
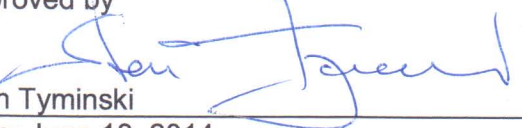


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Transduction

QUALITY CONTROL MANUAL

Prepared by 	Approved by 
Bojan Bosnic	Stan Tyminski
Date: June 18, 2014	Date: June 18, 2014

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Revision Index

Revision	Issue	Section	Description	Date	Approved By:
3.5	1	All Sections	Remove and update Appendix documents	06/18/2014	Stan Tyminski
3.4	1	3.5.7 Incoming Inspection	Approving invoice before payment	12/20/2013	Stan Tyminski
3.3	1	3.5.5 Procurement	Purchase request form to be completed to initiate purchase of parts Add Service (S) purchase orders	06/05/2013	Stan Tyminski
3.2	1	Selected Sections	Revised as per Candu Energy Audit	02/14/2012	Stan Tyminski
3.1	1	3.5.14 Special Processes & 5.0 Appendix	Revised Special Processes list Replace "Drawing 1"	02/09/2012	Stan Tyminski
Up One Level (3)	1	All Sections	Rewrite To Conform To CSA Standard CAN3 Z299.3-85 Format	01/24/2012	Stan Tyminski
2.10	5		Preliminary Version	07/05/2007	Stan Tyminski

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Quality Policy

The ultimate objective of the quality policy at Transduction is to produce high quality products, provide for effective quality assurance during all phases of manufacturing and to ensure that specific quality requirements of the customer contracts are satisfied.

The quality policy is implemented in detail through procedures affecting the Metal Fabrication, Manufacturing Engineering, and Quality Control Departments.

This Quality Control Manual is designed for compliance with CSA Z299.3-85.

Distribution

This Quality Control Manual is distributed to the following management personnel:

- Quality Control Manager & CEO – Stan Tyminski
- Purchasing and Expediting Department – Josie Zhong
- Metal Fabrication Engineering Department – Bart Deczkowski
- Manufacturing Engineering Department – Jack Zachcial
- Marketing and Administration Department – Bojan Bosnic
- Accounting Bookkeeper – Teresa Mandra

Internal distribution of the Quality Control Manual is maintained using a *“Quality Control Manual Internal Distribution List” (QCMDIL-001), (Ref.: Forms Registry, FR-001, Page 75).*

External distribution of the Quality Control Manual is maintained using a *“Quality Control External Distribution List” (QCMDL-001), (Ref.: Forms Registry, FR-001, Page 74).*

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**Transduction Inc.
Bldg. 23
Mississauga, Ontario
L4W 5A1**

Quality Control Manual
Certification

I hereby certify that this Quality Control Manual accurately describes the system used by Transduction to meet the requirements of CSA Z299.3-1985, CSA Z299.4-1985.

Quality Control Manager

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1.0 SCOPE

1.1 General

1.1.1

Transduction Inc. Quality Control Program and Quality Control Manual is based on the Canadian Standards Association CAN3-Z299.3-85, Quality Assurance Program Standards – Category 3. Transduction Inc. is responsible for maintaining this program which is aimed primarily at controlling inspection and test verifications which;

- a. Assure that Transduction products and services conform to specified requirements and;
- b. Readily detect and control the disposition of nonconformance.

The Quality Control Program will be implemented and maintained at the two locations, head office and manufacturing plant, located in Mississauga, Ontario.

Head Office	Metal Fabrication
5155 Spectrum Way, Bldg. 23	5155 Spectrum Way, Bldg. 20
Mississauga, ON L4W 5A1	Mississauga, ON L4W 5A1

1.1.2

Transduction Inc. Quality Control Program identifies special controls, measuring and testing equipment, and skill requirements for assuring product and service quality.

1.1.3

This Manual describes and outlines all the program elements as listed in the CAN3-Z299.3-85, Quality Assurance Program Standards – Category 3.

1.1.4

Transduction products are manufactured to a semi-finished inventory level and finished after receipt of a customer contract to the specified requirements included in the contract. All products shipped are supported by objective evidence that they are compliant with the contract specifications and terms and conditions.

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1.1.5

- a. Transduction manufacturing system and Quality Control Program is supported by a system of networked computers. The application programs, databases and personnel that use the computer system are also controlled as outlined in this manual.
- b. Computer software supplied to the customer is also subject to final acceptance and inspection and testing as outlined in this manual.

1.2 Customer Responsibility

In accordance with CAN3-Z299.3-85, Quality Assurance Program Standards – Category 3, clause 1.2 the customer should review and follow the points outlined.

1.3 Transduction Responsibility

Transduction acknowledges its responsibilities to:

- a. Satisfy requirements specified in a contract;
- b. Maintain the Transduction Quality Control Program;
- c. Conduct yearly evaluation and if needed, update the Quality Control Manual including documented system function descriptions and inspection and test reports when needed to improve the effectiveness of the program or reflect current practices;
- d. Provide customer access to Transduction facilities for the purpose of quality surveillance and audit; and identify for the customer before the award of the contract which products will be supplied from inventory and demonstrate that the Quality Control Program was implemented for the products at the time they were produced.

1.4 Regulatory Authority Requirements

Transduction meets the requirements of all Federal, Provincial, Territorial, and Municipal Acts, Regulations, Bylaws, and their Federal Codes that apply to Transduction products and services.

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2.0 DEFINITIONS

The following definitions apply in this Standard:

Batch (volume or lot) means an identifiable collection of products, or quantity of material, of a single type, grade, class, size, or composition produced in the same facility under essentially the same conditions and at essentially the same time.

Calibration means comparing two instruments, measuring devices, or standard, one of which is of known accuracy. It is done to detect, correlate, report, or eliminate by adjustment any variation in accuracy of the instrument or measuring device of unknown accuracy.

Characteristic means any distinct property or attribute of a product, process, or service that can be described and measured to determine conformance and nonconformance to specified requirements.

Contract means the written covenant and other documents agreed to and legally binding between the customer and supplier which specify requirements and conditions that must be met to successfully complete the work.

Customer means the party or his representative issuing a contract for procuring products or services.

Customer representative means the person appointed by the customer to survey and verify the quality of the supplier's work.

Description means a document stating the purpose and scope of an activity and who is responsible for what, and outlining what has to be done to complete it.

Design input means requirements and information specified by customers, regulatory authorities, and one design group or discipline for another and needed as a reference base for design work.

Design output means requirements and information needed to procure or produce products or provide services.

Design review means the formal, independent examination of a design to confirm its adequacy.

Disposition means an action to determine how a nonconformance is to be resolved.

Evaluation means an appraisal to determine whether or not production processes and quality assurance programs are capable of producing a quality product or providing a quality service and generating evidence that supports decisions of acceptability.

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Inspection means the examination, measurement, and testing of the characteristics of products or services to determine acceptability and record inspection data.

Inspection and test point means a location or stage in the production cycle where inspection and testing are performed by personnel whose responsibility is to determine the acceptability of products or services and to record inspection and test data.

Monitor process methods means to carry out independent, periodic verification of processes to confirm that all the parameters of those processes are maintained within the specifications defined by the process procedures.

Nonconformance means a deficiency in characteristic, documentation, or procedure which renders the quality of a product or service unacceptable or indeterminate or not according to specified requirements. Examples of nonconformance are: physical defects, test failures, inadequate documentation, and deviations from prescribed processing or from any other part of the program.

Positive recall means a method whereby a product can be released so that further work can proceed, provided that the product is identified as being subject to recall and can be removed, repaired, or reworked at a later stage if found unacceptable.

Procedure means a document that specified, as applicable, the purpose and scope of an activity; what shall be done and by whom; when, where, and how it shall be done; what materials, parts, equipment, and documentation shall be used; and how it shall be controlled.

Production means all activities involved in the fabrication, assembly, construction, and erection of products to specified requirements.

Quality means the totality of features and characteristics of products or services that bear on their ability to meet specified requirements.

Quality assurance means all those planned and systematic actions needed to provide adequate confidence that products or services will satisfy specified requirements.

Quality audit means a documented activity aimed at verifying by independent examination and evaluation that the applicable elements of the quality assurance program have been established, documented and implemented effectively in accordance with specified requirements.

Regulatory authority means the Federal, Provincial, Territorial, or Municipal agency having the lawful right and power to interpret the law and exercise authority.

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Repair means processing nonconforming products so that they can function reliably and safely although the products still do not conform to the originally specified requirement.

Rework means reprocessing products to conform to the originally specified requirement.

Scrap A disposition which may be imposed for a nonconforming product when it can be established that the product cannot be reworked, repaired or used for its intended function.

Special production process means a production process where conformance is assured by using evidence generated during the process. A production process is a special process when subsequent inspections required to establish conformance are either impossible or undesirable.

Special inspection processes means an inspection requiring either specialized inspector skills or inspection techniques, or both.

Specified requirements mean requirements prescribed by the customer in the contract and complimentary requirements prescribed by the supplier that are not directly prescribed by the customer.

Subcontract means a contract between a supplier and sub-supplier.

Supplier means the party responsible for the performance of the work specified in the contract.

Surveillance means the continuing evaluation, analysis, and verification of a supplier's records, methods, procedures, products, and services, to assure that requirements are met.

Use-as-is a disposition which may be imposed for a nonconforming product, when it can be established that the discrepancy will result in no adverse conditions and that the product under consideration will continue to meet all functional requirements including performance, maintainability fit and safety.

Verification means independently reviewing, inspecting, examining, measuring, testing, checking, witnessing, monitoring, or otherwise establishing and documenting that products, processes, services, and documents conform to specified requirements.

Work means any activity performed to provide products and services.

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3.0 QUALITY ASSURANCE PROGRAM REQUIREMENTS

3.1 General

Transduction is a manufacturer and distributor of industrial computers, custom chassis, monitors, display systems and I/O components. Transduction has planned, established, implemented and will maintain a Quality Control Program in accordance with the Canadian Standards Association, CAN3-Z299.3-85, Quality Assurance Program Standards.

3.2 Management Responsibilities

3.2.1 Management Policies and Organization

- a. The objective of Transduction management is to provide the highest level of quality industrial computers, monitors, custom metal fabrication and processes which conform to contractual customer requirements.

It is the policy of Transduction to establish and maintain an effective and efficient Quality Control Program in conjunction with other management functions. Determination of work conformance to contract requirements is made on the basis of objective evidence of quality and quantity.

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- b. The responsibilities and authority for quality of those managing and performing the work, and of those verifying conformance to quality requirements and their relationships are shown in *Figure 1* and “*Organizational Chart*” (TOC-001), (Ref.: *Forms Registry, FR-001 Page 55*)

Management	Responsibilities
CEO	<ul style="list-style-type: none"> - Oversees each management group below.
Quality Control Manager	<ul style="list-style-type: none"> - Ensures conformance to all quality control program documents, final identification and traceability requirements - Consult with engineering on pertinent technical subjects
Marketing & Administration	<ul style="list-style-type: none"> - Provide assistance to CEO - Design and implement marketing programs - Prepare quotations for approval - Quality Control representative appointed by QC Manager to act as contact for quality matters.
Accounting Bookkeeper	<ul style="list-style-type: none"> - Operate daily finances - Create and maintain financial statement and reports - Handle A/R and A/P accounts
Tenders & Contracts (Sales)	<ul style="list-style-type: none"> - Receive and approve contracts - Prepare and issue quotation - Sales order planning - Detect and resolve differences in contract and tender - Provide technical sales support
Purchasing & Expediting	<ul style="list-style-type: none"> - Shipping/receiving - Export documentation - Purchase orders - Order processing - Work status and production planning and scheduling - Vendor inspection and qualification

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Manufacturing Engineering	<ul style="list-style-type: none"> - Oversees engineering all aspects of computer system production and future products - Research and Development (R&D) of hardware and software. Interface with QC Manager as technical advisor - Measuring and test equipment - Disposition of non-contractual and contractual non-conformances
Metal Fabrication Engineering	<ul style="list-style-type: none"> - Oversee engineering all aspects of custom chassis and metal components. - Research and Development (R&D) - Vendor and inspection and qualification - Special Processes management
Shipping & Receiving	<ul style="list-style-type: none"> - Packing and shipping - Receive all incoming shipments
Production 1	<ul style="list-style-type: none"> - Reporting directly to Manufacturing Engineering - Hardware assembly - Issue software testing and configuration form
Production 2	<ul style="list-style-type: none"> - Reporting directly to Metal Fabrication Engineering

Figure 1 – Organizational Chart Management Responsibilities

- c. See the position interrelationships on the “*Organizational Chart*” (TOC-001), (Ref.: *Forms Registry, FR-001 Page 55*)

3.2.2 Management Review

Transduction management reviews the Quality Control Program at least once a year. The purpose of the review is to ensure the effectiveness and continuing suitability and adequacy of the quality system to meet the requirements of the CAN3-Z299.3-85 standard and quality policy and objectives. This review includes assessing opportunities for improvement and the need for changes to the Quality Control Program. Top management is responsible for scheduling and conducting the reviews. Records of the review will be maintained.

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The input to management review shall include any information on the following:

- Results of audits
- Customer feedback
- Process performance and product conformity
- Status of preventative and corrective actions
- Follow-up actions from previous management review
- Changes that could affect the quality management system
- Recommendations for improvement

The output from the management review will be recorded on a form of the agenda and a list of actions items. The output shall include any decisions and actions related to:

- Any improvement needed to maintain and improve the effectiveness of the Quality Control Program and its processes
- Improvement of product related to customer requirements
- Resource needs

3.2.3 Management Representative

- a. The Quality Control Manager will perform and verify at the organizational level such that the quality control requirements are not subordinated to procurement, production or delivery.
- b. The Quality Control Manager carries the authority to resolve quality matters pertinent to product and quality programs as established by drawing specifications, customer requirements and Quality Control policies and procedures. The Quality Control Manager may delegate his responsibility through management and reports to the CEO. The responsibilities of the Quality Control Manager are:
 - i. Implement Transduction policy on quality.
 - ii. Set quality objectives.
 - iii. Review organizational relationship as they affect quality and develop proposals for improvement.
 - iv. Determine and report the principal causes of quality losses.
 - v. Monitor Transduction Quality Control Program to determine where improvements are needed and take necessary corrective action.
- c. When required by contract, the customer will be advised of the name of the Quality Control Manager in writing.

