Pribusin Inc.

Manufacturers of Process Controls and Instrumentation

Instruction Manual

Model: *IUC-XX-ADD*

Function: *Isolated Adder/Subtracter*

Equation:
- ☐ I/P#1 + I/P#2 = O/P
- ☐ _____

Input:
- ☐ X=1: 1-5 mA
- ☐ X=2: 4-20 mA
- ☐ X=3: 0-1 mA
- ☐ X=4: 10-50 mA
- ☐ X=5: 1-5 VDC
- ☐ X=6: 0-10 VDC
- ☐ X=7: _____

Output:
- ☐ X=1: 1-5 mA
- ☐ X=2: 4-20 mA
- ☐ X=3: 0-1 mA
- ☐ X=4: 10-50 mA
- ☐ X=5: 1-5 VDC
- ☐ X=6: 0-10 VDC
- ☐ X=7: _____

Power:
- ☐ 117 VAC, 60 Hz, 6 VA
- ☐ 24 VDC, 160 mA
- ☐ _____

Serial #: _____

(If special or required)

For Technical Assistance And Questions Call
USA: (231) 788-2900 CANADA: (905) 660-5336

Restocking Policy

All product returned to Pribusin Inc. in prime condition (not damaged, scratched or defaced in any way) within seven (7) months from the original date of shipment is subject to a 50% restocking charge. All product must be accompanied by a Return Authorization number (RA number) which must be obtained from Pribusin Inc. prior to returning any product.

After seven (7) months from the original date of shipment, products cannot be returned for restocking.

Custom designed products, modified products or all non-standard products may not be returned for restocking.

Warranty Policy

Pribusin Inc. warrants equipment of its own manufacture to be free from defects in material and workmanship, under normal conditions of use and service, and will replace any component found to be defective, on its return to Pribusin Inc., transportation charges prepaid, within one year of its original purchase. Pribusin Inc. will extend the same warranty protection on equipment, peripherals and accessories which is extended to Pribusin Inc. by the original manufacturer. Pribusin Inc. also assumes noliability, expressed or implied, beyond its obligation to prelace any component involved. Such warranty is in lieu of all other warranties, expressed or implied.

Pribusin Inc.

Manufacturers of Process Controls and Instrumentation

Model: IUC-XX-ADD

Isolated Adder/Subtracter

NRTL/C

Standard Features:

High Input-Output-Power Isolation (1500VAC Test)

Industry Standard Inputs: 4-20 mA, 1-5 VDC, and more (see back)

Industry Standard Output: 4-20 mA, 1-5 VDC, more (see back)

1 to 4 Inputs can be easily field configured for Addition or Subtraction (Each Input has Scaling Adjustment)

Easy Field Calibration (Typ. calibration time < 2 min. using handheld meter only)

Microprocessor Controlled for High Accuracy

Two Wire Supply Option for Two Wire Transmitters

Power: 117 VAC 50/60 Hz (Optional 24 VDC)

High Noise Rejection

CSA and NRTL Approved (LR 51078)

Function:

The IUC-XX-ADD is a microprocessor controlled Adder/Subtracter. It is easily field configurable to any combination of adding inputs or subtracting inputs. Furthermore, each input can be scaled by a factor of 0-1.25 (or 0-2.5) to allow for unequal process inputs. This flexibility combined with easy field calibration allows for the fine tuning of a process on site with little effort. All that is required to change the calibration settings is a voltmeter and a small screwdriver.

Example: Adding two Flows of different sized pipes.

Pipe1 = 2 x Pipe2 (by Volume)

Scaling Input #1 by 0.67 and Input #2 by 0.33 will result in a combined flow total of 1.0 max.
(for scaling factor of 1.25: TP1=3.35V, TP2=1.65V)

Calibration:

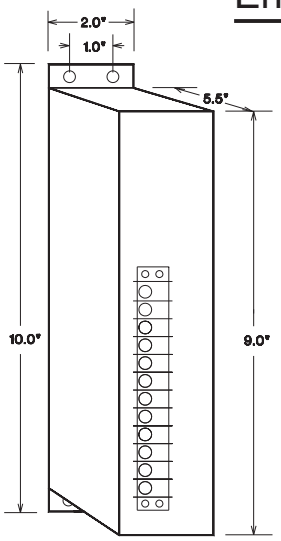
The Test Points (TP1 to TP4) and potentiometers K1 to K4 are used to adjust the scaling factors for the four inputs. The scaling factors can be in the range of 0-1.25 or 0-2.5 and can be read with a voltmeter at the Test Points. The Test Points show a voltage of 0-5 VDC for a scaling factor of 0-100% of the selected range (1.25 or 2.50).

