber is highly transparent and does not affect the functionality of the light beam diaphragm.
- Dose is transferred via DICOM to PACS and it is shown live during the examination, both static and dynamic dose.

Detector

High quality flat-panel 4343CB detector integrated in the Intelli-C system. The detector has high resolution, 139 μm pixel pitch. The combination of Varex' proprietary readout electronics and the sensitivity of a Cesium Iodide scintillator enables low-dose performance.

• Model	4343CB incl. Nexus sw/integration
• Pixel pitch	139 μm
• Pixel Matrix	3072 x 3072
• Scintillator	CsI
• Pixel Area	16.8 X 16.8 inch
• Limiting Resolution	3.6lp/mm (1x1) ; 1.8lp/mm (2x2)
• MTF (1x1) at 1 lp/mm typical	54%
• DQE (1x1, quantum-limited) at 0 lp/mm	74%
• Contrast Ratio	Large Area (120 mm): <0.8%; Small Area (10 mm): <7%
• Lag (1st frame)	<3%
• Maximum Entrance Dose/Frame typical	50 uGy
• Dynamic Range	94 dB std modes 108 dB DGS modes
• Energy Range	40 - 150 kVp
• Fill Factor	60.7%
• Scan Method	Progressive
• Data Output	LVDS, CameraLink
• A/D Conversion	16-bits
• Dual/Dynamic Gain Modes, Effective bits	>17-bits
• Non-Uniformity	1% maximum
• Inactive Lines	<9 total rows and columns, minimum separation 16 lines
• Inactive Pixels	No inactive visible pixel after interpolation
• Cooling	Air Cooling
• Radiation Tolerance	2000 Gy (active area)
• MAG modes	16.8 inch, 12.5 inch, 8 inch, 5.5 inch

Detector housing

Slim housing with fixed detector and one grid to be either in or out.

Removable grid placed in the detector housing:
47 inch focused, 80 l/cm, 12:1 ratio

Hardware

- | | |
|--------------------|---|
| • Processor | 3.0 GHz quad-core |
| • Memory | 8GB DDR3 (PC3-12800) |
| • Graphics | Discrete PCI-e GPU, 1.7GB dedicated video memory |
| • Hard Drives | 1 - 120GB solid state, SATA (OS and software)
4 - 250GB HDDs, SATA RAID10 (databases and images) |
| • Optical Drive | 24X/52X DVD/CD Combo writer, SATA |
| • Operating System | Microsoft Windows 10 |

Software

Multipurpose digital imaging system and NEXUS DRF combine RF and DR capabilities in one imaging platform and delivers high quality images. NEXUS software is DICOM 3.0 and IHE compliant.

Image Acquisition

- Automatic image optimization based on customizable acquisition profiles
- Acquisition up to 12 fps (rapid sequence spots)
- Programmable sequences – DSA option

Fluoro Capabilities

- Pulsed fluoro
- Acquisition up to 25 fps
- Fluoro loop
- Expanded edge enhancement
- Last image hold or real-time fluoro store
- Real-time road-mapping – DSA option



Software Features

- HIS/RIS worklist support
- Configurable automatic study advance
- Accept/reject functionality
- Auto region of interest (ROI)
- Thumbnail image display
- Left/right markers with smart positioning

Imaging monitors

Live monitor

- Available in the control room and in the x-ray room
- Provides live in-room fluoro image view

Reference monitor

- Provides in-room image view and controls
- Configuration to mirror the Nexus DRF functions available on the Imaging computer in the control room
- Various options in configuring reference image functionality
- For optional imaging monitor see page 13

Specifications

• Model	MX216, Colour TFT, LED backlight, Anti-glare
• Size	21.3 inch
• Viewing angles	Horizontal 178°, vertical 178° (CR≥10)
• Dot pitch	0.270 mm
• Response time:	Black-white-black: Approx. 20 ms
• Resolution	2M pixels (1200 dots × 1600 lines (H×V))
• Max. display colour	1.07 billion colours (10-bit input)
• Display area (H)×(W)	12.8 in × 17 in
• Dimensions (with stand; W×H×D)	14 in x 7.87 in × 22.52 in



