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XPM3
Reflow Soldering Systems

General Specification

GS337

OVER MODELS - DIMENSIONS - WEIGHTS							
Model Number		**520**	**730**	**820**	**940**	**1030**	**1240**
Heating zones	#	5	7	8	9	10	12
Cooling zones	#	2	3	2	4	3	4
Total heating length	(cm / in)	168 / 66	234 / 92	264 / 104	305 / 120	335 / 132	406 / 160
Total cooling length	(cm / in)	66 / 26	91 / 36	61 / 24	122 / 48	91 / 36	122 / 48
Total process length	(cm / in)	323 / 127	413 / 163	413 / 163	506 / 199	506 / 199	528 / 208
Total on /off load length	(cm / in)	28 / 11	28 / 11	28 / 11	28 / 11	28 / 11	28 / 11
Overall system length	(cm / in)	353 / 139	445 / 175	445 / 175	536 / 211	536 / 211	630/ 247
Overall system width*	(cm / in)	149 / 57	149 / 57	149 / 57	149 / 57	149 / 57	149 / 57
Overall system height	(cm / in)	165 / 65	165 / 65	165 / 65	165 / 65	165 / 65	165 / 65
Machine weight	(kg / lbs)	1275 / 2800	1800 / 3950	1800 / 3950	2275 / 5000	2275 / 5000	2770 / 6100
Skidded weight	(kg / lbs)	1406 / 3100	1973/ 4350	1973/ 4350	2495 / 5500	2495 / 5500	3039 / 6700
Crated weight	(kg / lbs)	1452 / 3200	2041 / 4500	2041 / 4500	2132 / 5700	2132 / 5700	3130 / 6900
Add 272 kg / 600 lbs for Nitrogen configuration, other options may increase weights.							
*Add (cm / in) 8 / 16 with keyboard tray up in working position.							

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GENERAL SYSTEM: STANDARD FEATURES & SPECIFICATIONS

- **Intended Use:**
  - The **XPM3** is a forced convection reflow soldering system (oven) designed for automated in-line processing of printed circuit assemblies for the purpose of reflow soldering for both tin-lead and lead-free applications.

- **Forced Convection Heating:**
  - Air Atmosphere operation
  - top and bottom heat cells = one heat zone (305 mm / 12 in. long),
  - composite high mass fast response heater with diffuser plate,
  - temperature monitoring in each heat cell via type K thermocouple,
  - over-temperature safety protection (bi-metallic switch) in each cell,
  - 350°C maximum set-point temperature, (not intended for all zones)
  - control accuracy +/- 1°C,
  - cross conveyor uniformity +/- 2ºC. *(See Note 1)*
  - time to "process ready" status from cold start <30 minutes (supply voltage and recipe dependent).

- **Forced Convection Cooling:**
  - top and bottom cool cells = one cool zone (305 mm / 12 in. long),
  - active forced convection <u>top</u> and <u>bottom</u> cooling cells with recirculating flow,
  - temperature monitoring in each top cool cell via type K thermocouple,
  - Ambient AIR Cooling Cells (standard for Air atmosphere configurations only),
  - Integrated basic Heat Exchanger in top cooling cells for N2 atmosphere configurations (reference table within),
  - *Enhanced Cooling* Packages with high efficiency Heat Exchangers in top cooling cells (optional for Air and N2 atmosphere configurations), available with:
    - On-board integrated recirculation system and closed loop coolant temperature control, or
    - High capacity cooling configurations with external coolant supply (chillers or factory chilled water).

- **Conveyor System:**
  - 20" Belt Conveyor: 490 mm / 19.25 in. usable width, stainless steel Flat Flex - 12.5 mm / 0.5 in. pitch - standard pitch,
  - DC brushless motor and drive - closed loop speed control,
  - Speed range: 25 - 190 cm/min. / 10 – 75 in/min.,
  - Speed accuracy +/- 1.3 cm/min / 0.5 in/min.
  - Height from floor 870 - 965 mm / 34.25 - 38 in.,
  - Direction Left-to-Right as viewed from operator station (right to left optional)

- **Gas Management:**
  - Individual Cell Inlet and Exhaust[TM] : [patented], enables optimized gas flow management
  - Flux Flow Control[TM] : flux evacuation system standard on all systems