Specifications:

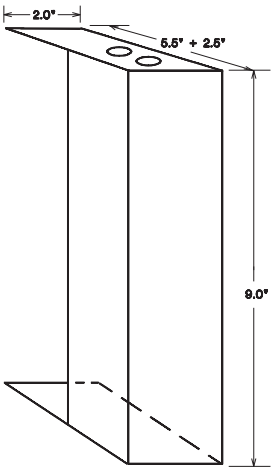
Accuracy/Linearity:
+/- 0.3% max., +/- 0.1% typ.
Operating Temperature:
-40 Deg.C. to + 50 Deg.C.
Temperature Effects:
+/- 0.5% max., +/-0.2% typ. (for 40 Deg. change)

IUC-XX-ADD

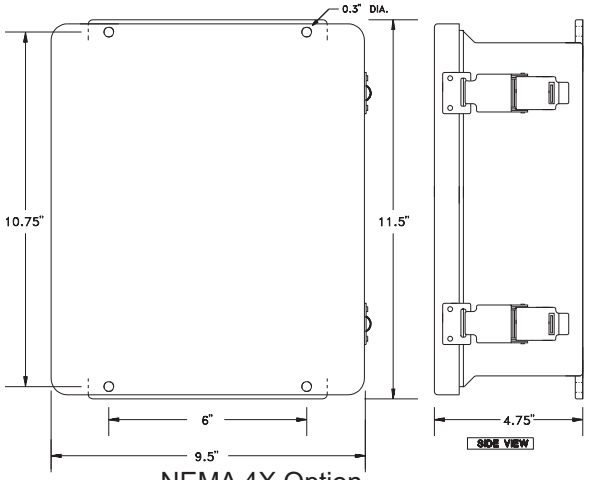
Enclosures & Dimensions:



Standard Metal Enclosure

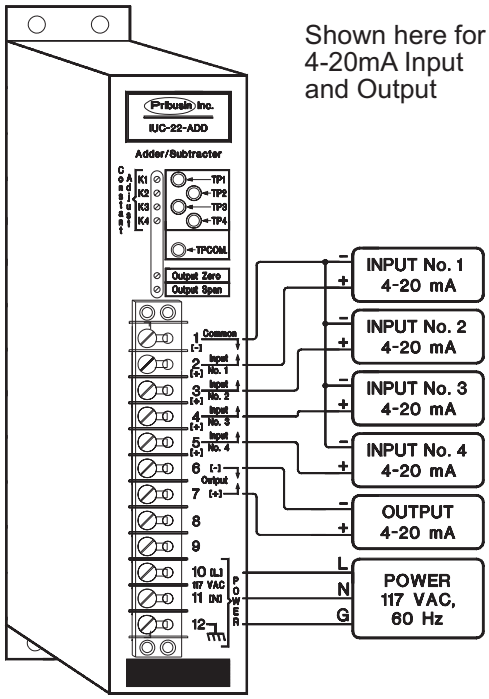


Conduit Cover Option
for Metal Enclosure



NEMA 4X Option

Connection:



Shown here for
4-20mA Input
and Output

Options: (Add letters to end of Model Number)

A - 24 VDC Prime Power
B - 240 VAC Prime Power (not CSA approved)
T - 200 mA Two Wire Supply (24 VDC unreg.)
C - Conduit Cover for Metal Enclosure (see above)
N - NEMA 4X enclosure (see above)

Model Designation:

IUC-X X-ADD

Input	Output
1: 1-5 mA (Zin=1K Ohm) 2: 4-20 mA(Zin=250 Ohm) 3: 0-1mA (Zin=5K Ohm) 4: 10-50 mA (Zin=100 Ohm) 5: 1-5 VDC (Zin=1Meg Ohm) 6: 0-10 VDC (Zin=1Meg Ohm) 7: Special Input	1: 1-5 mA (4000 Ohm Drive) 2: 4-20 mA (1000 Ohm Drive) 3: 0-1 mA (20000 Ohm Drive) 4: 10-50 mA (250 Ohm Drive) 5: 1-5 VDC (Zout=250 Ohm) 6: 0-10 VDC (Zout=500 Ohm) 7: Special Output