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3.2.4 Organizational Authority

- a. All Production Staff (1 & 2) under Manufacturing Engineering and Metal Fabrication Engineering are responsible for and authorized to identify and record nonconformance to contractual requirements, and required to notify the Quality Control Manager for disposition instructions.
- b. The Quality Control Manager exercises the authority to initiate and recommend disposition of nonconforming parts and parts for rework.
- c. The Quality Control Manager gives the final verification of correction of nonconforming products.
- d. The Quality Control Manager can prevent the further processing, delivery or installation of nonconformance products.

3.2.5 Independent Inspection, Witnessing and Monitoring

The Manufacturing Engineering Manager designates a representative in the Production Staff 1 Department for quality purposes. The representative is qualified to survey the inspection data, physical integrity, and all contract/purchase order criteria to satisfy customer requirements prior to packaging and shipping. The data is recorded on a *“Configuration Data Sheet” (CDS-001)*, (Ref.: *Forms Registry, FR-001 Page 54*) and is signed and dated. The Manufacturing Engineering Manager will verify each configuration data sheet and obtain approval from the Quality Control Manager.

Passmark BurnIn Test Software is used by the representative to support production configuration data collection, analysis and acceptance. The BurnIn Test produces a *“BurnIn Test Summary” (Ref.: Appendix, Page 78)* of all the major sub-systems of a computer simultaneously tested for endurance, reliability and stability for 24 – 48 hours depending on customer requirement. Passmark MonitorTest Software will be used when applicable to customer contractual requirements. The MonitorTest produces a *“MonitorTest Test Screen” (Ref.: Appendix, Page 79)* with generated test patterns on the screen at a variety of different resolutions and color depths to test for optimum visual performance.

When a contract requires “source inspection”, a representative from the Transduction Manufacturing Engineering Department is assigned to assist the customer’s representative in all quality testing.

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3.2.6 Indoctrination and Training

- a. Copy of approved Quality Control Manual is maintained and provided to each level of management *Ref.: "Organizational Chart" (TOC-001), (Forms Registry, FR-001 Page 55)*.
- b. Management is trained and qualified to ensure that they are aware of the responsibilities and are capable of performing to the quality control standards. This shall be evidenced by a *"Personnel Training Log" (PTL-001) (Ref.: Forms Registry, FR-001 Page 56)* maintained by the Quality Control Manager. Training and re-qualification will be done on a yearly basis.

3.3 Quality Control Manual

- a. Transduction Inc. has prepared the Quality Control Manual in compliance with CSA Z299.3-85 Standard. This manual has been approved by Transduction Management and signed by senior management officers.
- b. All Quality Control Program Descriptions will be implemented according to the Quality Control Manual.
- c. The following will be included in the Quality Control Manual.
 - i. **Program Application:** See *Ref.: 3.2.1(a), (b) and (c)*
 - ii. **Management Responsibilities and Organization:** See *"Organizational Chart" (TOC-001) (Ref.: Forms Registry, FR-001 Page 55)*. Transduction Inc. has no divisions.
 - iii. **Descriptions:** The Quality Control Program Documents are considered essential by Transduction for facilitating verification by the customer of the work performed; therefore, Quality Control Program Descriptions are included as part of the Quality Control Manual. All of the descriptions stated in section 3.4 of the CSA Z299.3-85 have been included. Each Quality Control Program Description documents the purpose, scope, who is responsible for what and an outline of what will be done. Forms used are included.
 - iv. **Manual Review:** The Transduction Inc. Quality Control Manager and Marketing and Administration will periodically review (a minimum of once a year), and determine if updates are warranted to reflect current quality verification practices. Changes to the manual will be implemented to comply with new CSA Standard requirements. Control of revisions and copies issued will be kept in the *"Revision Index" (Ref.: Page 3)* of this manual.

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3.4 Quality Control Program Descriptions

PURPOSE

To establish document procedure for the following system functions and any other such functions that apply to contracts:

Tender and Contract	3.5.1
Documentation	3.5.3
Measuring and Testing Equipment	3.5.4
Procurement	3.5.5
Inspection and Test Plan(s)	3.5.6
Incoming Inspection	3.5.7
In-Process Inspection	3.5.8
Final Inspection	3.5.9
Inspection Status	3.5.10
Identification and Traceability	3.5.11
Special Process	3.5.14
Packaging and Shipping	3.5.15
Quality Records	3.5.16
Nonconformance	3.5.17
Corrective Action	3.5.18
Customer-Supplied Products and Services	3.5.19
Statistical Techniques	3.5.20
External Quality Audit	3.5.21

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3.5 Quality Control Program Elements

3.5.1 Tender and Contract

PURPOSE

This procedure describes the requirements for accepting and processing tenders and contracts.

SCOPE

This procedure applies to all customer tenders and contracts received by Transduction.

RESPONSIBILITIES

The Tenders & Contracts Department (Sales) is responsible for:

- Receive tender from customer
- Acknowledge receipt
- Review and determine if the tender complies with Transduction production capabilities
- Prepare and issue quotation
- Approve quotation if issued by Marketing and Administration
- Receive contract from customer with reference to quotation
- Review the contract before acceptance to detect and resolve differences from the tender
- Approve contract for processing

PROCEDURES

This procedure describes the quality management system used within Transduction to control the processing of customer tenders and contracts.

- a. The Tenders and Contracts Department (Sales) receives tender from customer for review to ensure that:
 - i. The customer procurement document agrees with the offered quotation (if applicable); and,
 - ii. Transduction can meet the customer's technical requirements
- b. If tender is approved by Transduction, a formal "Quotation" (Ref.: Appendix, Page 80) is issued to customer.
- c. An official contract (purchase order) is needed for the tender and quotation to be deemed acceptable.
- d. Transduction authorized personnel (Tenders and Contracts Department) are responsible to review and accept customer's contract term and conditions.

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- e. If Transduction is unable to meet the terms and conditions, authorized personnel shall contact the customer to notify them of the circumstances and attempt to resolve concerns. If resolution cannot be achieved the customer contract will not be processed and, if applicable, the customer's equipment returned.
- f. If the customer requirements are deemed acceptable, the Tenders and Contracts Department will forward all pertinent documentation in reference to the contract to the Purchasing and Expediting and Manufacturing Departments respectively. The Purchasing and Expediting Department will record customer contract details in the "Customer Purchase Order Form" (CPOF-001) (Ref.: Forms Registry, FR-001 Page 62)

DOCUMENTS

Tender

Contract

Quotation (if applicable) (Ref.: Appendix, Page 80)

3.5.2 Design

Not required by this Standard.

3.5.3 Documentation

PURPOSE

To describe the process for managing and controlling all work and quality related documentation.

SCOPE

This procedure describes that all essential documentation affecting quality are:

- Reviewed, adequate and released by authorized personnel.
- Available at all levels of inspection and test points where applicable.
- Ensure documentation changes and obsolete issues are promptly resolved.
- Prepare and submit requests for changes to customer documents when required.

RESPONSIBILITIES

The Transduction Quality Control Manager is responsible for the adequacy of all essential documentation affecting quality. The Manufacturing Engineering and Metal Fabrication Engineering Department is responsible for its technical content. The Marketing and Administration Department is responsible for maintaining the system for creating and controlling

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the documentation, with the approval of the Quality Control Manager for any changes.

Documentation will include but will not be limited to:

- i. This manual;
- ii. Quality Control Program descriptions included in this manual;
- iii. Engineering specifications, drawings, procedures, and work instructions;
- iv. Procurement documentation required by section 3.5.5
- v. Inspection and Test Plan(s) required by section 3.5.6;
- vi. Special process procedures and documentation required by section 3.5.14
- vii. Nonconformance required by section 3.5.17
- viii. Corrective action required by section 3.5.18
- ix. Audit documentation required by section 3.5.21.

PROCEDURE

- a. The Marketing and Administration Department will oversee that any incomplete, ambiguous, or conflicting documentation is resolved and approved by the Quality Control Manager. All personnel having access to Transduction's documentation have the authority to report documentation discrepancies to the Quality Control Manager.
- b. Hard copies of current documentation will be maintained as the primary source using a "Forms Registry" (FR-001) (Ref.: Forms Registry, Page 53) filing system in the Marketing and Administration Department to ensure that only current documentation is used by work and inspection station personnel.
- c. All revision levels of documentation are maintained "electronically" on computer network as the secondary source.
- d. Changes to documentation will be initiated in writing using a "Document Change Notice" (DCN-001) (Ref.: Forms Registry, FR-001 Page 63). A hard copy of each change will be kept on file.
- e. The Document Change Notice will indicate all information to be updated with and purged of any nonconforming documentation.
- f. When required as a result of a Quality Control or engineering observation, a written request for changes and/or clarification to customer documentation will be submitted to the customer for acceptance of requested changes and/or clarification. The request and related responses will be maintained on file in the Marketing and Administration and Purchasing and Expediting Department.

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DOCUMENTS

Forms Registry (Ref.: FR-001) (Ref.: Forms Registry, Page 53)

Document Change Notice (Ref.: DCN-001)

3.5.4 Measuring and Testing Equipment

PURPOSE

To define requirements for control and calibration of all measuring and testing equipment used in activities affecting quality are accurate and conform to calibration standards and specifications.

SCOPE

This procedure applies to all measuring and testing equipment used at Transduction:

1. CALTEK Digital Multimeter, Model: CM3310
2. SIMPSON Leakage Current Meter, Model: 228
3. CRITERION Dielectric Strength Tester, Model: DV-25V-10
4. HART SCIENTIFIC Temperature Thermocouple Calibrator, Model: HDRC 9100
5. FLUKE 73III Multimeter (**INDICATION USE ONLY**) (see section 3.5.4 (e) and (k))
6. FLUKE 23II Multimeter (**INDICATION USE ONLY**) (see section 3.5.4 (e) and (k))
7. MITUTOYO 24 Inch Digital Caliper Model: 500-506-50 (**INDICATION USE ONLY**) (see section 3.5.4 (e) and (k))
8. MITUTOYO 12 Inch Digital Caliper Model: 500-193 (**INDICATION USE ONLY**) (see section 3.5.4 (e) and (k))
9. 10 Inch Metal Block (**used for confirming Digital Caliper gauge reading**)

RESPONSIBILITIES

- The Quality Control Manager is responsible for the implementation of this procedure.
- Manufacturing Engineering and Metal Fabrication Engineering Department review and establish that the measuring and testing equipment is readily available and calibrated for use on Transduction products.
- The Manufacturing Engineering and Metal Fabrication Engineering Departments ensure that all scheduled and newly purchased measuring and testing equipment is sent to a Calibration Laboratory for calibration, program enrolment or both.
- The Calibration Laboratory performs the calibration of all the measuring and testing equipment used.
- The Calibration Laboratory informs Transduction of nonconforming measuring and testing equipment and direct the disposal of rejected equipment if needed.
- The Manufacturing Engineering and Metal Fabrication Engineering Departments and Production Staff verify proper calibration of equipment prior to use and/or return from the Calibration Laboratory.

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PROCEDURES

- a. A measuring and testing equipment program will be implemented, maintained and approved by the Manufacturing Engineering and Metal Fabrication Engineering Departments and Quality Control Manger. Personnel will use only equipment traceable to the Institute for National Measurement Standards, National Research Council of Canada for in process inspection and final test. The measuring and testing equipment will periodically be calibrated and/or certified which contributes to the overall product quality and production yield. All calibration records and logs are maintained to provide adequate control over equipment in the calibration program.
- b. The Manufacturing Engineering and Metal Fabrication Engineering Departments review and establish that the measuring and testing equipment is available for existing and future Transduction products and services. Manuals of purchased equipment contain instructions for use of the equipment in meeting technical requirements.
- c. A Calibration Laboratory with standards traceable to the Institute for National Measurement Standards, National Research Council of Canada certifies all scheduled and newly acquired measuring and testing equipment. Labels are attached to the equipment for purposes of maintenance of periodic calibration dates.
- d. The Manufacturing Engineering and Metal Fabrication Engineering Departments has established that calibration intervals will be determined by the Calibration Laboratory or if there is significant change in measurement capability. This is subject to change per request by other agencies representing Transduction customers.
- e. All measuring and testing equipment (**exception MITUTOYO 24 & 12 Inch Digital Calipers as they are a continuity tester**) for specifications and personnel use are recorded on pertinent "Calibration and Log" forms (Ref.: Forms Registry, FR-001);
 - i. MTECDML-001 (Page 68)
 - ii. MTESLCML-001 (Page 69)
 - iii. MTECDSTL-001 (Page 70)
 - iv. MTEHSTTCL-001 (Page 71)

Any unsatisfactory performance by any of the measuring and testing equipment (**exception for FLUKE 73III Multimeter and FLUKE 23II Multimeter**) is sent to a Calibration Laboratory certified with a purchase order containing equipment information for repair and calibration.

Production Staff 2 with the approval of the Metal Fabrication Engineering Department will test the Digital Calipers before every use using a 10 inch Metal Block to verify proper operation.

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If it is determined by Production Staff 1 that there is unsatisfactory performance or suspicious results from FLUKE 73III and 23II Multimeters, CALTEK Digital Multimeter, Model: CM3310 will be used to verify suspicious results.

