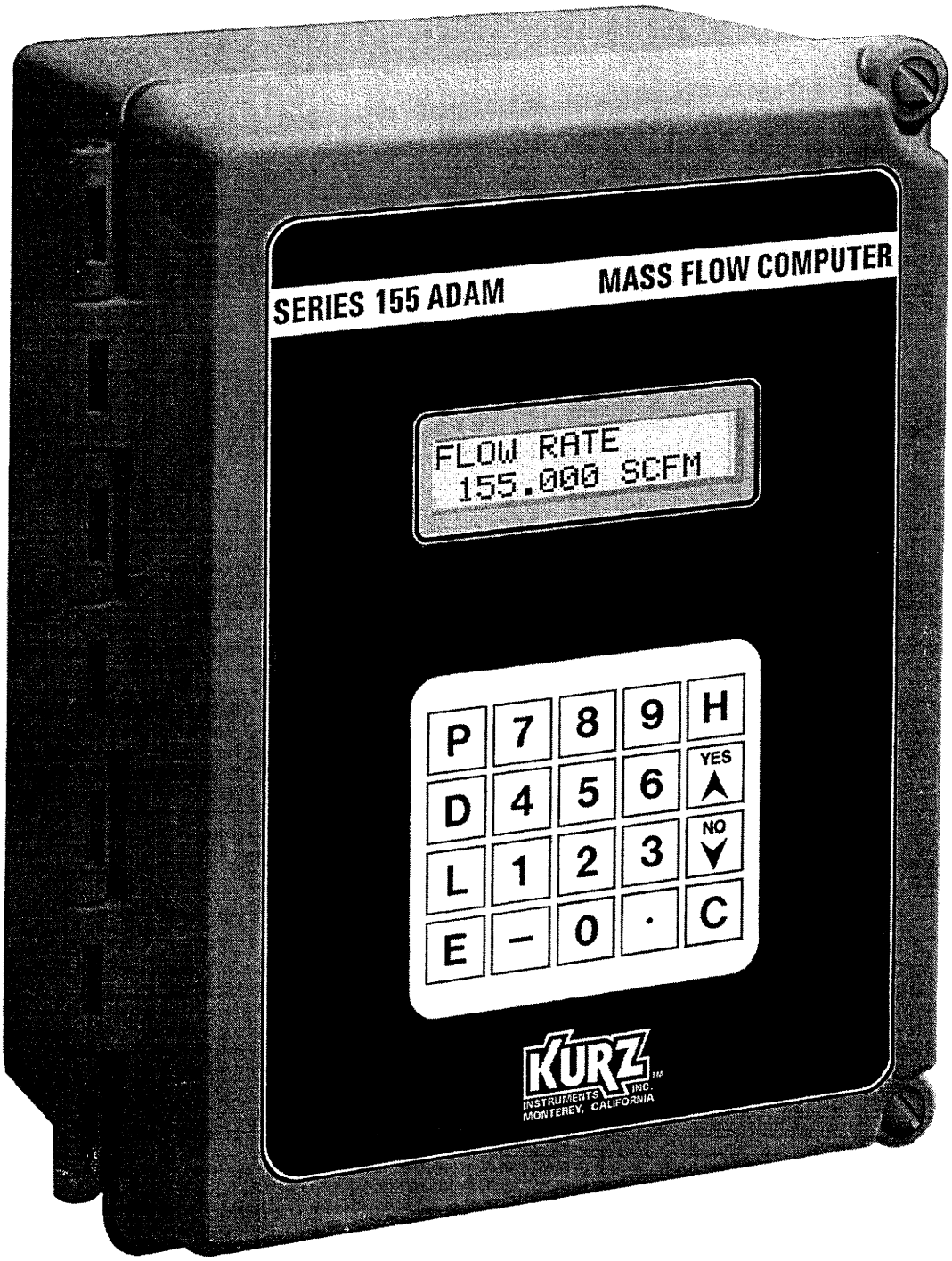
ADDENDUM

PLEASE NOTE THAT THE CIRCUIT BOARDS IN THE 155Jr HAVE BEEN REVISED. THE TERMINAL CONNECTIONS HAVE CHANGED SLIGHTLY. PLEASE REFER TO THE ENCLOSED WIRING DIAGRAM FOR THE NEW TERMINAL LOCATIONS AND PIN-OUTS.



