



Transportation Refueling Systems

KRP™ LPG DISPENSER

KRP LPG Dispenser for Propane Powered Vehicles



INSTALLATION & MAINTENANCE MANUAL

MANUAL: 254AY00.INS R02



Kraus Global Inc.
25 Paquin Road
Winnipeg, Manitoba
CANADA R2J 3V9

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1.0 Service and Product Support

Should you experience any difficulties in system operation, and you have referred to the troubleshooting tables in this manual without success, customer assistance is available.

The procedure to receive such assistance is as follows:

1. Document the following information:

- System Dysfunctions
- Corrective Measures Taken
- Dispenser Model Number
- Dispenser Serial Number
- Purchase Order Information
- Date of Installation
- Equipment Location (i.e. City, Address etc...)

2. Call or Fax our Product Service line at:

Company Service number	1 204 663 3893 (North America – Local and Int.)
Company Fax number	1 204 663 7112

One of our qualified personnel will provide assistance in getting your system operational.

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1.1 Notices and Safety Warnings

Throughout this manual, in the left hand margin, there will be indicators, with text, to give various hints and warnings. The following are examples of what you will see, and their meanings:



NOTE

PROVIDES FURTHER DETAILS OR ADVICE ON PROPER PROCEDURES



ATTENTION

GIVES NOTICE TO AN IMPORTANT ASPECT OF SYSTEM OPERATION.



CAUTION

GIVES A WARNING TO PREVENT DAMAGE TO EQUIPMENT OR PREVENT HUMAN INJURY.

KRAUS GLOBAL INC. AND ASSOCIATES ASSUME NO RESPONSIBILITY FOR PERSONAL INJURY OR EQUIPMENT DAMAGE CAUSED BY NON-OBSERVANCE OF THE SAFETY WARNINGS HEREIN.

2.0 Dispenser Theory of Operation

The **KRP™ LPG Dispenser** is designed to dispense pressurized and clean liquefied petroleum gas to LPG fueled vehicles. Liquefied petroleum gas (LP gas) is defined herein as commercial propane.

Figure 1, page 5 represents LPG supply equipment and dispenser components. Dispensers may be equipped with either a Migas™, Neptune™, Schwelm™ or LC™ (Liquid Controls) meter. All Kraus Global Inc. LPG dispensers operate similarly. Options such as cabinet style, meter brand, and number of dispensing hoses may vary.

How LP gas is dispensed:

1. The LPG dispensing attendant attaches the dispenser hose nozzle to the vehicle gas receptacle and resets the dispenser to authorize a fill. The dispenser solenoid valve opens.

Propane is pumped from the **supply tank** (Figure 1, #1) which contains both liquid and vapor propane at standard conditions of 100 psig at 70° F. The LP gas is cleaned through the **strainer** (Figure 1, #2), and passes through the **pump** (Figure 1, #3) and the **by-pass valve** (Figure 1, #4), to the dispenser inlet.

The purpose of the by-pass valve is to limit the gas pressure entering the dispenser to 125 psig above the supply tank pressure of 100 psig at 70° F at standard conditions. The maximum gas pressure through the valve to the dispenser may therefore be 225 psig at standard conditions. Thus, assuming standard conditions, gas at pressure of over 225 psig is redirected back to the supply tank.

The by-pass valve operates as follows:

- The flow of gas through the valve exerts pump pressure on the underside of the valve top, attempting to push the valve plunger UP, off of the valve seat. The combination of tank pressure (standard conditions of 100 psig at 70° F) plus the valve spring pressure (125 psig) is exerted down onto the top of the valve, attempting to push the plunger DOWN, onto the valve seat.

DISPENSER THEORY OF OPERATION

- When the plunger is unseated (i.e., when the gas pressure exceeds 225 psig), the gas exits through both the valve exit to the dispenser and through the top of the valve, to the supply tank.
 - When the plunger is completely seated on the valve seat (i.e., when the gas pressure does not exceed 225 psig), all of the gas flows out to the dispenser, and none is redirected to the supply tank.
2. Once inside the dispenser, impurities and vapor are removed from the propane as it flows through the **strainer** and **vapor separator** (Figure 1, #5). The vapor is returned back to the supply tank. Vapor may not be dispensed to the vehicle because it is less dense than liquid and therefore contains less energy (BTU's) per unit volume.
 3. The propane passes through the **measuring chamber** within the **meter** (Figure 1, #7). LP gas volume is measured within this chamber. Volume measurement is transferred to the MICON electronic pumphead register, for digital display. The gas then passes through to the meter **differential valve** (Figure 1, #8).

The purpose of the differential valve is to inhibit gas flow if gas pressure is below the combination of supply tank pressure (standard conditions of 100 psig at 70° F) plus the valve spring pressure (which is varied between 12 to 25 psig, depending on dispenser model). Therefore, if metered flow pressure drops below 112 to 125 psig, (depending upon spring pressure), gas is not dispensed. Vapor flows back to the supply tank until normal pressure is restored:

The flow of gas through the differential valve exerts pump pressure on the underside of the top of the valve, attempting to push the plunger UP, off the valve seat. The combination of supply tank pressure (100 psig 70° F) plus the valve spring pressure (12 to 25 psig) is exerted down onto the top of the valve, attempting to push the valve plunger DOWN onto the valve seat. When line pressure exceeds the 112-125 psig, the plunger is unseated, and gas may flow through the valve exit. When the line pressure drops below 125-112 psig the plunger is completely seated, the valve is sealed, and gas flow is completely blocked.

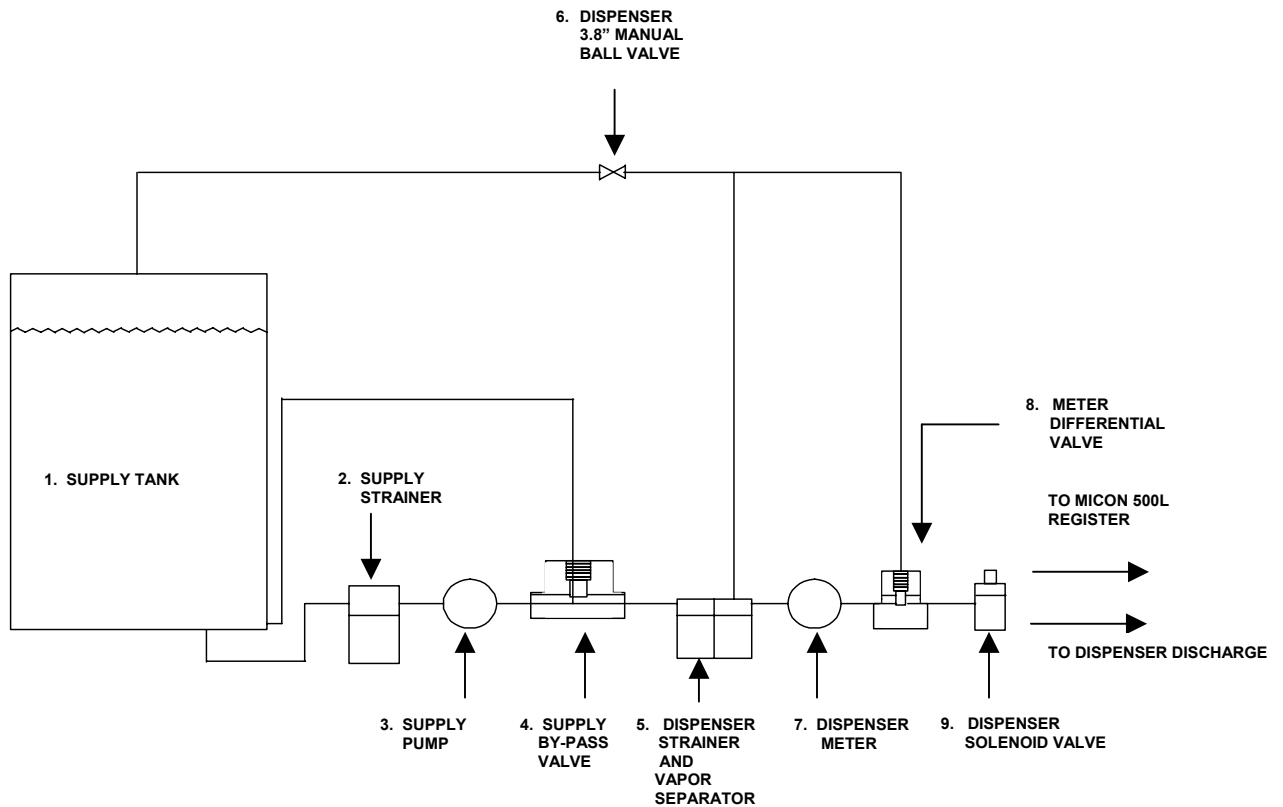
4. Propane flows through the **solenoid** (Figure 1, #9), if the dispenser is equipped with either the Migas™, Neptune™ or LC™ meter, and out the dispenser hose assembly to the LPG fueled vehicle.



NOTE

FOR DISPENSERS EQUIPPED WITH THE SCHWELM™ METER, THE SOLENOID VALVE IS MOUNTED IMMEDIATELY DOWNSTREAM OF THE DISPENSER STRAINER, UPSTREAM OF THE VAPOR SEPARATOR.

FIGURE 1 – LPG SUPPLY EQUIPMENT AND DISPENSER COMPONENTS



3.0 Component Description

Available components are:

1. Choice of 4 meter types:

Migas™ Flow Meter

The Migas™ meter is a direct drive four-piston design with lubricating seals and rotary drive, manufactured by Migas™

Neptune™ Flow Meter

The Neptune™ meter is a turbine type meter manufactured by Schlumberger Industries. This meter includes a built-in vapor separator and contaminant strainer.

Two types of Neptune™ meter configurations are available:

- Micon pulser direct drive
- Remote pulser driven

Schwelm™ Flow Meter

The Schwelm™ meter is a direct drive, two-piston design.

LC™ Flow Meter

The LC™ meter is a remote pulser driven rotor type meter manufactured by Liquid Controls Corporation.

2. Vapor Separator

A vapor separator (Figure 1, #5) is located on the liquid supply line before the meter. This ensures accurate measurement by directing vapor in the liquid away from the meter and back to the storage tank via the vapor return line.

- Vapor separator is a built-in feature on Neptune™ meters.

3. Strainer

A strainer is located after the main valve on the inlet line, keeping LPG contaminants from entering the refueler.

- Strainer is a built-in feature on Neptune™ meters.

4. Back Check Valve

The back check valve stops back flow through the refueler to prevent pressure from being bled out of the system and reverse meter movement.

- On Migas™, LC™ and Schwelm™ metered dispensers, the back check valve is located after the vapor separator and before the meter inlet.
- On Neptune™ metered dispensers, the back check valve is located between the ¾" gate (inlet) valve and separator.

5. Hydrostatic Relief Valves

Hydrostatic relief valves are located where excessive pressure may build up. If the supply and return lines are isolated, the internal pressure relief valve will not engage. The hydrostatic relief valves will provide pressure relief.

6. Differential Valve

A differential valve is located after the measuring chamber to prevent delivery of LPG if there is no differential pressure acting upon it. This ensures accurate measurement by preventing vaporization within the meter.

7. Pressure Gauge

A pressure gauge is supplied to determine static and operating pressures for troubleshooting and maintenance purposes.

COMPONENT DESCRIPTION

8. Solenoid Valve

A solenoid valve is located between the liquid inlet and the delivery hose. Controlled by the MICON and dead-man switches, the valve allows flow when it is energized.

9. Ball Valve

A ball valve is located at the end of the vapor line, between the separator and double back check filler valve indicated in Figure 3. It is used to isolate the refueler, or rapidly empty the entire system for maintenance purposes.

10. MICON Computerized Register

The MICON computerized register consists of several parts: a **pulser** that converts the meter's shaft rotation into a digital signal, which in turn is fed to a **computer** encased in an explosion proof enclosure.

The MICON computer also monitors the temperature of the measured liquid using a **temperature probe** located in the vapor separator (when using Migas™, Schwelm™ and LC™ meters). The vapor separator is a built-in feature on Neptune™ meters. The temperature probe sensor is screwed into the Neptune™ meter temperature probe flange.

The Micon electronic computer monitors and converts pulser signals into true volume and temperature equivalents then sending the results to a **display**. It also allows power to energize the motor control and solenoid valve. Power will automatically shut OFF should an error occur.

11. Breakaway Coupling

A breakaway coupling is installed in the hose assembly to protect the hose and the refueler should a vehicle drive away before the refueling process is complete.

FIGURE 2 –

MICON 500L™ ELECTRONIC REGISTER

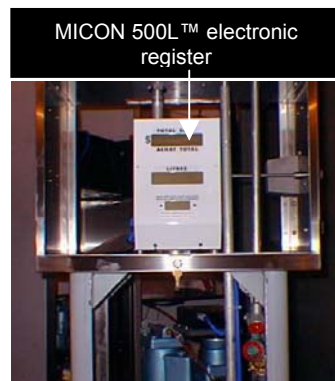


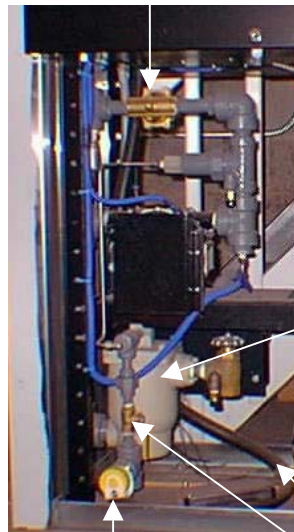
FIGURE 3 –

MIGAS™, SCHWELM™,
LC™ AND NEPTUNE™
METER COMPONENTS

MIGAS™, SCHWELM™
OR LC™ METER
COMPONENTS

NEPTUNE™
METER COMPONENTS

Solenoid valve is controlled by the MICON pumphead to control product flow. PRESENT WITH ALL METER TYPES.



The vapour line is routed to the differential valve. If vapour and differential spring pressure exceeds line pressure, flow shuts off until vapour in line is compressed back to liquid.

Vapor separator ("air eliminator") is installed in KRP dispensers not using Neptune™ meters.

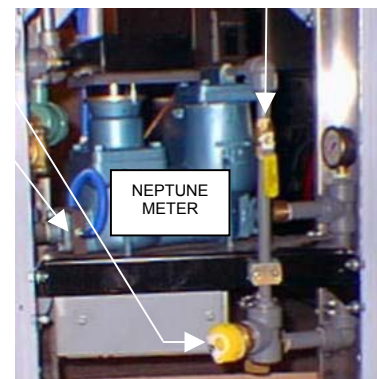
delivery hose

Double back check filler valve: to drain dispenser down, close ball valves in pit, take nozzle off dispenser and attach here.

Ball valve. Close this valve before bleeding system down.

Temperature probe sensor screws into probe flange (only on Neptune™ meter).

The probe screws into meter inlet port on hi-style KRP dispensers; screws into meter outlet port on low-style KRP dispensers.



Vapor separator and strainer are built-in features on Neptune meters.

DISPENSER INSTALLATION

4.0 Dispenser Installation

4.1 Site Preparation



CAUTION

THE FOLLOWING IS A LIST OF PRECAUTIONS THAT SHOULD BE FOLLOWED BEFORE INSTALLATION OF THIS PRODUCT. FAILURE TO DO SO COULD RESULT IN SERIOUS PERSONAL INJURY!

- Extreme caution should be used to ensure that no ignition sources exist.
- The dispensing area should be roped off or isolated from public use.
- Dispenser station operator should be made aware of the work that needs to be completed.
- Any main electrical disconnection should be labeled or locked to prevent accidental power up.
- Plan the installation for maximum rate of delivery, sizing the supply tank outlet, piping and valve for free gravity flow to the pump suction. To accomplish this, locate the pump as close as possible to the supply tank and use short inlet connections with few restrictions. Keep the number of elbows to a minimum and use large radius elbows, wherever possible.
- Locate the dispenser at any convenient place in the pump discharge line. Allow sufficient clearance for removal of the strainer.
- Be sure to size the vapor return line according to the distance from the dispenser to the storage tank.



ATTENTION

THE FOLLOWING POINTS SHOULD BE TAKEN INTO CONSIDERATION BEFORE INSTALLING THIS PRODUCT:

- Any electrical installation should be carried out by a registered electrician.

DISPENSER INSTALLATION

- Any fuel dispensing connections should be made by qualified and experienced personnel.
- Installation must be performed in accordance with the relevant standards, laws and by-laws governing the type of application equipment is used for.
- Supply tank, supply strainer, pump and supply by-pass valve must be installed by qualified professionals according to Measurement Canada (formerly referred to as the Legal Metrology Branch. i.e., *Weights & Measures*) rules and regulations governing the installation jurisdiction.
- The supply tank or its piping shall have a 1 3/4" ACME male fitting to allow the propane to be returned to the tank during an inspection.
- Where the 1 3/4" ACME fitting is located more than 30 meters (100 ft.) from the dispenser, means shall be provided by the owner of the dispenser to allow propane to be circulated through the dispenser to provide temperature stabilization of the meter prior to commencing the calibration test. This means it may be one of the following (but not limited to):
 - a) The installation of a return line to return liquid propane back to the supply tank. This line must include a 1 3/4" ACME male fitting installed in the dispenser and accessible to the inspector; or
 - b) Adequately sized hose complete with 1 3/4" ACME male fitting to mate with Measurement Canada test equipment. The length of hose provided is to be at least equal to the distance from the 1 3/4" ACME fitting to the 30 meters (100 ft.) length of hose supplied by Measurement Canada.
- The combination of static head, inlet piping and pump size supplying a dispenser shall provide sufficient pressure so that the dispenser will operate above its minimum rated capacity with minimum cavitation under all normal operating conditions.
- The vapor return line shall be of sufficient size to vent all vapor in the system under all conditions of use.
- Under no conditions shall a vapor return line be connected to the tank being filled while making a delivery.

DISPENSER INSTALLATION



ATTENTION

WHEN INSTALLING:

SECURE THE CONNECTING PIPING TO PREVENT STRAIN ON THE METER CASING. USE PIPE COMPOUND SPARINGLY.

4.2 Vent Line Installation

- The vent line from the dispenser vapor return to the vapor space of the supply tank should be 3/4" (minimum) inside diameter tube or pipe. Size piping according to distance.
- A shut-off valve must also be installed in the vapor vent line to permit removal of the strainer for cleaning or when other service is performed on the meter. *Use a union between the valve you provide and the valve in the KRP™.*



ATTENTION

THE VAPOR RELEASE VENT LINE MUST BE RETURNED TO THE SUPPLY TANK AND SHOULD NOT BE MADE A COMMON CONNECTION WITH OTHER VAPOR RETURN LINES OR PUMP BYPASS LINES.

When properly installed, this line must permit free flow in either direction. If the valve in the vent is closed, the meter will not function.



NOTE

A VAPOR LINE SHOULD NOT BE USED FROM THE TANK BEING FILLED. SUCH A CONNECTION WOULD CAUSE CONFUSION AS TO THE AMOUNT OF FUEL PRESENT IN THE TANK SHOULD VAPOR OCCUR IN EITHER DIRECTION.

The preceding instructions must be followed in order to maintain proper function of the differential valves.

4.3 Customer Harness Lead Electrical Connections: Warnings



WARNING

IMPORTANT!

ALL WIRING MUST BE INSTALLED IN ACCORDANCE WITH NATIONAL AND LOCAL ELECTRICAL CODES BY A QUALIFIED ELECTRICIAN.

SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

- Neutral wire must be provided for each hot source and not shared by any other equipment.



CAUTION

- **IMPORTANT: GROUND (GREEN) WIRE MUST BE SECURELY GROUNDED.**



CAUTION

ALL POWER GOING TO THE ELECTRONIC REGISTERS MUST BE THE SAME PHASE SO AS NOT TO PRODUCE **240 VAC** POTENTIAL. IF THIS HAPPENS, YOU MAY EXPERIENCE ERRATIC OPERATION AND EVENTUALLY BURN OUT THE REGISTER.



ATTENTION

WHEN THIS UNIT IS USED IN RETAIL TRADE IN CANADA, NOTIFY *MEASUREMENT CANADA*, AN AGENCY OF INDUSTRY CANADA, OF THE INSTALLATION OR SERVICING OF THIS UNIT. THIS UNIT IS SUBJECT TO INSPECTION UPON INSTALLATION AND AT SUCH OTHER TIMES AS REGULATIONS MAY STATE.

DISPENSER INSTALLATION

4.3 Customer Harness Lead Electrical Connections: Warnings (cont'd)



WARNING

WHEN PERFORMING INSTALLATION OR MAINTENANCE WORK OF ANY KIND, INCLUDING SERVICING MICON ELECTRONIC PUMPHEAD MAIN BOARDS, IT IS THE RESPONSIBILITY OF THE SERVICE PERSON PERFORMING THE WORK TO ENSURE:

- 1. ALL POWER TO MICON PUMPHEAD(S) IS TURNED OFF.**
- 2. ALL SUPPLY OF GAS TO DISPENSER(S) BEING SERVICED IS SHUT OFF.**
- 3. THE CUSTOMER LEAD EXIT, LOCATED IN THE TOP OF THE PUMPHEAD EXPLOSION-PROOF HOUSING, MUST BE PROPERLY SEALED WHEN EXITING INTO A DIVISION 2 AREA (NORTH AMERICAN ONLY). A SUITABLE BATTING MATERIAL MUST BE USED TO PREVENT THE SEALING COMPOUND FROM ENTERING THE HOUSING. THE SEAL MUST BE A MINIMUM DEPTH OF 3/4 INCHES OR THE INSIDE DIAMETER OF THE OPENING, WHICHEVER IS GREATER.**
- 4. ALL UNUSED WIRES MUST BE CAPPED OR TAPED OFF.**

DISPENSER INSTALLATION

4.3.1 Single LPG Model 120 VAC Micon 500L Dispensers

TABLE 1 - ALL SINGLE LPG MODEL 120 VAC MICON 500LN DISPENSERS: WIRING DESCRIPTION – NORTH AMERICAN

Wire No.	Wire Colour	AWG#	Description
1	BLACK	18	120 VAC head power. Supplies wire #2 (WHITE 18 AWG) with power for the head electronics. If the power is interrupted on these lines, the head will go into standby and power fail modes.
2	WHITE	18	Neutral for main head power and main board authorize request circuit.
3	GREEN	14	Ground. Connected internally to the casting and must be connected to the service ground.
6	ORANGE	18	Solenoid power output. Used to supply power to a high flow or cut-off solenoid under MICON control.
7	BLACK	14	Pump motor / Solenoid power input. Connected to wire #8 and #6 when the MICON is authorized and the handle switch is ON.
8	ORANGE	14	Pump motor power output. Connected to wire #7 when the KRP is authorized and the handle switch is ON.
11	PINK	18	Solenoid valve input. Applying 120 VAC to this wire (from wire #6) will open the solenoid valve.
14	BROWN	18	Authorize input. Application of 120 VAC will authorize the KRP to dispense product.
15	GREY	18	Authorize output. When 120 VAC is applied to wire #14, and the handle switch is ON, 120 VAC will be present on this line (max 3 amps).
Low Voltage Lines			
4	YELLOW	18	Money pulser positive. Normally connected to the pulser power supply positive line (+30 VDC Max) and provides power to money pulser line.
5	RED	18	Money pulser negative. The MICON will source a maximum of 100 mA from the pulser positive (#4) to this line to form a pulse once for each penny of product dispensed.
18	BLUE	18	Volume pulser negative. Provides a pulse for each specified fraction of a unit of volume (used for card/key systems).
19	WHITE/BLUE	18	Volume pulser positive. Normally connected to the pulser power supply positive line (+30 volts maximum, DC only), and provides power to the volume pulser output line.
Data Communication Lines			
9	PINK	18	Talk-to-pump. Connected to the appropriate terminal on the "TTP" terminal block of a MCIU*, and carries messages from the console to the pump. Also RS422 negative input, Gilbarco (negative terminal) & Tokheim console interface.
10	TAN	18	Talk-to-console. Connected to the "TTC" terminal block of a MCIU* and carries messages from the pump to the console. Also RS422 negative output, Gilbarco (positive terminal) & Tokheim console interface.
16	GREEN	18	Data channel common. Connected to the "DCC" terminal block of a MCIU*. Also RS422 positive output, or Tokheim console interface box
17	WHITE / BROWN	18	RS-422 positive input.

* See pages 22-23 for description of Kraus Global Inc. MCIU hook-up (North American).

DISPENSER INSTALLATION

4.3.2. Dual LPG 120 VAC Micon 500LN Dispenser

TABLE 2 - DUAL LPG 120 VAC MICON 500LN DISPENSERS: WIRING DESCRIPTION – NORTH AMERICAN			
Wire No.	Wire Colour	AWG#	Description
1	BLACK	18	120 VAC head power. Supplies wire #2 (WHITE 18 AWG) with power for the head electronics. If the power is interrupted on these lines, the head will go into standby and power fail modes.
2	WHITE	18	Neutral for main head power and main board authorize request circuit.
3	GREEN X 2	14	Ground. Connected internally to the casting and must be connected to the service ground.
6	ORANGE	18	Solenoid power output. Used to supply power to a high flow or cut-off solenoid under MICON control.
7	BLACK	14	Pump motor / Solenoid power input. Connected to wire #8 & #6 when the MICON is authorized and the handle switch is ON.
8	ORANGE	14	Pump motor power output. Connected to wire #7 when the KRP is authorized and the handle switch is ON.
11	PINK	18	Solenoid valve input. Applying 120 VAC to this wire (from wire #6) will open the solenoid valve.
14	BROWN	18	Authorize input. Application of 120 VAC will authorize the KRP to dispense product.
15	GREY	18	Authorize output. When 120 VAC is applied to wire #14, and the handle switch is on, 120 VAC will be present on this line (max 3 amps).
Low Voltage Lines			
4	YELLOW	18	Money pulser positive. Normally connected to the pulser power supply positive line (+30 VDC Max) and provides power to money pulser line.
5	RED	18	Money pulser negative. The MICON will source a maximum of 100 mA from the pulser positive (#4) to this line to form a pulse once for each penny of product dispensed.
18	BLUE	18	Volume pulser negative. Provides a pulse for each specified fraction of a unit of volume (used for card/key systems).
19	WHITE/BLUE	18	Volume pulser positive. Normally connected to the pulser power supply positive line (+30 volts maximum, DC only), and provides power to the volume pulser line.
Data Communication Lines			
9	PINK	18	Talk-to-pump. Connected to the appropriate terminal on the "TTP" terminal block of a MCIU*, and carries messages from the console to the pump. Also RS422 negative input, Gilbarco (negative terminal) & Tokheim console interface.
10	TAN	18	Talk-to-console. Connected to the "TTC" terminal block of a MCIU* and carries messages from the pump to the console. Also RS422 negative output, Gilbarco (positive terminal) & Tokheim console interface.
16	GREEN	18	Data channel common. Connected to the "DCC" terminal block of a MCIU*. Also RS422 positive output, or Tokheim console interface box
17	WHITE / BROWN	18	RS-422 positive input.

* See pages 22-23 for description of Kraus Global Inc. MCIU hook-up (North American).

DISPENSER INSTALLATION

4.3.3 Single LPG 240 VAC Micon 500LN Dispensers

TABLE 3 - ALL SINGLE LPG MODEL 240 VAC MICON 500LN DISPENSERS: WIRING DESCRIPTION – NORTH AMERICAN

Wire No.	Wire Colour	AWG#	Description
1	BLACK	18	240 VAC head power. Supplies wire #2 (WHITE 18 AWG) with power for the head electronics. If the power is interrupted on these lines, the head will go into standby and power fail modes.
2	WHITE	18	240 VAC for head power and main board authorize/authorize request circuit.
3	GREEN	14	Ground. Connected internally to the casting and must be connected to the service ground.
6	ORANGE	18	Solenoid power output. Used to supply power to a high flow or cut-off solenoid under MICON 500L control.
7	BLACK	14	Pump motor / Solenoid power input. Connected to wire #8 & #6 when the MICON is authorized and the handle switch is ON.
8	ORANGE	14	Pump motor power output. Connected to wire #7 when the KRP is authorized and the handle switch is ON.
11	PINK	18	Solenoid valve input. Applying 240 VAC to this wire (from wire #6) will open the solenoid valve.
14	BROWN	18	Authorize input. Application of 240 VAC will authorize the KRP to dispense product.
15	GREY	18	Authorize output. When 240 VAC is applied to wire #14, and the handle switch is on, 240 VAC will be present on this line (max 3 amps).
Low Voltage Lines			
4	YELLOW	18	Money pulser positive. Normally connected to the pulser power supply positive line (+30 VDC Max) and provides power to money pulser line.
5	RED	18	Money pulser negative. The MICON will source a maximum of 100 mA from the pulser positive (#4) to this line to form a pulse once for each penny of product dispensed.
18	BLUE	18	Volume pulser negative. Provides a pulse for each specified fraction of a unit of volume (used for card/key systems).
19	WHITE/BLUE	18	Volume pulser positive. Normally connected to the pulser power supply positive line (+30 volts maximum, DC only), and provides power to the volume pulser line.
Data Communication Lines			
9	PINK	18	Talk-to-pump. Connected to the appropriate terminal on the "TTP" terminal block of a MCIU*, and carries messages from the console to the pump. Also RS422 negative input, Gilbarco (negative terminal) & Tokheim console interface.
10	TAN	18	Talk-to-console. Connected to the "TTC" terminal block of a MCIU* and carries messages from the pump to the console. Also RS422 negative output, Gilbarco (positive terminal) & Tokheim console interface.
16	GREEN	18	Data channel common. Connected to the "DCC" terminal block of a MCIU*. Also RS422 positive output, or Tokheim console interface box
17	WHITE / BROWN	18	RS-422 positive input.