- f. Calibration Laboratory is located in a dedicated environmentally controlled area that is ISO9001:2008 registered. Adequate precautions concerning sufficient warm-up, temperature and humidity stabilization shall be taken at all times.
- g. Calibration of all measuring and testing equipment is certified as being traceable to National Measurement Standards National Research Council of Canada with a *“Certificate of Calibration Conformance” (Ref.: Appendix, Page 82).*
- h. *“Labels” (Ref.: Appendix, Page 83)* are attached to the case of the measuring and testing equipment indicating its calibration status and next due date. The label includes a reference to the certificate of calibration conformance.
- i. A seal (*Ref.: section 3.5.4 (h)*) is affixed to all measuring and testing equipment at the time of calibration to deter tampering. Equipment is not to be used with a damaged seal as it may be damaged or inaccurate. Production Staff are to notify the Manufacturing Engineering and Metal Fabrication Engineering Departments of any seal that is damaged respectively.
- j. The Purchasing and Expediting Department maintains a history of equipment calibration. All measuring and testing equipment will have a written certificate of calibration that includes pre and post calibration results.
- k. Measuring and testing equipment is located in the Manufacturing Engineering and Metal Fabrication Engineering Departments office (***except for FLUKE 73III and 23II Multimeters and MITUTOYO 24 & 12 Inch Digital Calipers as these are INDICATION USE ONLY used as continuity testers***) and is used by laboratory and inspection personnel only. Any use of the equipment is recorded on pertinent *“Calibration and Log” forms (Ref. Forms Registry, FR-001 Page 68, 69, 70 and 71).*
- l. Measuring and testing equipment that is not completely functional is identified and placed in Quality Control hold area in the “Stock Room Cage”. Purchasing and Expediting Department will be notified and a purchase order will be created so that the Shipping Department can ship the equipment to a certified Calibration and Repair Laboratory. If the equipment cannot be calibrated, adjusted within acceptable tolerances, has become obsolete, or requires excessive repair it will be taken out of service immediately with the approval from the Quality Control Manager.

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- m. When a possibility exists where a faulty measuring and testing equipment has compromised data, a meeting is assembled and appropriate action is taken. This meeting consists of the Quality Control Manager, Manufacturing Engineering and Metal Fabrication Engineering Departments.

DOCUMENTS

Calibration and Log Forms (Ref.: MTECDML-001, MTESLCML-001, MTECDSTL-001, MTEHSTTCL-001)

Certificate of Calibration Conformance (Ref.: Appendix, Page 82)

Label (Ref.: Appendix, Page 83)

3.5.5 Procurement

PURPOSE

To establish and maintain a system for the procurement (purchasing) of parts and material which will be incorporated into Transduction products.

SCOPE

This procedure applies to all procurement (purchasing) activities at Transduction.

RESPONSIBILITIES

The Manufacturing Engineering Department and Metal Fabrication Engineering Department are responsible for:

- Initiate purchase requisitions

The Purchasing and Expediting Department is responsible for:

- Procurement of parts and material which conform to technical specifications and purchase requisitions
- Maintain suppliers list
- Preparation and issue of purchase orders
- Supplier corrective action

The Quality Control Manager is responsible for:

- Supplier quality system audit
- Supplier source inspection (if required by Quality Control Program)
- Review purchase order for:
 - i. Specification of acceptance criteria
 - ii. Selection of Quality Control Program requirements for subcontracted (purchased) parts and material
 - iii. Certification of materials and parts

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PROCEDURE

Each new material or part that Transduction Manufacturing Engineering and Metal Fabrication Engineering Departments request and approve for procurement is assigned a unique part number (if required for customer contract, supplier part number is not designated or Transduction is the supplier). A *“Transduction Purchase Request” (TPR-001)* (Ref. *Forms Registry, FR-001 Page 76*) will be drawn up. At this time a *“Purchase Order” (Ref.: Appendix, Page 84)* is created by the Purchasing and Expediting Department that includes the unique part number (if applicable), approved supplier name, manufacturer catalog number, and any other specifications and quality control instructions as described in section 3.5.5 (b). This will ensure accurate procurement. The purchase order is maintained “electronically” with a hard copy backup.

A date, purchase order number, quantity and any other details are recorded on the purchase order for each transaction. Each purchase order is recorded in the *“Purchase Order Log” (POL-001)* (Ref.: *Forms Registry, FR-001 Page 61*). Purchase Order numbers begin with an abbreviation of the Department who issued the requisition and/or the process requirement;

- Manufacturing **(M)**
- Metal Shop **(MS)**
- Shipping/Receiving **(SHP)**
- Distribution **(D)**
- Service **(S)**
- Marketing and Administration **(OFF)**

Each purchase order is technically reviewed for accuracy and then submitted to supplier. It is then filed and maintained by the Transduction Purchasing and Expediting Department. A copy of the Purchase Order is provided to the Department which issued the requisition. All purchase orders over \$10,000 must be approved by the CEO. If during the technical review a nonconformance is found, the purchase order will be clearly marked **“Cancelled”** and a new purchase order number will be issued. Outstanding purchase orders will be put into suspense in the Purchasing and Expediting Department until parts are received and/or service performed in full. Incoming inspection will be done in accordance with section 3.5.7 of this manual.

All procurements (purchase orders) are subject to the following:

a. Selection

When the contract does not specify Quality Control Program standards for critical products and services, Transduction Manufacturing Engineering, Metal Fabrication and Purchasing and Expediting Departments are responsible for selecting which suppliers are approved to procure parts and material.

The selection of approved suppliers is based on their ability to meet the technical requirements. Critical parts and/or services will be procured from suppliers from the

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*“Approved Supplier List” (ASL-001) (Ref.: Forms Registry, FR-001, Page 72).*The selection process and type of quality control used to assess suppliers is also dependent on the type of part/material, past performance financial stability and Quality Control Program (Ref.: section 3.5.21.2).

The parts used in the manufacturing of Transduction products are complex electronic components provided by suppliers with extensive technical catalog information. Purchasing and Expediting Department uses this catalog information in developing an *“Inventory List” (Ref.: Appendix, Page 85).* The Inventory List is the reference for parts used in manufacturing Transduction products. The list includes references to the supplier, manufacturer catalog part numbers, quantity and cost. Surveillance of this type of supplier is limited to Transduction Incoming Inspection (section 3.5.7), In Process Inspection (section 3.5.8) and Final Inspection (section 3.5.9) unless past performance suggests additional quality controls.

If supplier provides parts and material to Transduction engineering design specifications or customer specifications requiring a Quality Control Program then:

- i. Transduction Quality Control Manager will select and justify applicable CSA or other Quality Control Program Standards to be used.
- ii. The Quality Control Manager will evaluate supplier/manufacturer ability to meet specified standard requirements before work begins by:
 1. Reviewing the supplier Quality Control Manual and implementation of the Quality Control Program. Note – Evidence of registration by a recognized authority may be used in lieu of this review.
 2. Verifying that the facility, resources and related plans are sufficient for meeting customer requirements.

b. Purchase Order Requirements

When required, the following will be included in the purchase order:

- i. Supplier name and part number. Also included will be any specifications, drawings and verification requirements not covered by the manufacturers published product description and data sheets. These documents are controlled in accordance with section 3.5.3(d) of this manual;
- ii. the title, number, and issue of the Quality Control Program standard to be applied to the parts and material;
- iii. requirements for approval or qualification of parts or material, procedures, processes, equipment, and personnel;
- iv. requirements for the submittal for acceptance of the disposition of non-conforming parts and material;

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- v. identification requirements for the parts and material;
- vi. requirements for preservation, packaging, and shipping;
- vii. the right of Transduction or its customer to –
 1. Review the supplier documentation required by the applicable Quality Control Program standard.
 2. Have access to the supplier facility or working area so that Transduction and Transduction's customer can audit, survey, and verify that the supplier is conforming to specified requirements.
- viii. points in supplier Inspection and Test Plan(s) where Transduction or Transduction's customer can verify conformance to contract requirements;
- ix. references as required by the contract;
- x. requirements for submission, retention and disposition of documentation and quality records;
- xi. information and instructions required when the products or services are shipped directly to a consignee other than Transduction; and
- xii. traceability requirements in accordance with section 3.5.11 of this manual.

c. Review

All purchase orders and associated reference data shall be available for review by Transduction customer representative.

d. Surveillance of Supplier

- i. Review supplier Inspection and Test Plan(s) to ensure specified requirements will be met.
- ii. Evaluate all subcontracted parts and material to determine the amount of inspection, surveillance, and audit needed at the supplier facility.
- iii. Carry out this inspection, surveillance, and external audit (Ref.: section 3.5.21.2).
- iv. Evaluate the disposition of all reported nonconforming parts and material.

e. Amendments to Purchase Orders

All purchase order amendments will be made by the Purchasing and Expediting Department. Amendments are referenced back to the original purchase order number. Any technical specification change or if the part/material is obsolete the discrepancy is reported to the Quality Control Manager for approval to have purchase order amended.

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DOCUMENTS

Purchase Order – (Ref.: Appendix, Page 84)
Inventory List – (Ref.: Appendix, Page 85)
Transduction Purchase Request (Ref.: TPR-001)
Purchase Order Log (Ref.: POL-001)
Approved Supplier List (Ref.: ASL-001)

3.5.6 Inspection and Test Plan(s)

PURPOSE

To establish and maintain a system outlining how customer test and inspection requirements will be fulfilled.

SCOPE

This procedure applies only if requested by customer to meet Quality Control requirements.

RESPONSIBILITIES

- The Manufacturing Engineering Department, Metal Fabrication Engineering Department and Quality Control Manager plan the inspection and test activities for contracts containing specific inspection and testing requirements.
- The Marketing and Administration Department will prepare custom inspection and testing documentation when contracts contain requirements to meet specific quality standards. Manufacturing Engineering and Metal Fabrication Engineering Departments will verify each document and receive approval from the Quality Control Manager.

PROCEDURE

The Inspection and Test Plan will be prepared in reference to customer Quality Control Standards after the award of the contract and must be approved before work starts.

DOCUMENTS

See Invensys for example of inspection and test plan(s).

3.5.7 Incoming Inspection

PURPOSE

To establish and maintain a system to monitor the quality level for parts and material received to ensure compliance with purchasing documents, specifications and drawings.

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SCOPE

This procedure applies to all parts and material purchased by Transduction.

RESPONSIBILITIES

- The Shipping and Receiving Department performs visual inspection to verify receipt of parts.
- The Purchasing and Expediting Department performs secondary visual inspection of all parts in accordance with purchase order.
- The Accounting Bookkeeper to issue payment to supplier if invoice is approved by the Purchasing and Expediting Department.
- The Purchasing and Expediting Department to dispose of parts nonconforming to purchase order.

PROCEDURE

- a. The receipt of parts and material at Transduction is through Shipping and Receiving Department. The Shipping and Receiving Department notifies the Purchasing and Expediting Department of receiving parts. These procedures are under the knowledge of the Quality Control Manager. The Shipping and Receiving Department shall count the quantity and compare the part number information with the information from copy of the supplier packing slip. The incoming parts are checked for quantity and identity only. Following receipt, the Shipping and Receiving Department will submit all documentation received with shipment to Purchasing and Expediting Department for secondary visual inspection in accordance with the purchase order. The supplier invoice will be checked for conformance with the "Purchase Order" (Ref.: Appendix, Page 84). The Purchasing and Expediting Department will initial invoice before giving to the Accounting Bookkeeper for payment. Any discrepancies will be dealt with accordingly by the Accounting Bookkeeper and the Purchasing and Expediting Department. Nonconforming parts will be segregated in quarantine area in "Stock Room Cage" until disposition is determined by the Purchasing and Expediting Department and Quality Control Manager. Incoming parts are held in bond in the receiving area until an inspection as described above has been completed, and applicable material certifications have been received. Accepted parts will be transferred to the controlled "Stock Room Cage" where all Transduction inventory is located.
- b. Any defective parts that may be provided by the supplier are identified by functional tests at the time of in-process inspection and/or engineering tests (BurnIn Test and/or Monitor Test if applicable) of the complete computer system at the time of final inspection. When purchased parts require specifications, the Quality Control Manager verifies that the specifications furnished with the parts are adequate. All documentation provided by the supplier showing evidence that the specified requirements were met is attached to the purchase order copy.

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- c. Incoming parts are held in a bonded area in the Shipping and Receiving Department until the proper inspection has been completed and applicable part specifications have been received (Ref.: section.:3.5.7 (a) and (b)).
- d. If parts received do not conform to the information given on the *“Purchase Order”* (Ref.: *Appendix, Page 84*), the parts are retained in “Stock Room Cage” for temporary storage and the Quality Control Manager is notified. The Quality Control Manager will create a *“Nonconformance Report”* (TNCR-001) (Ref.: *Forms Registry, FR-001 Page 59*) with issue of Return Material Authorization number from the *“Return Material Authorization (RMA) Log”* (RMAL-001) (Ref.: *Forms Registry, FR-001 Page 58*) and coordinate with Purchasing and Expediting and Manufacturing Engineering Departments for disposition instructions.

Disposition of the parts will be recorded on the original purchase order in Purchasing and Expediting Department.

DOCUMENTS

Purchase Order (Ref.: Appendix, Page 84)
Supplier Packing Slip
Supplier Invoice
Nonconformance Report (TNCR-001)
Return Material Authorization Log (RMAL-001)

3.5.8 In-Process Inspection

PURPOSE

Establish and maintain a system for the in-process inspection of parts to ensure compliance with customer contract and supporting documentation.

SCOPE

This procedure applies to all in-process products manufactured by Transduction and includes supplier source inspection (if applicable).

RESPONSIBILITIES

- Production Staff 1 and Production Staff 2 will conduct third visual inspection of all parts before assembly.
- Production Staff 1 will perform functional test to confirm operation of parts.
- The Metal Fabrication Engineering Department to perform metal fabrication and assembly in accordance to manufacturing process and referenced detailed drawings.
- The Metal Fabrication Engineering Department to monitor special process methods.

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PROCEDURE

- a. Parts that have passed incoming inspection are transferred to the Manufacturing Engineering Department for assembly as per customer contract requirements. A visual inspection is conducted and a functional test is performed using applicable measuring and testing equipment to confirm operation.

The Metal Fabrication Engineering Department will perform metal fabrication and assembly in accordance to the customer contract and manufacturing process required by the Manufacturing Engineering Department. Referenced detailed “*Drawings*” (Ref.: *Appendix, Page 86 and 87*) are created and used in the metal fabrication. Each drawing will include:

- i. Unique part number
- ii. Layout
- iii. Measurements
- iv. Parts used for assembly

Completed metal fabrication and assemblies are visually inspected for cosmetic appearance, correct gauge and conformity to drawing. Any discrepancies will be cause for rework. If spares have been manufactured then the nonconforming part will be scraped.