MODEL 155Jr

USER'S GUIDE

360156 Rev. A

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LIMITED WARRANTY-PRODUCT
(Liability for Repair or Replacement Only)

The Company's products are warranted to be free from defects in material and workmanship for one year from date of shipment from the factory. The Company's obligation is limited to repairing, or at their option, replacing products and components which, on verification, prove to be defective, at the factory in Monterey, CA. The customer is responsible for materials of construction selection and for materials suitability for the intended use of Kurz equipment. The company shall not be liable for installation charges, for expenses of Buyer for repairs or replacement, for damages for delay of loss of use, or other indirect or consequential damages of any kind. The Company extends this warranty only upon proper use and/or installation of the product in the application for which intended and does not cover products which have been modified without the Company's approval or which have been subjected to unusual physical or electrical stress, or upon which the original identification marks have been removed or altered.

Whenever the design of the equipment to be furnished of the system in which it is to be incorporated originate with the buyer, manufacturer's warranty is limited specifically to matters relating to furnishing of equipment free of defects in material and workmanship and assumes no responsibility for implied warranties of fitness for purpose or use.

Transportation charges for material shipped to the factory for warranty repair are to be paid by the shipper. The Company will return items repaired or replaced under warranty prepaid. No items shall be returned for warranty repair without prior authorization from the Company.

KURZ INSTRUMENTS INC.
2411 Garden Road
Monterey, CA 93940

July 11, 1996

CE COMPLIANCE ADDENDUM FOR THE MODEL 155JR USERS MANUAL P/N 360156 Rev. A.

This covers models 155Jr, 155Jr-Ex, 155Jr-ExW and 155Jr-Tr

To ensure CE compliance to the heavy industrial equipment immunity standard EN50082-2 and the light industrial, commercial and residential equipment emissions standard EN50081-2, the units must be installed per the field wiring diagrams 340155-29 or 340155-50.

The Declaration of CE compliance is Kurz doc. number 430005 Rev. B and the test report is number 430008 Rev. B.

TABLE OF CONTENTS

INSTALLATION

Introduction I-1
Applications I-1
Standard Features I-2
Optional Features I-2
Mechanical Installation I-3
Electrical Safety I-6
Electrical Installation I-7
Major Components I-8
CPU Board I-8
VF/8 Board I-8
Interface Board I-8
Power Supply Connections I-13
115 Vac Input Wiring I-13
230 Vac Input Wiring I-13
24 VDC Input Wiring I-15
Field Terminations I-17
Flow and Temperature Element Input Wiring I-19
0-5 VDC Output Signal Wiring I-21
4-20 mA Analog Output Connections I-23
Self-Powered Connections I-23
Externally (Loop) Powered Connections I-23
Alarm Output Connections I-25
Fault Isolation I-26
Error Codes I-27

OPERATION

How to Use the Keypad and Liquid Crystal Display O-2
Help Screens O-3
Menus O-5
Executive Mode O-5

Display Mode O-7
Meter Display Menu O-7
Flow Meter (Standard Cubic Feet or Standard Cubic Meters) O-9
Flow Meter (PPH or KGH) O-11
Temperature Meter O-13
Program Mode O-15
Reset Totalizers O-17
Set System Time and Date O-19
Set Meter Data O-21
Insertion Mass Flow Meter O-23
Inline Mass Flow Meter O-25
Temperature Meter O-27
Sum Flow Meter O-29
Set Box Filter O-31
Set Analog Output O-33
Set Alarms O-35
Set Alarms (Mass Flow Rate) O-37
Set Alarms (Velocity) O-37
Set Alarms (Temperature) O-39
Set Alarms (Channel Kickout) O-39
Set Channel Kickout (Global) O-41
See Input Volts O-43
Calibrate O-45
Input Calibration O-45
Output Calibration O-47
Output Calibrate (0-5 VDC) O-47
Output Calibrate (4-20 mA) O-49
Output Calibrate (4-20 mA, Externally Powered) O-51
Set Linearizers O-53
Set Linearizers (With VTM) O-57