Example: Adder with 1-5VDC Input & 4-20mA Output and 24VDC Power in NEMA 4X enclosure is designated by: IUC-52-ADD-AN

If no options specified, unit is 117 VAC Power in metal enclosure

Manufactured By:

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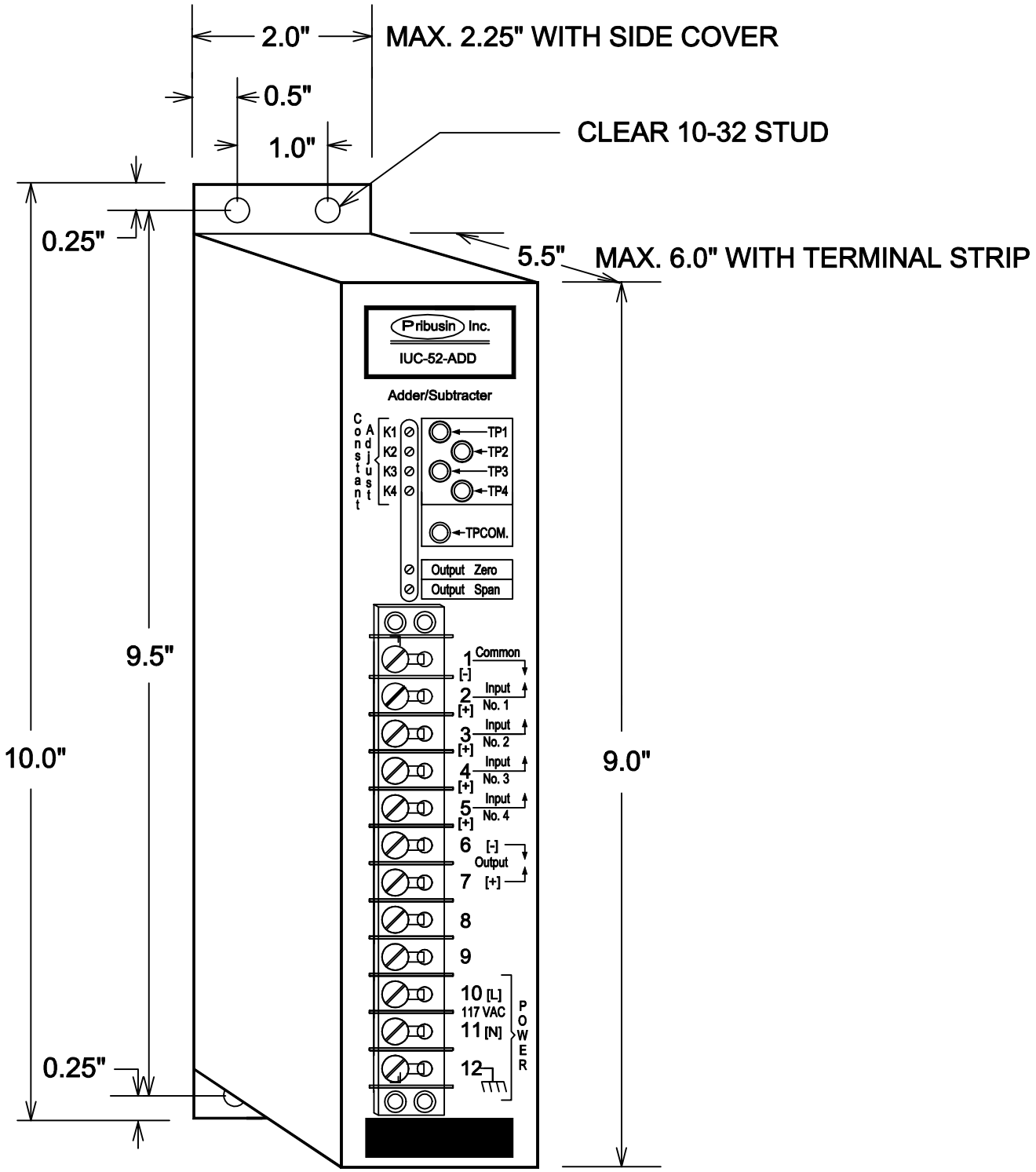

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CHKD:	DATE: SEP. 28/92	DRN: KS
Model: IUC-52-ADD Adder/Subtracter Enclosure Drawing		
DWG. NO.: 104038		REV. A

Function Calibration :

The setting of K pots is done with voltages at TP1 to TP4 with TPCOM.