***See pages 22-23 for description of Kraus Global Inc. MCIU hook-up (North American).**

DISPENSER INSTALLATION

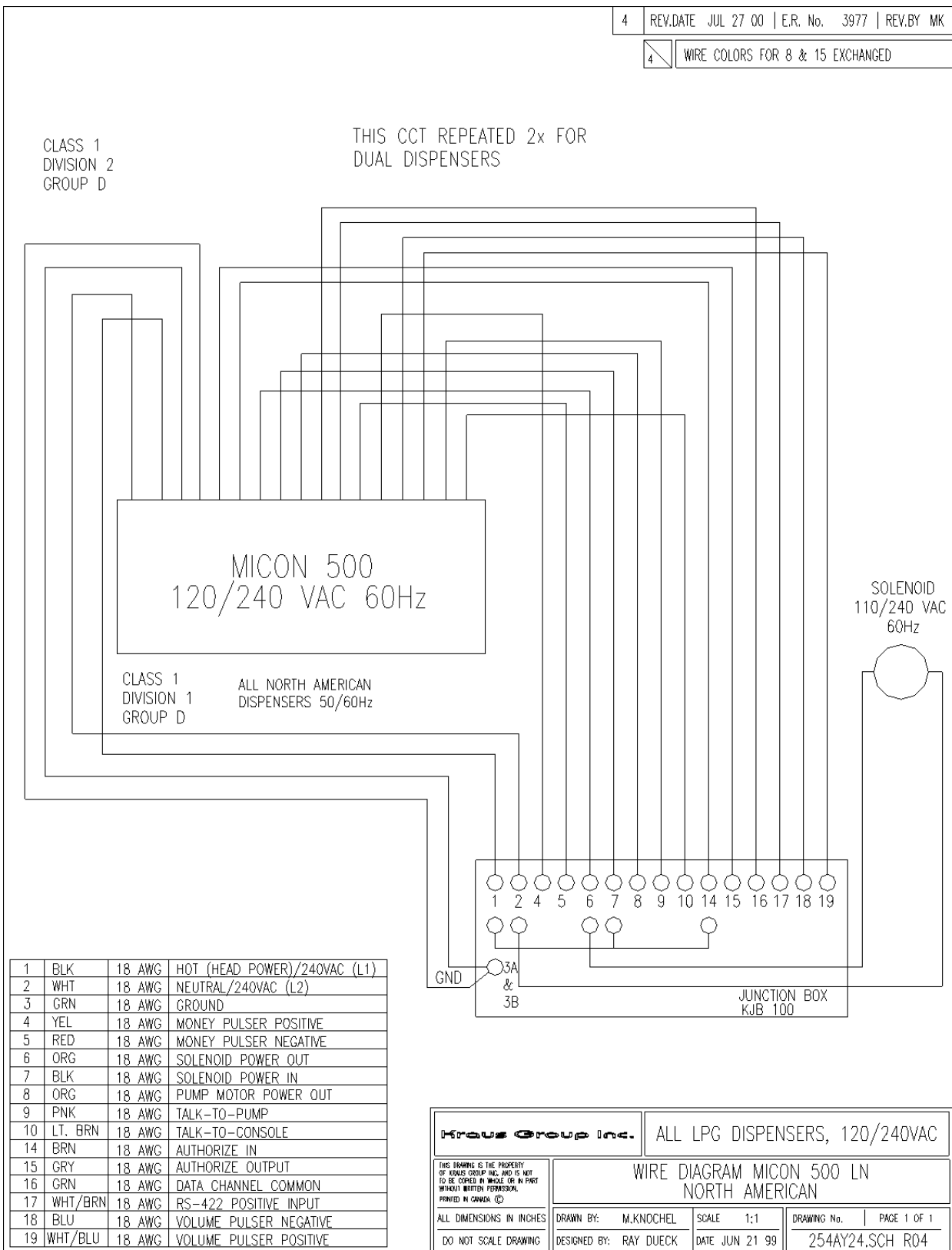
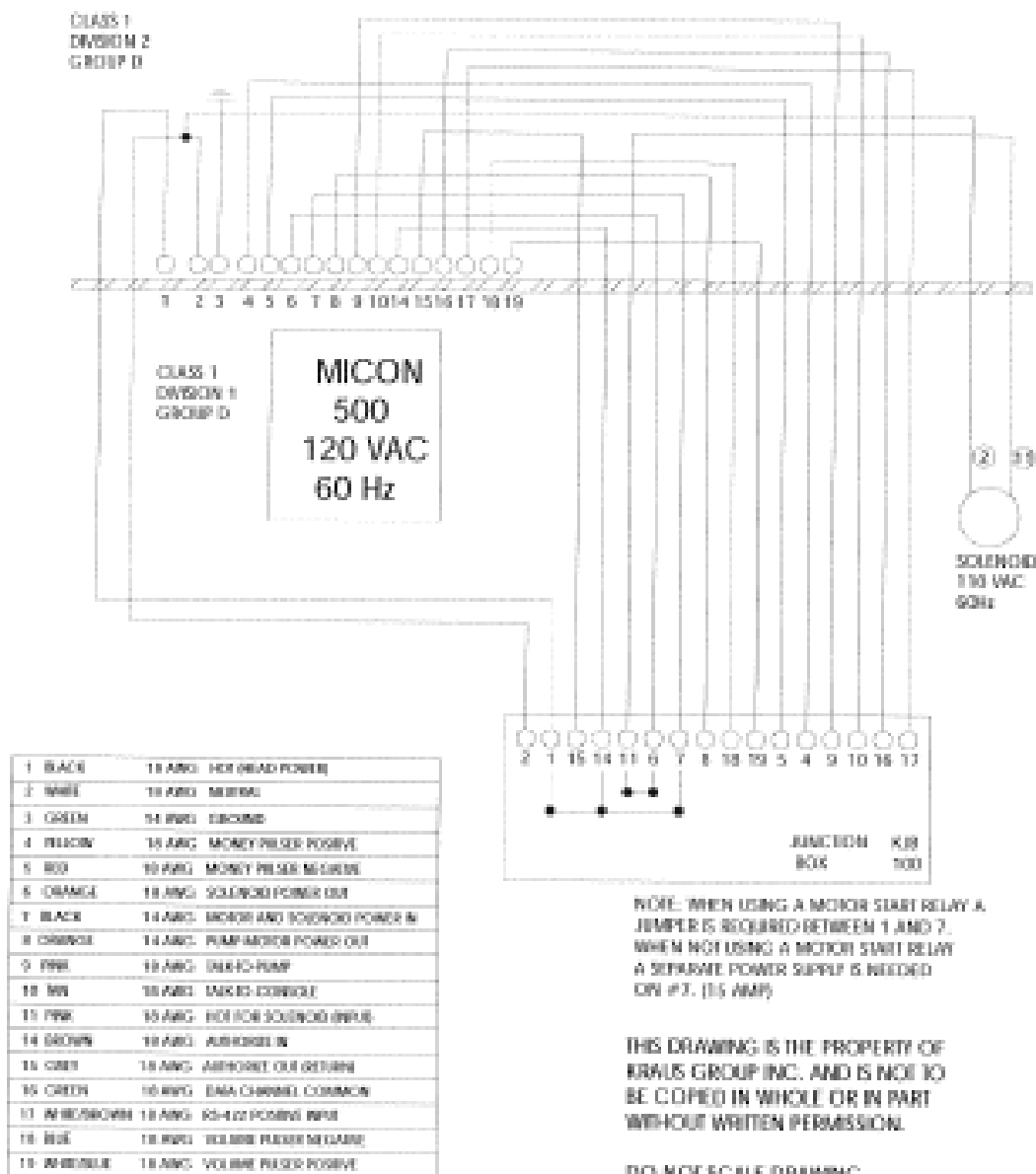


Figure 4 - Wiring Diagram: Micon 500LN for 120 VAC Dispensers

OLD STYLE

ALL SINGLE LPG MODELS
LPG DISPENSER:
WIRE DIAGRAM MICON 500LN
FOR 120 VAC DISPENSERS
DRAWING NUMBER: 5192
REVISION: 4



DISPENSER INSTALLATION

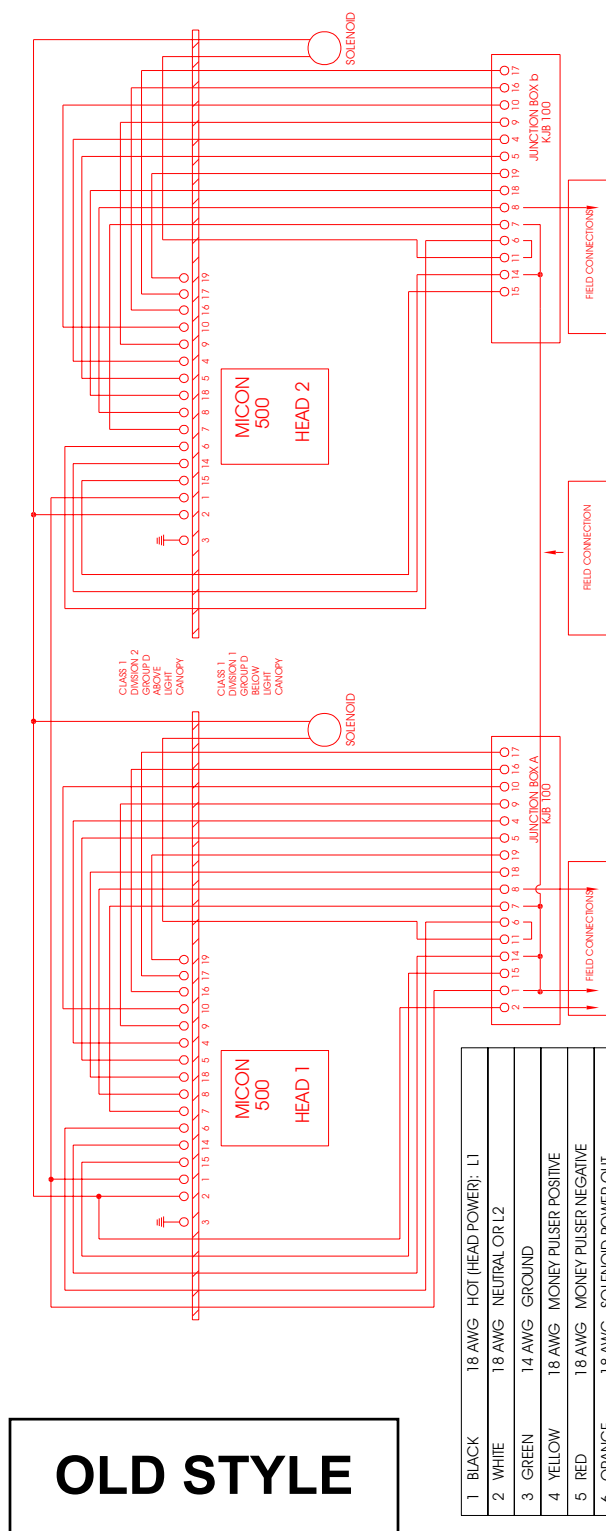


FIGURE 5

**DUAL LPG DISPENSER:
WIRING DIAGRAM FOR
ALL 120 VAC AND 240 VAC
MICON 500LN
DUAL LPG DISPENSERS
DRAWING NUMBER: 6213
REVISION: 0**

**NOTE: TWO PINK WIRES ARE
PRESENT ON WIRING
HARNESS: WIRE #11 IS
SOLENOID VALVE INPUT;
WIRE #9 IS TALK-TO-PUMP
ON MCIU.**

NOTE: WHEN USING A MOTOR START RELAY A
JUMPER IS REQUIRED BETWEEN #1 AND
#7. A SEPARATE POWER SUPPLY IS
NEEDED ON #7. (15 AMP)

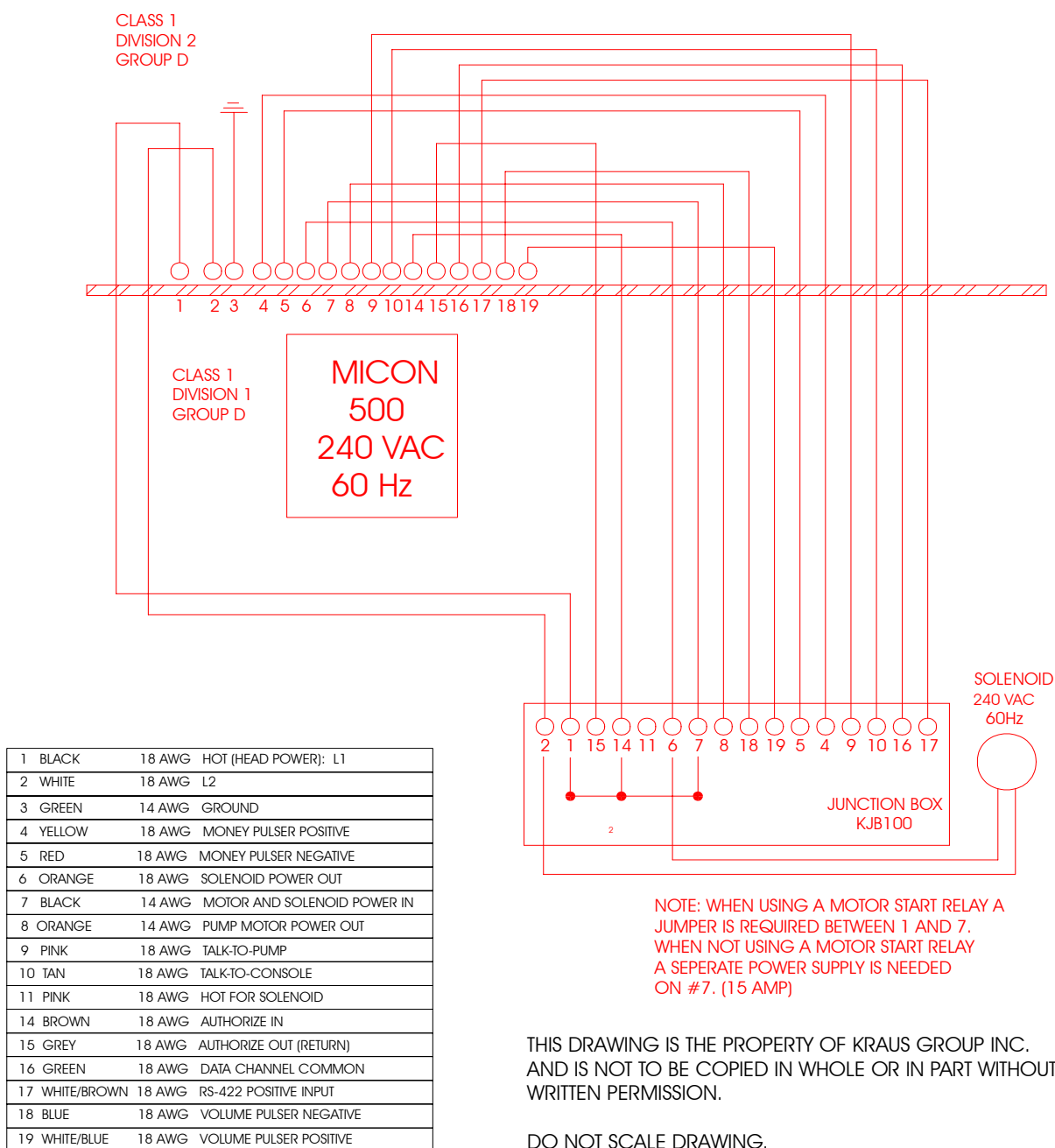
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**** LOWSTYLE MODEL INCLUDES LIGHTS (WIRE #12, #13) AS OPTION
HIGHEST MODEL (DEPICTED IN DIAGRAM) HAS NO PROVISION FOR LIGHTS

OLD STYLE

Figure 6
ALL SINGLE LPG MODELS
LPG DISPENSER:
WIRE DIAGRAM MICON 500LN
FOR 240 VAC DISPENSERS
(NORTH AMERICAN)
DRAWING NUMBER: 6104
REVISION: 2



DISPENSER INSTALLATION

4.3.4 MCIU INSTALLATION – NORTH AMERICAN

How to hook up Kraus Global Inc. MCIU (MICON 500L™ Communication Interface Unit):

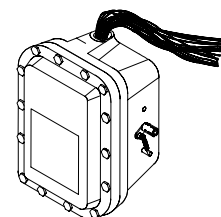
Each MCIU has the capability of communicating with up to sixteen MICON 500L™ pumpheads. Each MICON pumphead must be connected to the MCIU as outlined through the following steps #1 to #6.

1. Locate the wire conduit coming from the MICON tub.
2. Select 3 labeled wires on terminal block:

PINK wire # 9

TAN wire # 10

GREEN wire # 16



3. Observe the MCIU board. There are four 12 terminal blocks on each board: P1, P2, P3, P4. You will utilize 3 terminals per MICON hook-up: TTP, TTC and DCC, for a total of sixteen MICON 500L™ interfaces.
4. Connect wires to terminals as shown in Table 4.

TABLE 4 – MCIU WIRE CONNECTIONS – NORTH AMERICAN

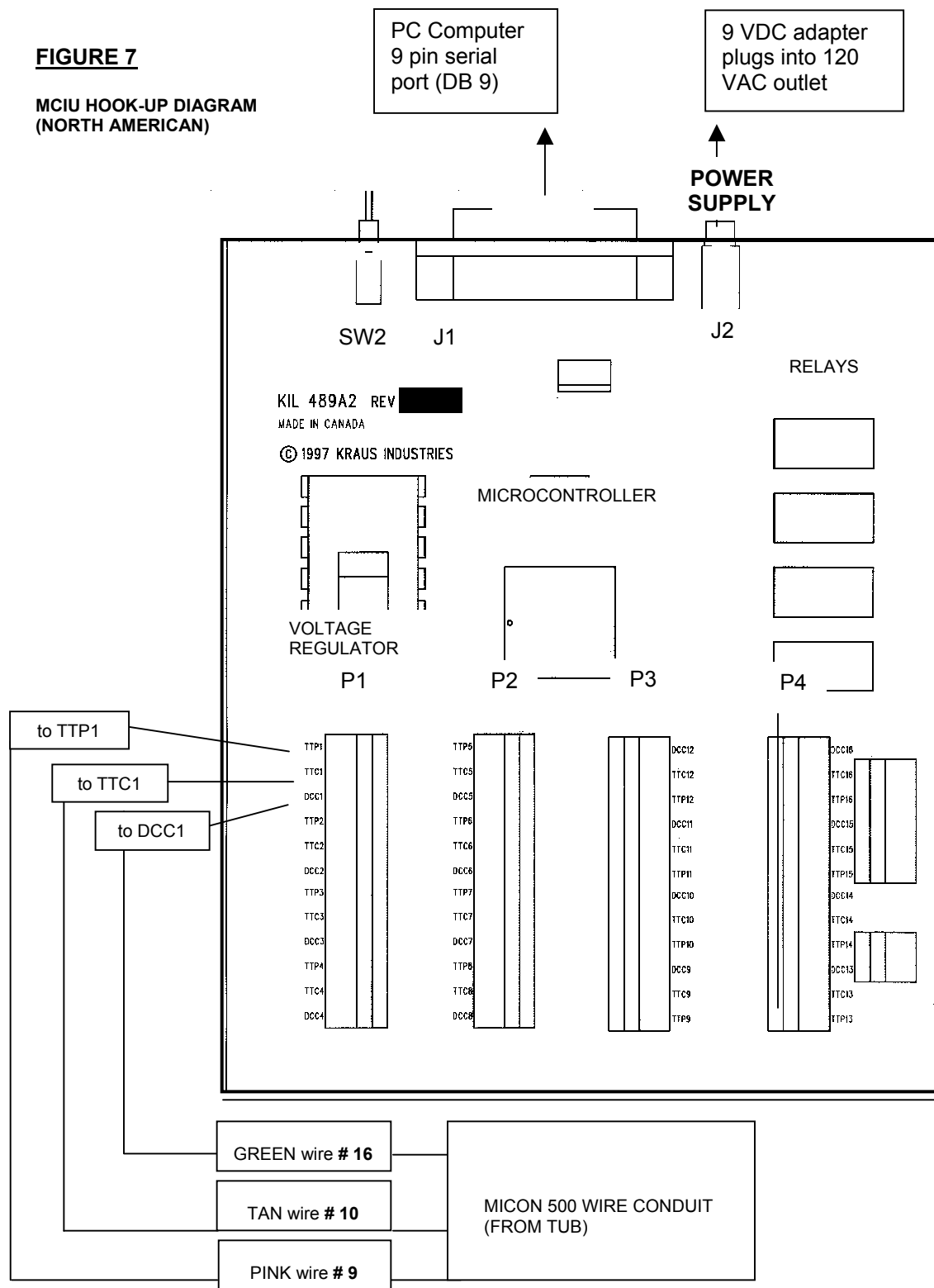
From MICON 500 Wire Conduit	Function	Connect to MCIU Board
PINK wire # 9	talk to pump	TTP1 (P1)
TAN wire # 10	talk to console	TTC1 (P1)
GREEN wire # 16	data channel common	DCC1 (P1)

If you are connecting more than one MICON head to the MCIU, use exactly the same configuration as above for heads 2—16 (i.e., TTP2, TTC2, DCC2, etc.).

5. Plug the RS-232 connector on the MCIU into the serial port of your computer. DB 25 pin male connector plugs into the MCIU. DB 9 pin female connector plugs into computer serial port.
6. Connect jack into MCIU at J2 as shown in wiring diagram (over). Plug other end with attached 9 VDC adapter into a 120 VAC outlet.

FIGURE 7

**MCIU HOOK-UP DIAGRAM
(NORTH AMERICAN)**



DISPENSER INSTALLATION

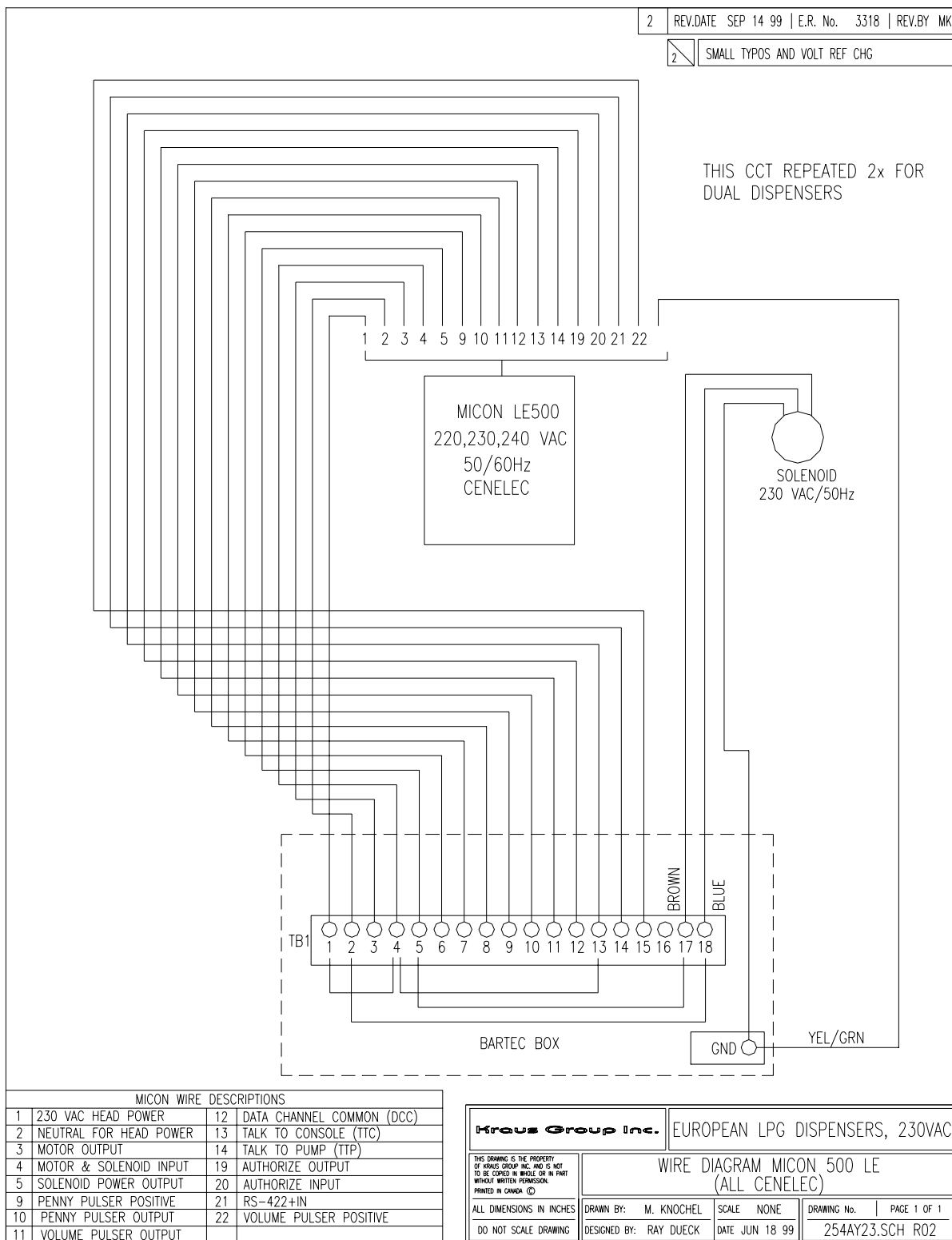
4.3.5 Single LPG 230 VAC Micon 500LE Dispensers.

TABLE 5 - ALL SINGLE LPG MODEL 230 VAC MICON 500LE DISPENSERS: WIRING DESCRIPTION - EUROPEAN

Wire No.	230 VAC Lines - (metric type shielded cable)
YEL/GRN	Earth. Connected internally to the casting and must be connected to the service ground.
1	230 VAC head power hot line. If power is interrupted on this line, the head will go into standby and power-fail modes.
2	Neutral for head power and main board authorize request circuit.
3	Motor output
4	Motor and solenoid input.
5	Solenoid power output.
6	Not used.
7	Not used.
8	Not used.
19	Authorize output. When 230 VAC is applied to wire #20 and the handle switch is on, 230 VAC will be present on this line. (3 Amp. maximum load)
20	Authorize input. Application of 230 VAC will "authorize" the MICON to dispense product. If 230 VAC is not present when the handle switch is turned on, the MICON applies a 14 K Ω capacitive reactance between this line and wire #2 to serve as an authorize request load for Kraus Industries Self-Serve equipment.
Wire No.	Low Voltage Lines
9	Money pulser positive. Normally connected to the pulser power supply positive line (+30 volts maximum, DC only) and provides power to the money pulser line.
10	Money pulser negative. The MICON will source a maximum of 100 mA from the pulser common (#9) to this line to form a pulse once for each penny of product dispensed. (Used with KRAUS MONITOR and MICRO consoles.)
11	Volume pulser negative. Provides a pulse (as described above for money pulser) for each specified fraction of a unit of volume. (Used for card or key systems.)
15	Not used.
16	Not used.
17	Not used.
18	Not used.
22	Volume pulser positive. Provides power to the volume pulser line.
Wire No.	Micro 2, Concept 5000 & MCIU Data Communications Lines
12	Data channel common. Connected to the "DCC" terminal block of a MCIU*. Also RS422 positive output, or Tokheim console interface box
13	Talk-to-console. Connected to the "TTC" terminal block of a MCIU* and carries messages from the pump to the console. Also RS422 negative output, Gilbarco (positive terminal) & Tokheim console interface.
14	Talk-to-pump. Connected to the appropriate terminal on the "TTP" terminal block of a MCIU*, and carries messages from the console to the pump. Also RS422 negative input, Gilbarco (negative terminal) & Tokheim console interface.
21	RS-422 positive input.

* See pages 27-28 for description of Kraus Global Inc. MCIU hook-up (European).

DISPENSER INSTALLATION



DISPENSER INSTALLATION

Figure 8. Wire Diagram: Micon 500 LE (All Cenelec)

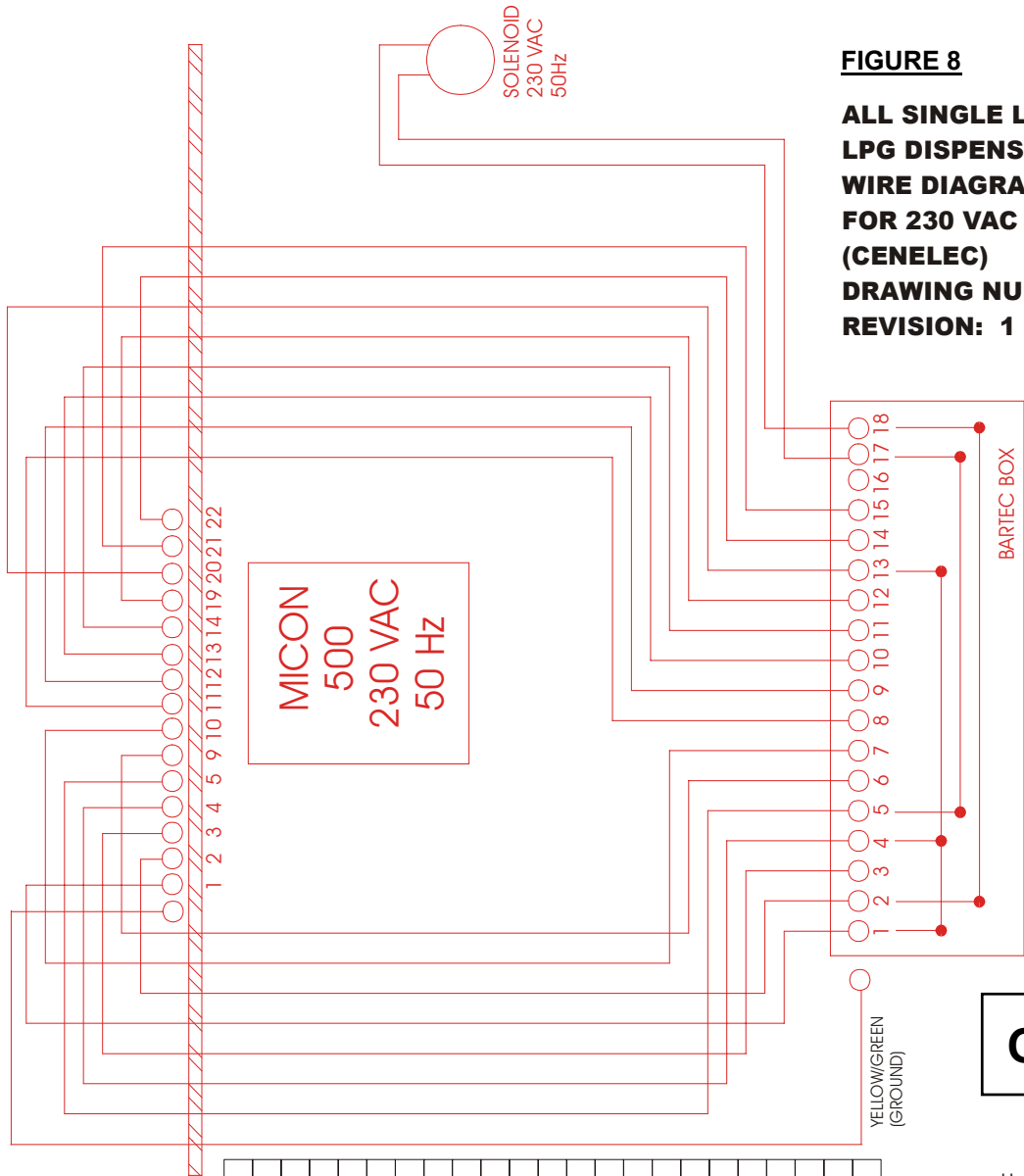


FIGURE 8

**ALL SINGLE LPG MODELS
LPG DISPENSER:
WIRE DIAGRAM MICON 500LE
FOR 230 VAC DISPENSERS
(CENELEC)
DRAWING NUMBER: 6105
REVISION: 1**

OLD STYLE

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4.3.6 MCIU INSTALLATION - EUROPEAN

How to hook up the Kraus Global Inc. MCIU (MICON 500L™ Communication Interface Unit):

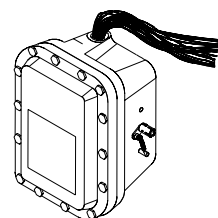
Each MCIU has the capability of communicating with up to sixteen MICON 500L™ pumpheads. Each MICON pumphead must be connected to the MCIU as outlined in the following steps #1 through #6.

1. Locate the wire conduit coming from the MICON tub.
2. Select 3 labeled wires:

wire # 14

wire # 13

wire # 12



3. Observe the MCIU board. There are four 12 terminal blocks on each board: P1, P2, P3, P4. You will utilize 3 terminals per MICON hook-up: TTP, TTC and DCC, for a total of sixteen MICON 500L™ interfaces.
4. Connect wires to pins as shown in table below:

TABLE 6 – MCIU WIRE CONNECTIONS – EUROPEAN

From MICON 500 Wire Conduit	Function	Connect to MCIU Board
wire # 14	talk to pump	TTP1 (P1)
wire # 13	talk to console	TTC1 (P1)
wire # 12	data channel common	DCC1 (P1)

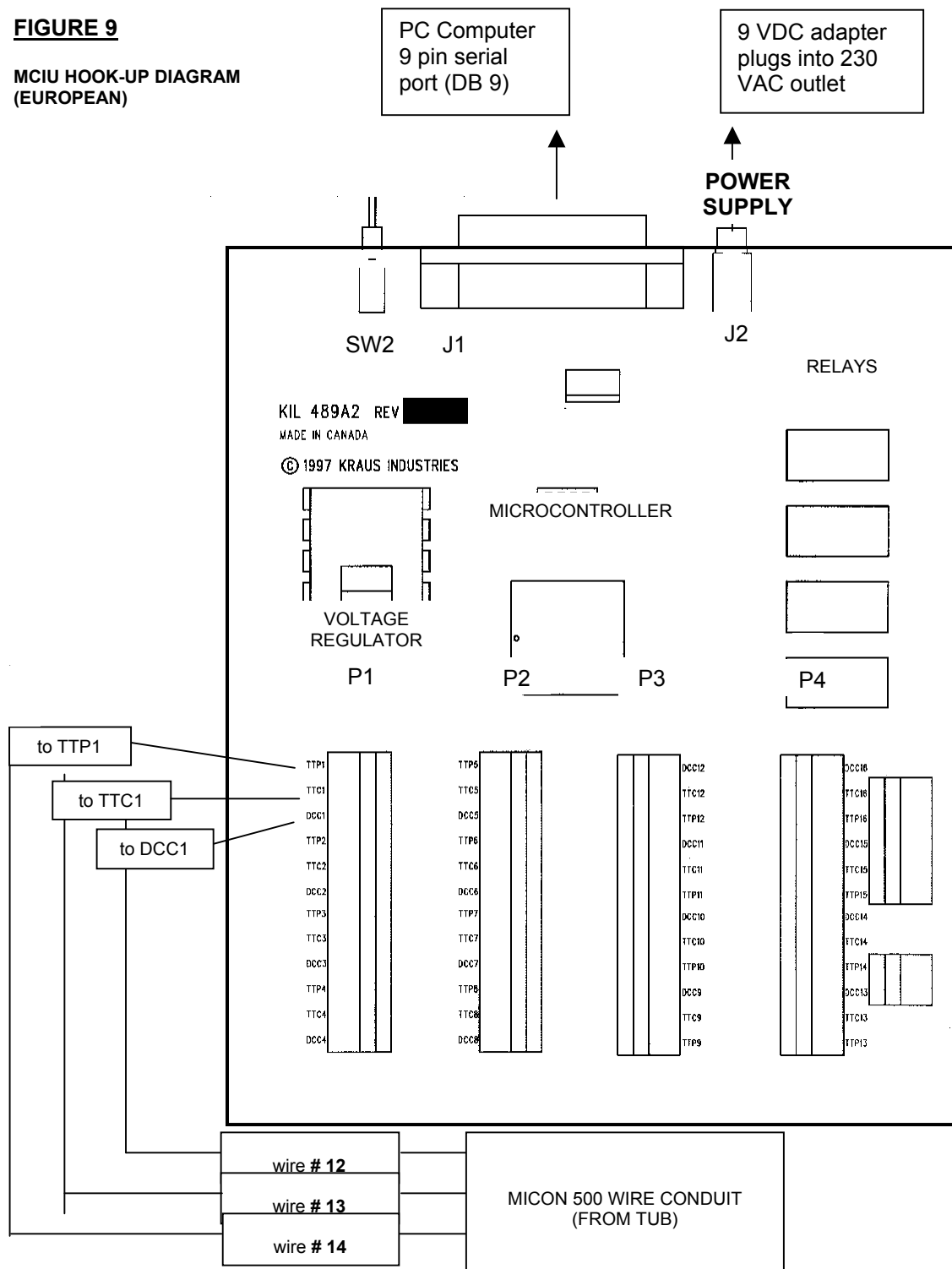
If you are connecting more than one MICON head to the MCIU, use exactly the same configuration as above for heads 2—16 (i.e., TTP2, TTC2, DCC2, etc.).

5. Plug the RS-232 connector on the MCIU into the serial port of your computer. DB 25 pin male connector plugs into the MCIU. DB 9 pin female connector plugs into computer serial port.
6. Connect the jack into MCIU at J2 as shown in the wiring diagram (over). Plug other end with attached 9 VDC adapter into a 230 VAC outlet.