GLOSSARY
APPENDICES

FIGURE LIST

INSTALLATION

Figure I-1, Installation Dimensions, NEMA 4X Type Enclosure I-4
Figure I-2, Installation dimensions, NEMA Type 7 Enclosure I-5
Figure I-3, Interconnection diagram, Interface, VF/8, and CPU Boards I-9
Figure I-4, Interface Board, Component Location I-10
Figure I-5, Model 155Jr Interface Board, Power Supply Wiring, 115 VAC I-12
Figure I-6, Model 155Jr Interface Board, Power Supply Wiring, 230 VAC I-12
Figure I-7, Model 155Jr Interface Board Power Supply Wiring, 24 VDC I-14
Figure I-8, Model 155Jr Interface Board Low Voltage Test Points I-16
Figure I-9, Phoenix™ Connector, Orientation and Wiring I-17
Figure I-10, Model 155Jr, Input Signal Wiring. I-18
Figure I-11, Analog Output Wiring, 0-5 VDC I-20
Figure I-12, Analog Output Wiring, 4-20 mA, Self-Powered I-22
Figure I-13, Analog Output Wiring, 4-20 mA, Externally (Loop) Powered I-22
Figure I-14, Interface Board, Location, Alarm Relays and Output Terminals I-24

OPERATION

Figure O-1, Model 155Jr, Front Panel Displays and Indicators O-1
Figure O-2, Turn-On and Executive Menu O-4
Figure O-3, Display Mode, Menu Tree O-6
Figure O-4, Display Menu Tree, Flow Meter, SCFM/SCMM O-8
Figure O-5, Display Menu Tree, Flow Meter (PPH/KGH) O-10
Figure O-6, Display Menu Tree, Temperature Meter O-12
Figure O-7, Program Mode, Menu Choices O-14
Figure O-8, Program Menu, Reset Totalizers O-16
Figure O-9, Program Menu, Set System Time and Date O-18
Figure O-10, Program Menu, Set Meter Data O-20
Figure O-11, Program Menu, Set Meter Data, Insertion Flow Meter O-22
Figure O-12, Program Menu, Set Meter Data, Inline Flow Meter O-24
Figure O-13, Program Menu, Set Meter Data, Temperature Meter O-26
Figure O-14, Program Menu, Set Meter Data, Sum Flow Meter O-28
Figure O-15, Program Menu, Set Box Filter O-30

Figure O-16, Program Menu, Set Analog Output O-32
Figure O-17, Program Menu, Set Alarms O-34
Figure O-18, Program Menu, Set Alarms (Mass Flow Rate) O-36
Figure O-19, Program Menu, Set Alarms (Velocity) O-36
Figure O-20, Program Menu, Set Alarms, (Temperature) O-38
Figure O-21, Program Menu, Set Alarms (Channel Kickout) O-38
Figure O-22, Program Menu, Set Channel Kickout O-40
Figure O-23, Program Menu, See Input Volts O-42
Figure O-24, Calibrate Input, Hardware Setup O-44
Figure O-25, Program Menu, Input Calibration O-44
Figure O-26, Output Calibration, 0-5 VDC, Hardware Setup O-46
Figure O-27, Program Menu, Output Calibration O-46
Figure O-28, Output Calibration, 4-20mA (Self Powered), Hardware Setup O-48
Figure O-29, Program Menu, Output Calibration O-48
Figure O-30, Output Calibration, 4-20mA Externally Powered, Hardware Setup . . . O-50
Figure O-31, Program Menu, Output Calibration O-50
Figure O-32, Program Menu, Set Linearizers, Initial Menu O-52
Figure O-33, Program Menu, Set Linearizers (No VTM) O-54
Figure O-34, Program Menu, Set Linearizers (With VTM) O-56