DeskPanel

- Provides positioner, generator and collimator functions
- Four 3-axis joysticks: one delegates collimation control, while the other three are for movement control
- The integrated Intelli-C user-interface allows intuitive control of the system movements and exposure parameters.



inControl Console

- Provides functionality identical to the **DeskPanel**
- Offers convenient in-room system management
- The movements, settings and generator parameters are controlled from the **inControl** touch screen
- Four hard buttons are used for autopositioning, collision control and CPR positioning
- The screen mirrors the functions found on the control room monitor but allows dedicated customization
- Motorized height adjustment and moveable within the X-ray room

inTouch sensors

All the joysticks contain built in **inTouch** sensors to reduce risk of accidental movements. **inTouch** technology senses the touch of a finger on at the top of the joystick, making this feature seamless, yet effective.

Exposure Foot Switch

In-room movable foot switch consists of three switches. Grey switch for DR exposure, yellow for Serial and blue for Fluoroscopy.



Standard configuration

At the time of order select either:

Left side suspended patient table



Right side suspended patient table



UPS (Uninterruptable Power Supply) for positioner and imaging workstation operation

The Intelli-C positioner and imaging workstation are supported by a UPS (Uninterruptible Power Supply) which will allow for seamless continuation of all movement controls in case of a power failure. The UPS will support full movement of the positioner for 15 minutes, and after that the system will shut-down automatically. This enables enough time for e.g. patient transfer off the table and a proper completion of image handling.

Optional configuration

- Instead of G1592/B180H X-ray tube specified in section X-ray tube, page 7.

	Standard Configuration	Optional Configuration		
	G1592/B180	G1592/B180/HE321	G1592/B180/HE281	G1092/B160/HE281
Model	High capacity x-ray tube	X-ray tube with oil/air heat exchanger	X-ray tube with oil/air heat exchanger	X-ray tube with oil/air heat exchanger
Foci	0.6/1.2 mm	<-	<-	0.6/1.2 mm
Foci loadings (broad/fine focus)	47kW/112kW	<-	<-	40kW/100kW
Anode Heat Storage Capacity	1.1 MJ (1500kHU)	<-	<-	740 kJ (1 000 kHU)
Leakage Technique Factors	150 kV, 7.2 mA	<-	<-	150 kV, 4.0 mA
HS Stator (speed)	3000/9000 rpm	<-	<-	3000/9000 rpm
Target-angle	12 degrees	<-	<-	12 degrees
Cooling performance	Natural Air Flow	2400W	2000W	2000W
Heat exchanger	-	HE321 oil/air heat exchanger	HE281 oil/air heat exchanger	HE281 oil/air heat exchanger

Instead of monitor, page 11.	Standard configuration	Optional configuration
Model	Eizo MX216	Eizo MX242W
Size	21.3"	24.1"
Resolution	1200 x 1600 (3:4 aspect ratio)	1920 x 1200 (16:10 aspect ration)
Max. display colour	10-bit	10-bit

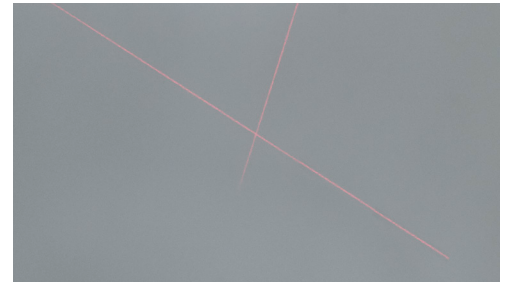
SmartPanel on detector housing

SmartPanel for convenient SID adjustment, transversal table movement, C-arm tilt, rotation and scan, as well as optional laser cross on/off and retrieve functions.



Laser cross

The detector housing will contain two lasers, which display a light cross projected on the patient in the center of the beam.



Detachable table

Detachable table allows exposures on patients who are standing, lying in a patient bed, or sitting in a wheelchair. (See p. 6)



Standard accessories

Mattress, 3 cm

A mattress for patient comfort to be placed on the carbon fibre patient table.