Constant settings are : See Detail A.

H1-5 OUT ; 0 - 1.25 (Mul.) = 0 - 5 V

Therefore 4V = Mul. of 1

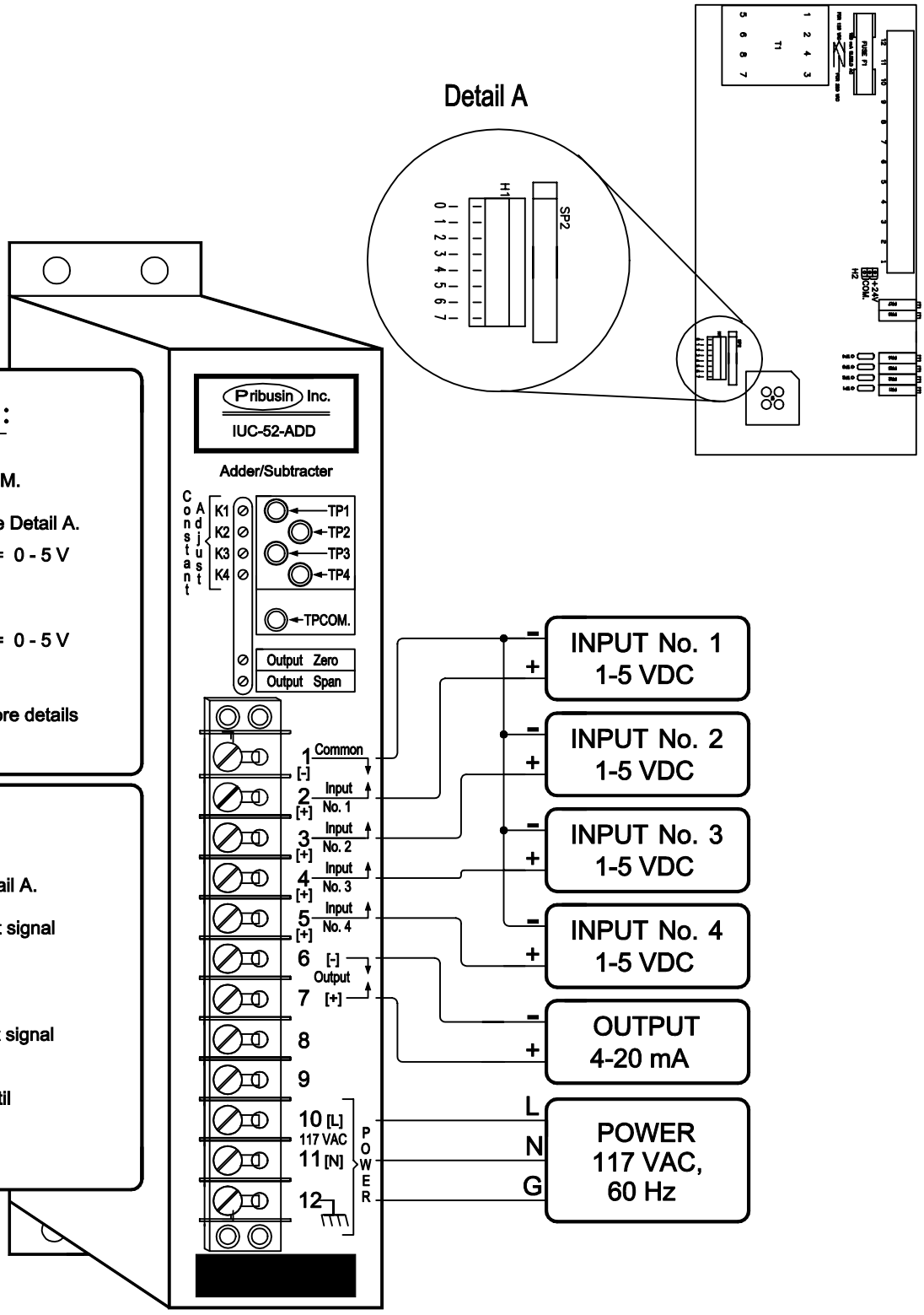
H1-5 IN ; 0 - 2.50 (Mul.) = 0 - 5 V

Therefore 2V = Mul. of 1

See drawing 104039-2 for more details and examples.