TABLE LIST

INSTALLATION

Table I-1, Model 155Jr, Recommended Configurations I-1
Table I-2, Model 155Jr, Power Requirements I-7
Table I-3, Interconnection Table, Interface, VF8, and CPU Boards. I-8
Table I-4, Interface Board, Component Location I-11
Table I-5, Low Voltage Test Points I-16
Table I-6. Maximum Flow or Temperature Element Two-wire Loop Distances I-19
Table I-7, 0-5 VDC Analog Output Connections I-21
Table I-8, 4-20mA Analog Output Connections I-23
Table I-9, Alarm Relays and Terminals I-25
Table I-10, Fault Isolation Table I-26

OPERATION

Table O-1, Program Mode, Menu Functions O-15
Table O-2, Output Calibration, Meter Connection, 0-5 VDC. O-47
Table O-3, Output Calibration Meter Connection, 4-20 mA Self Powered O-49
Table O-4, Output Calibration Meter Connections, 4-20 mA Loop Powered O-51

RETURN SHIPMENT

The shipper pays for equipment transportation to Kurz Instruments, Inc. for warranty repair. Kurz Instruments, Inc. returns repaired equipment back to the customer under warranty prepaid.

To return equipment to Kurz Instruments, Inc., follow these steps:

1. Obtain a Return Materials Authorization (RMA) number from Kurz Instruments, Inc., Customer Service:

   Telephone: (800) 424-7356 Ask for Customer Service
   FAX: (408) 646-1033

DO NOT RETURN ANY EQUIPMENT WITHOUT AN RMA NUMBER.

2. Your correspondence must include:

   - ✔ The Kurz Instruments, Inc. purchase order number on the customer invoice.
   - ✔ Reference all documents and correspondence to the RMA number.
   - ✔ The name and telephone number, including Area Code and extension (if any) of the person Kurz Instruments, Inc. can contact regarding the equipment.
   - ✔ The address to which the equipment is to be returned.
   - ✔ A description of the problem and the application conditions, an authorization of the work, and a request for the corrections to be performed at the Kurz Instruments, Inc. factory.

3. Kurz Instruments, Inc. requires a confirmed purchase order before performing non-warranty work.

4. Return the equipment and required documents to this address:

   Kurz Instruments, Inc.
   2411 Garden Road
   Monterey, CA. 93940

   Attn: Customer Service
   RMA # _____

5. It is the customer's responsibility to clean equipment before it is returned. Kurz Instruments, Inc. is not equipped to clean potentially hazardous chemical compounds. Dirty or contaminated equipment will be returned to the customer.

INTRODUCTION

The Kurz Instruments, Inc. Model 155Jr is the smallest and most popular of the Series 155 microprocessor-based Mass Flow Computers. The Model 155Jr provides precise mass flow calculations utilizing Kurz Instruments, Inc. two-wire current loop mass flow and temperature elements. Multiple correction factors allow users to obtain accurate flow measurements even with stack flow profile changes at differing gas velocities. Optional Velocity/Temperature Mapping (VTM) ensures accuracy over wide temperature and velocity ranges. The Model 155Jr is fully compatible with Kurz Instruments, Inc. Insertion Mass Flow Elements (Series 450), Inline Mass Flow Elements (Series 500) and Temperature Elements.

A front panel mounted membrane keyboard and Liquid Crystal Display (LCD) allow the user or technician to view system time and date, sensor voltages, flow rates, total flow, and system parameters. Tree -structured, menu-driven displays prompt the user or technician through the steps necessary to monitor or alter operation of the Model 155Jr. Access security codes allow operation, calibration, and configuration of the system while preventing casual alteration critical data.