Table Top Support, CPR

A height adjustable device intended to give support to the patient table in case of emergency CPR on the table.



Pair of Hand Grips

Hand Grips to be fixed freely along both sides of the table for increased patient comfort.



Foot Rest

To support the patient during table top angulation. The foot rest can be positioned freely along the patient table from either end.

Foot rest load capacity: 660 lbs



Optional accessories

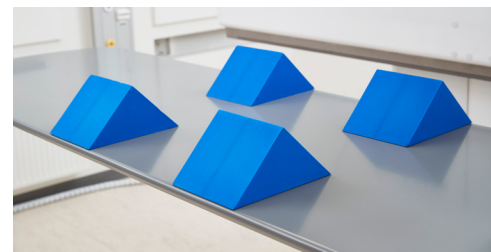
Mattress, Long

The long mattress (90 inch) is designed to increase patient comfort through the entire x-ray transparent area. It is equipped with an elastic band on the rear side.



Triangular Foam Pads

A set of four triangular foam pads for patient support during lateral table tilting movements.



Pair of Leg Supports

A set of two leg supports for gynecological and urological examinations. They can be placed freely along the patient table.



Shoulder Support

Shoulder support guides the positioning/support of the patient during angulation towards the Trendelenburg position.



Patient Support Straps

A set of three adjustable straps with quick-fit Velcro fastenings restrains the patient in a fixed position.



Side bar

A long hand bar to be fixed in any position along the patient table designed to support the patient while rolling over for various examinations.



Arm support

An adjustable arm support is intended mainly for use during intravenous injections of contrast media.



IV Stand

An IV stand to be fixed in any position along the patient table to attach infusion bottles during the examination.



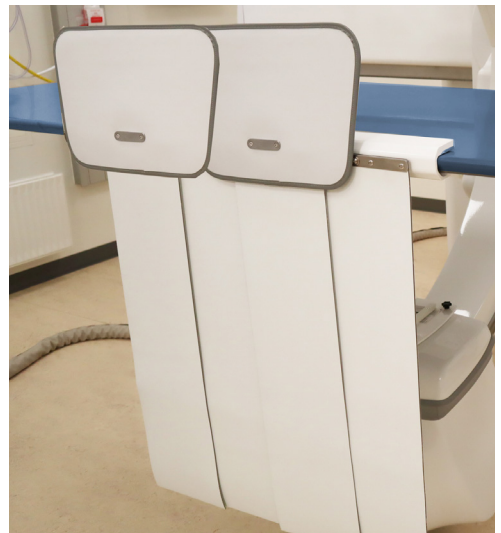
Radiation Shield, Below table

A radiation shield for operator protection against stray radiation during x-ray examination.



Radiation shield with top shield

The radiation shield is easily attached alongside the table top and it is intended to protect users against stray radiation from the patient both below and above the table. The radiation shield can be tilted and will maintain protection within a limited range of motion.



Radiation shield, End of table

The End-of table Radiation shield is intended for use on the Intelli-C patient table as protection of a caretaker positioned near the patients' head.



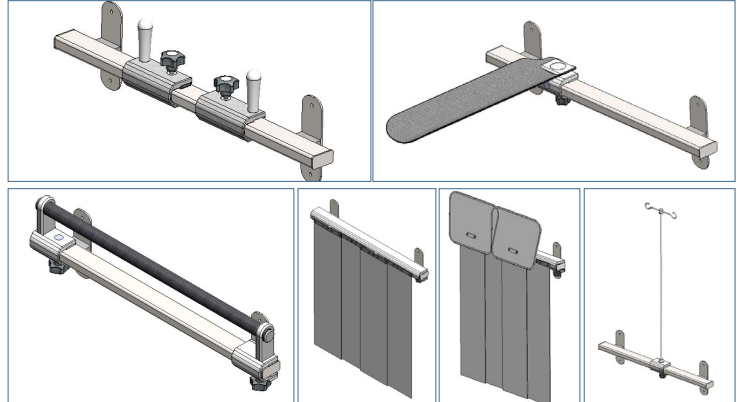
Wall mounts (optional)

Wall mounts are intended for wall suspension of the table mountable accessories. The Wall mounts make the accessories easily accessible for use and protect them from any unnecessary wear during storage.