- b. The monitoring of special processes will be detailed in the procedure specifying who will perform the monitoring of the process, and the frequency and method of monitoring (Ref.: section 3.5.14).
- c. When in-process inspection is required for material that requires specifications, inspection or test reports; the Quality Control Manager or designated representative will verify that they are complete. If specifications are required and not furnished, the Quality Control Manager or designated representative will hold the material in bond in the Shipping and Receiving Department until the specification requirement is satisfied. Only at the time of receipt of acceptable specification is the material released from the in-process inspection.
- d. In-process inspection is performed by Production Staff 1 and Production Staff 2 under the supervision and management of the Manufacturing Engineering and Metal Fabrication Engineering Departments. Any nonconformance identified in section 3.5.8 (a), will be removed from assembly. The Manufacturing Engineering Department will notify the Quality Control Manager and a “*Nonconformance Report*” (TNCR-001) (Ref.: *Forms Registry, FR-001 Page 59*) will be created with a Return Material Authorization number issued from the “*Return Material Authorization (RMA) Log*” (RMAL-001) (Ref.: *Forms Registry, FR-001 Page 58*). The Quality Control Manager and Manufacturing

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Engineering Department will review and provide disposition instructions. If nonconformance occurs in Metal Fabrication Engineering Department for “raw material”, the department will scrap all “raw material” that does not conform. Materials that are manufactured using special processes and are identified as nonconforming are initiated for rework.

After in-process inspection and test work is satisfied to engineering criteria, the parts proceed to the next production process of assembly and final testing. Parts from the Metal Fabrication Engineering Department are transferred to the Manufacturing Engineering Department for additional components to be added to complete assembly.

DOCUMENTS

Nonconformance Report (TNCR-001)
Drawing (Ref.: Appendix, Page 86 and 87)
Return Material Authorization (RMA) Log (RMAL-001)

3.5.9 Final Inspection

PURPOSE

Establish and maintain a system for final inspection of parts to ensure compliance with customer contract, documents and specifications.

SCOPE

This procedure applies to the final inspection of parts at Transduction in accordance with CSA Z299.3-85 Quality Control Program.

RESPONSIBILITIES

- The Quality Control Manger designates the Manufacturing Engineering Department to prepare and accept inspection and test records.
- The Manufacturing Engineering Department designated representative is responsible for identification of part or parts to customer contract number, drawing(s) and serial number.
- The Manufacturing Engineering Department will ensure products have been inspected at all points; from incoming inspection to final inspection.
- The Manufacturing Engineering Department will ensure operations, inspections and tests have been properly completed, dated and signed by the designated representative from Production Staff 1.
- The Manufacturing Engineering Department will advise the Quality Control Manager and Purchasing and Expediting Department that the inspection and final test records are complete and ready to be shipped to customer.

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PROCEDURE

- a. Final inspection will inspect and identify and be the verification that all parts individually and as an assembly meet all of the contractual requirements of the customer with all necessary inspection and test records dated and signed;
 - i. *“Configuration Data Sheet” (CDS-001) (Ref.: Forms Registry, FR-001 Page 54)*
 - ii. *“BurnIn Test Summary” (Ref.: Appendix, Page 78)*
 - iii. *“MonitorTest Test Screen” (Ref.: Appendix, Page 79) (If applicable)*
 - iv. Customer Contract
 - v. *“Quotation” (Ref.: Appendix, Page 80)*
- b. The Quality Control Manager or designated representative will be responsible for:
 - i. assuring all records are established and complete for all contractual requirements and;
 - ii. verifying that the products have been inspected at all points and accepted.
- c. If during the final inspection process a product is found not nonconforming during the inspection process a *“Color Tag” (Ref.: Appendix, Page 88)* is put on the part with written description. A *“Nonconformance Report” (TNCR-001) (Ref.: Forms Registry, FR-001 Page 59)* will be created with Return Material Authorization number from the *“Return Material Authorization (RMA) Log” (RMAL-001) (Ref.: Forms Registry, FR-001 Page 58)*. The Quality Control Manager will be advised of the issue. At that time, the Quality Control Manager and Manufacturing Engineering Department will review and provide disposition instructions as required.
- d. Pertinent inspection and test reports will be submitted to customer at time of contract completion. A *“Certificate of Conformance” (TCC-001) (Forms Registry, FR-001 Page 73)* if required by customer contract will be issued and submitted by the Purchasing and Expediting Department with the approval of the CEO.
- e. Only those items which fully meet the contractual requirements shall be submitted to the applicable customers and the designated representative of the Quality Control Manager.

If contractual requirement concessions are required for the nonconforming items, the Quality Control Manager or designated representative must present these concessions in writing prior to offering the non-contractual items for inspection.

DOCUMENTS

Inspection and Test Records

- Configuration Data Sheet (CDS-001)
- BurnIn Test Summary (Ref.: Appendix, Page 78)
- MonitorTest Test Screen (Ref.: Appendix, Page 79) (If applicable)

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Nonconformance Report (TNCR-001)
Color Tag (Ref.: Appendix, Page 88)
Quotation (Ref.: Appendix, Page 80)
Contract
Certificate of Conformance (TCC-001)

3.5.10 Inspection Status

PURPOSE

Describe a method to ensure that the required inspection and tests are performed, indicating inspection status of materials and process by means of documentation and tags throughout manufacturing.

SCOPE

This procedure applies to all manufactured products at Transduction in accordance with CSA Z299.3-85 Quality Control Program.

RESPONSIBILITIES

- The Quality Control Manager is responsible through his delegate(s) to ensure inspection and tests are performed in accordance to this procedure and other procedures referenced in this Quality Control Manual.
- The Manufacturing Engineering Department and Metal Fabrication Engineering Department is responsible for ensuring that all materials and parts are tagged and labeled as required. They are authorized to remove any inspection status.

PROCEDURE

- a. The Quality Control Manager or designated representative will ensure that the required inspections, tests and requirements set forth in the Quality Control Manual are performed and known throughout production.
- b. The inspection status of Transduction products use string "*Color Tag*" (Ref.: Appendix, Page 88), and the "*Configuration Data Sheet*" (CDS-001) (Ref.: Forms Registry, FR-001 Page 54) and "*BurnIn Test Summary and/or MonitorTest Test Screen*" (Ref.: Appendix, Page 78 & 79) to indicate final acceptance.

When in-process testing begins the designated representative(s) will perform a visual inspection of all parts and material referencing customer contract and/or quotation. During testing any nonconformance, rework required and corrective action, date, and inspection sign off will be recorded.

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Any parts that are found to be in nonconformance with the customer criteria will be given a Return Material Authorization number and a Nonconformance Report will be created and approved by Quality Control Manager. The nonconforming parts will be put in quarantine in the "Stock Room Cage" by the Purchasing and Expediting Department until further review has been done. Only after the Quality Control Manager and Manufacturing Engineering Department has met and there is appropriate sign off, will the assembly be returned to final test. These reports will be kept by the Marketing and Administration Department in a "Nonconformance Report Log" (NCRL-001) (Ref.: Forms Registry, FR-001 Page 60) for permanent record. If the part pertains to a customer purchase order, a copy will also be maintained with the customer order file if applicable.

- c. The supplier and inspector identity is noted on the "Nonconformance Report" (TNCR-001) (Ref.: Forms Registry, FR-001 Page 59).
- d. The Quality Control Manager or designated representative has the authority to apply and remove tags relating to inspection status. After final Quality Control acceptance these inspection and test reports will become a permanent record and stored in the original customer order file.

DOCUMENTS

Inspection and Test Records

- Configuration Data Sheet (CDS-001)
- BurnIn Test Summary (Ref.: Appendix, Page 78)
- MonitorTest Test Screen (Ref.: Appendix, Page 79) (If applicable)

Contract

Quotation (Ref.: Appendix, Page 80)

Nonconformance Report (TNCR-001)

Nonconformance Report Log (NCRL-001)

3.5.11 Identification and Traceability

PURPOSE

Ensure identification and traceability of all Transduction parts and material through the production process.

SCOPE

This procedure applies to all parts and manufactured products at Transduction in accordance with the Quality Control Manual.

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RESPONSIBILITIES

- The Manufacturing Engineering Department will record serial number identification of all major parts in assembly.
- The Metal Fabrication assigns unique part numbers to all parts manufactured "in-house".

PROCEDURE

- a. All procured parts and material are traceable to a purchase order that contains the supplier, manufacturer catalog part number, unique part number (if applicable), description and quantity.

Parts manufactured by the Metal Fabrication Engineering Department are all given a unique part number that are referenced with "*Drawing*" (Ref.: *Appendix, Page 86 and 87*) that include:

- i. Unique part number
- ii. Layout
- iii. Measurements
- iv. Parts used for assembly

The drawings are held electronically with a hard copy backup.

Standardized Transduction products manufactured by the Manufacturing Engineering Department are all given a unique part number for internal and customer reference.

In the Manufacturing Engineering Department, the serial number identification is taken from all the major parts of an assembly by Production Staff 1. This includes but is not limited to: the single board computer/motherboard, backplane, power supply, hard drive/solid state drive and operating software. This identification and traceability is maintained throughout the manufacturing, test and inspection process. This information is recorded on the "*Configuration Data Sheet*" (CDS-001) (Ref.: *Forms Registry, FR-001 Page 54*) and is maintained electronically and a hard copy with each pertinent customer order file.

In the case where a product is bought as "whole system" an internal serial number is assigned by the Manufacturing Engineering Department. The "*Serial Number*" (Ref.: *Appendix, Page 89*) is permanently identified to the assembly by an anodized aluminum tag. Parts within the assembly will be controlled by the serial number.

- b. When stipulated in a contract to Transduction, any specific part in addition to the above will be assigned a unique identification number. This will distinguish it from any other parts which are otherwise identical or produced in separated batches. The unique traceability identification shall be recorded on all processes, inspection and test records.

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DOCUMENTS

Drawing (Ref.: Appendix, Page 86 and 87)

Serial Number (Ref.: Appendix, Page 89)

Configuration Data Sheet (CDS-001)

3.5.12 Handling and Storage

Not required by this Standard.

3.5.13 Production

Not required by this Standard.

3.5.14 Special Processes

PURPOSE

Define the responsibilities and procedures to be used in the controlling of special processes.

SCOPE

Special Processes as referenced in this procedure means any manufacturing processes used to transform, join, finish or coat materials and parts.

Below is a list of special processes carried out by outside contractors:

- Anodizing – MIL-A-8625
- Zinc Plating (Clear/Black/Yellow) – ASTM B633
- Chemical Conversion (Alodine) – MIL-C-5541
- Powder and Liquid Paint
- Screen Printing (Silk-Screening)

DEFINITION

Special Processes are those processes where the results cannot be directly examined to establish full conformance.

RESPONSIBILITIES

- The Metal Fabrication Engineering Department is responsible for the specification of special process, parameters and acceptance criteria.
- The Metal Fabrication Engineering Department will control and conduct random source inspections of special process contractor to ensure compliance to procedures and qualification of personnel.

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- The contractor is to perform special process procedures according to Transduction specifications, standards and codes.

PROCEDURE

Special Process will be performed by qualified personnel using qualified procedures, documentation and equipment according to specific criteria.

Records will be maintained by contractor for the qualified personnel, procedures, and documentation according to applicable standards and codes. The records are available to Transduction upon request.

Qualification for personnel, procedures, documentation and equipment will be defined for special processes not covered by existing codes, standards or where the product quality exceeds the requirements of established codes or standards.

Evidence will be generated during the process to indicate the control of the process has been achieved according to specifications standards and codes.

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3.5.15 Packaging and Shipping

PURPOSE

To define the requirements for proper packaging and shipping of products to prevent damage and deterioration.

SCOPE

This procedure applies to all finished products from the Shipping and Receiving Department to the destination.

RESPONSIBILITIES

- The Manufacturing Engineering and Metal Fabrication Engineering Departments are responsible for preparing finished product for shipment.
- The Purchasing and Expediting Department will arrange shipping details and provide the following documents to the Shipping and Receiving Department:
 - i. Packing Slip (Ref.: Appendix, Page 90)
 - ii. Shipping Label (Ref.: Appendix, Page 91)
 - iii. Waybill
 - iv. Export Documents (if applicable)
 - v. Advise of Shipment Notice
- The Shipping and Receiving Department will conduct final visual inspection of shipment before packaging.
- The Shipping and Receiving Department will load products ready for shipment according to method of shipment:
 - i. Truck
 - ii. Air
 - iii. Rail
 - iv. Sea

PROCEDURE

The Shipping and Receiving Department will have the entire product contents, drawings, instructions if required, shipping labels, waybill, packing slip, export documents (if applicable), and all final test and inspection records included with shipment.

The Shipping and Receiving Department will inspect all final cleaning, preservation, packaging and marking and verify shipping instructions to ensure that specific requirements are met.

The Quality Control Manager or designated representative has the responsibility of final inspection to ensure that specific requirements are met.

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Any and all defects, discrepancies or missing documentation shall be resolved before products can proceed further in the shipping process.

After inspection and review the shipping document is signed and the material is protected with die cut foam inserts and boxed for shipment.

The packaged goods are then inspected and if acceptable they are released for shipment.

DOCUMENTS

Packing Slip (Ref.: Appendix, Page 90)

Shipping Label (Ref.: Appendix, Page 91)

Waybill

Export Documents

3.5.16 Quality Records

PURPOSE

To establish and maintain a system to generate and retain records, which adequately support and substantiate inspection, tests and processes performed, to provide evidence of the quality of the part and testify directly or indirectly that it is in compliance with jurisdictional/contractual requirements.

SCOPE

This procedure applies to all reports, forms and records as described within the Z299.3-85 Quality Program and detailed system function procedures.

RESPONSIBILITIES

- The Quality Control Manager is responsible with the support of the Marketing and Administration Department for the design and the maintenance of the quality records system.
- The Metal Fabrication, Manufacturing Engineering and Purchasing and Expediting Departments are responsible for implementing, filing and maintaining quality records as they are generated.

PROCEDURE

- a. The maintenance of the quality records system is the responsibility of the Quality Control Manager. He will be supported by Transduction organization to meet all of the requirements for objective evidence in performance of contractual and non-contractual requirements. Included in the scope of these files are engineering drawings, purchase orders, acceptable vendor lists, receiving records, test equipment records and *Forms*

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Registry" (FR-001) (Ref.: *Forms Registry, Page 53*) cataloging all standardized forms. All of these are retained in a hard copy and electronic backup on computer network.