APPLICATIONS

Due to the flexibility offered by ADAM™ programming, the Model 155Jr Mass Air Flow Computer is a superior instrument for gas flow measurement. When mated with the proper Kurz Instruments, Inc. flow and temperature elements, air, flue gases, volatile hydrocarbons, inert gases, hydrogen, ammonia, and other gases can be measured with precision.

The Model 155Jr provides mass flow outputs in Standard Cubic Feet per Minute (SCFM), Standard Cubic Feet per Hour (SCFH), Standard Cubic Meters per Minute (SCMM), Standard Cubic Meters per Hour (SCMH), Pounds Per Hour (PPH), and Kilograms per Hour (KGH). It can also provide standard velocity, temperature, total flow and elapsed time. This makes it ideal for both stand-alone applications or as an accurate signal source for process control. The availability of 0-5 VDC or 4-20 mA linear outputs allows connection (through the proper isolation devices) to single or multi-loop controllers, programmable controllers, or to a distributed control system (DCS). Optional PID control in conjunction with the Kurz Instruments, Inc. Model 730 line of rotary flow control valves, permits process control without the complexity of additional components. Table I-1 below lists the recommended input and meter configurations for a Model 155Jr.

CONFIGURATION	INPUT CHANNEL		METERS		OUTPUTS	
Single Mass Flow Series 450 or 500	A	Mass Flow Element	1	Mass Flow (SCFM...etc)	1	Linear Mass Flow
	B	NOT USED	–	–	2	–
Single Mass Flow with Temperature Series 450T or PT	A	Mass Flow Element	1	Mass Flow (SCFM...etc)	1	Linear Mass Flow
	B	Temperature Element	2	Temperature (DEGF or DEGC)	2	Temperature
Dual Mass Flow (Low Power only) Series 410 or 510	A	Mass Flow Element	1	Mass Flow (SCFM...etc)	1	Linear Mass Flow (either CH A or B)
	B	Mass Flow Element	2	Mass Flow (SCFM...etc)		
			3	Sum Flow (SCFM...etc)	2	Sum Flow

Table I-1, Model 155Jr, Recommended Configurations

STANDARD FEATURES

The following standard features are available with this instrument:

- ☆ Corrosion resistant, NEMA 4X enclosure.
- ☆ 115 VAC 50/60 Hz operation.
- ☆ Sealed membrane, twenty button keypad for data entry.
- ☆ Two-line, 16 character Liquid Crystal Display (LCD).
- ☆ Display in English or International units.
- ☆ Tree-structured menus with help screens.
- ☆ 24 hour clock/calendar.
- ☆ Multi-level security access codes.
- ☆ Lagrangian polynomial linear interpolation for maximum accuracy.
- ☆ User defined meter identification.
- ☆ Multi-Point calibration factors.
- ☆ Flow totalizer.
- ☆ User defined flow area.
- ☆ Accurate, easy digital calibration of inputs and outputs.
- ☆ RS232C, 9 pin port for connection to ASCII terminal which "echos" keypad functions.
- ☆ 0-5 VDC linear analog output.
- ☆ Software to upload/download configuration data utilizing IBM® compatible personal computer.

OPTIONAL FEATURES

In addition to the list of features standard with the Model 155Jr, the following options may be added to meet site-specific requirements:

- ☆ Velocity/Temperature Mapping for electronic temperature compensation.
- ☆ 24 VDC or 230 VAC 50/60 Hz operation.
- ☆ 1-PID controller to drive Kurz Instruments, Inc. Model 730 Rotary Flow Control Valve.
- ☆ Up to four, 5 amp alarm relays.
- ☆ Up to two, 4-20 mA analog outputs
- ☆ Additional 0-5 VDC linear analog output.
- ☆ Secondary RS232C data communication port.

Consult your Kurz Instruments, Inc. representative for other options that may be available to meet application-specific requirements.