- **Oven Control System:**
  - Integrated Micro-controller with programmable flash memory.
  - OCS Software - menu driven, closed-loop PID temperature and conveyor speed control, data logging, trend analysis, recipe storage, auto start/stop, multilevel passwords, multi-language support, HIS Host Interface Software with remote machine status viewer and data logger, integrated "How do I ?" self-help function, alarm cause and preventive maintenance software support functions.
  - Windows[TM] PC operating system.
  - OEM DELL PC / Windows[TM] XP Pro: (minimum) 2GHz+, CDRW, 40GB+ hard drive, 256 mb RAM, network interface, serial port for oven, USB ports, 56K modem. OEM DELL Flat Panel Display and Keyboard: integrated onto onload Control Tower.

- **Profiling Features:**
  - Precision Profiling[®] software and (3) type K thermocouple ports (miniature female socket type connector).
  - OEM Auto M.O.L.E.[®] and OEM KIC2000 Profiling Software: no OEM hardware required, use of Precision Profiling.

- **General Features:**
  - Electro-Mechanical Hood Lifts
  - Hour Meter
  - Emergency Stops: (4) total, (1) on each corner of the system.
  - Audible Alarm
  - NFPA 70 & NFPA 79 Standards compliance *(see Note 2)*
  - Operation / Technical Manuals - accessible through oven PC and additional CD copy (printed schematics in English)
  - Grey-White Painted Panels (RAL 9002 with standard Vitronics Soltec texture and gloss)
  - Heavy Duty Frame: 11gauge galvanized steel with welded support members, 77 mm / 3 in diameter leveling feet.

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- **General Features** *continued……….*
  - Tunnel / product clearances – see table below:

Conveyor Type ➤	Belt Only	Edge Rail Only	Combination Edge Rail & Belt
Standard Clearances			
Top side above belt	38mm / 1.5"	N/A	47mm / 1.88"
Top side above chain pin	N/A	25mm / 1"	25mm / 1"
Bottom side below chain pin	N/A	22mm / .88"	22mm / .88"
Optional Clearances			
Top side above belt	38mm / 1.5"	N/A	60mm / 2.38"
Top side above chain pin	N/A	38mm / 1.5"	38mm / 1.5"
Bottom side below chain pin	N/A	22mm / .88"	22mm / .88"

ELECTRICAL POWER SUPPLY OPTIONS:

Select one voltage configuration below. Consult Site Preparation & Installation Manual for facility requirements.
- Voltage - 200V 3 Ph
- Voltage - 208V 3 Ph
- Voltage - 220V 3 Ph
- Voltage - 240V 3 Ph
- Voltage - 380V 3 Ph
- Voltage - 400V 3 Ph
- Voltage - 415V 3 Ph
- Voltage - 440V 3 Ph
- Voltage - 480V 3 Ph

Select one frequency configuration below. All ovens are 50/60 hertz capable. Controller DIP switch position 4 is configured for the specific operating frequency of the destination facility prior to shipment.
- Frequency – 50 hertz
- Frequency – 60 hertz

CONVEYOR OPTIONS

- **Right-to-Left:** conveyor transport direction as viewed from operator station.

Belt Only Conveyor Options:
- 16" Belt Conveyor: 390 mm / 15.25 in. usable width, stainless steel Flat Flex - 12.5 mm / 0.5 in. pitch - standard pitch.
- 16" Belt Conveyor: 390 mm / 15.25 in. usable width, stainless steel Flat Flex – 7.3 mm / .286 in. pitch – *fine pitch*.
- 20" Belt Conveyor: 490 mm / 19.25 in. usable width, stainless steel Flat Flex - 12.5 mm / 0.5 in. pitch - standard pitch.
- 20" Belt Conveyor: 490 mm / 19.25 in. usable width, stainless steel Flat Flex – 7.3 mm / .286 in. pitch – *fine pitch*
- 24" Belt Conveyor 590 mm / 23.25 in. usable width, stainless steel Flat Flex – 12.5 mm / 0.5 in pitch - standard pitch.
- 24" Belt Conveyor 590 mm / 23.25 in. usable width, stainless steel Flat Flex - 7.3 mm / 0.286" pitch – *fine pitch.*

Edge-Rail Only Conveyor Options:
- 14" Edge-Rail Conveyor Only: 38 mm – 355 mm / 1.5 –14 in. usable width
- 18" Edge-Rail Conveyor Only: 38 mm – 457 mm / 1.5 – 18 in. usable width
- 22" Edge-Rail Conveyor Only: 38 mm – 559 mm / 1.5 – 22 in. usable width

Combination Edge Rail and Belt Conveyor Options:
- 14" Combination Edge-Rail and Belt Conveyor: 38 mm - 355 mm / 1.5 – 14 in. usable width (edge-rail); 337 mm / 13.25 in. usable width (belt – standard pitch).