Objective evidence will be maintained that;

- i. the Quality Control Program meets the requirements of the Z299.3-85 standard;
 - ii. the product or service and documentation meet specified requirements;
 - iii. personnel, procedures, documentation, and equipment for special processes are qualified, as required by section 3.5.14.3 (c);
 - iv. selection and surveillance, and audit of sub suppliers are met as required by section 3.5.5 (a), (b) and (d)
- b. The Quality Control Manual review records that identify all revisions required by section 3.3 (c) (iv) and will be maintained in the files as stated above in (a).
- c. Maintained in the quality records the following documents have records of verification and product or service inspections and tests;
- *"Configuration Data Sheet"* (CDS-001) (Ref.: *Forms Registry, FR-001 Page 54*)
 - *"BurnIn Test Summary"* (Ref.: *Appendix, Page 78*)
 - *"MonitorTest Test Screen"* (Ref.: *Appendix, Page 79*)
 - *"Service Report"* (TSR-001) (Ref.: *Forms Registry, FR-001 Page 57*)
 - *"Nonconformance Report"* (TNCR-001) (Ref.: *Forms Registry, FR-001 Page 59*)
- The above forms (See (a) and (c)) identify either;
- i. reference document number and revision or the part number of the product or service;
 - ii. applicable requirements for quality verification;
 - iii. specific inspections performed and results obtained. The basis for acceptance will be included if measurements are not required;
 - iv. nonconformance reports (section 3.5.17 (h)) and rework results;
 - v. date of the inspection or test;
 - vi. identify the inspector conducting the tests or;
 - vii. identify the data recorder being used.
- d. Upon request, the Quality Control Manager will make the quality records available to the customer representative for analysis and review.
- e. All quality records will be identified by the customer contract number (purchase order) and indexed and filed for ease of retrieval. This contract number will be identified through the Transduction computer network either by customer name, customer purchase order number or Transduction serial number.

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- f. The quality records will be maintained for ten years or for the time stated in a customer contract. They will be maintained in a suitable environment to minimize deterioration or damage and to prevent loss.

DOCUMENTS

Configuration Data Sheet (CDS-001)
 BurnIn Test Summary (Ref.: Appendix, Page 78)
 MonitorTest Test Screen (Ref.: Appendix, Page 79)
 Service Report (TSR-001)
 Nonconformance Report (TNCR-001)
 Forms Registry (FR-001) (Ref.: Page 53)

3.5.17 Nonconformance

PURPOSE

To establish the requirements for the control of nonconforming products within the Quality Control Program.

SCOPE

This procedure applies to nonconforming products supplied to, and manufactured by Transduction.

RESPONSIBILITIES

- The Metal Fabrication Engineering Department is responsible for the following:
 - Review and confirm all Production Staff 2 raised nonconforming issues.
 - Review and define disposition for all nonconforming items and special process items from suppliers.
- The Manufacturing Engineering Department is responsible for the following:
 - Review and confirm all Production Staff 1 raised nonconforming issues.
 - Assign Return Material Authorization number to products that do not conform to drawing(s) or applicable specifications.
 - Add or remove color tag when nonconformance is discovered, accepted or corrected.
 - Review all nonconforming items supplied to Transduction and define their disposition with the approval of the Quality Control Manager.
- The Quality Control Manager has the following responsibilities:
 - Ensure that the disposition will meet code and customer requirements
 - Request, when necessary, code, customer inspection representative to signify their approval of proposed disposition.

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- Ensure the approved disposition are carried out and re-inspected and tested as required.
- Issue Return Material Authorization number for all nonconforming products.

PROCEDURE

The Transduction Quality Control Manager is responsible for the disposition of all nonconforming items including those of suppliers to Transduction. Final acceptance of nonconforming items that violate contractual requirements is the prerogative of the customer. Approval for the acceptance must be established in writing prior to submittal of the material.

- a. Products during the inspection process that do not conform to Transduction engineering documentation, inspection, testing and customer criteria will be identified by a colored tag with written description. A Return Material Authorization number will be issued from the “Return Material Authorization (RMA) Log” (RMAL-001) (Ref.: Forms Registry, FR-001 Page 58) and a “Nonconformance Report” (TNCR-001) (Ref.: Forms Registry, FR-001 Page 59) will be created. The nonconforming items will be held in a segregated area pending corrective action and/or disposition instructions. All disposition actions will be recorded and signed off by the designated representative (Ref.: 3.5.7 (d), 3.5.8 (d) and 3.5.9 (b)).

Quality Control issues that are established as nonconformance are:

1. Appearance defect
 2. Properties of material
 3. Dimensional
 4. Operational defect
- b. The Quality Control Manager designates the Manufacturing Engineering and Metal Fabrication Engineering Department have the responsibility and authority of those assigned to the disposition of nonconforming products.

All personnel of Transduction involved in the manufacturing and production of equipment are obligated to report nonconformance.

- c. Any nonconformance identified during the production process or if customer equipment is returned for service and cannot be repaired will be recorded on a nonconformance report and given a Return Material Authorization number from the Return Material Authorization (RMA) Log. A “Nonconformance Log” (NCRL-001) (Ref.: Forms Registry, FR-001 Page 60) is maintained by the Marketing and Administration Department with record of all Nonconformance Reports.

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- d. A QC "bond" area in the "Stock Room Cage" will be appointed for segregating nonconforming products to prevent unauthorized use, shipment or mixing with conforming products. Where physical segregation is not practical tagging may be used (Ref.: 3.5.10 (b)).
- e. The disposition of nonconforming product is the responsibility of the Manufacturing Engineering and Metal Fabrication Engineering Departments with the approval of the Quality Control Manager.
- f. The Quality Control Manager or designated representative will implement the accepted disposition.
- g. Rework or repaired parts will be re-entered into the production process to a point that will insure adequate re-inspection. The parts will be accompanied by the applicable customer contract, manufacturing drawings and Nonconformance Report and thereby maintain the integrity of the materials and records.
- h. All nonconforming items will be recorded on the Nonconformance Report and submitted to the Quality Control Manager for processing. The recorded nonconformance will be maintained as permanent record in the Nonconformance Report log and electronically for backup.

All recorded Nonconformance Reports will address:

1. action to take to correct and/or disposition the nonconformance and;
2. corrective action to take to prevent or minimize the recurrence of the nonconformance

DOCUMENTS

Nonconformance Report (TNCR-001)

Nonconformance Log (NCRL-001)

Return Material Authorization (RMA) Log (RMAL-001)

Color Tag (Ref.: Appendix, Page 88)

3.5.18 Corrective Action

PURPOSE

To define methods to assure that conditions adverse to quality are promptly identified, documented, reported and resolved to prevent reoccurrence.

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SCOPE

This procedure applies to all nonconformities and potential nonconformities that maybe detected either in products or Quality Control process.

- All nonconformance issues detected
- Corrective action measures taken to prevent occurrence from:
 - a serious failure or breakdown in the implementation of the Transduction Quality Control Program occurs;
 - a significant deviation from performance specifications is discovered;
 - a known deficiency is not resolved in a timely manner; or
 - a repetitive or adverse trend exists.
- Corrective action taken for customer identified deficiencies

RESPONSIBILITIES

- The Quality Control Manager ensures the timely instigation of action to identify and correct cause of nonconformities.
- The Manufacturing Engineering Department and Production Staff 1 will investigate all requests for corrective action and resolve all customer-supplied Return Material Authorization products.
- Production Staff 1, with the approval of the Manufacturing Engineering Department, will determine the error cause and initiate effective and timely corrective action so as to reduce any further occurrences of similar nonconformities.
- The Quality Control Manager verifies that the corrective action taken has been effectively implemented.

PROCEDURE

Corrective Action for Customer Identified Deficiency

All customer identified deficiencies will be given a Return Material Authorization number from the *“Return Material Authorization (RMA) Log” (RMAL-001) (Ref.: Forms Registry, FR-001 Page 58)* by the Quality Control Manager, upon customer notification. Once the Return Material Authorization has been received the Quality Control Manager will be notified by the Shipping and Receiving Department. The Quality Control Manager will forward the Return Material Authorization to the Manufacturing Engineering Department who will then designate the Production Staff 1 to investigate the issue, service and determine corrective action for repair. The corrective action will be documented on the *“Service Report” (TSR-001) (Ref.: Forms Registry, FR-001 Page 57)* in reference to the Return Material Authorization number.

If customer identified deficiency cannot be serviced or repaired a *“Nonconformance Report” (TNCR-001) (Ref.: Forms Registry, FR-001 Page 59)* will be issued (Ref.: 3.5.17 (c)).

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Corrective Action for Significant or Repetitive Conditions

All significant and repetitive adverse quality conditions that are revealed during inspection or testing that are of nonconformance will be immediately removed to segregated QA bond area and have "Color Tag" (Ref.: Appendix, Page 88) attached on affected customer contracts and all parts in same batch associated with nonconformance.

Nonconformance or opportunities for improvement will be identified either by Transduction organization, customer identified deficiencies or by quality management system audit reports.

By whichever means a nonconformance is identified, the underlying cause of the nonconformance will be investigated.

The Production Staff 1 with the supervision of the Manufacturing Engineering Department will monitor nonconformance for patterns or adverse trends and analyze them for assignable causes and take action to eliminate them.

The Manufacturing Engineering Department with the supervision of the Quality Control Manager will review any issues raised and complete a "Nonconformance Report" (TNCR-001) (Ref.: Forms Registry, FR-001 Page 59) to identify root cause and level of action required.

Repeated nonconformity of the same nature or significant deviations from procedures or Quality Control Program will be reported to the Quality Control Manager for action and resolution. A corrective action request will be initiated by the Quality Control Manager and forwarded to the Manufacturing Engineering Department to investigate and eliminate assignable causes of nonconformance in areas of:

- Engineering
- Purchasing practices
- Vendor capabilities
- Fabrication or assembly methods
- Process control procedures
- Testing techniques

The corrective action request is documented on the "Corrective Action Report" (CAR-001) (Ref.: Forms Registry, FR-001 Page 64). Once completed, it is forwarded to the Quality Control Manager who determines the recommended corrective action is satisfactory, verifies that the action has been satisfactorily implemented and closes the corrective action in the Quality Control hard copy files.

DOCUMENTS

Return Material Authorization (RMA) Log (RMAL-001)
 Nonconformance Report (TNCR-001)
 Nonconformance Report Log (NCRL-001)
 Corrective Action Report (CAR-001)
 Service Report (TSR-001)
 Color Tag (Ref.: Appendix, Page 88)

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3.5.19 Customer-Supplied Products or Services

PURPOSE

To define the requirements for inspection, storage, and control of customer-supplied products.

SCOPE

This procedure applies to products and services supplied to Transduction by the customer.

RESPONSIBILITIES

- The Purchasing and Expediting Department is responsible for creating a purchase order as per section 3.5.5 except that the purchase order will be un-priced and clearly marked "Customer Supplied Product for Contract Number _____".
- The Manufacturing Engineering Department is responsible for ensuring that the customer-supplied product is listed on the applicable inspection and test reports.
- The Quality Control Manager is responsible for ensuring incoming inspection of all customer-supplied products.

PROCEDURE

Customer-supplied products and services include parts or components provided for installation/inclusion with shipment of Transduction products.

- a. Upon receipt, incoming customer-supplied products will be inspected or otherwise verified for completeness and proper type and to detect any damage that may have occurred in transit by Production Staff 1 with the supervision of the Manufacturing Engineering Department. (Inspection by Transduction does not absolve the customer of the responsibility to provide acceptable products.)
- b. Further in-process inspections and tests are carried out as specified in the contract and the applicable inspection procedure. The Purchasing and Expediting Department will store customer-supplied products in assigned area located in the "Stock Room Cage", separate from inventory and nonconformance parts.
- c. Handling will be in accordance with specific instructions issued by the Quality Control Manager or customer.
- d. Any customer-supplied hardware found to be nonconforming upon receipt, or which subsequently becomes nonconforming, lost, or otherwise unsuitable for use will be promptly reported to the customer in writing.

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3.5.20 Statistical Techniques

Transduction Quality Control Program requires that all products be tested to meet 100% of the defined characteristics and specifications unless otherwise specified by contract or by written authorization from the customer. Statistical techniques are not used by Transduction in any inspection and testing.

3.5.21 Quality Audits

3.5.21.1 Internal Quality Audits

Not required by this Standard.

3.5.21.2 External Quality Audits

PURPOSE

To establish a system that evaluates, controls and determines acceptance criteria for suppliers.

SCOPE

This procedure applies to all current and potential suppliers of Transduction.

RESPONSIBILITIES

- The Quality Control Manager along with the Purchasing and Expediting Department are responsible for conducting external quality audits.

PROCEDURE

Only suppliers that are approved in accordance to Transduction Quality Control Program will be used. Transduction will evaluate and determine acceptability based on the following:

1. Quality Control Program
2. Performance and;
3. Financial stability

The Quality Control Manager assisted by the Purchasing and Expediting Department will conduct an external quality audit on each supplier before consideration as a supplier to Transduction. The type of external quality audit conducted will depend on the economic feasibility of the audit. The Quality Control Manager will determine the most appropriate audit to implement.

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Transduction uses the following external audits for suppliers:

1. "Supplier Quality System Audit" (SQSA-001) (Ref.: Forms Registry, FR-001 Page 65-67)
2. Third-party evaluation (used for suppliers in Taiwan)
3. Source inspection

Supplier who do not have a specified Quality Control Program, but are proven suppliers of a quality product based on long term performance, are designated as one from whom, specified parts may be purchased subject to acceptance inspection by Quality Control Manager.

External audits are conducted as follows:

1. When there has been a period of more than 12 months since the last shipment from the supplier and the part to be ordered requires CSA Z299.3-85 Quality Control Program.
2. When the Quality Control Manager has recommended removing the supplier because of unsatisfactory quality performance.
3. Parts and material have been received within the past 12 months, but no audit has been conducted for more than 2 years.
4. Approving new supplier.

Approval of Quality Control Program does not absolve suppliers from responsibility for non-conformities discovered after receipt by Transduction. The responsibility shall be made clear with each supplier audited by Quality Control Manager.

Source inspection is performed by Transduction Quality Control at the supplier premises whenever;

1. Critical product characteristics cannot be checked after the purchased part has left the supplier
2. Significant costs and delays can be reduced by such practices and;
3. Required by customer contract

Arrangements for source inspection are made by the Purchasing and Expediting Department at the request of Quality Control Manager.