Wall mount, Long

Applicable for:

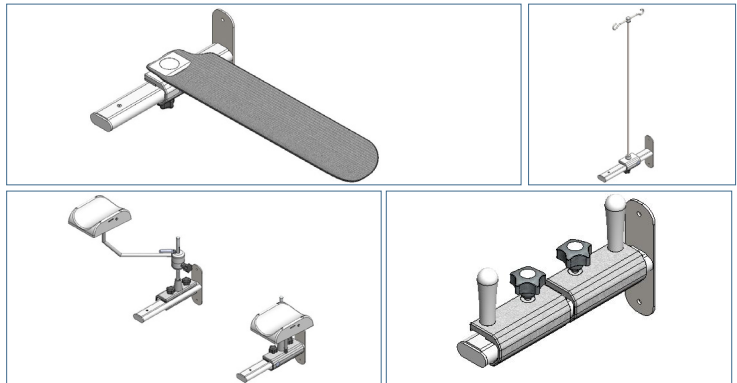
Arm Support
IV Stand
Pair of Hand Grips
Radiation Shield
Radiation Shield w. top shield
Side bar



Wall mount, Short

Applicable for:

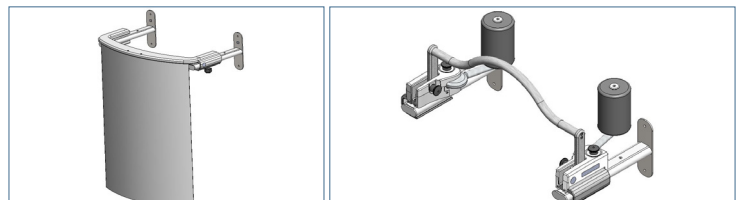
Arm support
IV Stand
Leg Support
Pair of Hand Grips



Wall mount, Across

Applicable for:

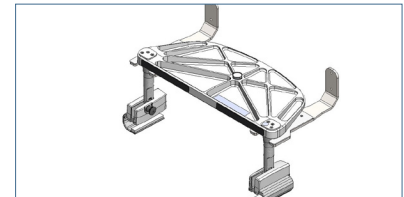
Radiation Shield, End of Table
Shoulder support



Wall mount, Foot rest

Applicable for:

Foot rest



Wall mount, CPR-support (standard)

Applicable for:

Table Top Support, CPR



Dose minimisation

- Carbon fiber patient table and detector housing
- Additional filtration available as standard in the collimator
- Virtual collimation
- Anti scatter grid
- Rise time <0.5 ms reduces the dose to patient
- 5 field solid state AEC, carbon fiber
- Move table out of the X-ray beam – save dose in e.g. standing DR examinations
- A feature for radiation free positioning allows positioning according to the LIH (Last Image Hold) or radiographic image without exposing the patient

Design summary

Truly versatile C-arm system

- Multipurpose tilt-C X-Ray system for universal radiographic, serial, fluoroscopic and specialized applications such as angiographic studies
- True DR imaging at low dose levels; up to 60 inch SID

Unique functionality

- Easy access around the table
- Unique detector lift design allows unrestricted positioning and full visibility along the patient
- Effortless switch between AP and PA position
- Move table out of the X-ray beam – save dose in e.g. standing DR examinations
- Easily choose from multiple beam projections – reduced need to reposition the patient

Advanced detector technology

- 139 µm pixel pitch for dynamic and DR imaging

Modern generator technology

- Rise time <0.5 ms reduces the dose to patient
- GenWeb - Web-based Diagnostic and Service Software

Positioner design

- Right and left side suspended table available
- +/- 90° table tilt
- 660 lbs table load capacity, 27.5 inch table width
- No extra technical room needed – only the generator cabinet is external to the system

inControl Console

- For convenient in-room system management
- Full generator and collimator functionality
- Four 3-axis joysticks with inTouch sensors
- Height adjustable and can be moved within the room