DISPENSER INSTALLATION

FIGURE 9

**MCIU HOOK-UP DIAGRAM
(EUROPEAN)**



DISPENSER INSTALLATION

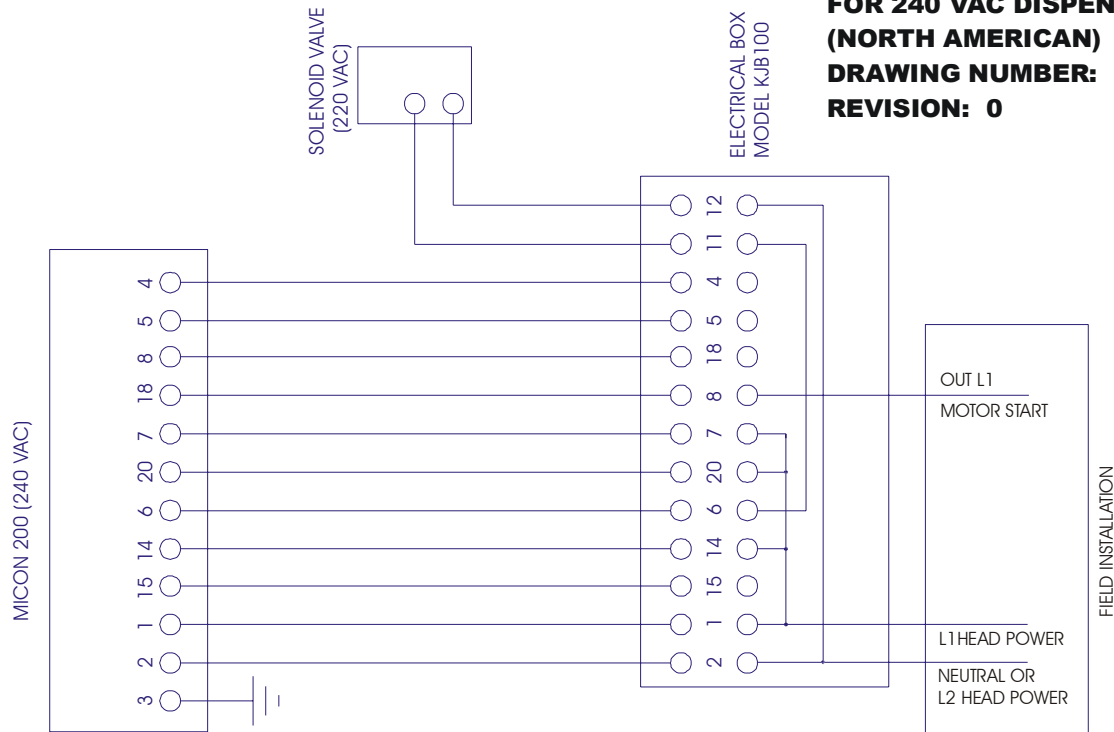
4.3.7 KRP N1/2(H) LPG 240 VAC Micon 200 Dispensers

TABLE 7 - KRP N1 / 2(H) LPG MODEL 240 VAC MICON 200 DISPENSERS: WIRING DESCRIPTION – NORTH AMERICAN

Wire No.	Wire Colour	AWG#	Description
1	BLACK	18	240 VAC LINE ONE head power. Supplies wire #2 (WHITE 18 AWG) with power for the head electronics. If the power is interrupted on these lines, the head will go into standby and power fail modes.
2	WHITE	18	240 VAC LINE TWO Neutral for head power and main board authorize request circuit.
3	GREEN	14	Ground. Connected internally to the casting and must be connected to the service ground.
6	ORANGE	18	Solenoid power output. Used to supply power to a cut-off solenoid under MICON control.
7	BLACK	14	Pump motor power input. Connected to wire #8 when the MICON is authorized and the handle switch is ON.
8	ORANGE	14	Pump motor power output. When the MICON is ready to dispense product, the power applied to wire #7 is switched to this line to operate the pump motor relay.
14	BROWN	18	Authorize input. Application of 240 VAC will authorize the MICON to dispense product. If 240 VAC is not present when the handle switch is turned ON, the MICON applies a 2.7 K Ω resistor between this line and wire #2 to serve as an authorize request load for Kraus Industries Self-Serve equipment.
15	GREY	18	Authorize output. When 240 VAC is applied to wire #14, and the handle switch is ON, 240 VAC will be present on this line (max 3 amps).
20	VIOLET	18	Solenoid power in. This line is switched to wire #6 by the MICON to activate the solenoid valve.
Low Voltage Lines			
4	YELLOW	18	Pulser common positive. Normally connected to the pulser power supply positive line (+30 VDC Max) and provides power to penny and volume pulser lines.
5	RED	18	Penny pulser negative (output). The MICON will source a maximum of 100 mA from the pulser positive (#4) to this line to form a pulse once for each penny of product dispensed. (Used with Kraus Monitor consoles.)
18	BLUE	18	Volume pulser negative (output). Provides a pulse for each specified fraction of a unit of volume (used for card/key systems).
Data Communication Lines			
9	PINK	18	Talk-to-pump. Connected to the appropriate terminal on the "TTP" terminal block of a MCIU*, and carries messages from the console to the pump.
10	TAN	18	Talk-to-console. Connected to the "TTC" terminal block of a MCIU* and carries messages from the pump to the console.
16	GREEN	18	Data channel common. Connected to the "DCC" terminal block of a MCIU*.

* See pages 22-23 for description of Kraus Global Inc. MCIU hook-up (North American).

DISPENSER INSTALLATION



1	BLACK	18 AWG	HOT (HEAD POWER); L1
2	WHITE	18 AWG	NEUTRAL OR L2
3	GREEN	14 AWG	GROUND
4	YELLOW	18 AWG	PULSER COMMON POSITIVE
5	RED	18 AWG	PENNY PULSER NEGATIVE (OUTPUT)
6	ORANGE	18 AWG	SOLENOID POWER OUT
7	BLACK	14 AWG	PUMP MOTOR INPUT
8	ORANGE	14 AWG	PUMP MOTOR POWER OUT
9	PINK	18 AWG	TALK-TO-PUMP
10	TAN	18 AWG	TALK-TO-CONSOLE
11	N/A	18 AWG	SOLENOID INPUT
12	N/A	18 AWG	SOLENOID INPUT
14	BROWN	18 AWG	AUTHORIZE IN
15	GREY	18 AWG	AUTHORIZE OUT (RETURN)
16	GREEN	18 AWG	DATA CHANNEL COMMON
18	BLUE	18 AWG	VOLUME PULSER NEGATIVE (OUTPUT)
20	VIOLET	18 AWG	SOLENOID POWER IN (SWITCHED)

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FIGURE 10
KRP N1 / 2(H)
LPG DISPENSER:
WIRE DIAGRAM MICON 200
FOR 240 VAC DISPENSERS
(NORTH AMERICAN)
DRAWING NUMBER: 5941
REVISION: 0

NOTE: CONFIGURATION SHOWN IS KRP N1(H)
DOUBLE CONFIGURATION FOR KRP N2 (H).

DISPENSER INSTALLATION

4.3.8 Dual LPG 120 VAC Micon 200 Dispensers

TABLE 8 - DUAL LPG 120 VAC MICON 200 DISPENSERS: WIRING DESCRIPTION – NORTH AMERICAN

Wire No.	Wire Colour	AWG#	Description
1	BLACK	18	120 VAC head power. Supplies wire #2 (WHITE 18 AWG) with power for the head electronics. If the power is interrupted on these lines, the head will go into standby and power fail modes.
2	WHITE	18	Neutral for head power and main board authorize/authorize request circuit.
3	GREEN	14	Ground. Connected internally to the casting and must be connected to the service ground.
6	ORANGE	18	Solenoid power output. Used to supply power to a cut-off solenoid under MICON control.
7	BLACK	14	Pump motor power input. Connected to wire #8 when the MICON is authorized and the handle switch is ON
8	ORANGE	14	Pump motor power output. When the MICON is ready to dispense product, the power applied to wire #7 is switched to this line to operate the pump motor relay.
12	WHITE	18	Light power neutral.
13	BLACK	18	Light power hot.
14	BROWN	18	Authorize input. Application of 120 VAC will authorize the MICON to dispense product. If 120 VAC is not present when the handle switch is turned ON, the MICON applies a 2.7 K Ω resistor between this line and wire #2 to serve as an authorize request load for Kraus Industries Self-Serve equipment.
15	GREY	18	Authorize output. When 120 VAC is applied to wire #14, and the handle switch is on, 120 VAC will be present on this line (max 3 amps).
20	VIOLET	18	Solenoid power in. This line is switched to wire #6 by the MICON to activate the solenoid valve.
Low Voltage Lines			
4	YELLOW	18	Pulser common. Normally connected to the pulser power supply positive line (+30 VDC Max) and provides power to penny and volume pulser lines.
5	RED	18	Penny pulser output. The MICON will source a maximum of 100 mA from the pulser positive (#4) to this line to form a pulse once for each penny of product dispensed. (Used with Kraus Monitor and Micro consoles.)
18	BLUE	18	Volume pulser negative (output). Provides a pulse for each specified fraction of a unit of volume (used for card/key systems).
Data Communication Lines			
9	PINK	18	Talk-to-pump. Connected to the appropriate terminal on the "TTP" terminal block of an MCIU*, and carries messages from the console to the pump.
10	TAN	18	Talk-to-console. Connected to the "TTC" terminal block of an MCIU* and carries messages from the pump to the console.
16	GREEN	18	Data channel common. Connected to the "DCC" terminal block of an MCIU*

* See pages 22-23 for description of Kraus Global Inc. MCIU hook-up (North American).

DISPENSER INSTALLATION

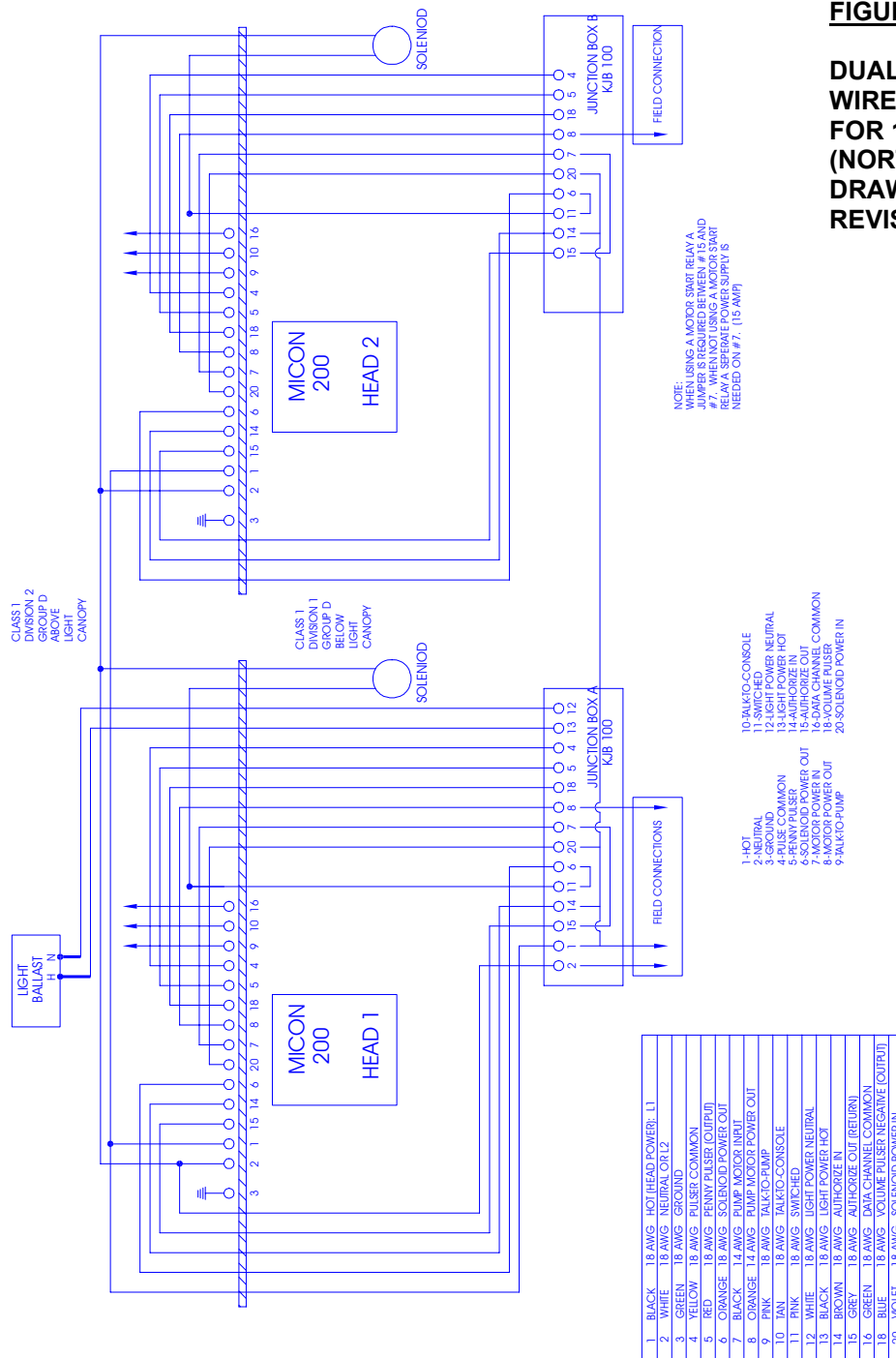


FIGURE 11

**DUAL LPG DISPENSER:
WIRE DIAGRAM MICON 200
FOR 120 VAC DISPENSERS
(NORTH AMERICAN)
DRAWING NUMBER: 5535
REVISION: 2**

DISPENSER INSTALLATION

4.3.9 KRP N1/2(H) LPG 220 VAC Micon 200 Dispensers (CENELEC)

TABLE 9 – KRP N1 / 2(H) LPG 230 VAC MICON 200 (European) Wiring Description

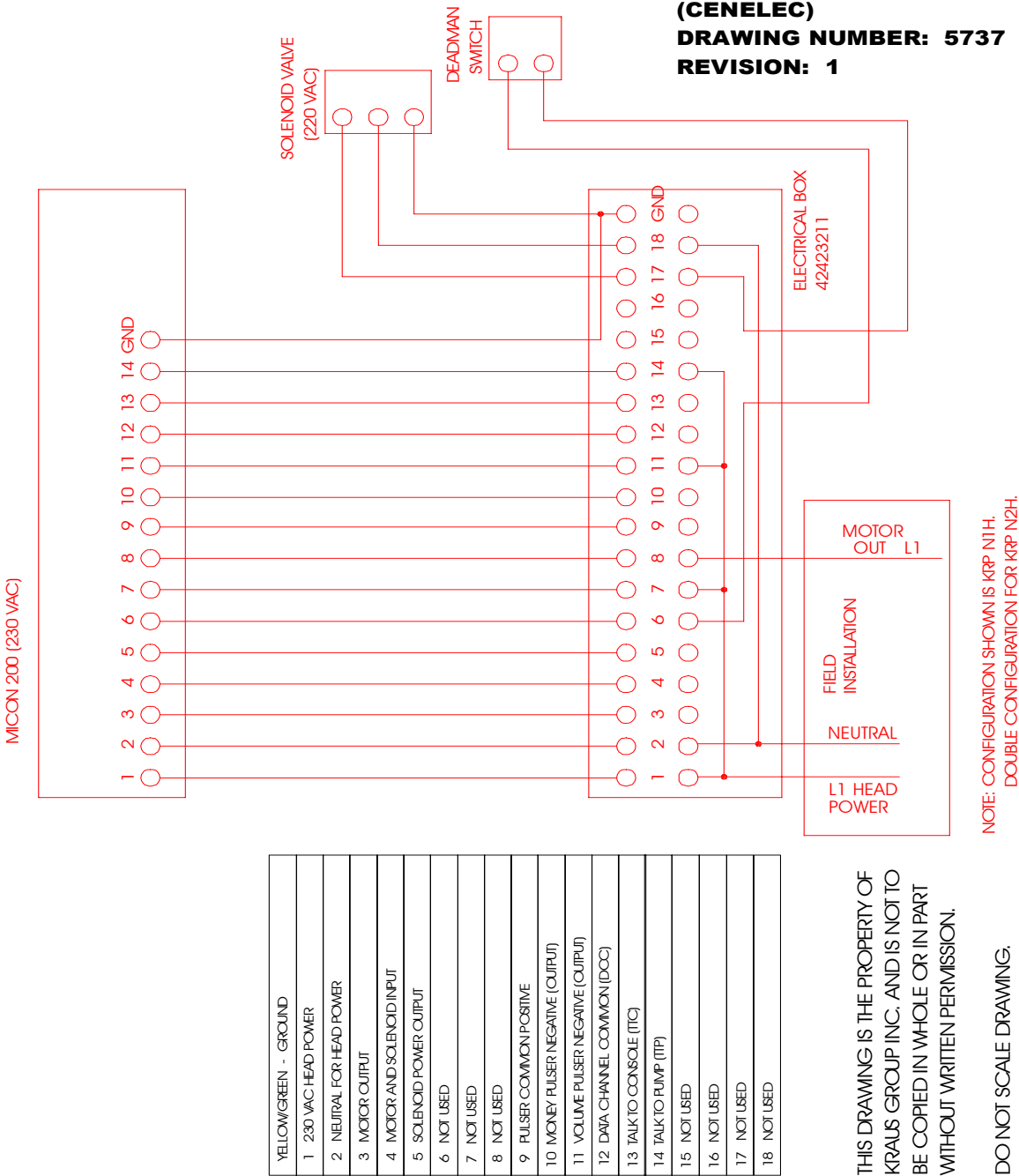
Wire No.	230 VAC Lines – (All wires 18 AWG)
YEL/GRN	Earth. Connected internally to the casting and must be connected to the service ground.
1	230 VAC head power. If the power is interrupted on these lines, the head will go into standby and power fail modes.
2	Neutral for head power and main board authorize request circuit.
3	Ground. Connected internally to the casting and must be connected to the service ground.
6	Solenoid power output. Used to supply power to a solenoid under MICON control.
7	Pump motor power input. Connected to wire #8 when the MICON is authorized and the handle switch is ON.
8	Pump motor power output. When the MICON is ready to dispense product, the power applied to wire #7 is switched to this line to operate the pump motor.
11	Solenoid valve input. Applying 230 VAC to this wire (from wire #6) will open the solenoid valve.
12	Light power neutral.
13	Light power hot.
14	Authorize input. Application of 230 VAC will authorize the MICON to dispense product. If 230 VAC is not present when the handle switch is turned ON, the MICON applies a 2.7 K Ω resistor between this line and wire #2 to serve as an authorize request load for Kraus Industries Self-Serve equipment.
15	Authorize output. When 230 VAC is applied to wire #14, and the handle switch is on, 230 VAC will be present on this line.
20	Solenoid power in. This line is switched to wire #6 by the MICON to activate the solenoid valve.
Low Voltage Lines	
4	Normally connected to the pulser power supply positive line (+30 VDC Max) and provides power to penny and volume pulser lines.
5	Penny pulser output. The MICON will source a maximum of 100 mA from the pulser positive (#4) to this line to form a pulse once for each penny of product dispensed. (Used with Kraus Monitor consoles.)
18	Volume pulser negative (output). Provides a pulse for each specified fraction of a unit of volume (used for card/key systems).
Data Communication Lines	
9	Talk-to-pump. Connected to the appropriate terminal on the "TTP" terminal block of a MCIU*, and carries messages from the console to the pump.
10	Talk-to-console. Connected to the "TTC" terminal block of a MCIU* and carries messages from the pump to the console.
16	Data channel common. Connected to the "DCC" terminal block of a MCIU*.

* See pages 27-28 for description of Kraus Global Inc. MCIU hook-up (European).

DISPENSER INSTALLATION

FIGURE 12.

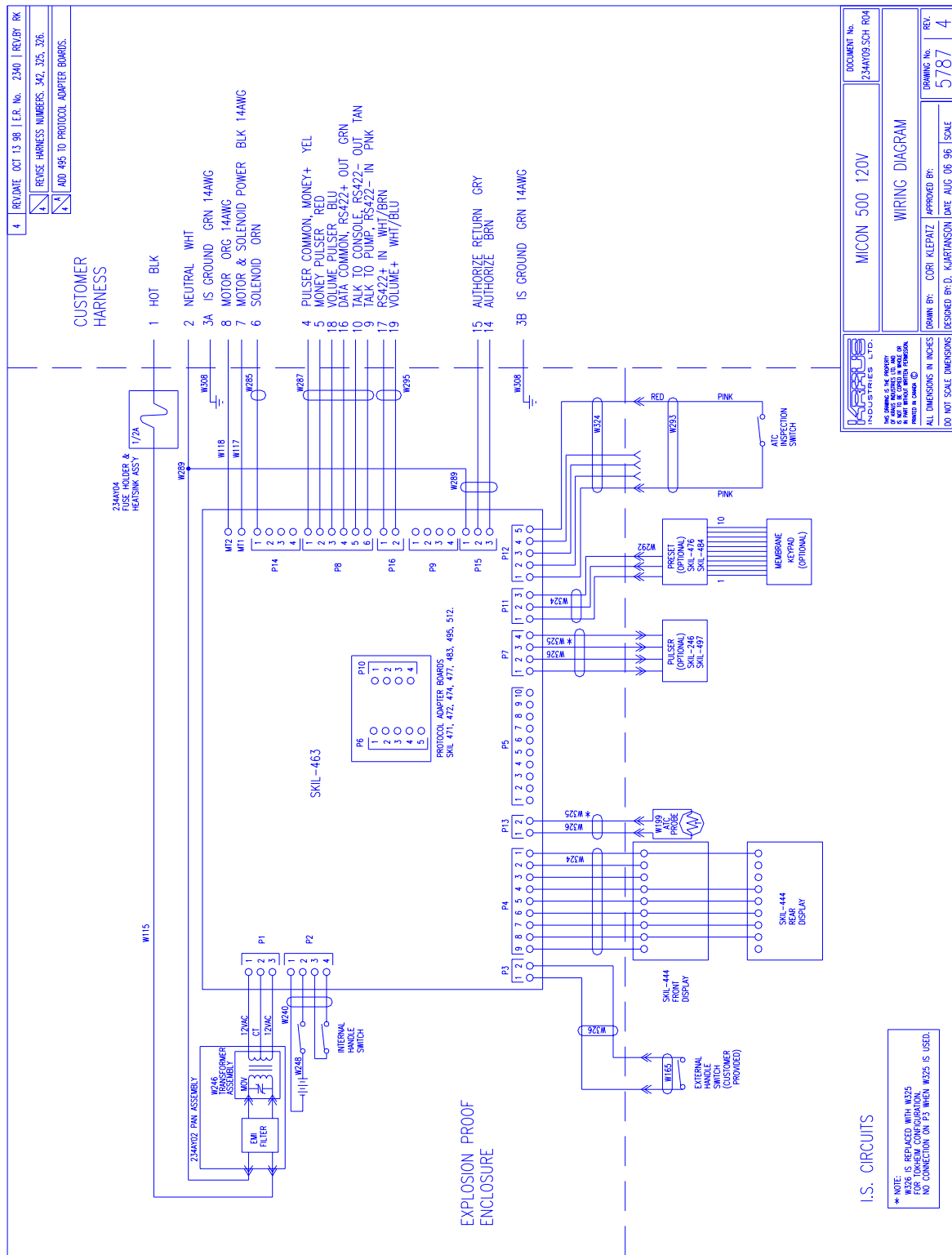
**KRP N1H / N2H
LPG DISPENSER:
WIRE DIAGRAM MICON 200
FOR 230 VAC DISPENSERS
(CENELEC)
DRAWING NUMBER: 5737
REVISION: 1**



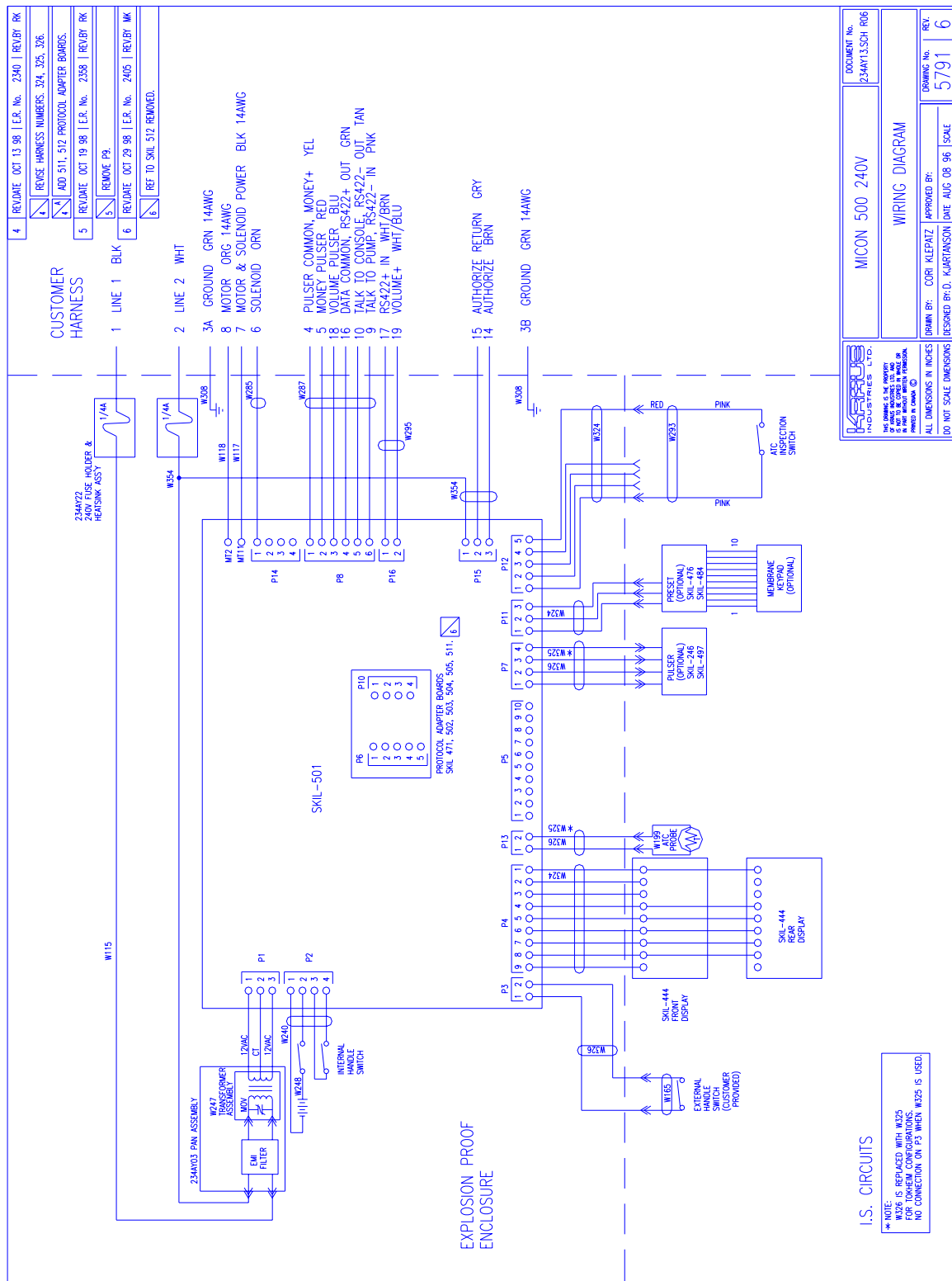
4.3.10 Internal Wiring Diagrams: MICON Electronic Pumpheads

The following pages provide North American and European wiring diagrams for electronic pumpheads utilizing automatic temperature compensation.

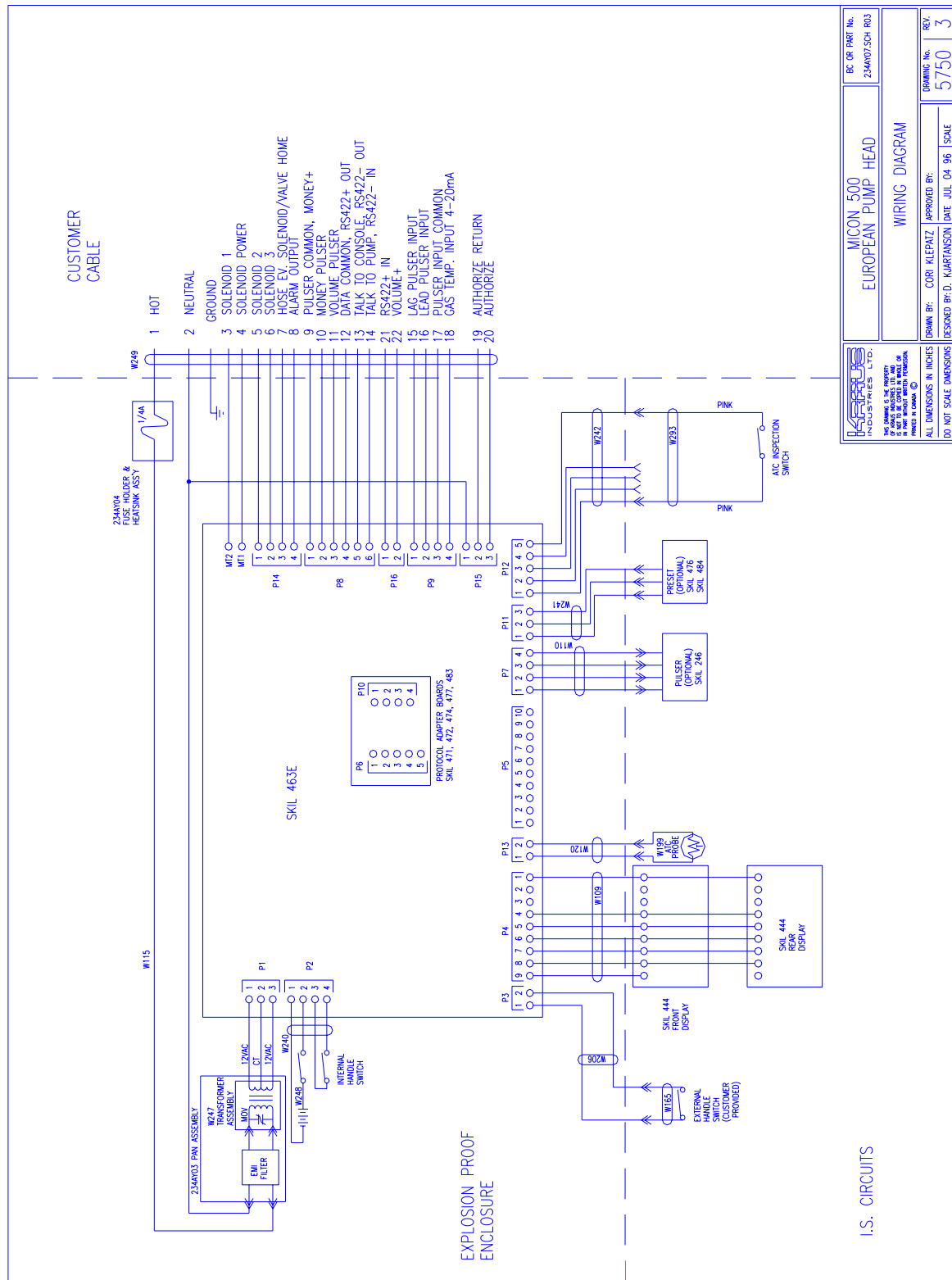
4.3.10.1 Micon 500L™ 120 VAC North American Pumphead



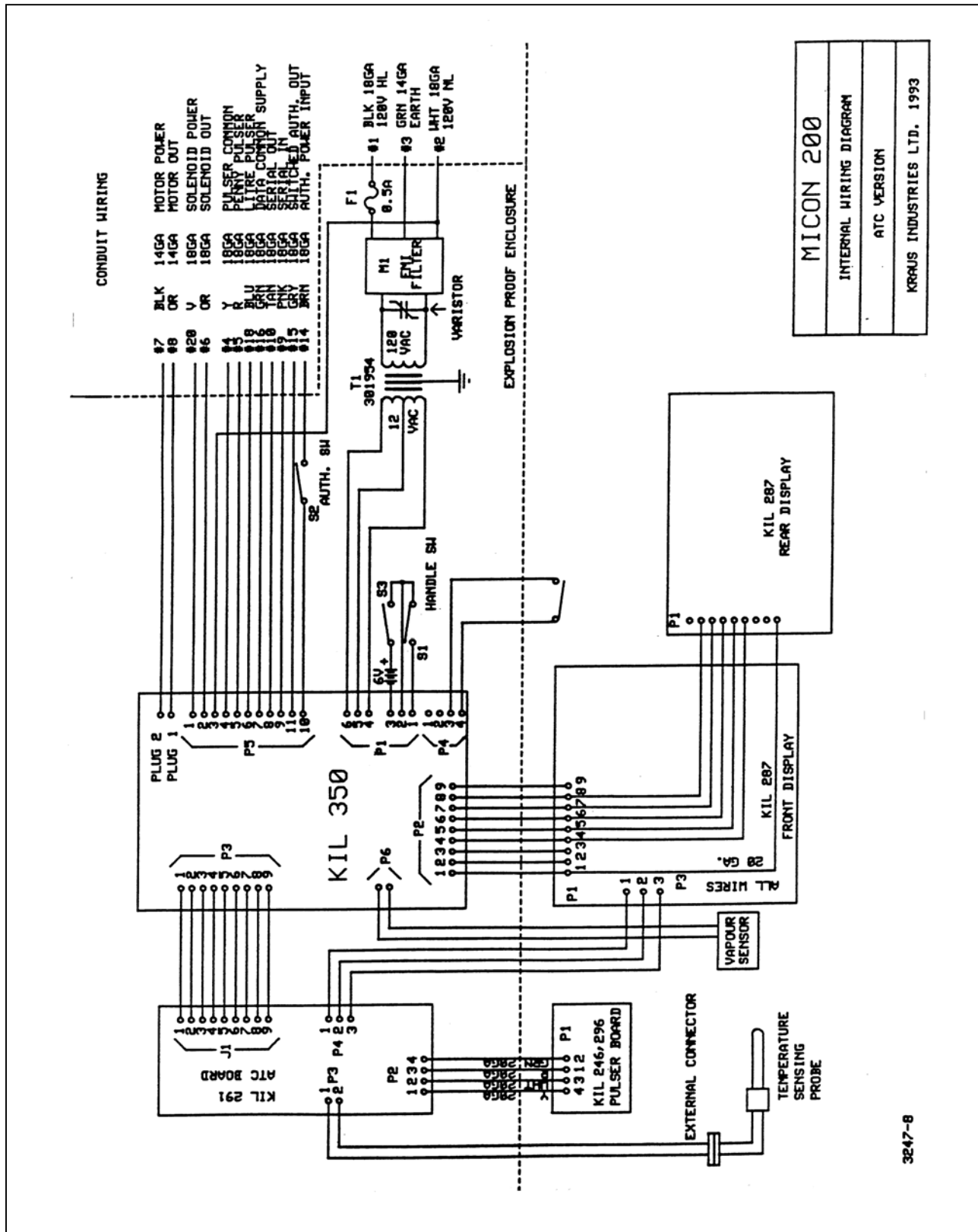
4.3.10.2 Micon500L™ 240 VAC North American Pumphead



4.3.10.3 Micon 500L™ European Pumphead



4.3.10.4 Micon 200 North American Pumphead



5.0 MICON Computerized Register Configuration: INFO-PAC Settings (m500L and m200)



*For complete, current configuration instructions, please see **INFO-PAC Programming of MICON 500L Manual** (Kraus Global Inc. document 206KT00.PRG), or **MICON 200 INFO-PAC Programming Manual** (Document #206AY01.PRG)..*

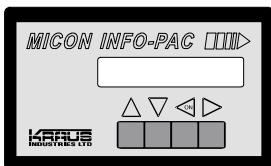
The MICON computerized register (described in section 3.0 – Component Description, page 6) is used to control liquid fuel flow from gasoline, diesel, propane or butane dispensers. The MICON monitors and converts pulser signals into true volume and temperature equivalents, and sends the results to a digital backlit display.