Output Calibration :

1. Put in Jumper 6(H1). See Detail A.
2. Adjust OUTPUT ZERO until output signal is 4 mA.
3. Move Jumper to 7(H1).
4. Adjust OUTPUT SPAN until output signal is 20 mA.
5. Repeat procedure starting at 1. until output signal is correct.
6. Remove Jumper from H1.



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CHKD:	DATE: SEP. 28/92	DRN: KS
Model: IUC-52-ADD Adder/Subtracter Connections/Calibration/Function		
DWG. NO. : 104039-1		REV. A

GENERAL INFORMATION

INPUT: FOUR 1-5 VDC — INPUTS BELOW 1 VDC ARE 0 IN VALUE

OUTPUT: 4-20 mA — TP_ AT 0VDC ARE 0 IN VALUE

OUTPUT = +/-K1(INPUT1) +/-K2(INPUT2) +/-K3(INPUT3) +/-K4(INPUT4)

CONSTANTS K1, K2, K3, K4 ARE ADJUSTABE;

H1-5 OUT RANGE: 0-1.25 (ADJUSTABLE BY POTS.) = 0-5V (TESTPOINT VOLTAGE)

H1-5 IN RANGE: 0-2.50 (ADJUSTABLE BY POTS.) = 0-5V (TESTPOINT VOLTAGE)

INPUTS ARE SELECTED FOR ADDITION OR SUBTRACTION BY PUSH ON JUMPERS

INPUT#1	ADD	=	H1-0 OUT	SUBTRACT	=	H1-0 IN
INPUT#2	ADD	=	H1-1 OUT	SUBTRACT	=	H1-1 IN
INPUT#3	ADD	=	H1-2 OUT	SUBTRACT	=	H1-2 IN
INPUT#4	ADD	=	H1-3 OUT	SUBTRACT	=	H1-3 IN

EQUATION # 1 SAMPLE

FOUR EQUAL INPUTS

OUTPUT = K1[I/P#1]+K2[I/P#2]+K3[I/P#3]+K4[I/P#4]
= .25I/P#1+.25I/P#2+.25I/P#3+.25I/P#4

Output	K1/TP1	K2/TP2	K3/TP3	K4/TP4
1	.25	.25	.25	.25
TEST POINT VOLTAGE →	TP1=1VDC	TP2=1VDC	TP3=1VDC	TP4=1VDC

EQUATION # 2 SAMPLE

INPUT#1 -INPUT#2

OUTPUT = K1[I/P#1]-K2[I/P#2]
= 1I/P#1-1I/P#2

NOTE: H1-1 IN FOR INPUT#2 SUBTRACTION

Output	K1/TP1	K2/TP2		
1	1	1		
TEST POINT VOLTAGE →	TP1=4VDC	TP2=4VDC		

EQUATION # 3 SAMPLE

INPUT#1+INPUT#2+ INPUT#3-INPUT#4

NOTE: INPUTS ARE NOT EQUAL

OUTPUT = K1[I/P#1]+K2[I/P#2]+K3[I/P#3]-K4[I/P#4]
= .5I/P#1+.3I/P#2+.2I/P#3-1I/P#4

NOTE: H1-3 IN FOR INPUT#4 SUBTRACTION

Output	K1/TP1	K2/TP2	K3/TP3	K4/TP4
1	.5	.3	.2	1
TEST POINT VOLTAGE →	TP1=2VDC	TP2=1.2VDC	TP3=.8VDC	TP4=4VDC

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CHKD :	DATE : SEP. 28/92	DRN: KS

Model: IUC-52-ADD
Adder/Subtracter
Connections/Calibration/Function

DWG. NO. : 104039-2	REV. A