- 18" Combination Edge-Rail and Belt Conveyor: 38 mm - 457 mm / 1.5 – 18 in. usable width (edge-rail); 438 mm / 17.25 in. usable width (belt – standard pitch).

- 22" Combination Edge-Rail and Belt Conveyor: 38 mm - 559 mm / 1.5 – 22 in. usable width (edge-rail); 540 mm / 21.25 in. usable width (belt – standard pitch).

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{Specifications for optional Edge-Rail conveyor configurations}
- Chain pin length - 4.8 mm / 0.187 in.
- Chain pin pitch - D3 - 9.5 mm / 0.375 in.
- Rail parallelism - at lead screws - 0.5 mm / 0.020 in.
- Tunnel clearance – reference table in General Features section
- Motorized edge-rail width and XCS adjust via rotary switch
- Front rail fixed (Rear rail fixed optional)
- Speed range: 25 - 190 cm/min. / 10 – 75 in/min.

- **Rear Rail Fixed:** changes the location of the "fixed rail" from the front to the rear, <u>requires</u> Edge-Rail configuration.

- **Xtruded Center Support:** chain support plate "park" <u>between</u> fixed edge-rail chain pins to provide full bottom side product clearance. Requires Edge-Rail Conveyor Only option with D3 - 9.5 mm / 0.375 in pitch chain on moveable rail and D1 - 19 mm / 0.750 in pitch chain on fixed rail. Not compatible with belt conveyors.
  - Minimum bottom side product unpopulated XCS path required - 3 mm / 0.120 in.
  - XCS chain plate height – 22.2 mm / 0.875 in.
  - XCS chain plate width – 1.25 mm / .050 in.
  - XCS chain plate pitch – 38.1 mm / 1.5 in.

- **Computer Controlled Edge-Rail Width Adjust:** available in single or dual axis configurations – for Edge Rail and XCS conveyor configurations.

- **Computer Controlled Edge-Rail Chain Lubrication:** available for single lane, dual lane edge rail conveyors and XCS chains.

- **Dual Lane Edge-Rail Conveyor Package:** simultaneously transports 216 mm / 8.5 in. maximum width products per lane, consult factory for desired configuration and features.

- **Dual Lane Combination Edge-Rail and Belt Conveyor Package:** consult factory for desired configuration and features.

- **Dual Lane Edge-Rail and Dual Xtruded Center Support Conveyor Package:** simultaneously transports and supports up to 8.5" [216 mm] wide products per lane, consult factory for desired configuration and features.

- **Low Conveyor Speed:** (7.6 - 95.5 cm/min / 3.0- 37.6 in/min.) Utilizes standard brushless DC motor with gear reduction.

- **Hand Crank:** emergency product evacuation, manually operated.

- **UPS Pre-Wiring:** prep for user installed APC "Smart" model 115 VAC UPS system only. Operates oven PC, controller, conveyor and hood lifts, optional Main Circuit Breaker Disconnect is <u>recommended</u>.

- **UPS Battery Backup:** Operates oven PC, controller, conveyor and hood lifts, optional Main Circuit Breaker Disconnect is <u>recommended.</u>

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ATMOSPHERE OPTIONS:

- **Nitrogen (N2) Atmosphere Control Package:**
  - Designed for optimized process performance at maximum convection rates (inverter not required)
  - sealed process tunnel, gas distribution panel, (4) dual scale flow meters with manual control,
  - vertically adjustable gate - onload end,
  - horizontally adjustable roller curtain - onload end (for Edge-Rail configurations only),
  - offload end strip curtains,
  - (1) Reflow Zone & (1) Source Gas sample port with push in ¼" tube connector for portable O2 analyzer connection,
  - Quick Purge feature achieves ≤100 PPM of residual O2 in less than 20 minutes,
  - NC1 Cooling Package (see COOLING OPTIONS for description)
  - typical residual oxygen levels throughout process tunnel <100 PPM, (Note: higher O2 PPM levels are attainable with O2 Doping option)
  - typical N2 operating flow rate range (20 – 56) m^3/hr [(700 - 2000) cfh] will vary depending on model, conveyor type, tunnel opening (Width x Height), loading frequency and other process variables.