NOTE

THE MICON 500L™ IS THE CURRENT MODEL USED IN KRP™ LPG FUEL DISPENSERS MANUFACTURED BY KRAUS GLOBAL INC. THE MICON 200 IS INSTALLED IN EARLIER MODELS OF KRP™ DISPENSERS. THE MICON 500L™ FEATURES A GREATER NUMBER OF CONFIGURATION OPTIONS THAN THE MICON 200, INCLUDING METERING UNIT CONVERSION FACTORS, CALIBRATION FACTORS, ATC PARAMETERS, AND SELECTION OF FUEL PRODUCT TYPE. (FOR OPTIONS COMPARISON AT-A-GLANCE, SEE TABLES 10 AND 11.)

A MICON *INFO-PAC* is required for configuring MICON computerized registers. The INFO-PAC is a hand-held, self-contained battery powered unit designed to configure MICON computerized registers. Configuration of the MICON computerized register is achieved by sending an infrared bit stream signal from the INFO-PAC to the MICON register.



- The **M500L INFO-PAC** is a *transmitter* and *receiver*. In addition to transmitting features to the MICON 500L™, this device receives and displays features already programmed to the MICON 500L™. Table 10, summarizes settable features.
- The **M200 INFO-PAC** is a *transmitter*. Programmable pumphead features can be set up in the INFO-PAC memory then transmitted to MICON 200 heads. Table 11, summarizes settable features.



NOTE

SETTABLE INFO-PAC OPTIONS DO NOT TAKE EFFECT UNTIL THE TRANSMIT OPTION IS EXECUTED SUCCESSFULLY. SETTING CONFIGURATION FEATURES IN THE MICON USING THE INFO-PAC (I.E., TRANSMITTING) REQUIRES BREAKING OF TWO WEIGHTS & MEASURES SEALS ON THE MICON COVER OR HANDLE SHAFT.

IMPORTANT: For configuring instructions see *INFO-PAC Programming of MICON 500L™ Electronic Pumpheads Manual (Kraus Global Inc. document 206KT00.PRG)*.

TABLE 10 – M500L INFO-PAC DEFAULT CONFIGURATION SETTINGS

OPTION	DESCRIPTION	DEFAULT SETTINGS
CONFIG	Sets all menu options to default values.	default
TEST	Puts MICON 500L into continuous display test mode.	off
PULSER	Sets pulser input source (i.s. external or conduit wiring).	i.s.
IN COUNT	Sets number of pulser edges to register 1 unit volume of fuel flow.	1000
MULTIPLIER	Sets volume of fuel flow equal to 1 unit.	1
CURRENCY	Sets type of currency sales registered in; number of decimal places in the price per unit.	dollars
VOL DISP	Sets number of decimal positions displayed in MICON 500L volume unit field.	1.000
SUPPRESS	Sets type of unit suppression, at reset if any.	0.030
CONV.	Converts volume units dispensed to volume units displayed by MICON 500L.	off
PRC RESTORE	Used for two tier pricing: reverts to regular price after a discounted transaction.	on
NO FLOW	Sets time interval MICON 500L keeps motor and solenoid valve ON if sale in progress but no fuel flow occurring.	off
VOL P. QUAD	Selects volume output pulser type: single channel with penny pulser option or two channel.	off
VOL PPU	Sets number of output pulses per unit transmitted on wire #18 volume out.	10
VOL PW	Sets width ("on" time) of volume pulse signal.	4.0ms
PENNY PW	Sets width ("on" time) of penny pulse signal.	4.0ms
W/M STANDARD	Sets allowable pulser errors to meet North American or European standards.	na
CLEAR ZEROS	Sets MICON 500L to display or suppress leading zeros on the current sale display.	off
CONSOLE	Not settable; displays communications protocol type in price per unit window after received.	kraus
PUMP ID.	Sets pump address used during serial data channel communications.	not set
GRADE	Grade is set depending upon which brand of console interface is used.	1
DISPLAY	Sets MICON 500L current sale display to retail, commercial or bulk.	normal
C. FACTOR	Sets electronic calibration factor for errors in meter registration.	+00.00%
ATC	Enables/disables automatic temperature compensation.	on
COMP. TEMP.	Sets temperature to which ATC feature compensates fuel volume.	15°C
PRODUCT	Sets type of fuel to be temperature compensated.	gas
SLOW FLOW	For preset sales, sets point at which fast flow valve closes; slow flow valve continues.	0.600
START KEY	This key has no effect on the MICON 500L. Reserved for future expansion.	disab
STOP KEY	This key has no effect on the MICON 500L. Reserved for future expansion.	disab
CUST.PRESET	Reserved for custom setting.	off
P. CODE	Sets user identification code to provide access for price changing.	0000
TRANSMIT	Transmits settings to MICON 500L units.	off
RX MICON 500L	Receives settings from MICON 500L units already programmed.	off

TABLE 11 – M200 INFO-PAC DEFAULT CONFIGURATION SETTINGS

OPTION	DESCRIPTION	DEFAULT SETTINGS
CONFIG	Sets all menu options to default values.	default
TEST	Puts MICON 200 into continuous display test mode.	off
IN COUNT	Sets number of pulser edges to register 1 unit volume of fuel flow.	1000
MULTIPLIER	Sets volume of fuel flow equal to 1 unit.	1
CURRENCY	Sets type of currency sales registered in; number of decimal places.	dollars
VOL DISP	Sets number of decimal positions displayed in MICON 200 volume unit field.	1.000
TIMES 2	If set ON, changes IN COUNT value to equal one half of INFO-PAC setting. Non ATC only.	off
GAL CONV	If set ON, MICON 200 converts US gallon metered pulses to litres. Non ATC only.	off
NO FLOW	If set ON, MICON 200 shuts off pump after 1.5 minutes of transaction without fuel flow.	off
VOL PPU	Sets number of output pulses per unit transmitted on wire #18 litre out pulser line..	10
VOL PW	Sets width ("on" time) of litre pulse signal.	4.0ms
PENNY PW	Sets width ("on" time) of penny pulse signal.	4.0ms
TRANSMIT	Transmits settings to MICON 200 units.	off
TX DISP	This key has no effect on the MICON 200. Reserved for future expansion.	off

5.1 MICON Computerized Register (models 500L, 200): Theory of Operation

The theory of operation is similar for both models:

The MICON computerized register is designed to calculate and display fuel volume displacements. The meter is mechanically coupled to an input shaft pulser encoder with direction sensing and compensation. Cumulative measurements are multiplied by a dollar (or other currency) amount ranging from 0 to 9.999 per unit of flow (e.g., gallon, litre), settable using the *INFO-PAC*. The MICON register display shows the calculated currency amount.

Price setting is configured using the MICON *Communicator*, described in section 5.3. Both the *INFO-PAC* and the *Communicator* are hand-held battery operated devices which communicate configuration parameters to the MICON register using an infrared bit stream.

At default settings, pulses are configured as either 1 pulse per 0.001 volume units (standard metric mode) or 1 pulse per 0.0037865 units (when converting US gallons to litres). The model 500L also configures 1 pulse per 0.0045460968 units (when converting Imperial gallons to litres).

IN COUNT and MULTIPLIER configuration features permit setting the number of voltage “edges” that must be received on the two incoming pulser lines (F1 and F2) to register 1 unit of fuel flow.

The pulser has two outputs operating in quadrature so that one faulty channel can be detected. If the two outputs are not within range of one another for a total of 50 pulser outputs, the power output to the solenoid and motor will be turned OFF. The power will remain OFF until a reset sequence is performed.

A reset sequence is accomplished by manually moving the dispenser handle from OFF to ON while the Authorize Input is ON (120 volts AC North American; 230 volts AC European to Authorize Input). The reset sequence causes the previous fuel delivery information to be entered in the cumulative totalizers. A display segment check then automatically occurs. This resets the shaft encoder error count, clears current sale display, then places the computer in the “ON” mode. If a display overflow occurs, the cumulative totals will still be correct. Digital display of most recent fuel transaction record will only display if a console is in use.

5.1 MICON Computerized Register (models 500L, 200): Theory of Operation (cont'd)

During accumulation of volume and dollar data of sale, the penny (or money) and volume pulser output lines transmit one pulse per penny of sale and one pulse per 0.1 units (adjustable) of volume respectively. The default pulser width is set to of 4.0 milliseconds. If the delivery rate exceeds this amount, the pulser output will lag slightly. However, when the delivery rate is reduced or stopped, the pulser outputs will 'catch up' to the delivery amount. This buffered pulse output will only be lost if the delivery goes beyond \$99.99 or 999.9 (10PPU) ahead of the pulser.

"ON" mode occurs when the handle switch is ON, the Authorize Input is ON, and the shaft encoder error count is less than 50. "ON" mode is indicated by the presence of 120 volts AC North American (230 volts AC European) on the motor or motor power output. 120 VAC North American (230 volts AC European) will also be present on the solenoid output.

Input pulses from the pulser are generated and displayed when the pulser input shaft is rotated in the correct direction.

Additional features available from the model INFO-PAC M500L, intended for use with the MICON 500L™, are described in Table 10, and the INFO-PAC Programming Manual.

- **PULSER** – sets pulser input source: external or conduit wiring.
- **SUPPRESS** – suppresses initial sale units on MICON register display. This suppression prevents the display of fuel expansion in the hose before the nozzle is opened.
- **CONV.** – converts volume units dispensed to the desired volume units displayed.
- **PRC RESTORE** – used when two tier pricing is in effect to restore price of fuel to discount or regular values after a sale.
- **VOL P. QUAD** – selects volume pulser quadrature type.
- **W/M STANDARD** – sets *Weights and Measures* (Measurement Canada) allowable pulser errors
- **CLEAR ZEROS** – suppression / display of leading zeros on MICON register sale display.
- **CONSOLE** – provides console type recognition.

5.1 MICON Computerized Register (models 500L, 200): Theory of Operation (cont'd)

- **PUMP ID** – sets pump serial address for data channel communications.
- **GRADE** – sets fuel grade consistent with brand of console used.
- **DISPLAY** – sets MICON sale register displays (e.g., net, gross volume; temperature; price).
- **C. FACTOR** – sets flow meter electronic calibration factor (percentage of actual fuel volume in excess of register volume).
- **ATC** – sets automatic temperature compensation ON or OFF.
- **COMP TEMP** – when ATC feature enabled, sets temperature for which signals received from the temperature probe and flow meter are compensated.
- **PRODUCT** – selects fuel type to be compensated.
- **SLOW FLOW** – sets fuel volume at which fast flow valve closes.
- **P. CODE** – price changing security feature; sets user identification code.

5.2 MICON Computerized Register Configuration (models 500L, 200): Power OFF Modes

During power failure (i.e., absence of 120 VAC head power; 230 VAC European) the MICON electronic pumphead goes into *standby* mode for approximately one minute, then into the *power fail* mode.

The displays flash off and on to indicate the head is in standby mode. After the pump has gone into power fail mode, it can be brought back into the standby mode by turning the handle switch to the ON position. (In standby mode, the communicator can set fuel price. See section 5.3).

The MICON will enter power fail mode one minute after standby mode. In this mode all cumulative memory of price, last sale and totalizers are retained. The pump can remain in this mode and retain this data for 6 months.

5.3 MICON Computerized Register Configuration (models 500L, 200): Price Setting with the MICON Communicator

5.3.1 Price Setting – Single Tier

1. At breaker box turn OFF AC power to MICON electronic head being serviced. **Caution: Ensure breaker box does not feed power to equipment, which should remain ON.**

MICON display should be flashing ON and OFF once a second.

If display is not flashing, unit is in *battery save* mode. To correct this, turn handle ON and OFF. Display will start flashing. The dollar (top) display on the MICON displays the dollar amount and “Prc 1”.


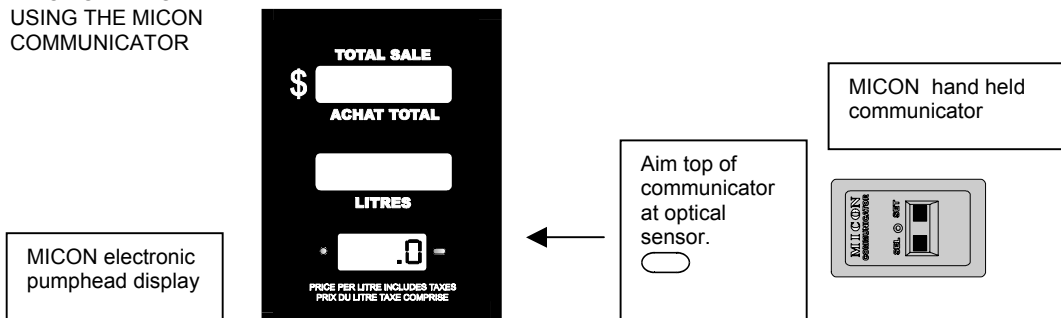
2. Aim the MICON hand held communicator at the front display of the MICON electronic pumphead.
3. Aim the communicator at the optical sensor (oval “hole” ) at right of price per unit display on MICON.

FIGURE 13

PRICE SETTING
USING THE MICON
COMMUNICATOR



4. To set prices:
 - While aiming the communicator’s transmitter (located on the top of the unit) at the MICON optical display sensor, press and hold the “SEL” key until the display increments to the desired number.
 - Use the “SEL” key to select the next digit to be changed. Press and hold the “SET” key until the display increments to the desired number.
 - When the correct price per unit has been entered, return the dispenser handle switch to the OFF position and restore head power.

5.3.2 Reading Totalizers

COMMUNICATOR
TRANSMITTER

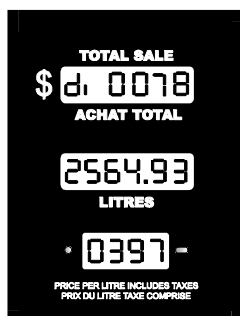


1. Ensure the dispenser handle is in the **OFF** position, and the 120 VAC (230 VAC European) MICON head power is turned ON.
2. Aim the communicator's transmitter (located on the top of the unit) at the optical reader located to the right of the price per unit display.
3. Depress and hold the "SEL" key on the communicator. The red indicator to the left of the price display will flash as the MICON receives the communicator's signal.
4. Hold the "SEL" key until the dollar sales total is displayed. Dollars sale total uses ten digits of the dollars and volume displays preceded by the letters "d l". Refer to Figure 14.
5. To display volume total, continue to depress and hold the "SEL" key until the display shows "V l" followed by the ten digit volume total. Pressing the "SEL" key repeatedly or holding it down will cause the display to switch back and forth between volume and dollars totals.
6. To display gross totals (M500 only), press the set button when dollars or volume totals are displayed. The gross total reading will be preceded by three horizontal dashes "≡" where the "d" or "v" was.

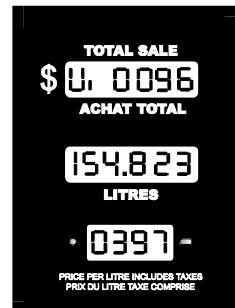
FIGURE 14

DISPLAY DOLLAR AND VOLUME TOTALS

TOTAL **DOLLAR SALES** DISPLAY
THIS DISPLAY READS:
\$782564.93



TOTAL **UNIT SALES** DISPLAY
THIS DISPLAY READS:
96154.823 UNITS



5.3.3 Two Tier Pricing Function: models 500L, 200

On **MICON** units equipped with the two-tier price option it is possible to make sales at two different prices. For example, cardholders may receive a discount from the regular price while fuel is dispensed to non-cardholders at full price. The unit maintains separate totalizers for each price of sales.

5.3.3.1 Two Tier Option Installation

Two-tier installation requires a connector (included with part #W242 - harness) and push-button switch (#PWP 320) or key-switch (#Y101). To order these optional parts contact your local service representative.

To install the two tier option:

- Connect the push button switch between the black and purple wires on the provided connector. The push button switch can then be mounted in a 7/8" hole in the side of the dispenser.
- An optional key-switch is available, which can be used instead of, or together with, the push-button. Wire the key-switch and push-button in series, not parallel.

5.3.3.2 Making Discount Price Sales on a Two Tier Dispenser

1. To make a discount priced sale, simply press the DISCOUNT push button, located on the side of the dispenser, before turning the dispenser handle ON. When the button is pressed, the discount price will be displayed. The next sale will proceed at the discount price.
 - If the DISCOUNT button is pressed by mistake and you do not wish to make a discounted sale, simply press the DISCOUNT button again and the dispenser will revert back to the regular price.

5.3.3.2 Making Discount Price Sales on a Two Tier Dispenser (cont'd)

- Pressing the DISCOUNT button while the dispenser is in the ON position has no effect on the dispenser.
2. When the discounted sale is completed turn the dispenser handle to the OFF position. The regular price will again be displayed and subsequent sales will occur at the regular price.



NOTE


The INFO-PAC used to monitor and program the MICON pumpheads has a setting intended for use when two tier (regular and discount) pricing is used: PRC RESTORE (price restore). When this setting is ON (default setting), the MICON reverts back to tier 1 (regular). It is possible to set PRC RESTORE OFF, in which case the price used for the current sale is retained for the next sale. Refer to INFO-PAC Programming of MICON 500L Electronic Pumpheads Manual (Kraus Global Inc. document 206KT00.PRG) for details.

5.3.3.3 Setting Prices on a Two Tier Dispenser

Setting prices on a two-tier dispenser is the same as on single tier dispensers except that pressing the **DISCOUNT** button will change which price is being set.


1. **To set “Prc 1”, which is the regular price**, turn OFF AC MICON head power at breaker box. MICON display should be flashing.

If display is not flashing, unit is in *battery save* mode. To correct this, turn handle ON and OFF. Display will start flashing. The dollar display on the MICON displays the dollar amount and “Prc 1” at first.

Set this price by aiming the communicator’s transmitter (on top of unit) at the optical sensor (oval “hole”  at right of price display on MICON.

Press the SEL key to select the digit to be changed, and press the SET key to increment to the desired number.

2. To set “Prc 2”, which is the discounted price, press the DISCOUNT button located on the side of the dispenser. The dollar display on the MICON will then display the dollar amount and “Prc 2” at first. “Prc 2” indicates the discounted price.

Set this price by aiming the communicator at the optical sensor (oval “hole” ) at right of price per unit display on Micon front display. Press the SEL key to select the digit to be changed, and press the SET key to increment to the desired number

5.3.3.4 Reading Totals on a Two Tier Dispenser


Reading volume and dollar totals on two tier dispenser totalizers is the same as on single tier dispenser totalizers, except that pressing the **DISCOUNT** button will change which volume/dollar totals (regular or discount) is being displayed.

5.3.3.5 Two Tier Totals Operation

The two-tier dispenser contains two sets of totalizers:

- volume and dollar totals for **regular** priced sales;
- volume and dollar totals for the **discount** priced sales.

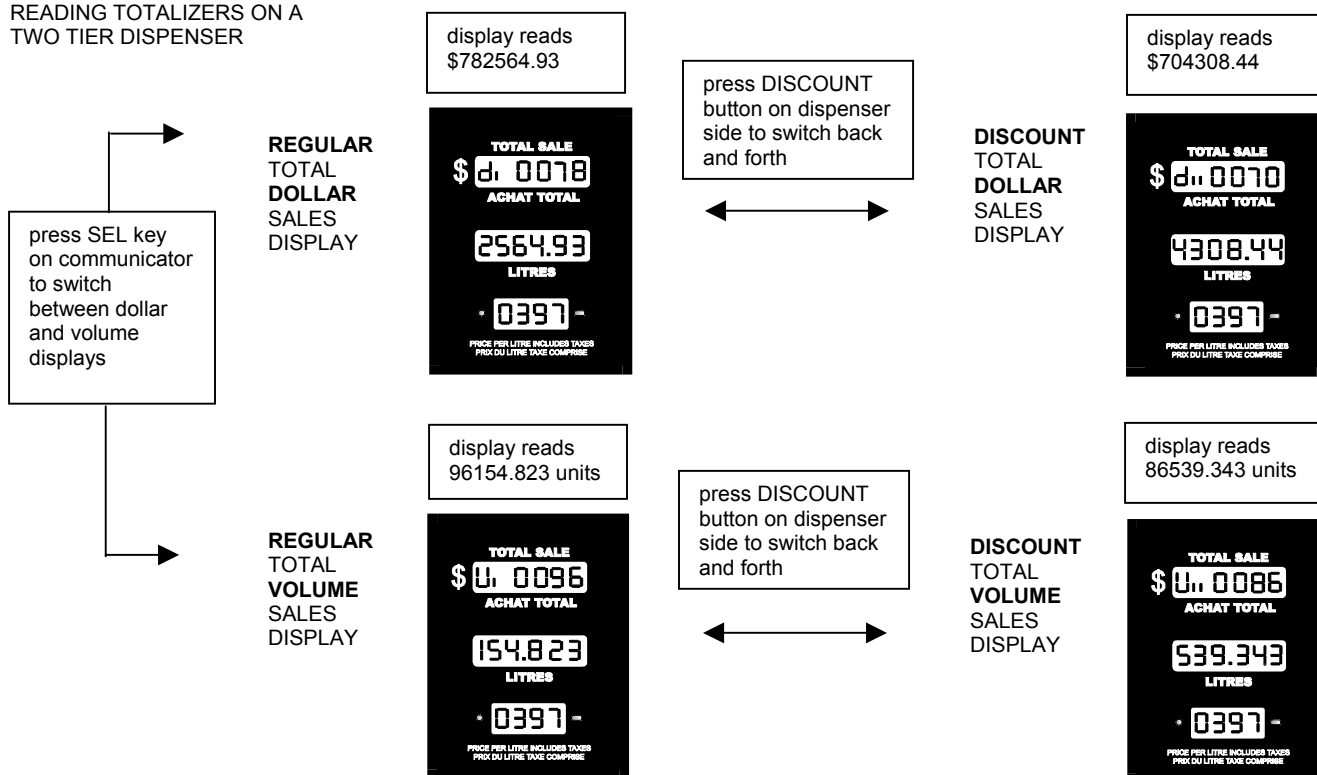
To read the totalizers:

1. Aim the communicator’s transmitter (on top of unit) at the optical sensor (oval “hole” ) at right of price per unit display on MICON 500L front display. Press and hold the SEL key until the dollar sales total is displayed.
2. Display will show “d l” for regular dollar totals. Press the DISCOUNT button. Display will show “d l” for discount dollar totals.
3. Press the SEL key until the display shows “v l” (regular priced volume total) or “v l” (discount priced volume total). Press the DISCOUNT button to switch back and forth between “v l” and “v l”.
4. Press and hold the SEL to switch back and forth between dollar and volume total displays.

Grand total volume and dollar sales are the sum of the regular and discount volume and dollar totals.

FIGURE 15

READING TOTALIZERS ON A TWO TIER DISPENSER



6.0 Post Installation: Dispenser Purging and Pressurization (all models)

1. Purge all dispenser lines. Prepare and/or purge fuel tank using approved fluid. If tank is not purged in the field, moisture may enter meter, causing components to freeze and crack.

To purge dispenser:

- a) Hook dispenser up. Make all appropriate connections as required, connecting discharge line (ACME 1 $\frac{3}{4}$ " fitting) from the external meter to the dispenser nozzle outlet.

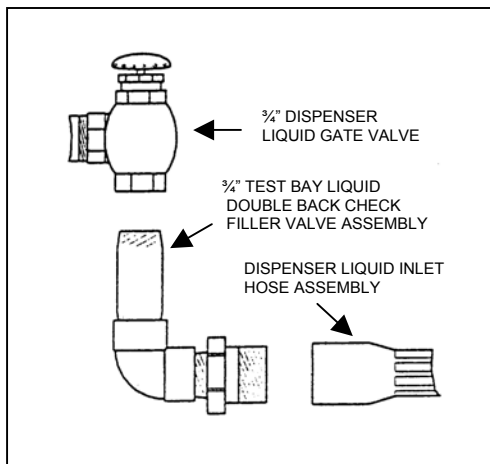


FIGURE 16

DISPENSER LIQUID INLET CONNECTION

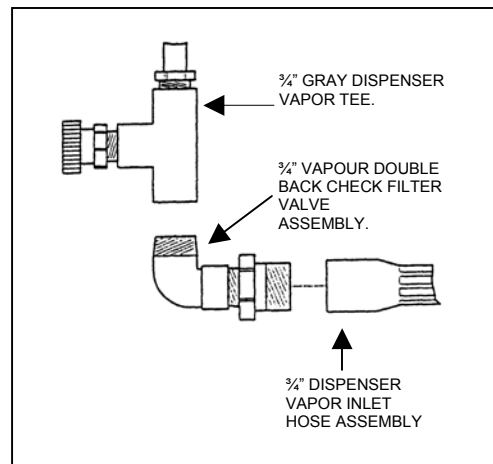


FIGURE 17

DISPENSER VAPOR INLET CONNECTION

- b) Reset dispenser by turning handle OFF, then ON. After the reset cycle, the dispenser solenoid will “click” open. All zeros should appear on the dispenser display.
- c) **Slowly** open vapor return valve, to charge entire meter with vapor.
- d) Turn pump ON and **slowly** open liquid gate valve. It is critical to open liquid line **slowly** to prevent “hammering” of meter sleeve and piston, and /or damage to differential diaphragm. Should hammering occur, meter will become uncalibrated.
- e) Charge meter to **pump pressure** (200 to 250 psi), not tank pressure.
- f) Connect nozzle to filler valve in dispenser

POST INSTALLATION: DISPENSER PURGING AND PRESSURIZATION (ALL MODELS)

- g) Reset dispenser again by turning handle OFF then ON. Slightly crack open the delivery nozzle and **slowly** purge the vapor from the dispenser. Close the nozzle, wait a few seconds and repeat.
 - h) Shut dispenser OFF and let stand unused for five minutes.
 - i) Repeat process from a) to h), if necessary.
2. Reset dispenser by turning handle OFF, then ON and **slowly** open liquid line valve. Check rate of flow. Flow-rate should not exceed meter recommended volumetric flow rate, pump capacity or nozzle capacity. 45 lpm (litres per minute) is recommended for all meter types.
 3. Adjust the external pump bypass to deliver the maximum practical rate of flow utilizing the least amount of pump pressure.



ATTENTION

- The pump relief valve (normally built into the pump assembly) should relieve at a pressure above the external bypass setting.
- Shut off valves must **always** be opened gradually to prevent excess flow valves from locking up.
- Maximum working pressure on the system **must** not exceed 350 psi.
- Avoid the use of a small diameter hose to reduce flow rates; this may result in premature wear on the pump.
- To avoid flashing on the system (sudden drop of pressure producing vapor, i.e., boiling) there should be no more than one pipe size drop at each joint between the tank and the meter. Although all meters are carefully calibrated and tested after assembly and no changes should be necessary, field calibration is recommended after installation is complete.
- While the installation is still new, clean the strainer frequently. After the system has been in service, only periodic cleaning is necessary.



CAUTION

SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

7.0 Operation Check

After checking all wiring connections, the correct operation of the KRP™ LPG dispenser should be verified as follows:

1. Turn the pump handle ON and OFF, and observe that the MICON volume and dollars displays indicate slowly flashing zeros.
2. Enter a price. Follow steps outlined in section 5.3.1, for single tier pricing; section 5.3.3., for two tier pricing.
3. After entering a price, apply the 120 VAC (230 VAC European) MICON head power.
4. Make sure the pump handle is in the OFF position. Turn ON pump motor power and ensure that the pump motor does not run and that no product can be dispensed. (If remote self serve equipment, key lock or cardlock is being used, authorize the dispenser accordingly.)
5. Place the handle switch in the ON position. The displays will flash to all 8's momentarily then return to zero. The pump motor should run and/or the solenoid valve should energize.
6. Dispense a convenient amount of product into a test tank and check that the MICON head displays the proper volume and dollar amount.
7. Place the pump handle in the OFF position and ensure that the pump motor and solenoid shuts off.

This completes the post installation check. If the unit does not function in a satisfactory manner, contact your factory or service representative.



ATTENTION

WHEN THIS UNIT IS USED IN RETAIL TRADE IN CANADA, MEASUREMENT CANADA, AN AGENCY OF INDUSTRY CANADA, MUST BE NOTIFIED OF THE INSTALLATION OR SERVICING OF THIS UNIT. THIS UNIT IS SUBJECT TO INSPECTION UPON INSTALLATION AND AT SUCH OTHER TIMES AS THE REGULATIONS MAY STATE. WHEN ELECTRONIC CALIBRATION OR ATC (AUTOMATIC TEMPERATURE COMPENSATION) IS USED, THE ENCLOSURE COVER MUST BE SEALED BY AN INSPECTOR AND THE UNIT MUST BE REINSPECTED IF THE SEAL IS BROKEN.

OUTSIDE OF CANADA, WEIGHTS AND MEASURES REGULATIONS MUST BE ADHERED TO ACCORDING TO THE REQUIREMENTS OF THE JURISDICTION IN WHICH THE UNIT IS INSTALLED.

8.0 Calibration

Test the dispenser, using a volumetric prover large enough to permit the meter to operate for at least one minute at normal flow rate. *Slip tube and rotary gauge readings are not sufficiently accurate as proving meters.*

On Neptune™ meters a thermal well is provided for taking temperature readings to confirm temperature probe accuracy. It is covered by a snap plug to keep dirt from entering the well. When temperature readings are to be obtained, the well must be filled with a permanent type antifreeze, if available, or with a light oil.

If a gravimetric test is used, the conversion to litres must be on the basis of:

- Specific gravity determined at the time of testing (not an assumed value);
- Product temperature as it is passed through the meter.



ENSURE THAT AREA IS NON-HAZARDOUS BEFORE OPENING EXPLOSION-PROOF COVER.

8.1 Electronic Calibrator Adjustment for MICON 200 only

The KRP™ dispenser is equipped with an ATC (Automatic Temperature Compensator) which also contains an Electronic Calibration feature. The KRP™, when equipped with the MICON 200, is capable of electronically compensating meter errors of +/- 6.35% with the "Z" option, or +0 to +12.7% with the "P" option. The required calibration error is programmed into the ATC via 8 switches located within the explosion-proof housing. These switches are factory set for 0% calibration error. If the meter is correctly calibrated, no further adjustment is necessary. See MICON 200 installation if calibration is necessary.

When the switch on the front display is in the "DOWN" or "ATC Diagnostics" position, the ATC readings are shown on the display. The display then indicates as shown below. See Table 12, for front display switch location.

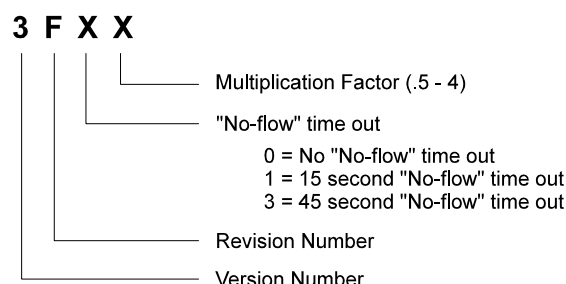
TOP DISPLAY	% calibration (while SW 10 "ON")
	Temperature (while SW 10 "OFF")

8.1 Electronic Calibrator Adjustment for MICON 200 Only (cont'd)

CENTER DISPLAY Uncompensated volume-sale

BOTTOM DISPLAY Flow rate/status

For the first 5 seconds after reset, a software ID message will be shown on the bottom display as follows:



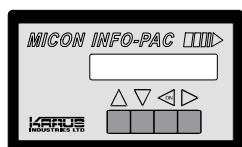
Five (5) seconds after reset, and until/unless flow begins or a shutdown error occurs, the product compensation type will be displayed:

PROP = PROPANE

If normal flow begins, the flow rate display will be displayed continuously until/unless an error occurs. If a pump shutdown occurs, the "REASONS" code will replace the above message with one of:

BAD Temperature probe defect (valid only if ATC on)
 FLO If shutdown due to no flow time out
 ERR If pulser error caused shutdown




8.2 Electronic Calibrator Adjustment for MICON 500L™ only



The KRP™, when equipped with the MICON 500L™, is capable of electronically compensating meter errors within a range of -19.99% to +19.99%. The INFO-PAC m500L is used to set the desired electronic calibration factor. INFO-PAC factory default setting is +00.00%.