Installation

Exam room size

Length		Depth		Ceiling Height	
Recommended	Minimum	Recommended	Minimum	Recommended	Minimum
14.7 ft. 4.5 m	11.5 ft. 3.5 m	14.7 ft. 4.5 m	13 ft. 4 m	9.5 ft. 2.9 m	9 ft. 2.72 m

Audible noise emission

Control room	45 dB (A)			
	Without Silence Cabinet		With Silence Cabinet	
X-ray room	Standby	Peak, multi-move	Standby	Peak, multi-move
Without x-ray tube heat exchanger	< 47 dB (A)	< 63 dB (A)	< 46 dB(A)	< 62 dB(A)
With x-ray tube heat exchanger	< 53 dB (A)	< 69 dB (A)	< 46 dB(A)	< 62 dB(A)

Power connection requirements

	Voltage			Frequency	Input impedance	Emergency Supply	Supplied by
	NOM	MIN	MAX	NOM			
Generator Indico IQ	400 VAC 3 phase	-10%	+10%	50/60 Hz	≤ 0.13 ohms	Emergency Power Generator	Hospital/ Distributor
Positioner	230 VAC	-10%	+10%	50/60 Hz	N/A	UPS supplied with the system	Manufacturer with the system
Control room Transformer	230 VAC	N/A	+10%	50/60 Hz	N/A	UPS supplied with the system	Manufacturer with the system

Operating environment

	Ambient temperature	Humidity	Atmospheric Pressure
Operating	50 °F - 90°F	35 - 60% RH Non-condensing	900 - 1060 hPa
Storage	32°F - 104°F	35 - 60% RH Non-condensing	860 - 1060 hPa

Mode of operation	10% intermittent operation; 1 min operation, 9 min rest
Start-up time	< 120 seconds
Shutdown time	Depends on the number of exposures during the day
Complete system weight	3968 lbs
Further information	13400012 Site planning and Preparation
It is recommended to turn the system off every day after use.	

Heat generation

		Turned off	Standby	Average load / mixed operation	High load / interventional operation
Location split					
Generator	W		200	285	370
Exam room	W		200*	335*	440*
Control area	W		135	135	135
System element split					
Generator	W		200	285	370
Positioner and image system	W		335*	470*	575*
Total system	W	<25	535	755	945

*In case system is configured with x-ray tube heat exchanger, 270W is to be added.

Environment

Materials satisfy the RoHS directive, the REACH regulation, and the Montreal protocol.

Classification and standards

FDA: Class II

The Intelli-C is classified in accordance with:

21CFR Part 892, subpart B, Sec. 892.1650

Product code: OWB

Device: Interventional Fluoroscopic X-ray System

Regulation number 892.1650

Product code: JAA

Device: Image-intensified fluoroscopic x-ray system

Regulation number: 892.1650

ABOUT NRT

NRT X-RAY A/S has been developing and manufacturing medical X-ray equipment for hospitals since the early 1970's. Today NRT is recognized in the market as a manufacturer of particularly user friendly, flexible and reliable X-ray systems.

So far, NRT has delivered more than 3500 X-ray systems worldwide. These systems represent more than forty individual products, which have contributed to the continuous improvement of both technologies and processes at X-ray departments worldwide.

In 2002, a management buyout resulted in an increased focus on new products, developed in close cooperation with clinical staff and marketed under the NRT brand - the evolving Adora product family and the CFP platform demonstrates this effort.

Though operating globally, NRT remains loyal to its Scandinavian heritage, valuing proud workmanship, world class design and engineering, collaboration with innovative technology partners and distributors, and user-driven innovation.

Since 2011, NRT has been involved with R&D programs in cooperation with University Hospitals.

All NRT operational processes are certified to the ISO 13485 standard. The certification is maintained to e.g. enable manufacture of medical devices in CE class IIb. Product certification includes FDA 510k, UL/CSA listing and CE marking.

Intelli-C is developed and manufactured by NRT, and distributed in the US by Alpha Imaging.



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