- **Basic N$_2$ / AIR Switching:** allows recipe-activated switching from N2 atmosphere mode to modified AIR atmosphere mode operation. Includes controlled exhaust, regulator / gauge assemblies for Air inlets.

- **True N$_2$ / AIR Switching:** allows recipe-activated switching from N2 atmosphere Mode to optimized AIR atmosphere mode operation. Includes controlled exhaust, regulator / gauge assemblies and valves for Air inlets, Maintains similar internal process gas flows in both operating modes.

- **O2 Doping:** provides capability to manually set and control higher O2 levels within a stable N2 atmosphere by introducing a controlled amount of air into the reflow zones via manual metering valves. Controllable range 100 -2500 ppm O2 in the Reflow zone. This option will not reduce overall N2 consumption. Requires OEM Integrated Analyzer.

- **OEM Integrated Oxygen Analyzer & Multi-Port O2 Sampling System**: includes on-board powered analyzer, communications with Oven Control Software for alarm handling, real time Reflow Zone gas sampling and display of O2 PPM level. Includes (4) gas sample ports with PC selectable zone display of Reflow Zone, Source Gas, Service Mode Onload and Service Mode Offload for calibration and set-up activities. Includes replaceable in-line flux fume filters, source gas pressure regulator and push-in ¼" tube connector.

- **OEM Portable Oxygen Analyzer:** digital display, PPM-% range, internal pump, hose, externally mounted replaceable in-line flux fume filters, (specify voltage 110V or 230V when ordering). Note: The Portable O2 analyzer option is not designed for system integration or communications with the computer / controller.

COOLING OPTIONS:

- **AC1 Ambient AIR Cooling:** (standard with Air Atmosphere configurations only) top and bottom forced convection cells (not compatible with Nitrogen Atmosphere configurations).

- **NC1 Cooling Package:** (standard with N2 Atmosphere configurations only) includes tube type Heat Exchangers (top cooling cells only) and connections for customer supplied recirculating coolant system. Active blower powered gas recirculation flow through top and bottom cooling cells.

- **NC2 Cooling Package:** (optional with N2 Atmosphere configurations only) includes tube type Heat Exchangers (top cooling cells only) with integrated on-board recirculating coolant supply system.

- **EC1** *Enhanced Cooling* **Package:** (optional with N2 or Air Atmosphere configurations) includes tube and fin high efficiency Heat Exchangers (top cooling cells only) and connections for customer supplied recirculating coolant system.

- **EC2** *Enhanced Cooling* **Package:** (optional with N2 or Air Atmosphere configurations) includes tube and fin high efficiency Heat Exchangers (top cooling cells only) with integrated on-board recirculating coolant supply system, closed-loop coolant temperature control (input side) from 60 – 80°C. Provides cooling zone stability and control over product cooling slopes and exit temperatures.

- **EC3** *Enhanced Cooling* **Package:** (optional with N2 or Air Atmosphere configurations) includes high efficiency *Enhanced Cooling* Cells (top only) with stand-alone 24,000 BTU/hr OEM integrated Chiller, closed loop coolant temperature control from 10 - 80°C, refrigerated coolant supply system, electrical interface for Auto Start / Stop and alarm notification. Requires separate customer supplied electrical power and floor space provisions, consult Manual for details.