To calibrate the meter electronically using the INFO-PAC m500L, follow steps 1 through 13 as follows:

8.2 Electronic Calibrator Adjustment for MICON 500L only (cont'd)


1. *Receive* existing MICON 500L™ configuration settings:
 - a) Go to breaker box and turn power OFF. **Caution: Ensure breaker box does not feed power to equipment which should remain ON.** The MICON display should be flashing.
 - b) Using INFO-PAC, scroll downward  to RX MICON option. Scroll  laterally to set **RX MICON on**. This setting permits INFO-PAC to *receive* MICON settings from registers which have already been programmed.
 - c) Locate optical sensor (oval “hole” ) at right of price display on MICON.
 - d) Aim INFO-PAC transmitter (located behind red tinted filter at centre edge of INFO-PAC) at MICON optical sensor. Red LED to left of MICON price display flashes as INFO-PAC receives data from MICON.
 - e) When INFO-PAC has received a copy of the MICON setup information correctly, INFO-PAC display will show “Received Micon”.
2. If MICON 500L™ is equipped with ATC (automatic temperature compensation), set INFO-PAC menu option **ATC off**.
3. Set INFO-PAC calibration factor to **C.FACTOR +00.00%**.
4. Transmit INFO-PAC settings to the MICON:
 - a) Switch OFF the head power to the MICON by removing cover of explosion-proof MICON housing and removing fuse. The MICON display should be flashing. This requires breaking of a Measurement Canada seal on the cover, and removal of bolts. Flip the slide switch on the solder side of main board up to enable programming mode.
 - b) With the Info-Pac, scroll to TRANSMIT option. Set **TRANSMIT on**.



ATTENTION

BEFORE TRANSMITTING SETTINGS FROM THE INFO-PAC TO THE MICON 500L™ ELECTRONIC PUMPHEAD, SCROLL CAREFULLY THROUGH ALL OPTIONS DISPLAYED ON THE INFO-PAC, AND ENSURE THAT EACH AND EVERY ONE IS STILL ON THE DESIRED SETTING, EVEN IF YOU HAVE CHANGED ONLY A SINGLE SETTING.

WHENEVER PROGRAMMING WITH THE INFO-PAC, ALL PARAMETERS ARE REWRITTEN IN THE MICON 500L™.

c) Locate optical sensor (oval “hole” ) at right of price display on MICON.

d) Aim INFO-PAC transmitter/receiver (located in center behind red tinted filter on edge of INFO-PAC) at MICON optical sensor.

Red LED to left of MICON price display flashes as MICON receives data from INFO-PAC.

e) When MICON has correctly received setup information, will show on price per unit display.



f) Exit programming mode by flipping switch inside MICON 500L to DOWN (Normal position).

g) Place ATC display toggle switch (location described in table 12,) ON. The 0.00% calibration can be observed in the top window of the display.

h) Switch the head power back ON and run the MICON which is now calibrated at +00.00%.

5. Place MICON handle switch in ON position. Observe MICON dollars and volume displays reset to zero.

6. Dispense a known volume of product and record the reading on the volume display.

7. Use formula below to calculate percentage correction required:

$$\% \text{ Correction} = \frac{\text{Actual Volume} - \text{Register Volume}}{\text{Register Volume}} \times 100$$

8. Set calibration factor on INFO-PAC to the closest setting available.

Example

Product dispensed: 25.00 Litres
Register reading: 26.360 Litres

$$\% \text{ Correction} = \frac{(25.000 - 26.360)}{26.360} \times 100 = -5.159\%$$

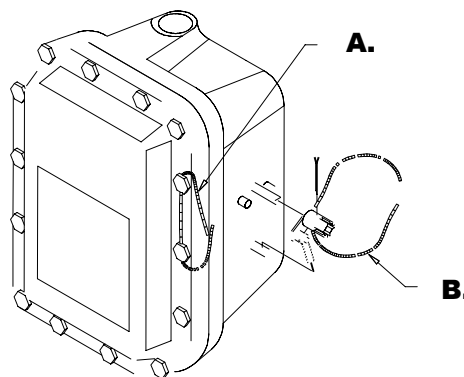
Set INFO-PAC calibration factor to **C.FACTOR – 5.16%**.

Turn ATC switch OFF, remove head power and place the programming slide switch up into program mode and transmit the calibration factor to the MICON with the INFO-PAC TRANSMIT function, as described in Section 8.2, Steps 4 a-h. The dollars section of the MICON display would show “-5.16” for the example given.

9. Repeat steps 5 and 6 to verify calibration of the MICON.
10. If ATC used at this installation, set ATC INFO-PAC menu option **ATC on**, and retransmit.

NOTE: The program mode is also available for 60seconds after a cold start display sequence on battery power.

11. Replace the cover of the explosion-proof MICON housing and:
 - a) Install a suitable legal seal through the two adjacent drilled cover bolts to ensure the cover cannot be removed without breaking the seal.
 - b) Install a suitable legal handle seal through the handle shaft, behind the cotter pin, so that the handle coupler cannot be removed from the handle shaft.



8.3 Automatic Temperature Compensation (ATC): models 500L, 200

In addition to electronic calibration, the Automatic Temperature Compensator will compensate the volume of product delivered to the equivalent volume at 15°C. The following procedure can be used to verify the operation of the ATC and provide an approximate calibration verification.

1. Use a tank that has small amount of propane in it. Weigh the tank with the dispenser hose connected, after running a small amount of product.
2. Open front panel housing of dispenser. Turn the ATC inspection switch ON, to enter ATC display mode.

TABLE 12 - MICON HEAD ATC DISPLAY CONTROL SWITCH

MICON MODEL #	ATC DISPLAY LOCATION
M500L	ATC DISPLAY TOGGLE SWITCH IS LOCATED AT SIDE OF MICON HEAD BASE.
M200L	ON THE BACK SIDE OF THE FRONT DISPLAY. TO IDENTIFY WHICH OF THE TWO DISPLAYS IS FRONT: <ul style="list-style-type: none"> • FRONT DISPLAY IS CONNECTED TO ALL 9 WIRES. (OPTICAL SENSOR CONNECTIONS ARE USED AT FRONT DISPLAY ONLY.) • REAR DISPLAY IS CONNECTED TO 6 WIRES.
M100I (OLDER MODELS)	ON THE BACK SIDE OF REAR DISPLAY. THE DISPLAY THAT HAS THE 3 WIRE HARNESS GOING TO IT.

3. Dispense a convenient volume of product into the tank from the KRP™ LPG dispenser and record the temperature and weight of the product in the tank, with the hose connected.
4. The volume indicated on the display in ATC mode, is the uncompensated volume. This volume should agree directly with the volume weight measured in the test tank.
5. Compare the compensated volume of fuel dispensed (i.e., volume corrected to legal product temperature of 15°C); to the uncompensated fuel volume. Using the fuel temperature previously recorded, calculate the difference.
6. Return the ATC switch to the regular position.

This completes the testing of the ATC. If you encounter any difficulty please contact your service representative. Do not use steps 1 to 6 (preceding) for legal calibration.



ATTENTION

ALL CALIBRATION MUST BE PERFORMED COMPLETELY WITH *MEASUREMENT CANADA*, AN AGENCY OF INDUSTRY CANADA, APPROVED TEST PROCEDURES.



CAUTION

HIGH VOLTAGE IS PRESENT INSIDE THE EXPLOSION PROOF ENCLOSURE. TAKE NECESSARY PRECAUTIONS TO AVOID ELECTRICAL SHOCK AND/OR PERSONAL INJURY.

8.3.1 SKIL 291 ATC Board Replacement: model 200 only



ATTENTION

ATC (AUTOMATIC TEMPERATURE COMPENSATION) BOARD IS BUILT INTO THE SKIL 463 MAIN BOARD ON THE MICON 500L.

1. Remove the SKIL 350 control board (as described in section 9.4.
2. Unplug the SKIL 291 ATC board from P3 connection on the SKIL 350 board.
3. Disconnect all applicable connectors from the SKIL 291 board and remove.



NOTE

THE SWITCH SETTINGS ON THE NEW BOARD MUST BE CHANGED TO COINCIDE WITH THE SETTINGS ON THE DEFECTIVE BOARD. IN ADDITION, THE PROGRAMMABLE CHIP, WHICH IS RESIDENT ON THE SKIL 291 BOARD, IS UNIQUE TO THE VARIOUS TYPES OF INSTALLATIONS.

4. Install the replacement board, ensuring that all applicable connectors are properly aligned and secured.
5. Install cover and displays. Check MICON 200 for proper operation.
6. Check MICON 200 for proper operation.
7. Place pump handle in the ON position.
8. Place the ATC selector switch on display in the DOWN position.

9. Observe the top readout on the same display. The probe temperature or calibration % factor (depending on the position of switch #10 on the SK291 board) must be displayed to signify system is functioning properly.
10. Perform a functional test on the unit to ensure proper operation.
11. Return the ATC selector switch to the normal (UP) position.

9.0 MICON Models 500L, 200 Subassembly Replacement Procedures.

9.1 Standby Battery Measurement: models 500L, 200

Under normal operating conditions the 6 volt standby battery will last at least 5 years. The life of the standby battery will be shortened considerably if improper charging voltage is applied or MICON register is operated for prolonged periods on battery power.

The main control board (SKIL 463 for M500L; SKIL 350 for M200) has a *low battery detect* circuit which causes the red status indicator on the front register display to turn ON and OFF approximately once per second (in battery back-up mode). MICON register goes into battery back-up mode when AC power is turned OFF at breaker box, and dispenser handle shaft is positioned flat side UP.

The condition of the standby battery should be verified in the following manner:

1. Turn OFF the 120 VAC (230 VAC European) head power.
2. The display read-out should flash off and on for 60 seconds and the red status indicator on the front display should remain OFF to indicate satisfactory condition of battery.
3. Turn ON the 120 VAC (230 VAC European) head power.



ATTENTION

THE INTERNAL BATTERY WILL SELF DISCHARGE DURING STORAGE. THEREFORE, DEPENDING ON THE DEGREE OF DISCHARGE, IT MAY BE NECESSARY TO ALLOW BATTERY TO CHARGE FOR UP TO 8 HOURS BEFORE CONDUCTING THE ABOVE TEST.

If the battery condition test indicates the battery is not properly charged, the charging circuit may be defective.

Battery charger verification:

1. Remove the bolts and cover from the MICON explosion proof housing.
2. Measure the voltage at:
 - Pin #2 of connector P1 on the SKIL 463 control board for **model M500L**
 - TP1 on the SKIL 350 control board for **model M200**

In each case, the negative lead of the voltmeter should be connected to the case.

The charging voltage varies slightly with temperature (It should read from 6.9 to 7.1 volts with no battery connected. Reading should be 6.5 volts and climbing with battery connected).

An improper voltage at this test point indicates a defective control board.

9.2 Standby Battery Replacement: models 500L, 200

1. Record the electronic totalizers and remove the main control board (SKIL 350 or SKIL 463) by following steps 1-7.
2. Disconnect the positive and the negative leads from the internal 6.0 volt standby battery.
3. Remove the defective battery.
4. Connect new battery to positive and negative leads.
5. Re-install the main control board, ensuring that the connectors are properly aligned and secured.
6. Re-install the cover, tightening all 14 bolts. (Before installing the cover, ensure MICON pumphead is operating properly.)

9.2.1 Communicator Battery Replacement



COMMUNICATOR

1. Remove the screw on the back of the communicator to expose the 9V transistor battery.
2. Unplug the battery and replace with a new 9V transistor battery.
3. Install battery into the case, close and replace screw.

9.3 Microswitch and Authorize Relay Operation Check

The pump handle, which is mechanically coupled to the MICON electronic head, actuates one internal micro switch and the authorize relay (early MICON 200's used two micro switches). The correct mechanical and electrical operation of this system can be verified in the following manner:

1. The ON/OFF operation of the pump handle should allow the coupler assembly to travel fully between the stops on the side of the computer. This operation must also rotate the actuator shaft a full 90°.
2. Connect 120 VAC (230 VAC European) supply to the BROWN #14 lead (#20 lead European), which authorizes input. Moving the pump handle from the OFF to the ON position should cause the head to reset. This verifies the proper electrical operation of switches S1 and authorize relay / S2.
3. *If microswitches are not operating properly:*

Connect 120 VAC (230 VAC European) to the BROWN #14 lead (#20 lead European) as in Step 2. Place the pump handle in the OFF position. Measure the voltage on the #15 lead (#19 European), authorize output. Measure with respect to neutral. A reading of zero VAC should be obtained. Place the pump handle in the ON position. A reading of 120 VAC (normal; 230 VAC European) should be obtained on the #15 lead (#19 lead for European). This check verifies the correct operation of microswitch S2/ authorize relay. S1 switches the battery voltage.

9.3.1 Microswitch Replacement: older model 200 only

1. Remove the SK350 control board as described in section 9.4.
2. Disconnect the red lead from the battery. Remove the coupler assembly and *the actuator shaft that passes through the enclosure (*not necessary with new SK409 switch assemblies, or newer switch assemblies).
3. Remove the nut that secures the switch mounting plate to the side of the housing and swing the mounting plate up in order to access the microswitch screws. (In the case of SK409, or newer assemblies, replace entire assembly.)
4. Desolder the appropriate leads and replace the defective switch.
5. Reverse the above procedure to reassemble the unit.



HIGH VOLTAGE IS PRESENT INSIDE THE EXPLOSION PROOF ENCLOSURE. TAKE NECESSARY PRECAUTIONS TO AVOID ELECTRICAL SHOCK AND/OR PERSONAL INJURY.

9.4 Control Board Replacement (SKIL 463 board: M500) (SKIL 350 board: 200) North American and European

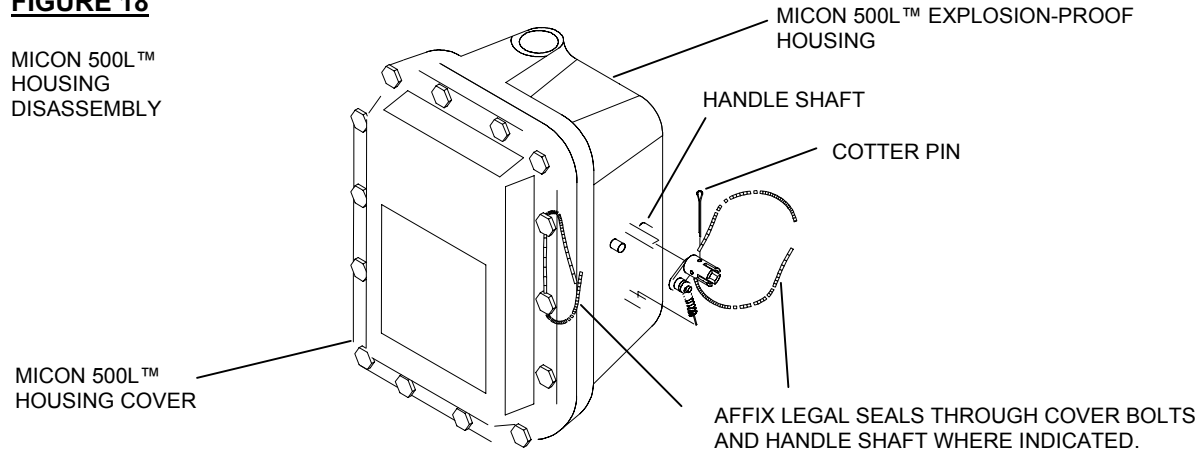
1. Take MICON pumphead totalizer readings.
2. Disconnect the power supply to pump motor and solenoid power input wires, authorize input wire and authorize output wire as indicated in Table 13.
3. Remove cotter pin from handle coupler and rotate handle shaft with flat side down to disconnect battery power.

TABLE 13 – WIRE DISCONNECTS FOR MICON 500L™ MAIN CONTROL BOARD REPLACEMENT

SKIL 350 Control Board (M200)	SKIL 463 Control Board (M500)	European Control Board
Disconnect 120 VAC power supply to:	Disconnect 120 VAC power supply to:	Disconnect 230 VAC supply to:
wire #7 – BLACK - pump motor input	wire #7 – BLACK – pump motor and solenoid input	wire #4 - pump motor and solenoid input
wire #14 – BROWN – authorize input	wire #14 – BROWN – authorize input	wire #20 – authorize input
wire #20 – VIOLET – solenoid input		

4. Remove the cover from the MICON explosion proof housing.
5. Remove the main fuse (F1).
6. Remove the 2 screws securing the control board to the enclosure.

FIGURE 18



7. Disconnect all applicable connectors in order to remove the control board.
8. Install the replacement board, ensuring that the connectors are properly aligned and secured.
9. Finally, re-install the cover, tightening all 14 bolts. (Before installing the cover, ensure MICON pumphead is operating properly.)



ATTENTION

WHEN THE MICON ELECTRONIC RETROFIT COMPUTER IS USED IN RETAIL TRADE, *MEASUREMENT CANADA*, A DEPARTMENT OF INDUSTRY CANADA, MUST BE NOTIFIED OF THE INSTALLATION OR SERVICE OF THIS UNIT.

WHEN ELECTRONIC CALIBRATION OR ATC IS USED, THE ENCLOSURE COVER MUST BE SEALED BY AN INSPECTOR AND THE UNIT MUST BE REINSPECTED IF THE SEAL IS BROKEN. LEGAL SEALS MUST BE AFFIXED THROUGH THE HANDLE SHAFT AND COVER BOLTS AS INDICATED IN FIGURE 18.

9.5 Display Assembly Replacement: models 500L, 200

1. Unplug all display harnesses and remove the 2 mounting screws that secure the face plate to the cast aluminum base (applies to low style dispensers only).
2. Install the new display assembly. Re-attach connectors harnesses. Ensure that the connectors are not misaligned or interchanged.
3. Verify the display assembly is functioning correctly.

9.6 Pulser Assembly Replacement

If troubleshooting procedures indicate a defective pulser board and / or disk then the entire base assembly should be replaced as described in steps 1-6, as follows:



THESE PROCEDURES DO NOT APPLY TO REMOTE PULSERS.

1. Remove the MICON face plates.
2. Unplug the harness that enters the pulser housing.
3. Remove any other necessary hardware in order to slide the base out from under the explosion proof housing (it may be necessary to loosen the conduit coupling to lift the tub assembly).
4. Install the new base assembly.
5. Reassemble the MICON. Connect the wire harness.



REVERSE POLARITY OF THE TWO SIGNAL LINES: WHITE WIRE PROVIDES LEADING DIGITAL SIGNAL; YELLOW WIRE PROVIDES LAGGING DIGITAL SIGNAL. IF POLARITY OF THESE TWO WIRES IS NOT CORRECT, SOLENOID VALVE WILL SHUT OFF WHENEVER FLOW IS DETECTED.

6. Test the dispenser for proper operation.

10.0 Meter Maintenance

For sustained accuracy of the meter, little maintenance is required other than to ensure proper conditions of operation are preserved. Should any malfunction develop, do not dismantle the meter until the cause of the trouble has first been determined. Refer to Troubleshooting, section 11, and repair, if necessary.

Having the following elements present in the dispensing system may prevent the meter from operating properly:

1. Sediment

The liquid passing through the meter measuring chamber must be free of grit and other forms of sediment to prevent unnecessary friction, as well as to eliminate scoring of the piston and chamber walls. Evidence of trouble from this source will be found in under-registration of the meter. Periodic cleaning and inspection of the meter strainer will help prevent such occurrences.

2. Vapor

Meters measure volume and therefore record the passage of vapors, as well as the liquid being measured. Over-registration results from passage of vapor through meter. Where this condition exists, check the adequacy of the vapor elimination system.

3. Water

Incidental water will cause no damage to the meter. When water is allowed to remain in the meter, condensation and/or freezing can occur, resulting in meter damage.

4. Erratic Registration

Erratic registration can be caused by:

- vaporization of the product
- faulty differential valve or vapor release valve (over-registration)
- dirt or pipe scale in the measuring chamber (under-registration).

1. Clean the meter, if necessary, as directed in meter maintenance manual.
2. If meter continues to creep at beginning of sale when outlet valve is closed, check:

- **differential valve seal**
- **check valve**
It may be necessary to install a one-way check and high pressure relief valve after solenoid valve, outside dispenser, at point where hose screws into cabinet.
- **INFO-PAC *SUPPRESS* setting; ensure it is not turned OFF.** As described in the INFO-PAC MICON 500L Programming manual, the *SUPPRESS* setting enables or disables suppression, and determines the quantity of suppression units at reset.

INFO-PAC setting choices are:

SUPPRESS 0.030 (default)

For first 0.029 units of liquid fuel dispensed, MICON 500L sale register display shows ZERO. For 0.030 units and over, the sale amounts are displayed.

SUPPRESS 0.009

For first 0.008 units of liquid fuel dispensed, MICON 500L sale register display shows ZERO. For 0.009 units and over, the sale amounts are displayed. (This is the maximum suppression allowed for sales registered in U.S. gallons.)

SUPPRESS 0.000

MICON 500L sale register display shows the sale amount. Suppression is turned OFF.

If meter consistently registers either more or less than is delivered and no other cause in system function can be determined, calibration of the metering system is recommended.

11.0 MICON DISPLAY FAULT CODES

Should an operational error occur while using the MICON 500L electronic register, a fault code will show in the bottom display.

Fault codes are interpreted as shown in Table 14.

Table 14 Micon 500L Fault Codes

ISPLAY CODE	DESCRIPTION OF FAULT	PROBABLE CAUSE	RECOMMENDED ACTION	TO CLEAR FAULT CONDITION
CO26	PULSER FAULT	Missing or disconnected pulser.	Check customer harness lead electrical connections.	1. Correct source of error. 2. Turn handle switch OFF, then ON.
CO27	PULSER BUFFER OVERFLOW FAULT	Input pulses coming in faster than MICON 500L rated to handle. Meter may be programmed for higher pulse per unit (ppu) number than MICON 500L rating.	Ensure meter and MICON 500L flow rates are compatible.	
CO28	DISPLAY DISCONNECT FAULT	LCD (liquid crystal display) lost connection. Display disconnected or improperly connected.	Check connections. If connections are valid, display may require replacement.	
CO29	EEPROM CHECKSUM FAULT	EEPROM corrupted.	Reset pumphead by turning handle switch OFF, then ON. If reset ineffective, reprogram the MICON, using the INFO-PAC. If reset and reprogramming ineffective, internal processor may require replacing. Contact your service representative.	
CO30	EXCESSIVE REVERSE COUNTS	Pulser connected backwards.	Check customer harness lead electrical connections.	
CO31	AMBIENT TEMPERATURE PROBE	Probe has open circuit.	Check probe connections / replace probe.	
CO32	AMBIENT TEMPERATURE PROBE	Probe has short circuit.	Check probe connections / replace probe.	

12.0 Troubleshooting and Repair Guide

If, after installation, the dispenser does not operate as it is supposed to, the following tables should be consulted **before** calling your service representative.



ATTENTION

AFTER CORRECTING SOURCE OF ERROR, A RESET CYCLE IS REQUIRED TO CLEAR THE ERROR CODE OUT.

Troubleshooting tables have been divided alphabetically into the following 8 categories:

1. communicator
2. display
3. flow
4. leakage
5. pressure
6. (MICON) pumphead power
7. pump motor and/or solenoid valve
8. registration

1. COMMUNICATOR

Problem	Possible Cause	Recommended Action
1.1 Unable to read totals or price setting with the communicator, but it functions normally with other MICON heads.	Defective optical reader on the display board.	Replace display board as described in section 9.5.
	Defective display wiring harness.	Replace harness.
	Defective KIL 350 control board (M200). Defective KIL 463 control board (M500L).	Contact your service representative to order new board. Follow replacement guidelines in section 9.4.
	Contact your service representative for communicator upgrade or replacement.	Older communicators may not work on newer MICONs, the communicator may need to be replaced or modified.
1.2 Communicator exhibits poor range when attempting to set prices or read totals on all MICON heads.	Optical reader is in direct sunlight.	Shade optical reader with hand.
	Weak or dead battery in communicator.	Unscrew back of communicator and replace 9 volt transistor battery.

TROUBLESHOOTING AND REPAIR GUIDE

2. DISPLAY

Problem	Possible Cause	Recommended Action
2.1 Backlighting is out and display blinks slowly on and off with pump handle in the ON position.	The breaker supplying power to wire #1 has been tripped.	Re-trip breaker.
	No head power.	Check 120 VAC (230 VAC European) supply to wire #1 (hot) and wire #2 (neutral).
	Blown fuse.	Check and replace as needed.
	Defective KIL 350 control board (M200). Defective KIL 463 control board (M500L).	Contact your service representative to order new board. Follow replacement guidelines in section 9.4.
	Defective Transformer or EMI filter.	Replace as required.
2.2 Displays immediately turn blank when 120 VAC head power is disconnected.	Dead or low battery.	Follow standby battery measurement guidelines in section 9.1 page 61. If battery does not recharge, contact your service representative.
	Defective KIL 350 control board (M200). Defective KIL 463 control board (M500L).	Contact your service representative to order new board. Follow replacement guidelines in section 9.4.
	Handle shaft is in the wrong position.	Position handle shaft flat side up (normal handle off position).
2.3 Segment(s) on display board are staying ON all the time or missing entirely. One display or all displays reading 8's. Other display board reads correctly.	Defective display board.	Unplug display boards from the MICON head one at a time and observe display to isolate defective board.
	Defective display wiring harness.	Unplug wire harness from MICON head and check connections.

TROUBLESHOOTING AND REPAIR GUIDE

2. DISPLAY (cont'd)

Problem	Possible Cause	Recommended Action
2.4 Both display boards reading 8's or erroneous segments being displayed.	Defective display board.	Unplug display boards from the MICON head one at a time and observe display to isolate defective board.
	Defective display wiring harness.	Unplug wire harness from MICON head and check connections.
	Defective KIL 350 control board (M200). Defective KIL 463 control board (M500L).	Contact your service representative to order new board. Follow replacement guidelines in section 9.4.
2.5 MICON displays will not reset to zero when pump handle ON. Product is dispensed; previous sales are added onto first.	Switch S1 is not disengaging when the handle is turned OFF.	The pump handle is mechanically coupled to the electronic head, and actuates two internal switches. Verify correct operation of internal microswitches #1 and #2 as described in section 9.3.
2.6 MICON front display LED is flashing once per second while in battery back-up mode.	Low battery.	Follow standby battery measurement guidelines in section 9.1. If battery does not recharge, contact your service representative.



REMINDER

AFTER CORRECTING SOURCE OF ERROR, ALWAYS TURN DISPENSER HANDLE SWITCH OFF, THEN ON.

3. FLOW

Problem	Possible Cause	Recommended Action
<p>3.1 Pump motor starts and solenoid is energized, but no delivery results. (Note: Solenoid valve normally “clicks” once when open/energized. However, “click” may be heard, and valve may still not be energized. To test, hold a wrench against the solenoid coil. If it becomes magnetized, solenoid is energized.)</p>	<p>Not all ball valves are opened. This operating error occurs frequently.</p> <p>Diaphragm in the differential valve is broken.</p> <p>Piston in the differential valve is blocked in the closed position. This problem commonly occurs with Schwelm™ meters.</p> <p>Jammed meter. This problem can occur with all meter types.</p>	<p>After initial system hook-up, always open all lines.</p> <p>Replace the damaged diaphragm. In the case of a Schwelm™ meter, remove bolts and contact your Kraus service representative for a new diaphragm.</p> <p>In the case of a calibrated unit, replace the complete differential valve (and obtain re-stamping).</p> <p>Free piston or replace the complete differential valve (and obtain re-stamping).</p> <p>Replace the meter. Precision is affected; therefore meter not serviceable.</p>
<p>3.2 MICON accumulating a sale with closed delivery nozzle.</p>	<p>Diaphragm in the differential valve is broken, causing “creepage”.</p>	<p>Replace the damaged diaphragm. In the case of a Schwelm™ meter, remove bolts and contact your Kraus service representative for a new diaphragm.</p> <p>In the case of a calibrated unit, replace the complete differential valve (and obtain re-stamping).</p>



REMINDER

AFTER CORRECTING SOURCE OF ERROR, ALWAYS TURN DISPENSER HANDLE SWITCH OFF, THEN ON.

TROUBLESHOOTING AND REPAIR GUIDE

3. FLOW (cont'd)

Problem	Possible Cause	Recommended Action
<p>3.3 Pump motor starts, but there's no flow. (Problem may only occur when temperature outside is below freezing.)</p>	<p>Obstruction in vapor vent between the differential pressure valve and the vapor space in tank.</p> <p>Differential valve may be frozen or dirty. Same problem may exist with the solenoid valve although solenoid valve may sound as if it is working.</p>	<p>Check for obstruction and clear.</p> <p>Check for product flow. Turn pump ON then OFF several times. If still no flow, check:</p> <ol style="list-style-type: none"> 1) Differential Valve: Turn dispenser ON. Place hand near differential valve; listen/feel for shuttle movement. If movement detected, loosen copper line at differential valve flange SLOWLY. If vapor is present, differential valve is operating properly. If liquid is present, change lip seals in meter. If shuttle movement is not initially detected, shuttle may be very slightly out of alignment with differential valve opening. Realign. 2) Solenoid valve: Turn dispenser ON. Solenoid resets; listen for the "click". "Click" may be heard and solenoid valve may still not be energized. To test, hold a wrench against the coil. If it becomes magnetized, solenoid is energized. If the solenoid is not energized and appears frozen, bleed down system to unfreeze solenoid.

CONT'D NEXT PAGE



REMINDER

AFTER CORRECTING SOURCE OF ERROR, ALWAYS TURN DISPENSER HANDLE SWITCH OFF, THEN ON.

3.0 FLOW (cont'd)

Problem	Possible Cause	Recommended Action
3.4 Unsatisfactory flow rate or complete stoppage of flow.	The pump is too small or insufficient. The pump must have sufficient capacity and pressure to pump against higher heads than are normally found in gasoline or fuel oil installations. This is especially true when the delivery nears completion.	Install replacement pump with sufficiently high capacity and pressure.
	Pump vapor bound.	Check bypass relief valve setting.
	High loss of head pressure.	Check length, diameter and condition of delivery hose. Ensure too many valves and elbows are not present in the lines.
	Pressure buildup in the tank being filled. Conditions worsen as the delivery nears completion.	Do not overfill tank.
	Blocked strainer or meter piston is stuck.	If using Schwelm™ meter, remove blockage or reposition meter. If using Neptune™ meter, bleed down and remove/clean strainer measuring chamber.
	There is an open valve in the piping allowing liquid to circulate around the pump.	Check for stuck valve; check for valve installed backwards.
	Worn pump.	Replace pump.
	Defective nozzle.	Replace nozzle.

4. Leakage

Problem	Possible Cause	Recommended Action
4.1 Leakage in the system between the delivery system and tank.	Stresses in piping and fitting system.	Promptly switch OFF current, close all ball valves and start safety precautions.
	Use of unsuitable sealing material.	Use Teflon™ sealing tape or pipe dope.

TROUBLESHOOTING AND REPAIR GUIDE

5. Pressure		
Problem	Possible Cause	Recommended Action
5.1 Safety valve relieves with the pump running and closed delivery nozzle due to pressure build-up.	<p>Pump bypass valve is locked in the closed position, not permitting excess pressure to exit to tank.</p> <p>Not all ball valves are opened. This operating error occurs frequently.</p>	<p>Make the bypass valve operative (using only finishing material) or replace.</p> <p>After initial system hook-up, always open all lines.</p>
5.2 Safety valve relieves with the pump running and under normal pressure – approx. 200 psi.	<p>Safety valve is contaminated or loose due to foreign matter.</p>	<p>Remove safety valve and clean or replace if defective.</p>
5.3 Pressure gauge shows no reaction in case of pressure changes.	<p>Defective pressure gauge.</p>	<p>Replace pressure gauge.</p>
5.4 Delivery and pressure (at the pressure gauge) in the delivery system is too low.	<p>Bypass valve set to a pressure below the value prescribed.</p> <p>Strainer upstream of pump or filter in dispenser contaminated.</p> <p>Diaphragm in the differential valve is broken.</p> <p>Bypass valve is locked in the open position.</p>	<p>Regulate bypass valve.</p> <p>Clean filter or strainer with gasoline and blow out with compressed air.</p> <p>Replace the damaged diaphragm or, in the case of a calibrated unit, the complete differential valve (and obtain re-stamping).</p> <p>Attempt to unlock valve. If differential valve is stuck open, too much pressure will escape through by-pass valve. If valve will not unlock, replace.</p>
5.5 Following bleeding down dispenser, after decompression of the liquid the vapor occurs again.	<p>Decompression of liquid phase effected too quickly (strong icing).</p>	<p>Decompression must only be effected <i>slowly and carefully</i>.</p>

6. MICON (PUMPHEAD) POWER

Problem	Possible Cause	Recommended Action
6.1 MICON keeps tripping breaker.	Blown varistor. Possible line short on wire #1 (underground).	Replace EMI filter/varistor (120V: part #V140LA10A; 240V: part #S14K275). Have qualified personnel test for short; repair/replace wire as needed.
6.2 MICON shuts OFF during delivery.	various	Move pump handle from OFF to ON position to reset dispenser.
6.3 MICON shuts OFF at beginning of delivery.	Reversed pulser lines. (Observe the PPU (price per unit) display in the MICON. If fault code CO30 displays, problem is excessive reverse counts, caused by backward connected pulser. No pulses being generated (pulser). (Observe the PPU [price per unit] display in the MICON. If fault code CO26 displays, problem is missing or disconnected pulser.) Observe the PPU (price per unit) display in the MICON. If fault code CO27 displays, problem is pulser buffer overflow fault.	Reconnect pulser assembly as indicated in section 9.6, page 66: connect WHITE wire where YELLOW located; connect YELLOW wire where WHITE located. Reconnect pulser assembly as indicated in section 9.6, page 66. Micro motion meter may be programmed for higher <i>ppu</i> than MICON rating. Ensure micro motion meter and MICON flow rates are compatible.



REMINDER

AFTER CORRECTING SOURCE OF ERROR, ALWAYS TURN DISPENSER HANDLE SWITCH OFF, THEN ON.