DOCUMENTS

Supplier Quality System Audit (SQSA-001)

4.0 FORMS REGISTRY

FORMS REGISTRY LIST

Form/Record	Description	Revision
TQCM-001	Quality Control Manual	3.5
CDS-001	Configuration & Factory Acceptance Test	2
TOC-001	Organizational Chart	1
PTL-001	Personnel Quality Control Program Training Log	1
TSR-001	Service Report	1
RMAL-001	Return Material Authorization (RMA) Log	1
TNCR-001	Nonconformance Report	2
NCRL-001	Nonconformance Report Log	1
POL-001	Purchase Order Log	1
CPOF-001	Customer Purchase Order Form	1
DCN-001	Document Change Notice	1
CAR-001	Corrective Action Report	1
SQSA-001	Supplier Quality System Audit	1
MTECDML-001	Measure and Test Equipment - Caltek Digital Multimeter Calibration & Log	1
MTECDSTL-001	Measure and Test Equipment – Criterion Dielectric Strength Tester Calibration & Log	1
MTEHSTTCL-001	Measure and Test Equipment – Hart Scientific Temperature Thermocouple Calibrator Calibration & Log	1
MTESLCML-001	Measure and Test Equipment – Simpson Leakage Current Meter Calibration & Log	1
ASL-001	Approved Supplier List	1
TCC-001	Certificate of Conformance	1
QCMDL-001	Quality Control Manual External Distribution List	1
QCMDIL-001	Quality Control Manual Internal Distribution List	1
TPR-001	Transduction Purchase Request	1

Configuration Data Sheet

CONFIGURATION DATA SHEET

CUSTOMER:

PO#

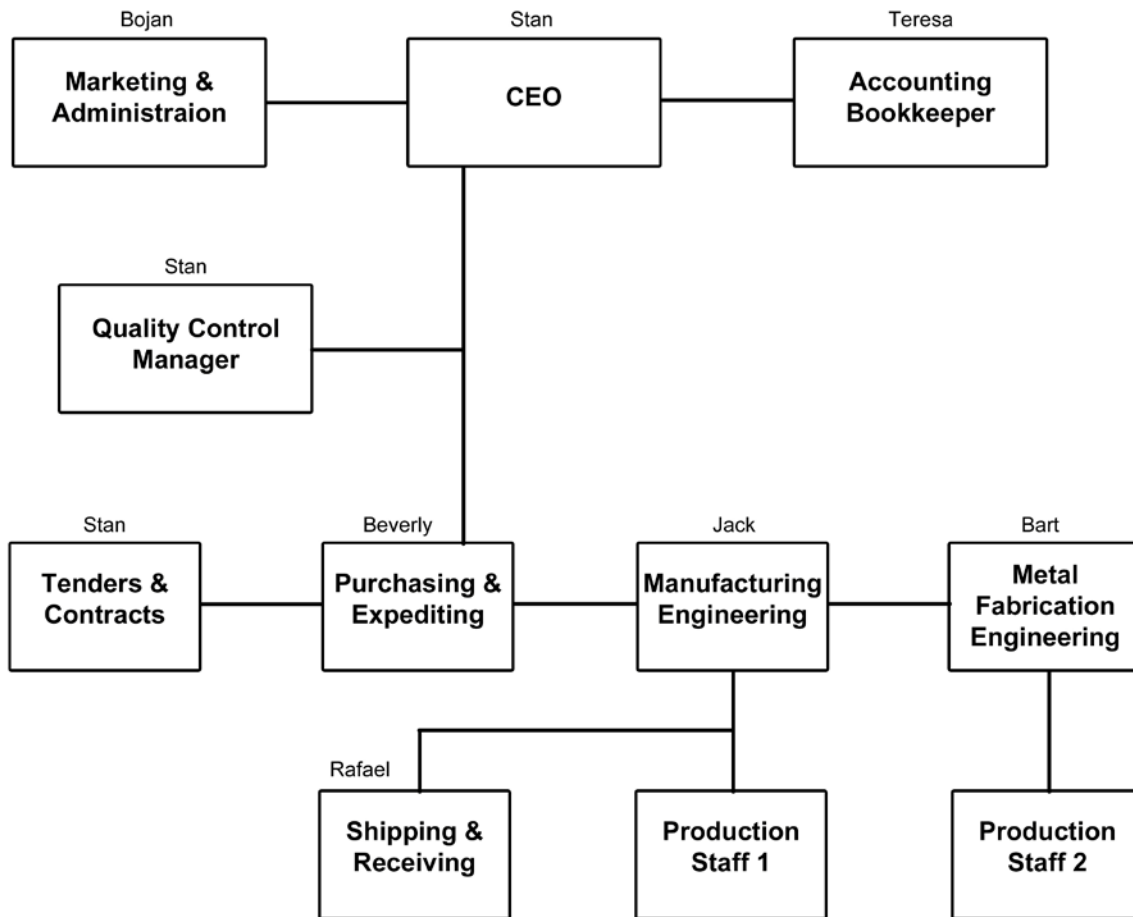
Description	Serial #	Model
Basic Configuration Components Below:		
Chassis		
Power Supply		
Custom Customer Configuration Components Below:		
Hours burned in	hrs	Note:
Test Performed	<input type="checkbox"/> Windows <input type="checkbox"/> BurnIn Test <input type="checkbox"/> Monitor Test <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Assembled by: Signature:		Date:
Verified by:		Date:

TRANSDUCTION INC.
5155 Spectrum Way, Bldg. 23, Mississauga, ON, Canada, L4W 5A1
Tel: (905) 625-1907 In USA and Canada 1-800-268-0427 Fax: (905) 625-0531

Organizational Chart

Quality Control Manual Reference 3.2.1 (a), (b) and (c); 3.3 (c).

Transduction Organizational Chart



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Service Report

TRANSDUCTION SERVICE REPORT

CUSTOMER NAME :

RMA #

PO#

INDICATE WHICH APPLIES:

DEPOT _____ WARRANTY _____ CONTRACT _____ FIELD SERVICE _____

EQUIPMENT:

REPORTED FAULT:

ACTION:

SERVICED BY: _____ **DATE:** _____

REPORT BY: _____

CHARGES (IF APPLICABLE):

_____ PARTS	=	_____
_____ HRS @ /HR	=	_____
_____ KM @ /KM	=	_____
_____ SUB TOTAL	=	_____
_____ GST/HST	=	_____
_____ TOTAL	=	_____

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Nonconformance Report

TRANSDUCTION NONCONFORMANCE REPORT

Name	
Date	
RMA #	
Vendor	
PO #	
Part #	
Part Description	
Quantity	
Drawing #	
Signature	
Found During What Activity	
<input type="checkbox"/> Incoming Inspection <input type="checkbox"/> In process Inspection <input type="checkbox"/> Final Inspection <input type="checkbox"/> Other	
Description of Nonconformance:	
Corrective Action Taken:	
Disposition	
<input type="checkbox"/> Repair <input type="checkbox"/> Rework <input type="checkbox"/> Return to Vendor <input type="checkbox"/> Scrap	
Corrective Action Approval	
Signature:	Date:
Closing the Nonconformance	
Signature:	Date:

Document Change Notice

DOCUMENT CHANGE NOTICE		
DCN No.:	Date:	Dept.:
Requested By:		
Document Number	Title	New Revision
Description of Change (FROM/TO):		
Reason for Change:		
Action Taken: <i>(check all that apply)</i>		
<input type="checkbox"/> Change(s) included in new revision <input type="checkbox"/> DCN attached to document(s), changes to be included in next revision <input type="checkbox"/> Other (specify):		
Approvals:		
Verified By: _____	Signature: _____	
Approved By: _____	Signature: _____	

Corrective Action Report

For Transduction Identified Significant and Repetitive Adverse Conditions

Corrective Action Report		RMA#: _____
		Cust. PO# (If Applicable): _____
1	Type: Customer <input type="checkbox"/> Supplier <input type="checkbox"/> Internal <input type="checkbox"/>	Customer/Supplier (If Applicable):
	Part#:	External Contact Name:
	Quantity:	External Contact Phone:
	Initiated By:	Due Date:
	Initiation Date:	
	Assigned To:	
	Respond To Customer? Yes <input type="checkbox"/> No <input type="checkbox"/> By Date:	Plant Visit Required? Yes <input type="checkbox"/> No <input type="checkbox"/>
2	Description of Issue:	Can the issue affect other products or processes? Is it a systemic issue that can re-occur?
3	Containment Action: (Steps taken immediately to isolate effect of issue)	
4	Corrective Action: (Steps taken to eliminate issue)	
5	Preventative Action For Long-Term Solution: (Steps taken to modify systems and procedures to prevent similar occurrence elsewhere)	
6	Department Manager: Accept <input type="checkbox"/> Reject <input type="checkbox"/>	Signature: _____ Date: _____
	Quality Control Manager: Accept <input type="checkbox"/> Reject <input type="checkbox"/>	Signature: _____ Date: _____

Supplier Quality System Audit

(Page 1)

SUPPLIER QUALITY SYSTEM AUDIT			
**Note: This form is to be filled out by the supplier		Date:	
Supplier Profile			
Company Name:			
Company Address:			
Remit To Address:			
Product or Service Details:			
Company Website:			
Email:			
Company Contact:			Tel:
Quality Assurance Manager:			Fax:
Year Started Operations:			Position:
Annual Sales:			# Employees:
			Annual Sales:
Quality System Standards			
Quality Systems Compliant To: (Title, Revision, Issue and Date)			
Title	Revision	Issue	Date
Does Transduction Inc. and/or it's customers have the right to review documentation as listed above:			
Yes	<input type="checkbox"/>	No	<input type="checkbox"/> If "No" reason why:
Does Transduction Inc. have permission if needed to to access premises for purposes of auditing, surveying and product conformance:			
Yes	<input type="checkbox"/>	No	<input type="checkbox"/> If "No" reason why:

Supplier Quality System Audit (Cont'd)

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Supplier Quality Capabilities			
Place "X" in appropriate column. Explain any "No" or "Not Applicable" answers.			
	Yes	No or N/A	Explain all "No" and "Not Applicable" responses
Are specifications reviewed and production methods established that ensure applicable customer and regulatory requirements can be met on a consistent basis?			
When required, is the customer notified of changes to items that may adversely affect quality or reliability, such as, manufacturing site, process methods, raw materials, etc.?			
Is there a documented corrective action system in use that focuses on elimination of problem root cause?			
Are control plans (or equivalent) maintained that show the process steps, key inspection points, inspection/test method, sample size and frequency?			
Are process capability studies or statistical methods used to monitor and control production processes?			
Are documented methods used to qualify and approve machinery, process equipment, inspection/test equipment and production tooling?			
Is product conformance to specified requirements verified prior to further processing or shipment and are records maintained?			
Are precautions taken to control and monitor the condition of product during storage, handling and shipping to prevent loss or damage?			
Are the materials and parts produced in accordance with applicable environmental and product safety regulations, laws and directives? (ie., RoHS, UL, CSA)			

Supplier Quality System Audit (Cont'd)

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SUPPLIER QUALITY SYSTEM AUDIT (Cont'd)			
<i>*Note: This form is to be filled out by Transduction</i>			
Personnel Involved in Audit (Transduction to Complete)			
Transduction Audit Team:			
First Name:	Last Name:	Title:	
Supplier Personnel Involved in Audit:			
First Name:	Last Name:	Title:	
Acceptance Criteria			
Supplier Previous Performance:	Satisfactory	Unsatisfactory	Not Applicable
Product conformance to specified specifications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality and product documents are kept on record and provided when needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical service and support provided for any issues and questions that arise with product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Products are tested to ensure compliance with all applicable regulations and standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product traceability is maintained to facilitate problem evaluation and corrective action	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Production samples are tested and provided to customer upon request	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Corrective Action system is in place that provides root cause and failure analysis and takes effective action to prevent recurrence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Custom product specifications required are reviewed and implemented in a timely manner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is able to implement and sustain all aspects of RoHS Compliance Standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper equipment and methods are used to prevent product damage or loss	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supplier has a Quality System Standard in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Certificate of Conformance



5155 Spectrum Way, Bldg 23
Mississauga, ON L4W 5A1

Tel: (905) 625-1907
Fax: (905) 625-0531
www.transduction.com/

CERTIFICATE OF CONFORMANCE

To: _____
Company: _____
Address: _____

Transduction Inc. Ref.: _____

This is to certify that product(s) supplied under Purchase Order (PO) number _____ meet or exceed all requirements described in the Purchase Order.

Documentation supporting certification is on file and shall be made available for review upon request.