XPM3 Cooling Configurations							
All cooling configurations are designed with active forced convection <u>top</u> and <u>bottom</u> cooling cells with recirculating flow for improved cooling efficiency and capability.							
Cooling Option	Oven Atmosphere		Heat Exchanger (HX) Type (top cells only)		Coolant Supply Type			Coolant Temperature Control
	Air	N2	Tube HX	*Fin & Tube HX	Customer Supplied Coolant & Control	VS Supplied Onboard Recirculating System	VS Supplied OEM Integrated Chiller	Closed-Loop
AC1	S	-	-	-	-	-	-	-
NC1	-	S	✓	-	✓	-	-	-
NC2		O	✓	-	-	✓	-	-
EC1	O	O	-	✓	✓	-	-	-
EC2	O	O	-	✓	-	✓	-	✓
EC3	O	O	-	✓	-	-	✓	✓

S: Standard Feature
O: Optional
- : Not available
✓: Provided with feature (S) or option (O) selected
*Fin Type HX provides maximum efficiency

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GENERAL OPTIONS:

- (**3) Color LED Light Tower**: Red, Yellow, Green. Oven status indicator, integrated on operator control tower located on control side, on-load end.

- **Main Circuit Breaker Disconnect**: integrated main electrical disconnect switch (included with CE and UL Compliance options).

- **Product Tracking:** provides single lane or dual lane graphical representation of product positioning and alarm functions (included with SMEMA Interface option).

- **Primary Cell Blower Speed Control:** enables simultaneous convection level control of all heating and cooling cells, motor speed control via computer interfaced AC variable frequency drive.

- **Individual Cell Sensing:** minimizes diagnostic time by detecting and indicating a specific cell motor under speed condition and or cell over-temperature switch activation.

- **Redundant Over Temperature System:** provides over-temperature detection system utilizing redundant cell thermocouples and independent over-temperature monitoring.

- **Integrated Exhaust Stack Filter:** filters process related exhaust with filter clog detection and alarm notification.

- **Low Exhaust Sensing System:** senses a low facility exhaust flow condition and provides alarm notification. (Recommended when processing materials that may generate airborne hazardous substances).

- **High Temperature Exhaust Hose Kit:** contains two 8" [200mm] diameter by 8' [2.4m] length high temperature exhaust hoses with clamps.

- **Custom Color:** single color specified per customer supplied RAL color code or paint chip.

- **Tunnel / product clearance:** 38 mm / 1.5 in maximum, reference table in General Features section. *(see Note 3)*

- **120VAC Courtesy Outlet:** for use with peripheral options only.

INTERFACE & COMPLIANCE OPTIONS:

- **SMEMA Electrical Equipment Interface:** per IPC-SMEMA-9851 for single lane or dual lane conveyors, includes Product Tracking option.

- **CE Compliance:** EU Directive safety compliance. Local inspections not included if required. Includes Main Circuit Breaker Disconnect option, bleedable ball valves with lock-out provisions on compressed Air and N2 inlets, Onload & Offload CE Covers for in-line processing.

- **Special 900 mm Onload & Offload CE Covers:** for stand-alone manual processing. Requires customer installation and customer supplied in-feed and out-feed conveyors.

- **UL 499 Compliance:** UL 499 Standard for Safety for Electric Heating Appliances. Also covers CSA and Ontario Hydro. Local inspections not included if required. Includes Main Circuit Breaker option, Onload & Offload CE Covers. *(See Note 4)*

- **Host Communications Software:** (CAMX) Computer Aided Manufacturing using XML (CAMX), per IPC-2501 standard. Provides centralized message broker, open standard information routing, HTTP interface to pass XML messages.

- **Barcode Scanner Package:** includes bar code reader and management information software package. Enables recipe start / change based on product barcode, software maintains operating conditions, product and recipe data. Requires SMEMA option.

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PROFILING OPTIONS:

- **Traveling TC Extensions** (3), type K miniature male connector - for use with oven's on-board Precision Profiling®

- **OEM ECD** profiling products (consult factory)

- **OEM KIC** profiling products (consult factory)

- **OEM Datapaq** profiling products (consult factory)

SPARES PART OPTIONS:
- Consult price list

FACILITIES REQUIREMENTS:

- Consult Installation & Operation Overview Manual.

- *Note 1:As measured using Vitronics Soltec standard Thermal Performance Verification Test procedure.*
- *Note 2: NFPA-70 and NFPA-79 is configuration dependent.*
- *Note 3: Larger conveyor widths and tunnel clearance configurations will increase N2 consumption rates.*
- *Note 4: Heater design meets CE Compliance Hi-Pot test requirements.*

Machine specifications are subject to periodic review and may change without notice.
Reference Price List for available configurations.
Vitronics Soltec assumes no obligation for specifications contained herein.

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