TROUBLESHOOTING AND REPAIR GUIDE

7. PUMP MOTOR AND/OR SOLENOID VALVE

Problem	Possible Cause	Recommended Action
7.1 No reset cycle, pump motor and/or solenoid valve will not turn on when handle is placed in the ON position. Previous sale is not cleared when handle is turned ON.	Defective or inoperative linkage to MICON handle shaft (detent). No authorize input voltage. Defective internal microswitch and/or authorize relay (main board) inside MICON head.	Replace linkage. Check for 120 VAC on wire #14 or #15. (European: Check for 240 VAC on wire #20 or #19.) Contact your service representative to order new microswitch. Follow replacement guidelines in section 9.3.
7.2 Pump motor and/or solenoid valve will not turn on when handle is placed in the ON position. Reset sequences displaying 8's and clearing last sale.	If both pump motor and solenoid valve are not coming on, most likely the problem is a defective temperature probe (ATC only) No power supplying the internal triacs. One of the triacs in the control board (M200: KIL 350) (M500L: KIL 463) is physically burnt.	Check the PPU (price per unit) display in the MICON 500L. If fault code CO31 displays, problem is disconnected temperature probe. If fault code CO32 displays, problem is short circuited temperature probe. Check for 120 VAC (230 VAC European) on motor and solenoid input wire. Check output power on wire #6 (solenoid) or wire #8 (motor). European: Check output power on wire #5 (solenoid) or wire #3 (motor). Check for a short circuit on either the motor, solenoid or dead man switch.
7.3 Pump motor is always ON when the handle is in the OFF position (new installation).	If the motor is controlled by the MICON, detent is in the wrong position. Shorted triac	Remove cotter pin and rotate detent to opposite position (Normally, handle OFF, battery on = Flat side UP.) Replace main control board.



REMINDER

AFTER CORRECTING SOURCE OF ERROR, ALWAYS TURN DISPENSER HANDLE SWITCH OFF, THEN ON.

8. REGISTRATION

Problem	Possible Cause	Recommended Action
8.1 Product can be dispensed but it's not registering on either the mechanical totalizer or electronic display.	Defective Meter	Repair or replace
	Inoperative drive to MICON input shaft.	Repair drive.
	Stripped or loose gears on MICON base. This only occurs when direct drive meters are used (i.e., those that do not use a remote pulser).	Replace MICON base.
	Broken coupling between the meter and electronic register.	Replace coupling.
8.2 Product flow registering only on mechanical totalizer.	Defective MICON base (pulser).	Replace MICON base.
	Defective ATC or main board.	Replace main board as needed.
8.3 MICON registering incorrectly (new installation or board replacement only).	Incorrect ATC (automatic temperature compensation).	Follow ATC board replacement guidelines in section 8.3.
	Incorrect IN COUNT OR MULTIPLIER setting (INFO-PAC: M500L only).	Consult INFO-PAC MICON 500L Programming Manual (document number: 206KT00.PRG).
8.4 MICON registering erratically.	Vapor release valve failing to close, causing differential valve to remain closed or open slightly.	Check vapor release valve. Ensure vent line connection to supply tank is a minimum of ¼" in diameter. Any orifice or partially closed valve will result in a malfunction of the differential valve.
	<ul style="list-style-type: none"> • Dirt in meter measuring chamber or under seat of measuring chamber. • Badly worn control roller or diaphragm in the meter. • Meter main casing is distorted or damaged. 	Maintain or replace meter as appropriate.

CONT'D NEXT PAGE

TROUBLESHOOTING AND REPAIR GUIDE

8. REGISTRATION (cont'd)

Problem	Possible Cause	Recommended Action
8.5 MICON over-registration (erratic).	Leaking o-ring on the differential valve. Vapor release valve jamming, allowing vapor to pass through meter (Schwelm™ meters only).	Replace o-ring. Check vapor release valve.
8.6 MICON is losing its price settings and totals.	Low battery.	Follow standby battery measurement guidelines in section 9.1. If battery does not recharge, contact your service representative.
8.7 MICON totals are jumping or the price is changing by itself.	Low battery. Defective KIL 350 control board (M200). Defective KIL 463 control board (M500L).	Follow standby battery measurement guidelines in section 9.1. If battery does not recharge, contact your service representative. Contact your service representative to order new board. Follow replacement guidelines in section 9.4.
8.8 The electronic register increments with closed delivery nozzle after pump motor has started.	Defective diaphragm in differential. Gas phase in meter. Gas phase in the liquid phase between meter and delivery nozzle due to leakage.	CONT'D NEXT PAGE Replace differential. Clean the gas separator nozzle. Clean the gas separator nozzle; eliminate leakage. Shield installation from excessive sunlight.
8.9 The electronic register and meter run slowly in reverse order, although the pump is out of operation.	The back check valve between the dispenser inlet and the meter may not be seating properly, allowing product to escape. Even a small metal filing can prevent seating.	Clean back check valve or replace if necessary. CONT'D NEXT PAGE



REMINDER

AFTER CORRECTING SOURCE OF ERROR, ALWAYS TURN DISPENSER HANDLE SWITCH OFF, THEN ON.

8.0 REGISTRATION

Problem	Possible Cause	Recommended Action
8.10 Jerky operation of electronic register and meter.	Displaced control sliding disc in piston meter/Schwelm™ type.	Replace piston meter (control sliding disc may only be adjusted with special tools).
	Product is in a vapor phase within the meter. (Excessive exposure of the installation to sunlight <i>may</i> cause the vaporization.)	Clean the gas separator nozzle and/or shield installation from excessive sunlight.
	Gas phase in the liquid phase between meter and delivery nozzle due to leakage.	Clean gas separator nozzle or eliminate leakage.



REMINDER

AFTER CORRECTING SOURCE OF ERROR, ALWAYS TURN DISPENSER HANDLE SWITCH OFF, THEN ON.

TECHNICAL DATA: MICON MODELS 500L,200

13.0 Technical Data: MICON models 500L, 200

(Specifications are at 25°C, unless otherwise noted)

Electrical Data: models 500L, 200	
Electronic Computer Types	<ul style="list-style-type: none">• MICON model 500L with ATC (Automatic Temperature Compensation)• MICON model 200 with ATC
Power Consumption (Operating)	90-120VAC @ 0.4A (max)
Motor Control Output	Up to 15A @ 120VAC (continuous)
Solenoid Control Output	Up to 0.5A @ 120VAC (continuous)
Penny Pulser Output	Solid State Switch 5-30VDC @ 100mA (max) RS = 40Ω Pulser width = 4.0 ms (adjustable)
Volume Pulser Output	As above except 1 pulse per .1 unit. (adjustable)
Authorize Input	90-125VAC @ 80mA (max) ZIN=2.7K Ω capacitive
Battery Life in Power Fail Mode	6 Months (min)

Actual pulse output may lag actual delivery time depending on delivery rate (see pulse width specification). If delivery rate exceeds minimum pulse width specification, pulses will be stored and will eventually be given. Storage rollover will occur at +999 pulses stored.

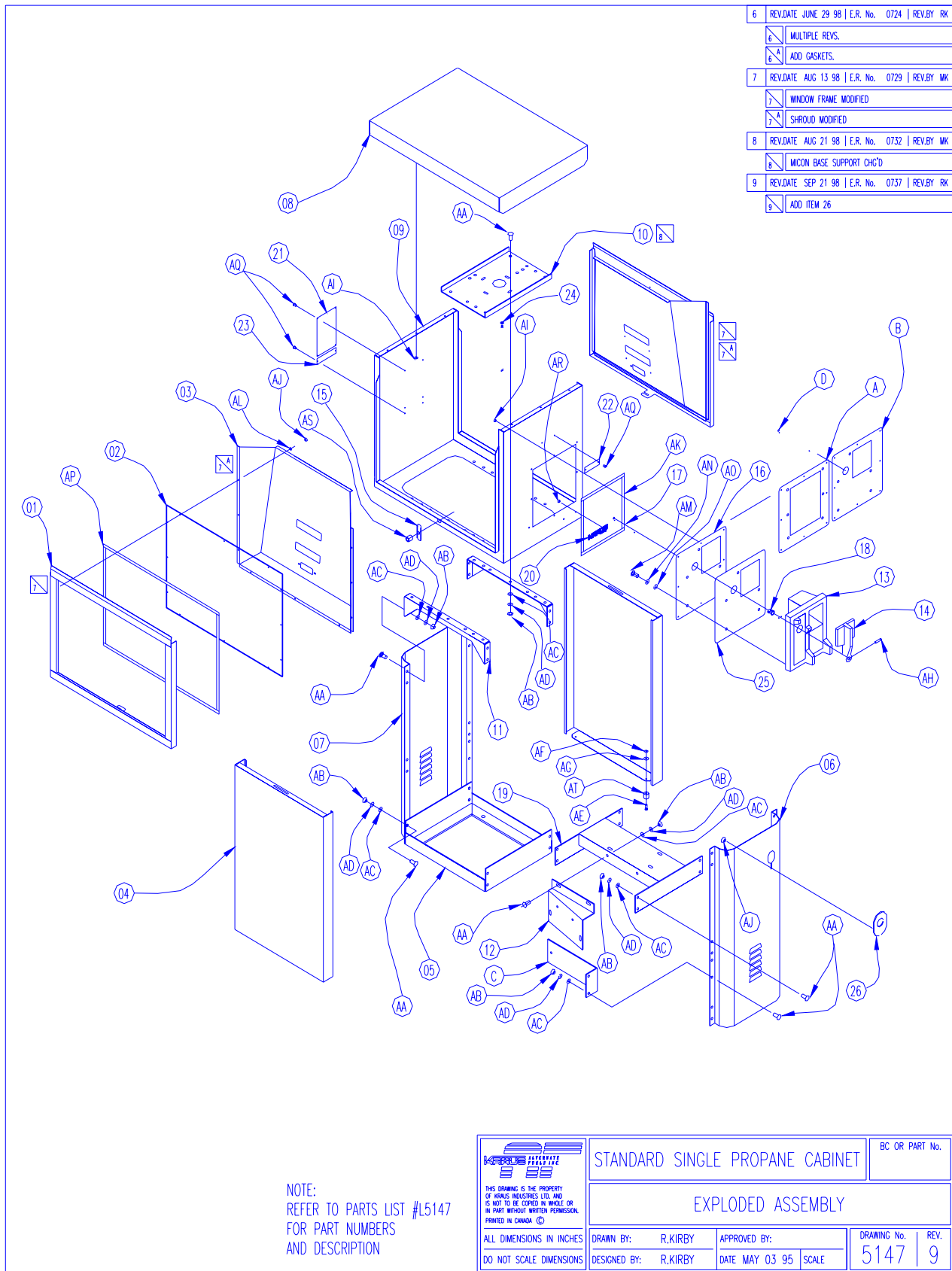
Display (LCD) Data: models 500L, 200	
Viewing Angle	+/- 60° (nominal)
Dollar Volume sale	Up to 9999.99 per sale (+.5 cents max)
Unit Volume sale	Up to 999.999 per sale (.004 units metric +/- .001 units normal)
Total Dollar Volume totalizer	Up to 99999999.99 before rollover
Total Unit Volume totalizer	Up to 9999999.999 units before rollover
Price Setting	0.0 to 9.999 per unit

13.0 Technical Data – models 500L, 200

Mechanical Specifications: models 500L, 200	
Maximum Working Pressure	350 psi
Minimum Accurate Delivery Rate Micon Models 500L, 200 Migas Meter 1174-A Neptune Meter Type 4D Schwelm Meter 840705 :LC Meter MA-5	5 litres/minute / 1.32 US gallons/minute 5 litres/minute / 1.32 US gallons/minute 12 litres/minute / 3.17 US gallons/minute 5 litres/minute / 1.32 US gallons/minutes 23 litres/minute / 6.072 US gallons/minutes
Maximum Accurate Delivery Rate Micon Models 500L, 200 Migas Meter 1174-A Neptune Meter Type 4D Schwelm Meter 840705 LC Meter MA-5	113.52 litres/minute / 30 US gallons/minute 90 litres/minute / 23.77 US gallons/minute 68 litres/minute / 17.95 US gallons/minute 50 litres/minute / 13.20 US gallons/minute 102 litres/minute / 27.92 US gallons/minute
Inlet Fitting Size	3/4 NPT
Vapor Return Size	3/4 NPT

Temperature Data: models 500L, 200	
Operating Temperature	-55°C to +50°C (R.H. 5 to 100% non condensing)
Standby Temperature (1 day)	-50°C to +70°C (R.H. 50% maximum)
Storage Temperature (3 days)	-50°C to +70°C (R.H. 25% maximum)
Storage Temperature (indefinite)	-40°C to +50°C (R.H. 50% maximum)

LPG Volume Change with Temperature: models 500L, 200	
Temperature (°C)	% Volume Change from 15°C
-40	-13.9
-30	-11.5
-20	-9.2
-10	-6.8
0	-4.2
+10	-1.4
+15	0
+20	+1.4
+30	+4.6
+40	+7.7



L5147-12 (E.C.O. No.0737)

PARTS LIST

DATE: 21-Jul-04

PROJECT REF.: STANDARD SINGLE LPG DISPENSER CABINET

DWG. REF.: 5147-9

PARTS

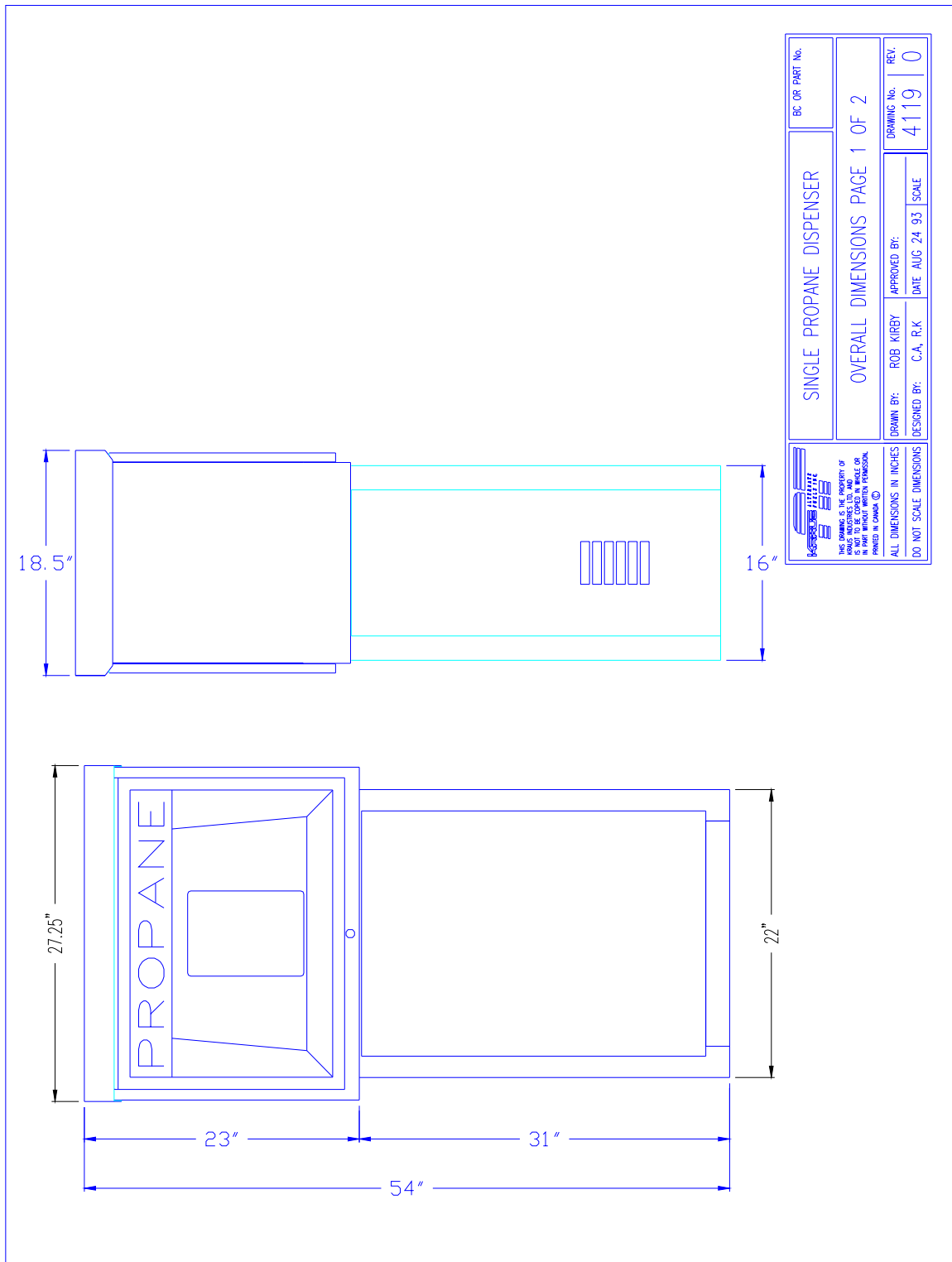
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG. No.	QTY
1.	WINDOW FRAME	11118	BC0605	3720-4	2
2.	WINDOW	11140	BC0616-L	3731-5	2
3.	SHROUD	11189	BC0859	4107-2	2
4.	FRONT PANEL	11114	BC0603	3718-5	2
5.	BOTTOM FRAME	11112	BC0602	3717-3	1
6.	SIDE PANEL OUTLET HOLE	11111	BC0601	3716-5	1
7.	SIDE PANEL	11193	BC0867	4131-3	1
8.	TOP COVER	11177	BC0702	3870-2	1
9.	TOP FRAME	11116	BC0604	3719-9	1
10.	MICON BASE SUPPORT	11133	BC0612	3728-8	1
11.	CROSS BRACE	11650	BC1911	6369-0	2
12.	J BOX BRACKET NEPTUNE	11138	BC0615	6032-3	1
13.	NOZZLE HOLSTER DETENT	11165	BC0673	3848-2	1
14.	ON/OFF HANDLE	BC683	BC0683	3849-2	1
15.	LOCK CLASP	BC622	BC0622	6124-0	2
16.	HOLSTER PLATE NEPTUNE	BC1865	BC1865	6275-0	1
17.	HANDLE LINK NEPTUNE	BC1863	BC1863	6273-0	1
18.	HANDLE SHAFT	BC611	BC0611	3732-6	1
19.	MOUNTING BRACKET NEPTUNE	11196	BC0869	4133-3	1
20.	KRAUS NAMEPLATE	15653	BC1671	5894	1
21.	SPECIFICATIONS PLATE	13614	BC0634	3784-1	1
22.	ON/OFF PLATE	BC489	BC0489	3596-0	1
23.	MICON APPROVAL PLATE (USED IN NORTH AMERICA ONLY)	14607	BC0149		1
24.	NEPTUNE METER LINK	BC1864	BC1864	6274-2	1
25.	NOZZLE HOLSTER GASKET	BC684	BC0684	3852-0	2
26.	OUTLET HOLE COVER PLATE	14584	BC1967	6471-0	1

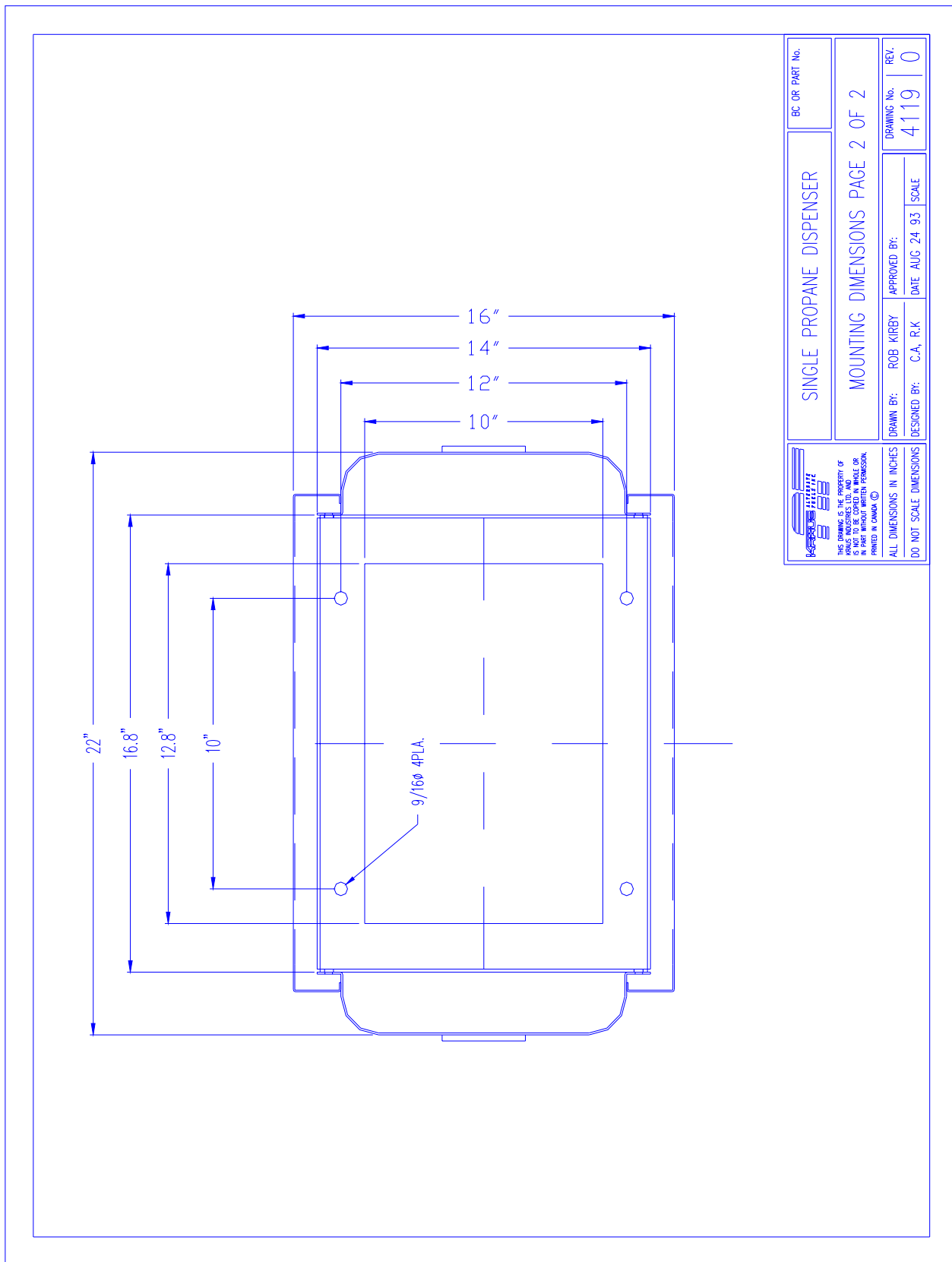
OPTIONAL PARTS

ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG. No.	QTY
A.	HOLSTER PLATE DV-10	11609	BC1866	6276-1	1
B.	HOLSTER PLATE SCHWELM / LC	17020	BC1867	6277-0	1
C.	J BOX BRACKET SCHWELM / LC	BC1868	BC1868	6278-0	1
D.	HANDLE LINK SCHWELM / LC	11142	BC0617	6125-0	1

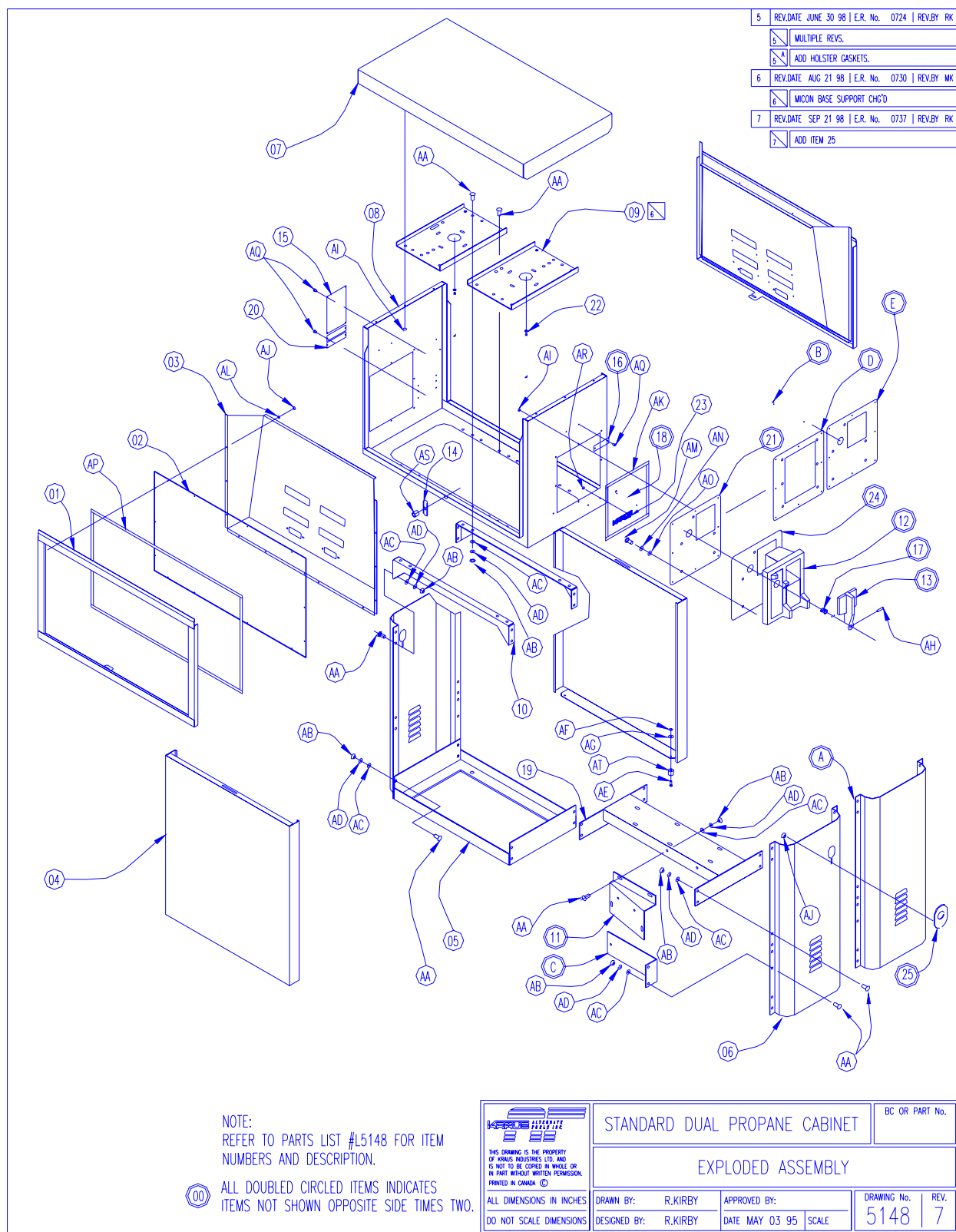
REFERENCE INFORMATION				
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
A 1	ELECTRICAL EXPLODED ASSY. (N1/N2)		5144	
A 2	GAS EXPLODED ASSY.(N1/N2)		4572	
A 3	GROUND CONNECTIONS (N1)		4745	
A 4	ELECTRICAL EXPLODED ASSY.(LC1/LC2)		5412	
A 5	GAS EXPLODED ASSY.(LC1/LC2)		5411	
A 6	ELECTRICAL EXPLODED ASSY.(S1/S2)		4378	
A 7	GAS EXPLODED ASSY.(S1.S2)		5131	
A 8	GROUND CONNECTIONS (S1/LC1)		4485	
A 9	KRP N1 MANUFACTURING PLAN		50000	
A 10	KRP LPG MANUAL		0187	
A 11	MOUNTING AND OVERALL DIMENSIONS		4119	

HARDWARE (PLATED UNLESS SPECIFIED)				
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
AA.	5/16" N.C x 3/4 LG BOLT			36
AB.	5/16" N.C NUT			36
AC.	5/16" FLAT WASHER			36
AD.	5/16" LOCK WASHER			36
AE.	#10-32 x 1/2 LG PAN HEAD SLOT SCREWS STAINLESS			4
AF.	#10-32 NUT STAINLESS			4
AG.	#10-32 LOCKWASHER STAINLESS			4
AH.	SPRING PIN 1/8 x 1.0 LG			1
AI.	#10-32 NUTS K-LOK			14
AJ.	#6-32 NUTS			25
AK.	3/8 x 1/16 TH x 34" LG BLACK CLOSED CELL SPONGE ONE SIDE ADHESIVE			
AL.	#6 FLATWASHERS			24
AM.	1/4 NC X 1/2 LG BOLTS			5
AN.	1/4 LOCKWASHERS			5
AO.	1/4 FLATWASHERS			5
AP.	1/2 x 1/4TH x 164" LG TH BLACK CLOSED CELL SPONGE ONE SIDE ADHESIVE			
AQ.	1/8 x 3/16 LG ALUMINUM POPRIVET			8
AR.	1/8 EXTERNAL RETAINING RING	R6100-12		2
AS.	UTILITY LOCK	ULR625STD5/8		2
AT.	RUBBER FEET	31S-466		4





SINGLE PROPANE DISPENSER		BC OR PART No.	
MOUNTING DIMENSIONS PAGE 2 OF 2		DRAWING No.	
ALL DIMENSIONS IN INCHES		REV.	
DO NOT SCALE DIMENSIONS		4119 0	
DRAWN BY:	ROB KIRBY	APPROVED BY:	
DESIGNED BY:	C.A. R.K	DATE	AUG 24 93
		SCALE	