Stan Tyminski
CEO

Date

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5.0 APPENDIX

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BurnIn Test Summary

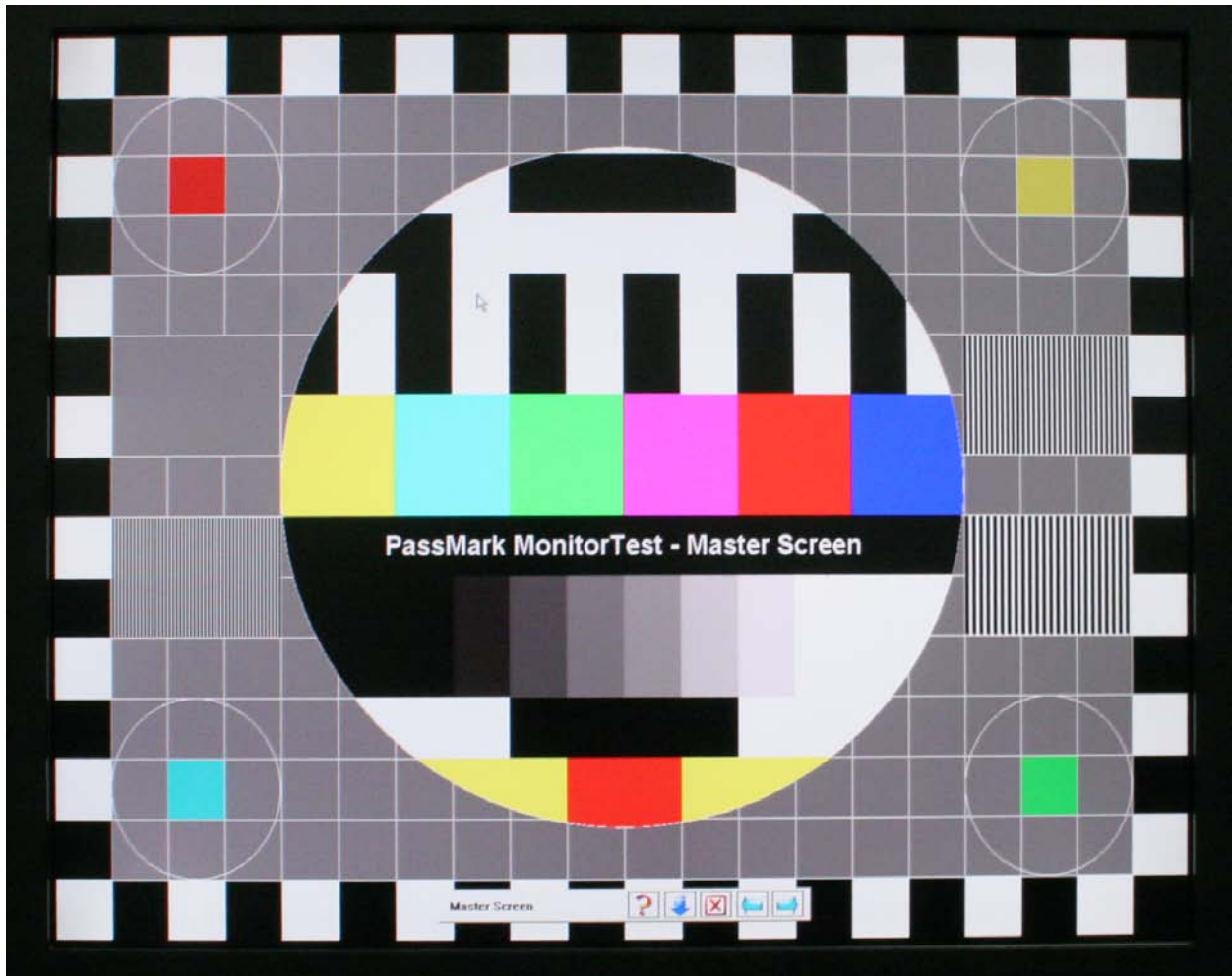
<i>BurnInTest results (Detail: Normal)</i>	
Machine type	TR-MAX4-PDSL
Machine serial #	27950
Network Name	PDSLSTN01
Date	11/16/11
Time	09:57:17
Operating system	Windows XP
Number of CPUs	2
CPU manufacturer	GenuineIntel
CPU type	Intel(R) Core(TM)2 Duo CPU E8400 @ 3.00GHz
CPU1 speed	2992.6 MHz
CPU2 speed	2992.4 MHz
Level 2 cache size	Unknown
CPU features	MMX SSE SSE2
CPU Serial #	Not available or disabled
RAM	3478237184 Bytes
Video card	Intel(R) Q35 Express Chipset Family
Video resolution	1024x768x32

RESULT SUMMARY					
Test Start time	Test Start time: Tue Nov 15 09:55:39 2011				
Test Stop time	Wed Nov 16 09:56:40 2011				
Test Duration	Test Duration: 024h 01m 01s				
Temp (Min / Current / Max)	0.0 / 0.0 / 0.0				
Test	Cycles	Operations	Result	Errors	Last Error
CPU - Maths	34688	9.720 Trillion	PASS	0	No errors
CPU - MMX / SSE	14901	24.999 Trillion	PASS	0	No errors
Memory (RAM)	30	61.231 Billion	PASS	0	No errors
2D Graphics	1343	1.344 Million	PASS	0	No errors
3D Graphics	119579	382 Billion	PASS	0	No errors
Disk (C:)	87	91.428 Billion	PASS	0	No errors
Disk (D: PDSL)	89	93.655 Billion	PASS	0	No errors
Network 1	1560	12.480 Million	PASS	0	No errors
Network 2	1577	12.621 Million	PASS	0	No errors
CD/DVD (E:)	3351	44.524 Billion	PASS	0	No errors
Parallel Port	953	285 Million	PASS	0	No errors
Serial Port 1	2047	117 Million	PASS	0	No errors
Serial Port 2	2048	117 Million	PASS	0	No errors
Serial Port 3	2051	118 Million	PASS	0	No errors
Serial Port 4	2052	118 Million	PASS	0	No errors
Notes	TR-980 / INTEL E8400 / 2x2GB DDR2				
DETAILED ERROR LOG					
2011-11-15 09:55:39, Status, Completed started test run					
2011-11-16 09:56:40, Status, Test run stopped					

Results Produced by PassMark BurnInTest (<http://www.passmark.com>)

Version: V4.0 Pro

MonitorTest Test Screen



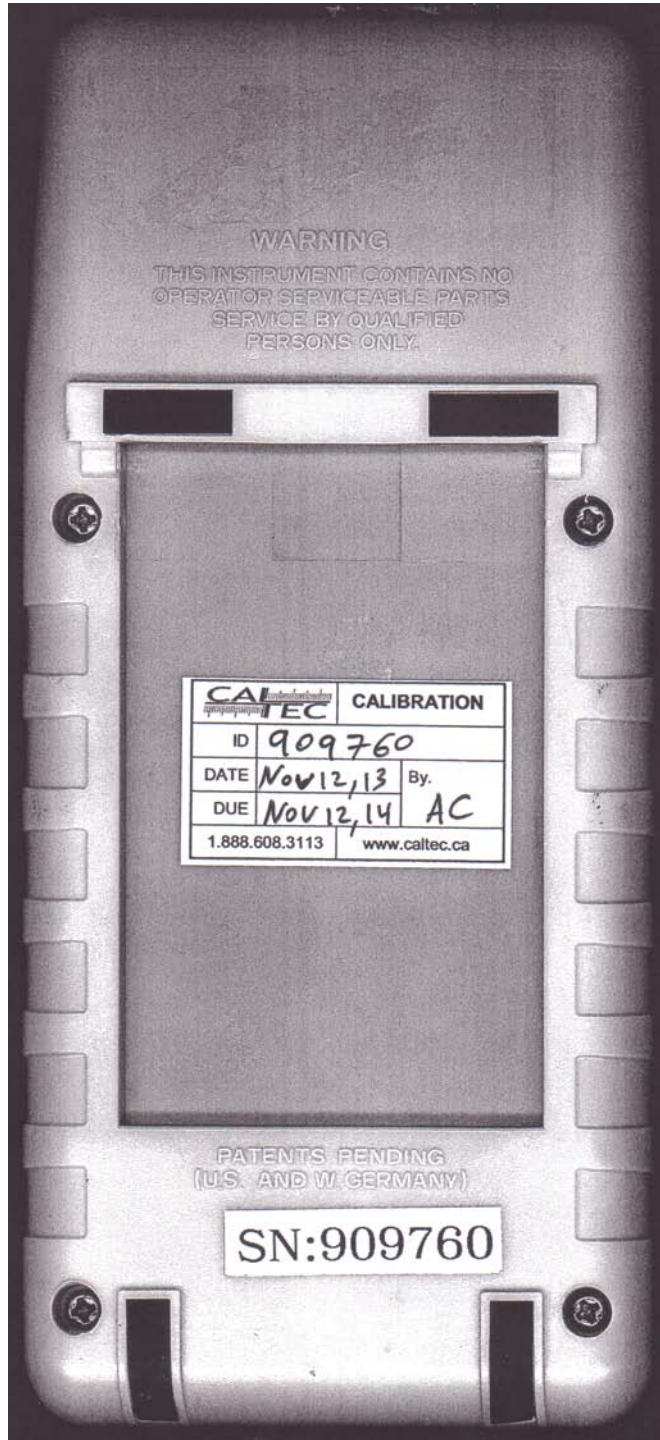
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Forms Registry

FORMS REGISTRY LIST

Form/Record	Description	Revision
TQCM-001	Quality Control Manual	3.5
CDS-001	Configuration & Factory Acceptance Test	2
TOC-001	Organizational Chart	1
PTL-001	Personnel Quality Control Program Training Log	1
TSR-001	Service Report	1
RMAL-001	Return Material Authorization (RMA) Log	1
TNCR-001	Nonconformance Report	2
NCRL-001	Nonconformance Report Log	1
POL-001	Purchase Order Log	1
CPOF-001	Customer Purchase Order Form	1
DCN-001	Document Change Notice	1
CAR-001	Corrective Action Report	1
SQSA-001	Supplier Quality System Audit	1
MTECDML-001	Measure and Test Equipment - Caltek Digital Multimeter Calibration & Log	1
MTECDSTL-001	Measure and Test Equipment – Criterion Dielectric Strength Tester Calibration & Log	1
MTEHSTTCL-001	Measure and Test Equipment – Hart Scientific Temperature Thermocouple Calibrator Calibration & Log	1
MTESLCML-001	Measure and Test Equipment – Simpson Leakage Current Meter Calibration & Log	1
ASL-001	Approved Supplier List	1
TCC-001	Certificate of Conformance	1
QCMDL-001	Quality Control Manual External Distribution List	1
QCMDIL-001	Quality Control Manual Internal Distribution List	1
TPR-001	Transduction Purchase Request	1

Label



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Purchase Order

Transduction

5155 Spectrum Way, Bldg 23
 Mississauga ON Canada
 L4W 5A1
 Tel: 905-625-1907 Fax: 905-625-0531
 Toll Free: 1-800-268-0427

Purchase Order

June 18, 2014

VENDOR:

SHIP TO: SAME AS ABOVE

ATTN:

TEL: () FAX: ()

SHIP VIA:

DUE DATE: ASAP

Item No.	Code #	Qty Ord'd	Qty Rec'd	Description	Unit Price	Disc %	Amount
Total							

AUTHORIZED SIGNATURE _____ JOSIE ZHONG

- TERMS AND CONDITIONS OF THIS ORDER:
- Deliver no goods without a Purchase Order.
 - Acknowledge receipt of this order specifying prices and a definite shipping date.
 - Make no substitutions or changes without authority from us.
 - We reserve the right to cancel this order if shipment is not made as promised.
 - This order must not be filled at prices higher than quoted.

PST EXEMPTION

I/We certify that the tangible personal property ordered herein is purchased for the purpose of resale.