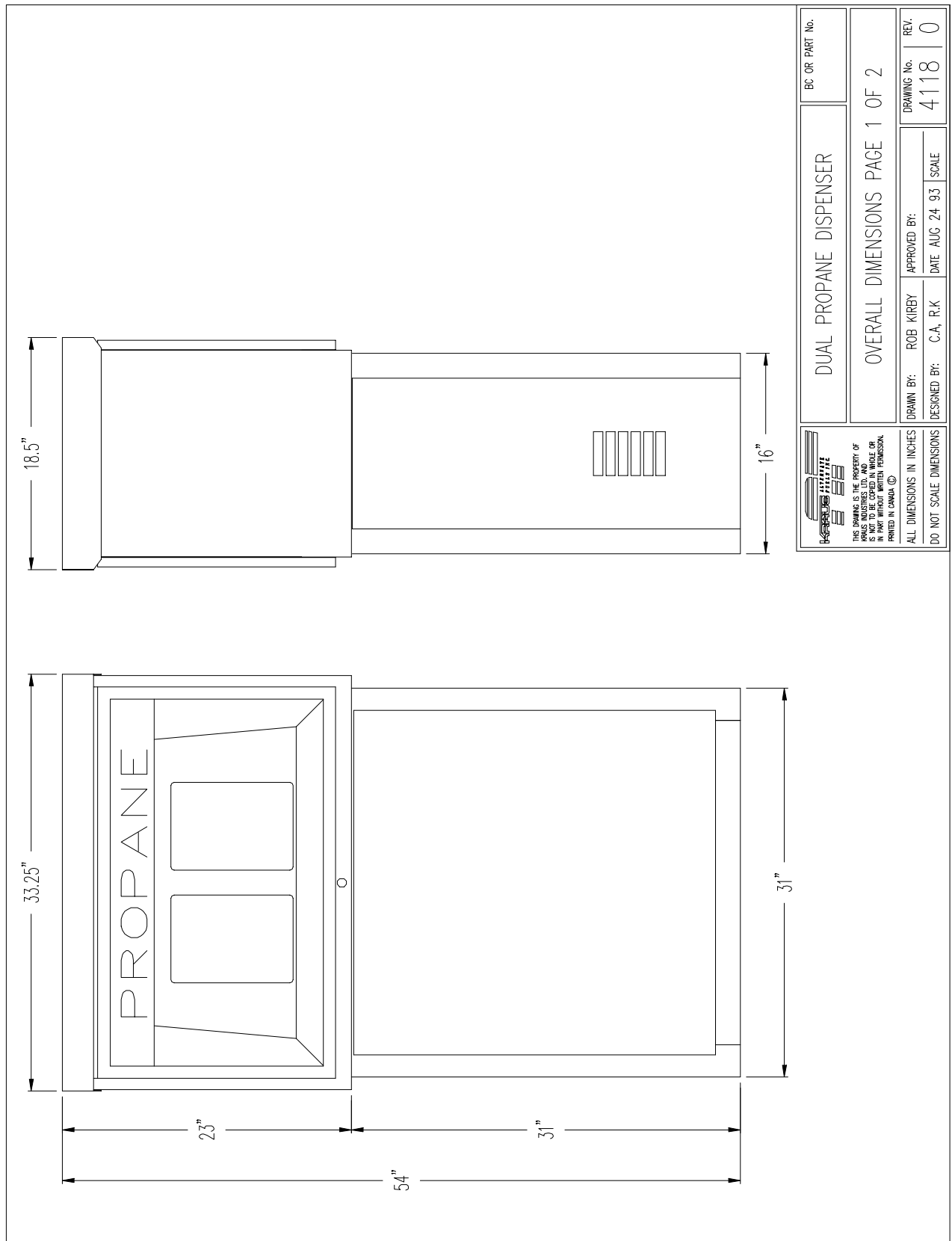


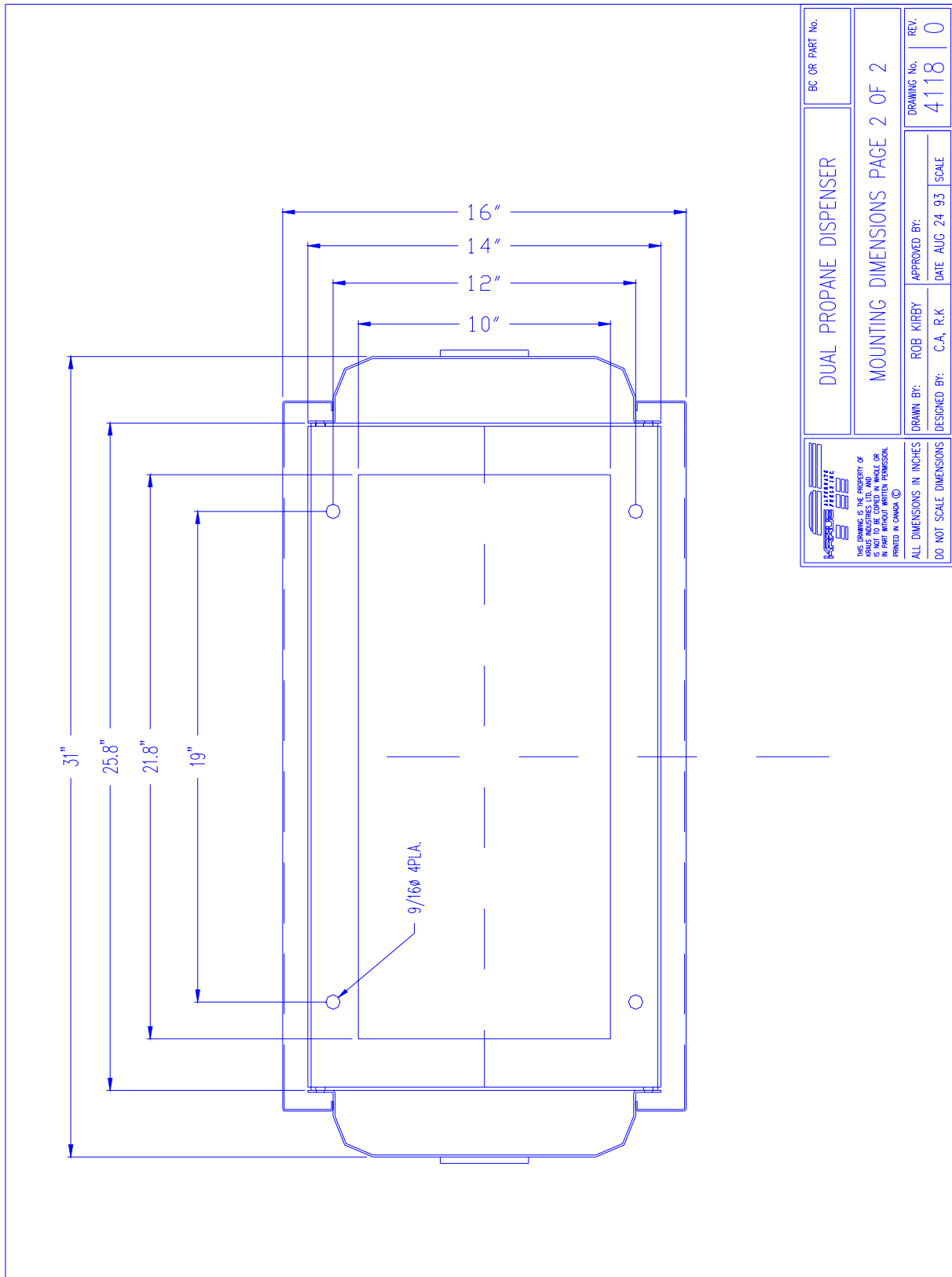
PARTS					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG. No.	QTY
1.	WINDOW FRAME	11148	BC0636	3786-3	2
2.	WINDOW	11154	BC0639-L	3789-5	2
3.	SHROUD	BC860	BC0860	4108-1	2
4.	FRONT PANEL	13021	BC0641	3791-6	2
5.	BOTTOM FRAME	11160	BC0644	3794-4	1
6.	SIDE PANEL OUTLET HOLE	11111	BC0601	3716-5	2
7.	TOP COVER	15570	BC0713	3881-2	1
8.	TOP FRAME	11147	BC0635	3785-11	1
9.	MICON BASE SUPPORT	11133	BC0612	3728-8	2
10.	CROSS BRACE	15414	BC1912	6370-0	2
11.	J BOX BRACKET NEPTUNE	11138	BC0615	6032-3	2
12.	NOZZLE HOLSTER DETENT	11165	BC0673	3848-2	2
13.	ON/OFF HANDLE	12452	BC0683	3849-2	2
14.	LOCK CLASP	BC622	BC0622	6124-0	2
15.	SPECIFICATIONS PLATE	BC0887	BC0887	4151-4	1
16.	ON/OFF PLATE	BC0489	BC0489	3596-0	2
17.	HANDLE SHAFT	BC0611	BC0611	3732-6	2
18.	HANDLE LINK NEPTUNE	BC1877	BC1877	6306-0	2
19.	MOUNTING BRACKET(NEPTUNE)	11194	BC0868	4132-2	1
20.	MICON APPROVAL PLATE	BC1672	BC1672	5903-1	2
21.	HOLSTER PLATE NEPTUNE	BC1865	BC1865	6275-0	2
22.	NEPTUNE METER LINK	BC1864	BC1864	6274-2	2
23.	KRAUS NAMEPLATE	15653	BC1671	5894	1
24.	NOZZLE HOLSTER GASKET	BC0684	BC0684	3852-0	2
25.	OUTLET HOLE COVER PLATE	14584	BC1967	6471-0	2

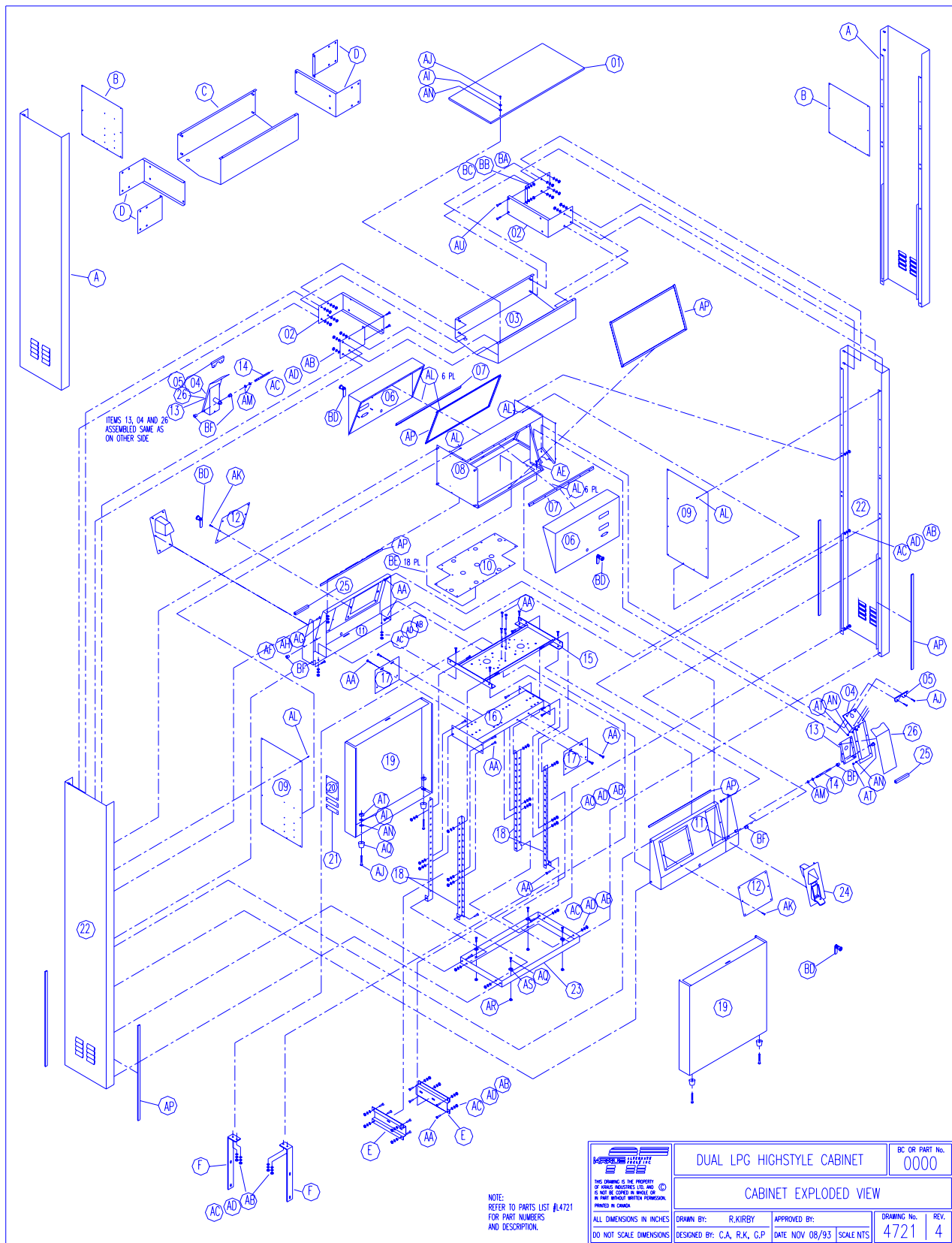
OPTIONAL PARTS					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG. No.	QTY
A.	SIDE PANEL SCHWELM / LC	11193	BC0867	4131-4	2
B.	HANDLE LINK SCHWELM / LC	11168	BC0681	3845-3	2
C.	J BOX BRACKET SCHWELM / LC	BC1868	BC1868	6278-0	2
D.	HOLSTER PLATE DV-10	11609	BC1866	6276-1	2
E.	HOLSTER PLATE SCHWELM / LC	17020	BC1867	6277-0	2

REFERENCE INFORMATION				
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
A 1	ELECTRICAL EXPLODED ASSY. (N1/N2)		5144	
A 2	GAS EXPLODED ASSY.(N1/N2)		4572	
A 3	GROUND CONNECTIONS (N2)		5957	
A 4	ELECTRICAL EXPLODED ASSY.(LC1/LC2)		5412	
A 5	GAS EXPLODED ASSY.(LC1/LC2)		5411	
A 6	ELECTRICAL EXPLODED ASSY.(S1/S2)		4378	
A 7	GAS EXPLODED ASSY.(S1.S2)		5131	
A 8	KRP N2 MANUFACTURING PLAN		50001	
A 9	KRP LPG MANUAL		0187	
A 10	MOUNTING AND OVERALL DIMENSIONS		4118	
A 11	KRPS2 GROUND CONNECTIONS		4722	

HARDWARE (PLATED UNLESS SPECIFIED)				
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
AA.	5/16" N.C x 3/4 LG BOLT			36
AB.	5/16" N.C NUT			36
AC.	5/16" FLAT WASHER			36
AD.	5/16" LOCK WASHER			36
AE.	#10-32 x 1/2 LG PAN HEAD SLOT SCREWS STAINLESS			4
AF.	#10-32 NUT STAINLESS			4
AG.	#10-32 LOCKWASHER STAINLESS			4
AH.	SPRING PIN 1/8 x 1.0 LG			2
AI.	#10-32 NUTS K-LOK			22
AJ.	#6-32 NUTS K-LOK			26
AK.	3/8 x 1/16 TH x 68 LG BLACK CLOSED CELL SPONGE ONE SIDE ADHESIVE			
AL.	#6 FLATWASHERS			24
AM.	1/4 NC X 1/2 LG BOLTS			10
AN.	1/4 LOCKWASHERS			10
AO.	1/4 FLATWASHERS			10
AP.	200" - 1/2 x 1/4 BLACK CLOSED CELL SPONGE ONE SIDE ADHESIVE			
AQ.	1/8 x 3/16 LG ALUMINUM POPRIVET			12
AR	1/8 EXTERNAL RETAINING RING	R6100-12		2
AS	UTILITY LOCK	ULR625STD5/8		2
AT	RUBBER FEET	31S-466		4







PARTS					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG. No.	QTY
1.	CANOPY COVER PANEL	11224	0941	4247-1	1
2.	HOSE RETRACTOR BRACKETS	11204	0924	4216-3	4
3.	CANOPY	11223	0940	4246-1	1
4.	HOSE DOOR GLAND	15408	1184	4822-1	2
5.	HOSE DOOR GLAND CLAMP	11305	1182	4820-1	2
6.	DISPLAY PANEL ASSEMBLY	11216	0935	4234-5	2
	- DISPLAY SIDE PANEL			4236-2	
	- DISPLAY PANEL			4235-4	
7.	DISPLAY PANEL HINGE	11217	0936	4237-2	2
8.	HEAD ASSEMBLY	11218	0937	4238-7	1
	- HEAD SIDE PANEL			4239-4	
	- HOSE COVER PLATE			4241-6	
	- HEAD TOP PANEL			4243-3	
	- DISPLAY FLANGES			4242-7	
	- BOTTOM PANEL			4240-3	
9.	VERTICAL SIDE PANEL COVER	11221	0939	4245-3	2
10.	VAPOUR BARRIER ACCESS PANEL	11220	0938	4244-6	1
11.	MAIN CROSS BRACE ASSEMBLY	BC931	0931	4223-5	2
	- PIVOT SHAFT BLOCK			4227-3	
	- MICON ACCESS PANEL FLANGE			4226-3	
	- MAIN CROSS BRACE GUSSETS			4225-6	
	- BRACE PANEL			4224-4	
12.	MICON ACCESS PANEL	11213	0932	4228-4	2
13.	BREAKAWAY DOOR ASSEMBLY	11214	0933	4229-3	2
	- DOOR GUSSET			4232-4	
	- DOOR MAIN SHAFT			4230-3	
14.	BREAKAWAY DOOR PIVOT SHAFT	BC934	0934	4233-3	2
15.	MICON SUPPORT BASE	11376	1470	5430-1	1
16.	NEPTUNE METER SUPPORT BASE	BC929	0929	4221-5	1
17.	MAIN JUNCTION BOX BRACKET	11225	0949	4255-3	2
18.	VERTICAL MOUNTING CHANNEL	11209	0928	4220-3	4
19.	MAIN FRONT PANEL	11208	0927	4219-3	2
20.	SPECS. PLATE ENGLISH OR	BC887	0887	4151	1
	SPECS. PLATE SPANISH	0888	0888	4152	1
21.	MICON APPROVAL LABEL	14607	0149		2
22.	VERTICAL SIDE PANEL	11206	0925	4217-2	2
23.	DISPENSER BASE	11207	0926	4218-2	1
24.	STANDARD HOLSTER ASSY	15267	BC1568	5827	2

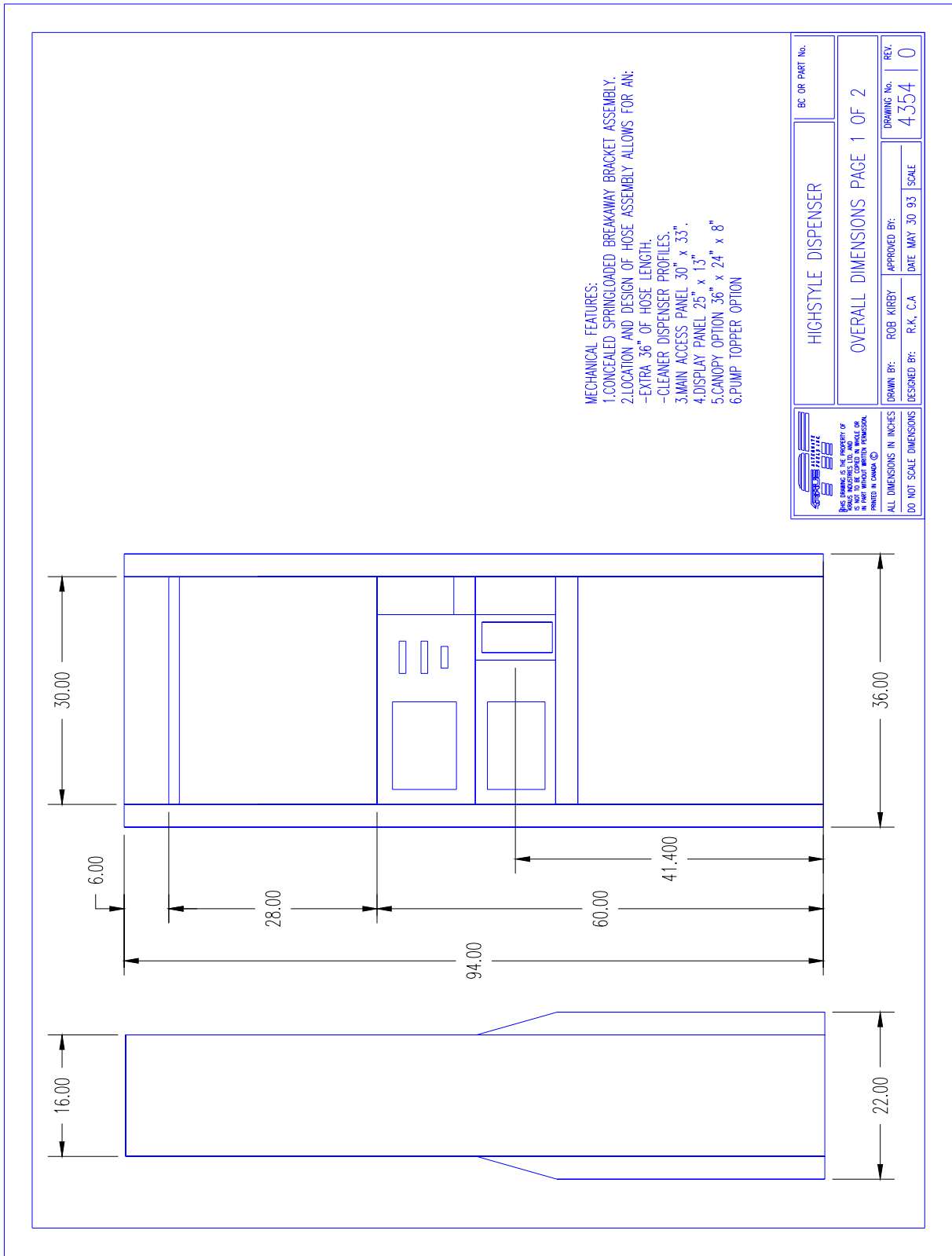
PARTS					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG. No.	QTY
25.	RUBBER EXTRUSION	15267	BC1568	5702	2
26.	BREAKAWAY DOOR PANEL	15264	BC1801	4231-4	2

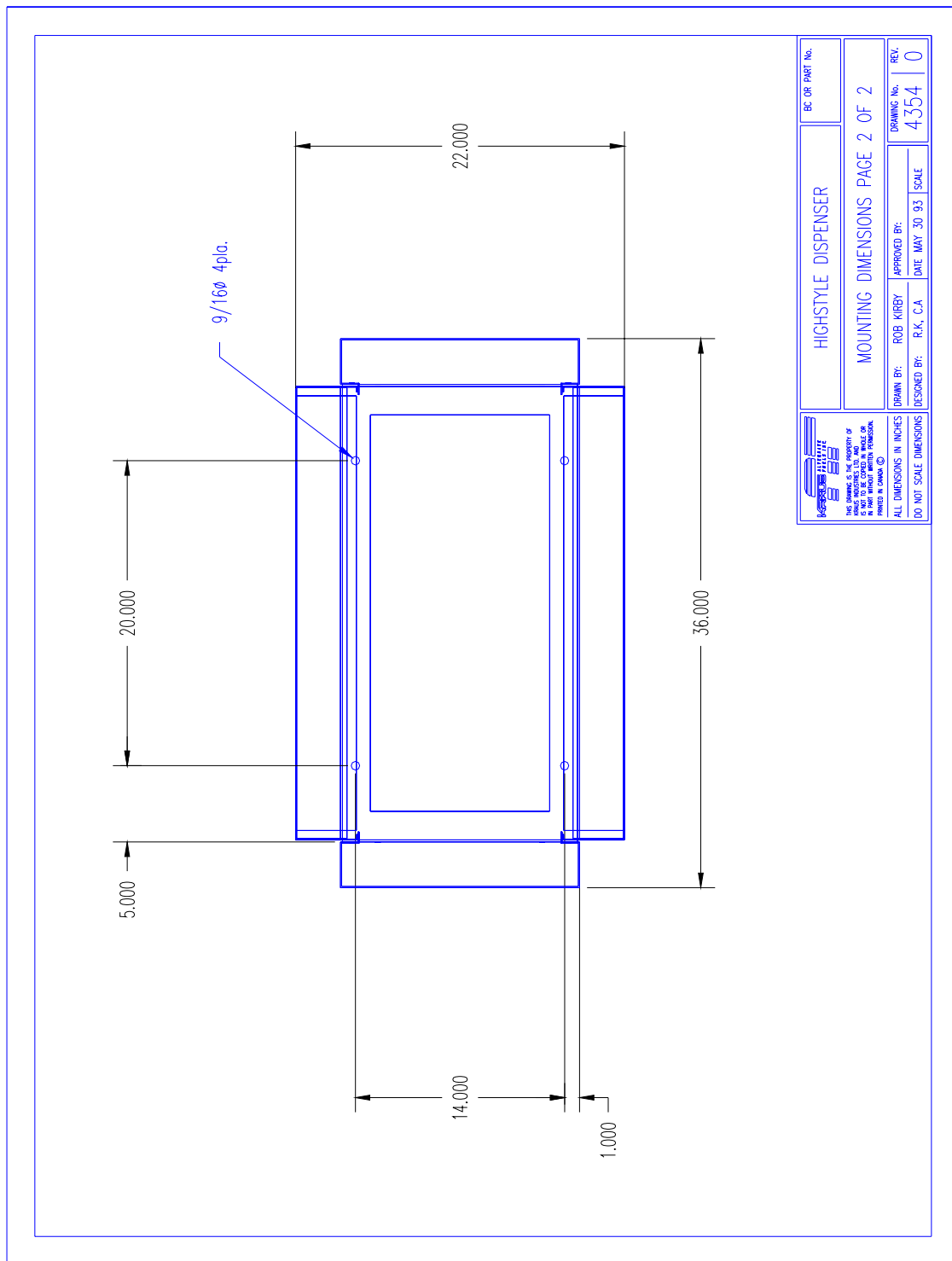
OPTIONAL PARTS					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG. No.	QTY
A.	VERTICAL SIDE PANEL (10" REDUCED MODEL HIGHSTYLE)	11690	1948	6419-0	2
B.	VERTICAL SIDE PANEL COVERS (10" REDUCED MODEL HIGHSTYLE)	11691	1949	6420-0	2
C.	CANOPY (10" REDUCED MODEL HIGHSTYLE)	11692	1950	6421-0	1
D.	HOSE RETRACTOR BRACKETS (10" REDUCED MODEL HIGHSTYLE)	11693	1951	6422-0	4
E.	SEPARATOR BRACKET (MYGAS)	11694	1952	6423-0	2
F.	JUNCTION BOX BRACKET (MYGAS/STD)	11699	1958	6430-0	2

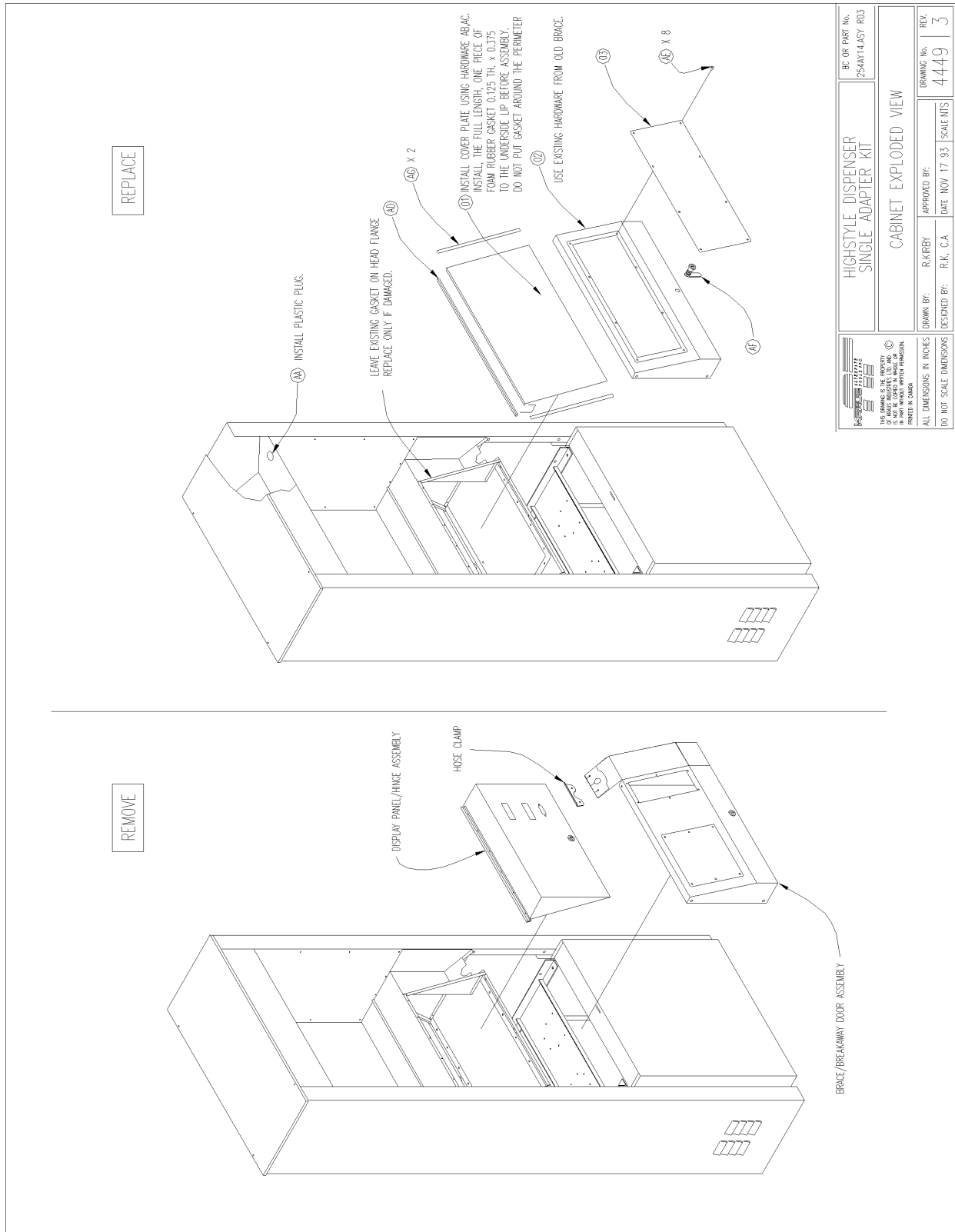
REFERENCE INFORMATION					
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY	
A 1	DISPLAY PANEL SCREENING (GALLONS)		4257		
A 2	DISPLAY PANEL SCREENING (LITERS)		5128		
A 3	LPG FILLING PROCEDURE ART		4278		
A 4	GAS PIPING PARTS LIST(N1H/N2H)		4391		
A 5	ELECTRICAL ASSY.(N1H/N2H)		5145		
A 6	GROUND CONNECTIONS(N1H/N2H)		4719		
A 7	GAS PIPING ASSY.(LC1H/LC2H)		4813		
A 8	ELECTRICAL ASSY.(LC1H/LC2H)		4815		
A 9	GROUND CONNECTIONS(LC1H/LC2H)		4720		
A 10	KRPN2H MANUFACTURING PLAN		50003		
A 11	KRP LPG MANUAL		0187		
A 12	MOUNTING AND OVERALL DIMENSIONS		4354		

HARDWARE					
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY	
AA.	0.3125" x 75 LG BOLT			48	
AB.	0.3125" NUT			72	
AC.	0.3125" FLAT WASHER			72	
AD.	0.3125" LOCK WASHER			72	

HARDWARE				
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
AE.	0.25" x .625 LG BOLT			2
AF.	0.25" NUT			2
AG.	0.25" FLAT WASHER			2
AH.	0.25" LOCK WASHER			2
AI.	#10-32 S.S. LOCKWASHER			8
AJ.	#10-32 x 0.5 LG PANHEAD SLOT S.S. SCREW			12
AK.	#6-32 x 0.50 LG PANHEAD PHILLIPS STAINLESS STEEL			12
AL.	0.125" x 0.3125 LG S.S. FLATHEAD POP RIVET			32
AM.	C-CLIP STAINLESS STEEL	R2000-37		4
AN.	#10-32 FLATWASHER STAINLESS			26
AO.	RUBBER FEET	31S-466		4
AP.	312" - 1/2 x 1/8 WEATHERSTRIP			
AQ.	3/8 x 1 1/4 LG BOLT			4
AR.	3/8 x 7/16 LG TEENUT			4
AS.	1 /2 O.D x 3/8 I.D x 16GA. FLATWASHER			4
AT.	#10-32 NUT STAINLESS STEEL			22
AU.	3/8 x 5/8 LG BOLT			4
BA.	3/8 NUT			4
BB.	3/8" LOCK WASHER			4
BC.	3/8" FLAT WASHER			4
BD.	UTILITY LOCK	ULR625STD5/8		4
BE.	#6-32 x 1 /2 LG SELF-TAPPING SCREWS			18
BF.	NYLON SNAP BUSHING	315-709		6







L4449-0

PARTS LIST

DATE: 21-Jul-04

PROJECT REF.: HIGHSTYLE DISPENSER SINGLE ADAPTER KIT

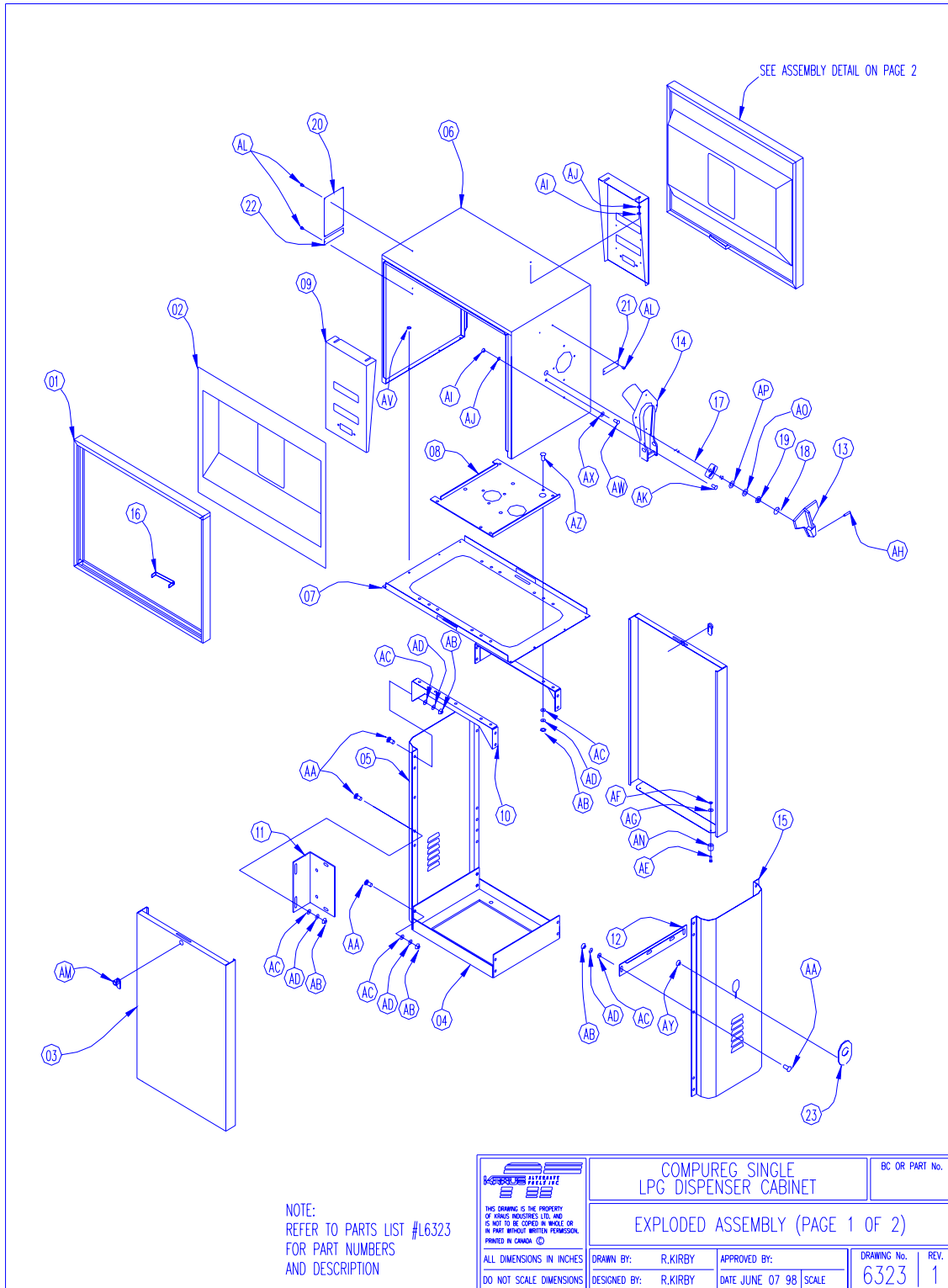
DWG. REF.: 4449-3

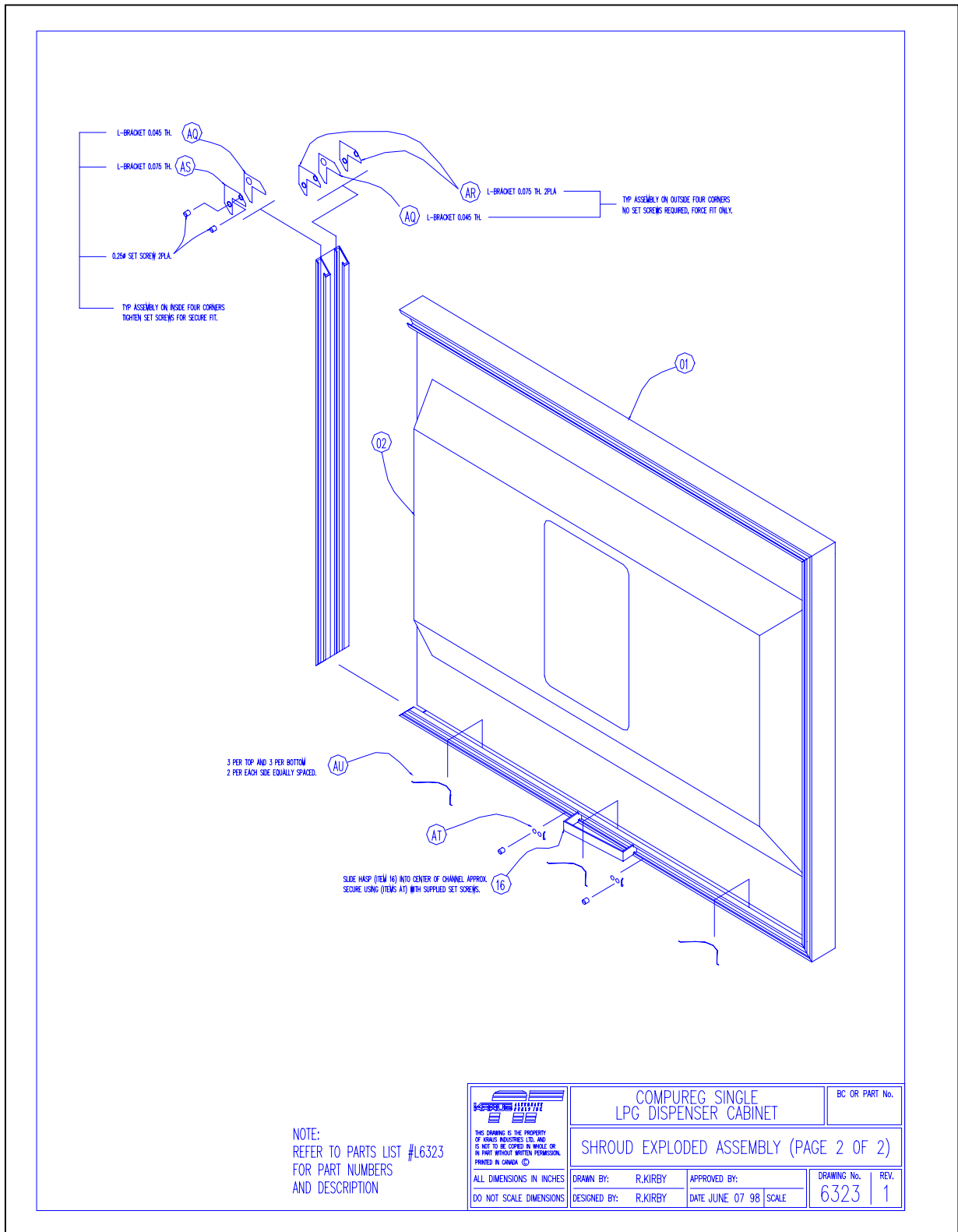
PARTS

<i>ITEM</i>	<i>DESCRIPTION</i>	<i>MFG/SUPPLIER</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
1.	DISPLAY COVER PLATE	SPECTRUM	1012	4447	1
2.	MAIN CROSS BRACE	SPECTRUM	1011	4446	1
3.	MICON ACCESS PANEL	SPECTRUM	1424	5349	1