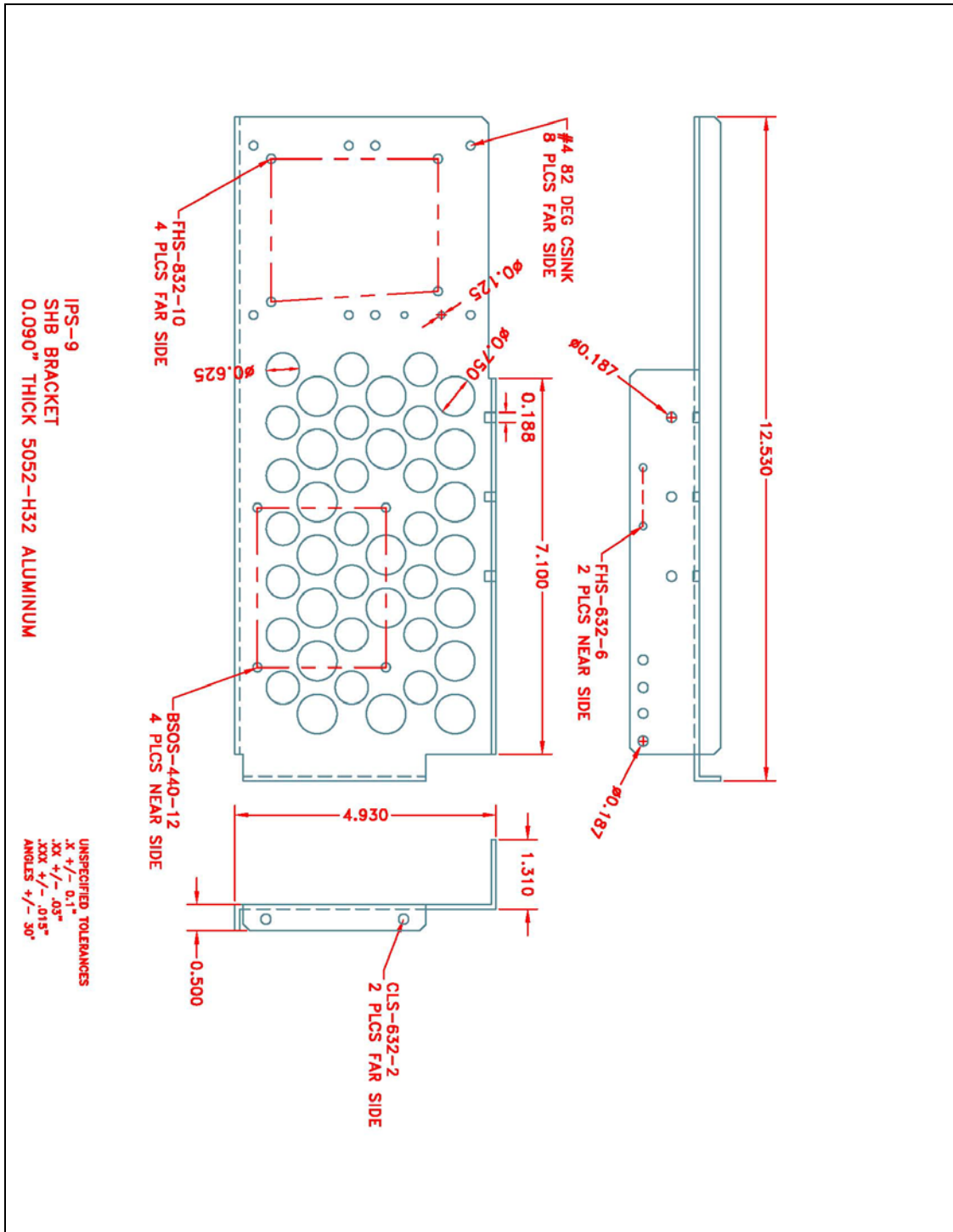
Permit 40269914 TRANSDUCTION LIMITED

Signature _____

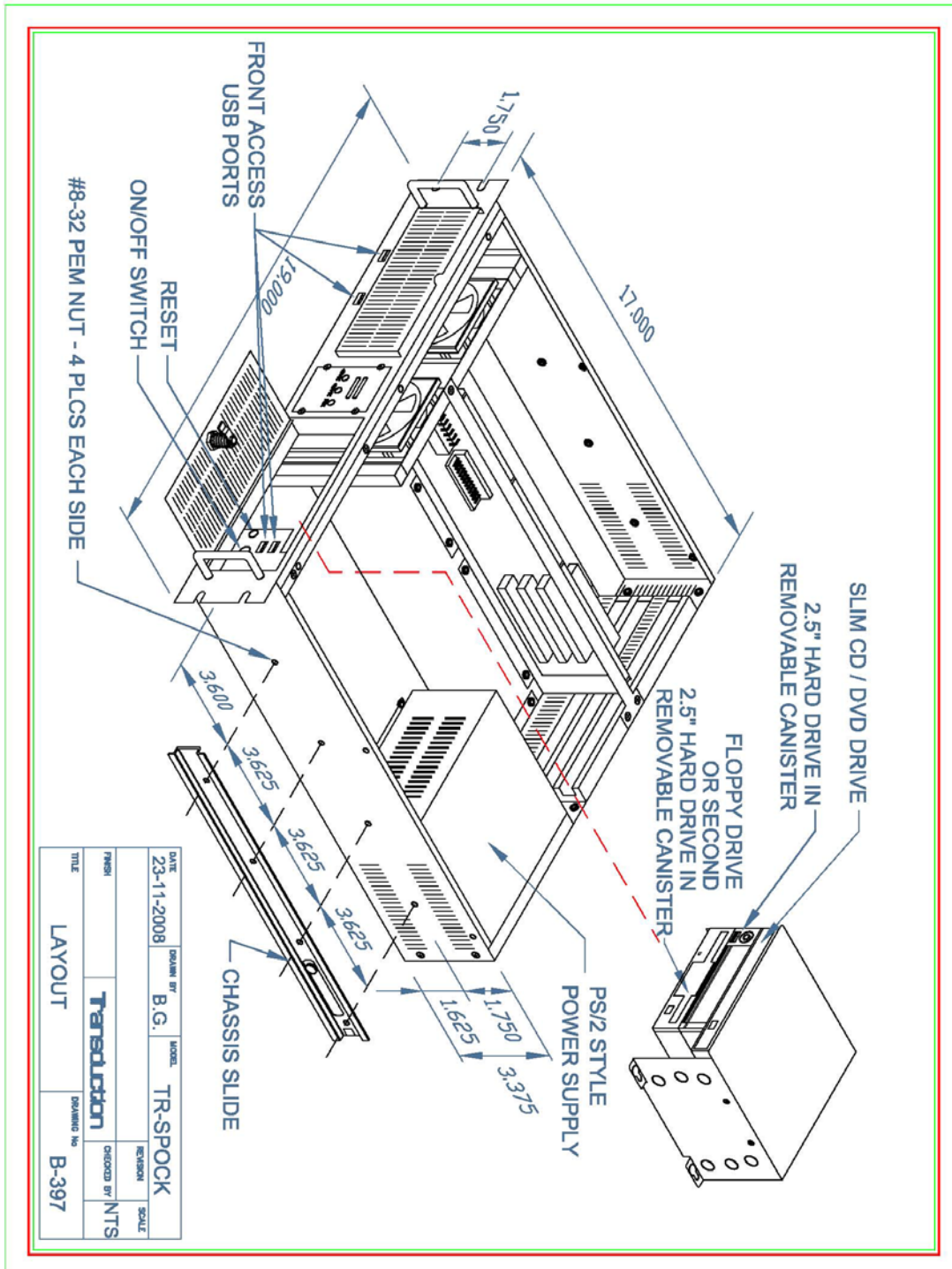
Inventory List

Transduction		PARTS - INVENTORY		U.S. EXCHANGE 1,0443			
NR	PART NUMBER	DESCRIPTION	Q_TY	PRICE	PR_PER	TOTAL	SUPPLIER
1	941001602	B4 P/S OVERLAY-STICKER	305	0.00	1	0.00	ALTERNATE SOURCE
2	94100619	BB FRONT PANEL OVERLAY-STICKER	114	0.00	1	0.00	ALTERNATE SOURCE
3	072193	CAUTION LABEL-STICKER	1526	0.00	1	0.00	ALTERNATE SOURCE
4		WARNING LABEL-STICKER	2700	279.00	1000	753.30	K PROMOTIONS LTD.
5	941001600	OPTO POWER MODULE-STICKER	553	0.00	1	0.00	ALTERNATE SOURCE
6	941001601	OPTO ANALOG I/O-STICKER	756	0.00	1	0.00	ALTERNATE SOURCE
7		OPTO DIGITAL STATUS-STICKER	446	0.00	1	0.00	ALTERNATE SOURCE
8	062592	S/N LABELS-STICKER	665	0.00	1	0.00	ALTERNATE SOURCE
9	4-40x1/4 PHMSPHSTZY	SCREW YELLOW	0	14.88	1000	0.00	SOURCE "4" FASTENERS
10	4-40x3/8 PHMSPHSTZY	SCREW YELLOW	5600	4.00	100	224.00	SOURCE "4" FASTENERS
11	4-40 KPNTMSSTZY	KEEP NUT YELLOW	1680	0.15	1	252.00	PENCOM CANADA
12	6-32x1/4 PHMSPHSTZY	SCREW YELLOW	10600	0.02	1	222.60	PENCOM CANADA
13	6-32 KPNTMSSTZY	KEEP NUT YELLOW	10150	0.02	1	203.00	PENCOM CANADA
14	6-32x3/8 PHMSPHSTZY	SCREW YELLOW	12800	21.00	1000	268.80	PENCOM CANADA
15	8-32x3/8 PHMSPHSTZY	SCREW YELLOW	1570	9.95	100	156.22	RUSH ELECTRONICS
16	6-32x5/8 PHMSPHSTZY	SCREW YELLOW	3140	49.70	1000	156.06	SOURCE "4" FASTENERS
17	8-32x1/4 PHMSPHSTZY	SCREW YELLOW	5420	27.00	1000	146.34	SOURCE "4" FASTENERS
18	8-32 KPNTMSSTZY	KEEP NUT YELLOW	2660	59.10	1000	157.21	SOURCE "4" FASTENERS
19	51106	GLORIA-D FRONT PANEL STICKER	1063	1.67	1	1775.21	K PROMOTIONS LTD.
20	941000619C	IPC FRONT PANEL STICKER	812	1.79	1	1453.48	K PROMOTIONS LTD.
21	4-40x1/4 PHMSPHIL 18.8	SCREW SS 18.8	1580	1.11	100	17.54	SOURCE "4" FASTENERS
22	TRN-B05	BB MOUNTING BKT. R&L	208	0.00	1	0.00	QUESTA DESIGN
23		BLANK FILLER PLATE	122	0.00	1	0.00	METALWORK SHOP
24	200012	BLANK FILLER PLATE W/PEM NUTS	78	2.50	1	195.00	METALWORK SHOP
25	200054	BERTA KBD. PLATE W/PEM NUTS	125	2.65	1	331.25	METALWORK SHOP
26	BLACK LEXAN	BLACK LEXAN SHEETS 24"x48"	49	17.90	1	877.10	K PROMOTIONS LTD.
27	B4L-004-E	B4X-L CARD GUIDE BKT.	11	0.00	1	0.00	QUESTA DESIGN
28	20049	BB DB-9 FILLER	447	1.00	1	447.00	METALWORK SHOP
29	T-OPTO-8-D	BB DB-25 FILLER	154	1.00	1	154.00	METALWORK SHOP
30	TRN-B06	BB DB CONNECTOR PLATE	0	0.00	1	0.00	QUESTA DESIGN
31	TRN-B0P	BB KBD/SPEAKER PANEL	109	0.00	1	0.00	METALWORK SHOP
32	200008	SPEAKER/KBD. PLATE	0	0.00	1	0.00	METALWORK SHOP
33	T-OPTO-8-E	OPTO PHX CONN. FILLER PLATE	261	0.00	1	0.00	QUESTA DESIGN
34	T-OPTO-3-E	OPTO PAX CONN. FILLER PLATE	311	0.00	1	0.00	QUESTA DESIGN
35	200018	OPTO TEST-POINT BKT.	76	0.00	1	0.00	METALWORK SHOP
36	200013	OPTO DIGITAL STATUS PLATE	7	0.00	1	0.00	METALWORK SHOP
37	200064	DB-9 CHASSIS FILLER	50	2.00	1	100.00	METALWORK SHOP
38	4099-BLANK	BLANK I/O CHASSIS FILLER	7000	0.35	1	2450.00	TAICON ELECTRONICS*
39	4099-BLANK-ROHS	BLANK I/O CHASSIS FILLER	550	0.68	1	374.00	TAICON ELECTRONICS
40	4099-25-ROHS	DB-25 I/O CHASSIS FILLER	400	0.76	1	304.00	TAICON ELECTRONICS
41	17501-10-B	POWER CORD - VOLEX	9	0.00	1	0.00	ELECTROSONIC
42	70405060234	2x18 AWG POWER CORD	50	0.00	1	0.00	INTERPOWER CORP. US
43	MX08-50-0114 (PO_M66520)	MOLEX CRIMP TERMINAL	550	0.09	1	46.75	DIGI-KEY
44	MX08-50-0114 (PO_M65466)	MOLEX CRIMP TERMINAL	1000	0.08	1	78.80	DIGI-KEY
45	37-704-0 (PO_M65423)	HOUSING - 4POS. W/RAMP	0	4.40	100	0.00	ELECTROSONIC
46	37-704-0(MX09-50-3041)	HOUSING - 4POS. W/RAMP	210	3.90	100	8.19	ELECTROSONIC
47	37-970-0(MX08-50-0106)	CRIMP TERMINAL	800	30.00	1000	24.00	ELECTROSONIC
48	MX09-50-3061	MOLEX HOUSING	1545	0.00	1	0.00	SIMCONA ELECTRONICS
49	MX22-01-3047(WM2002-ND)	MOLEX 2.5 mm CRIMP HOUSING	420	0.12	1	49.98	DIGI-KEY
50	LED-GREEN-12V	12V PANEL MOUNT GREEN LED	16	5.85	1	97.75	STEINAIR INC. US

Drawing 1



Drawing 2



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Color Tag



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Serial Number



Packing Slip (Transduction)

Transduction
 5155 SPECTRUM WAY, BUILDING NO. 23,
 MISSISSAUGA, ONTARIO, CANADA L4W 5A1
 TEL: (905) 625-1907 • FAX: (905) 625-0531
 TOLL FREE: 1-800-268-0427
 www.transduction.com

REFERENCE NO.	INVOICE DATE
72225	PAGE
NUMBER	

PACKING SLIP

SOLD TO:

SHIP TO:

CUSTOMER PURCHASE ORDER NO.	SHIPPED VIA	PPD	COLL	WAYBILL NO.	SALESPERSON

ITEM	QUANTITY			DESCRIPTION
	ORDERED	SHIPPED	B.O.	

TERMS AND CONDITIONS

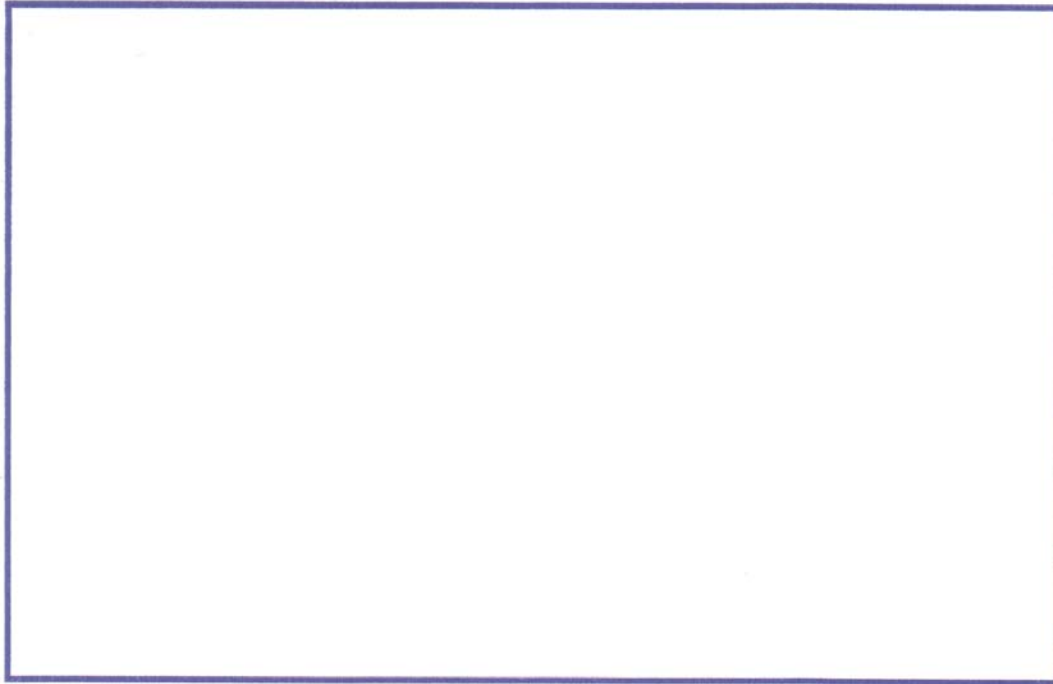
1. PAYMENT IS DUE IN FULL ON OR BEFORE 30 DAYS FROM INVOICE DATE. A SERVICE CHARGE OF 2% PER MONTH WILL BE ADDED TO ALL PAST DUE ACCOUNTS OVER 30 DAYS.
2. GOODS RETURNED WITHOUT AUTHORIZATION WILL NOT BE ACCEPTED. SHIP RETURNED GOODS PRE-PAID UNLESS OTHERWISE ADVISED.
3. GOODS RETURNED 30 DAYS AFTER INVOICE DATE WILL BE SUBJECT TO A RE-STOCKING FEE.
4. ANY DISCREPANCIES NOTED IN THE INVOICE OR PACKING SLIP MUST BE REPORTED WITHIN 10 DAYS OF INVOICE DATE.

Thank
You

PACKING SLIP

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Shipping Label



TRANSDUCTION

5155 Spectrum Way, Bldg. 23, Mississauga, Ontario L4W 5A1
(905) 625-1907 Fax (905) 625-0531 www.transduction.com