HARDWARE (PLATED UNLESS SPECIFIED)

<i>ITEM</i>	<i>DESCRIPTION</i>	<i>MFR/SUPPLIER</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
AA.	SNAP IN PLUG	SPAE-NAUR	245-008		1
AB.	#4-32 K-LOK NUTS				4
AC.	#4 FLATWASHERS				4
AD.	0.375 x 0.125 TH BLACK CLOSED CELL SPONGE ONE SIDE ADHESIVE				30"
AE.	#6-32 x 1/2 LG STAINLESS SOCKET HEAD CAP SCREW				8
AF.	UTILITY LOCK	SHIELD SUPPLY	ULR625STD5/8		1
AG.	RUBBER EDGE TRIM 14" LG	SPAE-NAUR	RW-25		2





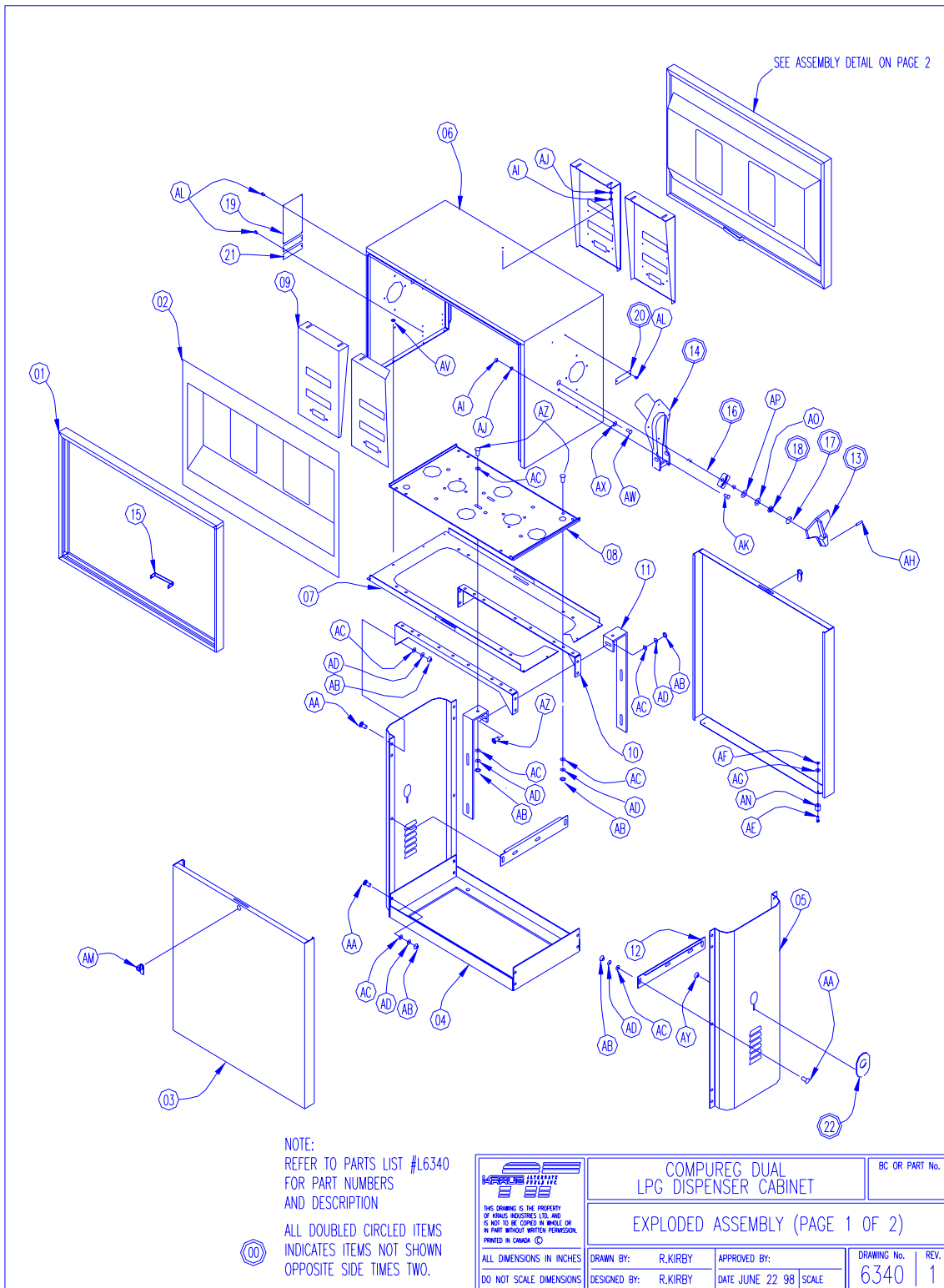
PARTS

ITEM	DESCRIPTION	MFR/SUPPLIER	BC/PART No.	DWG. No.	QTY
1.	WINDOW FRAME	HALL VISUAL SYSTEMS, CALGARY	BC1882	6327-0	2
2.	PLASTIC SHROUD	JENTEL MNFG,CALGARY	BC1883	6328-1	2
3.	FRONT PANEL	SPECTRUM	BC1895	6341-0	2
4.	BOTTOM FRAME	SPECTRUM	BC0602	3717-3	1
5.	SIDE PANEL	SPECTRUM	BC0867	4131-4	1
6.	TOP FRAME	SPECTRUM	BC1879	6324-1	1
7.	TOP FRAME BOTTOM PANEL	SPECTRUM	BC1880	6325-1	1
8.	MICON BASE SUPPORT	SPECTRUM	BC1881	6326-1	1
9.	DISPLAY PANEL	SPECTRUM	BC1884	6329-1	2
10.	CROSS BRACE	SPECTRUM	BC1911	6369-0	2
11.	J BOX BRACKET	SPECTRUM	BC1892	6338-1	1
12.	SEPERATOR SUPPORT BRACKET	SPECTRUM	BC1891	6337-1	1
13.	ON/OFF HANDLE	DURAPRENE IND, CALGARY	BC1886	6332-0	1
14.	NOZZLE HOLSTER	DURAPRENE IND, CALGARY	BC1885	6331-1	1
15.	SIDE PANEL OUTLET	SPECTRUM	BC1988	6504-0	1
16.	LOCK CATCH	SPECTRUM	BC1893	6330-1	2
17.	HANDLE SHAFT -HANDLE SHAFT DETENT	SPECTRUM	BC1887	6333-1 6336-1	1
18.	HANDLE SPACER	SPECTRUM	BC1888	6334-1	1
19.	HANDLE BUSHING	SPECTRUM	BC1889	6335-1	1
20.	SPECIFICATIONS PLATE	ARISTOPRINT OR INTERGRAPHICS	BC0887	4151-4	1
21.	ON/OFF PLATE	ARISTOPRINT OR INTERGRAPHICS	BC0489	3596	1
22.	MICON APPROVAL PLATE	ARISTOPRINT OR INTERGRAPHICS	BC1672	5903-1	1
23.	OUTLET HOLE COVER PLATE	SPECTRUM	BC1967	6471-1	1

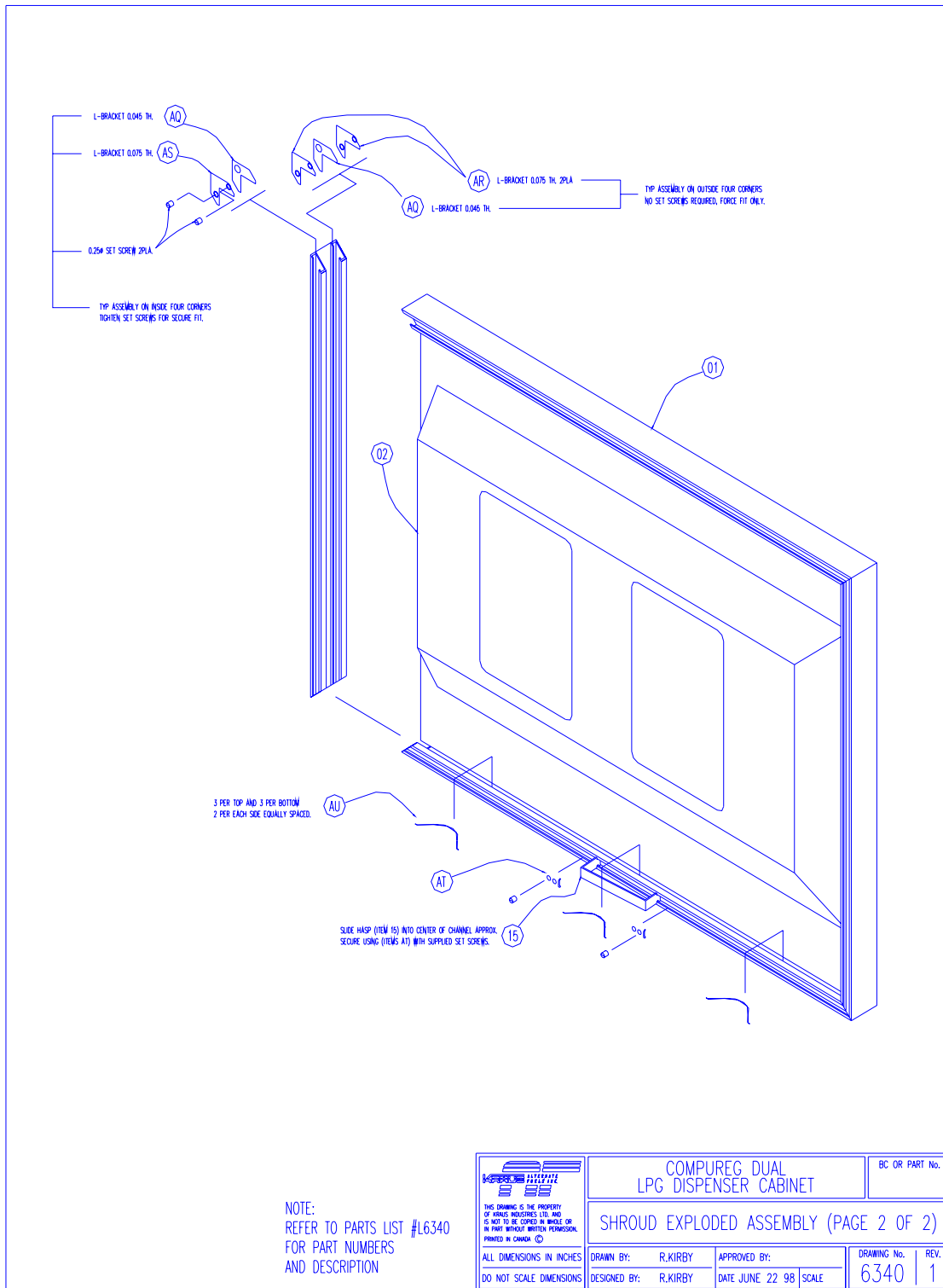
REFERENCE INFORMATION

ITEM	DESCRIPTION	MFR/SUPPLIER	BC/PART No.	DWG. No.	QTY
A 1	ELECTRICAL EXPLODED ASSY.	KRAUS		6345	
A 2	GAS EXPLODED ASSY.	KRAUS		6344	
A 3	GROUND CONNECTIONS.	KRAUS		6346	
A 4	MANUFACTURING PLAN	KRAUS		00000	
A 5	MOUNTING AND OVERALL DIMENSIONS	KRAUS		6347	
A 6	3D ASSEMBLY DWG	KRAUS		6216	
A 7	DISPLAY PANEL ARTWORK	SIGN GROUP CALGARY		6505	

HARDWARE (PLATED UNLESS SPECIFIED)					
ITEM	DESCRIPTION	MFR/SUPPLIER	BC/PART No.	DWG. No.	QTY
AA.	5/16" N.C x 3/4 LG BOLT				26
AB.	5/16" N.C NUT				30
AC.	5/16" FLAT WASHER				30
AD.	5/16" LOCK WASHER				30
AE.	#10-32 x 1/2 LG PAN HEAD SLOT SCREWS STAINLESS				4
AF.	#10-32 NUT STAINLESS				4
AG.	#10-32 LOCKWASHER STAINLESS				4
AH.	SPRING PIN 3/16 x 1.0 LG				1
AI.	#10-32 NUTS K-LOK				9
AJ.	#10 FLATWASHER				9
AK.	#10 x 3/4 LG COUNTERSUNK ROBERTSON				5
AL.	1/8 x 3/16 LG ALUMINUM POP RIVET				8
AM.	7/16 UTILITY LOCK	SHIELD SUPPLY	MFW23038		2
AN.	RUBBER FEET	SPAE-NAUR	31S-466		4
AO.	E-CLIP EXTERNAL	SPAE-NAUR	R1000-62		1
AP.	BOWED SPRING TENSION WASHER	SPAE-NAUR	W270		1
AQ.	L-BRACKET 0.045 TH ONE HOLE	HALL VISUAL SYSTEMS, CALGARY	METBP		16
AR.	L-BRACKET 0.075 TH TWO HOLE (NO SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METTCNS		16
AS.	L-BRACKET 0.075 TH TWO HOLE (1/4 SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METTCWS		8
AT.	LOCK HASP CLAMP (1/4 SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METRH		4
AU.	SPRING CLIP	HALL VISUAL SYSTEMS, CALGARY	METFS		20
AV.	1/4-20 NUT K-LOK				8
AW.	1/4-20 x 3/8 LG BOLT				1
AX.	1/4 LOCKWASHER				1
AY.	#6-32 NYLOCK NUT				1
AZ.	5/16" N.C x 1.0 LG BOLT				4



(This Drawing is included in this addendum for easy reference only)

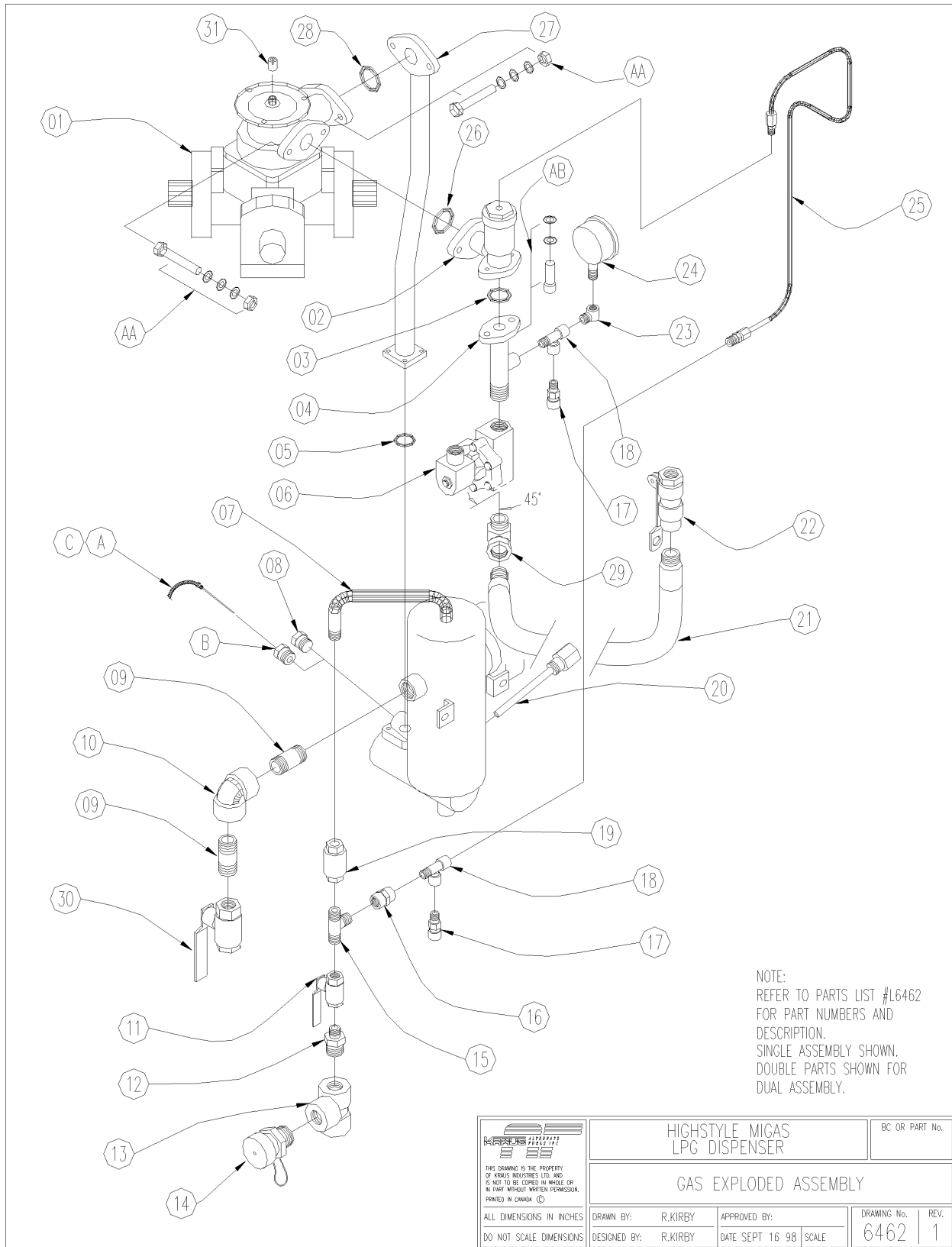


(This Drawing is included in this addendum for easy reference only)

PARTS					
ITEM	DESCRIPTION	MFR/SUPPLIER	BC/PART No.	DWG. No.	QTY
1.	WINDOW FRAME	HALL VISUAL SYSTEMS, CALGARY	BC1904	6356-0	2
2.	PLASTIC SHROUD	JENTEL MNFG,CALGARY	BC1905	6357-1	2
3.	FRONT PANEL	SPECTRUM	BC1908	6360-0	2
4.	BOTTOM FRAME	SPECTRUM	BC0644	3794-4	1
5.	SIDE PANEL OUTLET	SPECTRUM	BC1988	6504-0	2
6.	TOP FRAME	SPECTRUM	BC1901	6353-1	1
7.	TOP FRAME BOTTOM PANEL	SPECTRUM	BC1902	6354-1	1
8.	MICON BASE SUPPORT	SPECTRUM	BC1903	6355-1	1
9.	DISPLAY PANEL	SPECTRUM	BC1884	6329-1	4
10.	CROSS BRACE	SPECTRUM	BC1912	6370-0	2
11.	J BOX BRACKET	SPECTRUM	BC1907	6359-1	2
12.	SEPERATOR SUPPORT BRACKET	SPECTRUM	BC1891	6337-1	2
13.	ON/OFF HANDLE	DURAPRENE IND, CALGARY	BC1886	6332-0	2
14.	NOZZLE HOLSTER	DURAPRENE IND, CALGARY	BC1885	6331-1	2
15.	LOCK CATCH	SPECTRUM	BC1893	6330-1	2
16.	HANDLE SHAFT -HANDLE SHAFT DETENT	SPECTRUM	BC1906	6358-1 6336-1	2
17.	HANDLE SPACER	SPECTRUM	BC1888	6334-1	2
18.	HANDLE BUSHING	SPECTRUM	BC1889	6335-1	2
19.	SPECIFICATIONS PLATE	ARISTOPRINT OR INTERGRAPHICS	BC0887	4151-4	1
20.	ON/OFF PLATE	ARISTOPRINT OR INTERGRAPHICS	BC0489	3596	2
21.	MICON APPROVAL PLATE	ARISTOPRINT OR INTERGRAPHICS	BC1672	5903-1	2
22.	OUTLET HOLE COVER PLATE	SPECTRUM	BC1967	6471-1	2

REFERENCE INFORMATION					
ITEM	DESCRIPTION	MFR/SUPPLIER	BC/PART No.	DWG. No.	QTY
A 1	ELECTRICAL EXPLODED ASSY.	KRAUS		6345	
A 2	GAS EXPLODED ASSY.	KRAUS		6344	
A 3	GROUND CONNECTIONS	KRAUS		6361	
A 4	MANUFACTURING PLAN	KRAUS		00000	
A 5	MOUNTING AND OVERALL DIMENSIONS	KRAUS		6362	
A 6	3D ASSEMBLY DWG	KRAUS		6228	
A 7	DISPLAY PANEL ARTWORK	SIGN GROUP CALGARY		6506	

HARDWARE (PLATED UNLESS SPECIFIED)					
ITEM	DESCRIPTION	MFR/SUPPLIER	BC/PART No.	DWG. No.	QTY
AA.	5/16" N.C x 3/4 LG BOLT				20
AB.	5/16" N.C NUT				30
AC.	5/16" FLAT WASHER				30
AD.	5/16" LOCK WASHER				30
AE.	#10-32 x 1/2 LG PAN HEAD SLOT SCREWS STAINLESS				4
AF.	#10-32 NUT STAINLESS				4
AG.	#10-32 LOCKWASHER STAINLESS				4
AH.	SPRING PIN 3/16 x 1.0 LG				2
AI.	#10-32 NUTS K-LOK				18
AJ.	#10 FLATWASHER				18
AK.	#10 x 3/4 LG COUNTERSUNK ROBERTSON				10
AL.	1/8 x 3/16 LG ALUMINUM POP RIVET				12
AM.	7/16 UTILITY LOCK	SHIELD SUPPLY	MFW23038		2
AN.	RUBBER FEET	SPAE-NAUR	31S-466		4
AO.	E-CLIP EXTERNAL	SPAE-NAUR	R1000-62		2
AP.	BOWED SPRING TENSION WASHER	SPAE-NAUR	W270		2
AQ.	L-BRACKET 0.045 TH ONE HOLE	HALL VISUAL SYSTEMS, CALGARY	METBP		16
AR.	L-BRACKET 0.075 TH TWO HOLE (NO SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METTCNS		16
AS.	L-BRACKET 0.075 TH TWO HOLE (1/4 SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METTCWS		8
AT.	LOCK HASP CLAMP (1/4 SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METRH		4
AU.	SPRING CLIP	HALL VISUAL SYSTEMS, CALGARY	METFS		20
AV.	1/4-20 NUT K-LOK				8
AW.	1/4-20 x 3/8 LG BOLT				2
AX.	1/4 LOCKWASHER				2
AY.	#6-32 NYLOCK NUT				2
AZ.	5/16" N.C x 1.0 LG BOLT				11



(This drawing is included in this addendum for the purpose of easy reference only.)

Kraus Global Inc. 07/2004
Publication Number: 254AY00.INS R02

LPG Manual
Installation & Maintenance Manual

L6344-1 (E.R. No. 0000)

PARTS LIST

DATE: 21-Jul-04

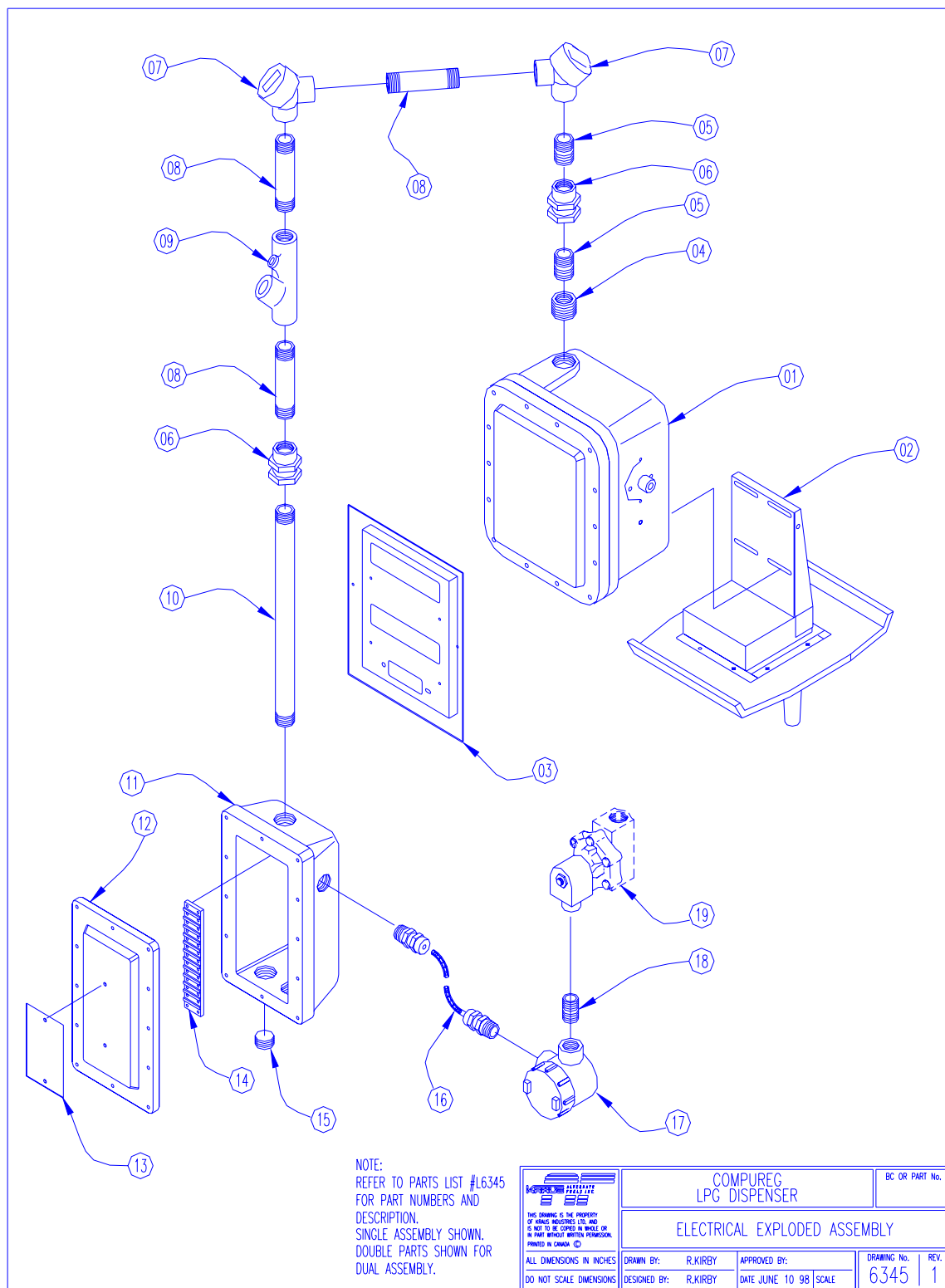
PROJECT REF.: COMPUREG LPG DISPENSER GAS PIPING EXPLODED ASSEMBLYDWG.
REF6344-1

PARTS					
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>MFG/SUPPLIER</i>	<i>BC/PART No.</i>	<i>DWG.</i>	<i>QTY</i>
1.	MIGAS LPG METER	MIGAS	1174-A		1
2.	DOUBLE FLANGE DIFFERENTIAL VALVE	MIGAS	1189-B		1
3.	O-RING	MIGAS	OR-4112*		1
4.	3/4 " NPT TEE STUB FLANGE	MIGAS	1271-A		1
5.	O-RING	MIGAS	OR-3100*		1
6.	SOLENOID VALVE W/ 120V COIL ONLY (220V NOT AVAILABLE)	HONEYWELL	SEE DWG 6345 or 6441 FOR SOLENOID SPECS		1
7.	MIGAS SEPERATOR	MIGAS	1269-A		1
8.	3/4" NPT PLUG (OMIT WHEN OPTION B IS USED)	GRINNELL	0361301005*		1
9.	3/4"NPT x 2 1/2 LG NIPPLE	GRINNELL	0332619204*		2
10.	3/4" NPT ELBOW 3000lbs FS	GRINNELL	0361101009*		1
11.	3/8" NPT FULL PORT SHUTOFF VALVE	JOMAR/FAIRVIEW or APOLLO or GIACOMINI	BV2103-C-CGA* 80-102-01 R250UY002		1
12.	3/8"NPT MALE TO 3/4"NPT FEMALE NPT REDUCER	FAIRVIEW	24SA12X06*		1
13.	3/4" NPT TEE 3000lbs FS	GRINNELL	0361119803*		1
14.	3/4" NPT FILL VALVE	SHERWOOD	PV1855-SD*		1
15.	3/8" NPT STREET TEE (ALL MALE)	FAIRVIEW	M101-C*		1
16.	3/8" TO 1/4" NPT FEMALE REDUCER	FAIRVIEW	S1003-CB*		1
17.	1/4" NPT RELIEF VALVE	REGO or SHERWOOD	RE-3125L* or PV3865400*		2
18.	1/4" NPT STREET TEE (2 female, 1 male)	FAIRVIEW	107-B*		2
19.	3/8" NPT BACKCHECK VALVE	VALVOLA EUROPA	1-145		1
20.	BRASS THERMOWELL		WT92-08-BRS-004.5-00-00		1
21.	3/4"NPT x 84" HOSE	FAIRVIEW	I12C84MP12MP12		1
22.	3/4"NPT BREAKAWAY	REGO	A2141A6		1
23.	1/4" NPT STREET ELBOW	FAIRVIEW	116-B*		1
24.	1/4" NPT GAUGE	WIKA	8345805		1
25.	1/4" COPPER RETURN LINE ASSEMBLY	KAF	BC1897	6348	1
26.	O-RING	MIGAS	OR-4137*		1
27.	3/4" x 21" LONG BENT DOUBLE FLANGE	MIGAS	1148-A		1
28.	O-RING	MIGAS	OR-4175*		1
29.	3/4" NPT STREET ELBOW (PLATED)	FAIRVIEW or PARKER	FAIS1016-E*or 2102-12-12*		1
30.	3/4"NPT FULL PORT BALL VALVE	APOLLO or GIACOMINI	80-104-01* R850UY104		1
31.	METER COUPLER	SPECTRUM	BC1978	6490	1

OPTIONAL PARTS					
ITEM	DESCRIPTION	MFG/SUPPLIER	BC/PART No.	DWG.	QTY
A	ATC PROBE	KRAUS	W199		1
B	3/4" NPT MALE TO 1/8" NPT FEMALE BUSHING	GRINNELL			1
C	3/8" BLUE LOOM x 42" LG	KRAUS	38362		1

HARDWARE					
ITEM	DESCRIPTION	MFG/SUPPLIER	BC/PART No.	DWG.	QTY
AA	8mm x 2" LG HEX HEAD BOLT				4
	8mm NUT				4
	8mm FLATWASHER				8
	8mm LOCKWASHER				4
AB	8mm x 7/8 LG SOCKET HEAD CAP SCREW	UNBRAKO			2
	8mm FLATWASHER				2
	8mm LOCKWASHER				2

NOTE: 1) ABOVE QUANTITIES ARE FOR **SINGLE** ONLY. FOR **DUAL**, MULTIPLY QUANTITIES BY TWO.
2) ALL PIPE FITTINGS ARE 3000lbs FORGED STEEL UNLESS OTHERWISE SPECIFIED.
3) ALL PIPE IS SCHEDULE 80 EXTRA HEAVY SEAMLESS.
4) * PARTS CAN BE REPLACED WITH EQUIVALENT PARTS FROM DIFFERENT MANUFACTURERS.

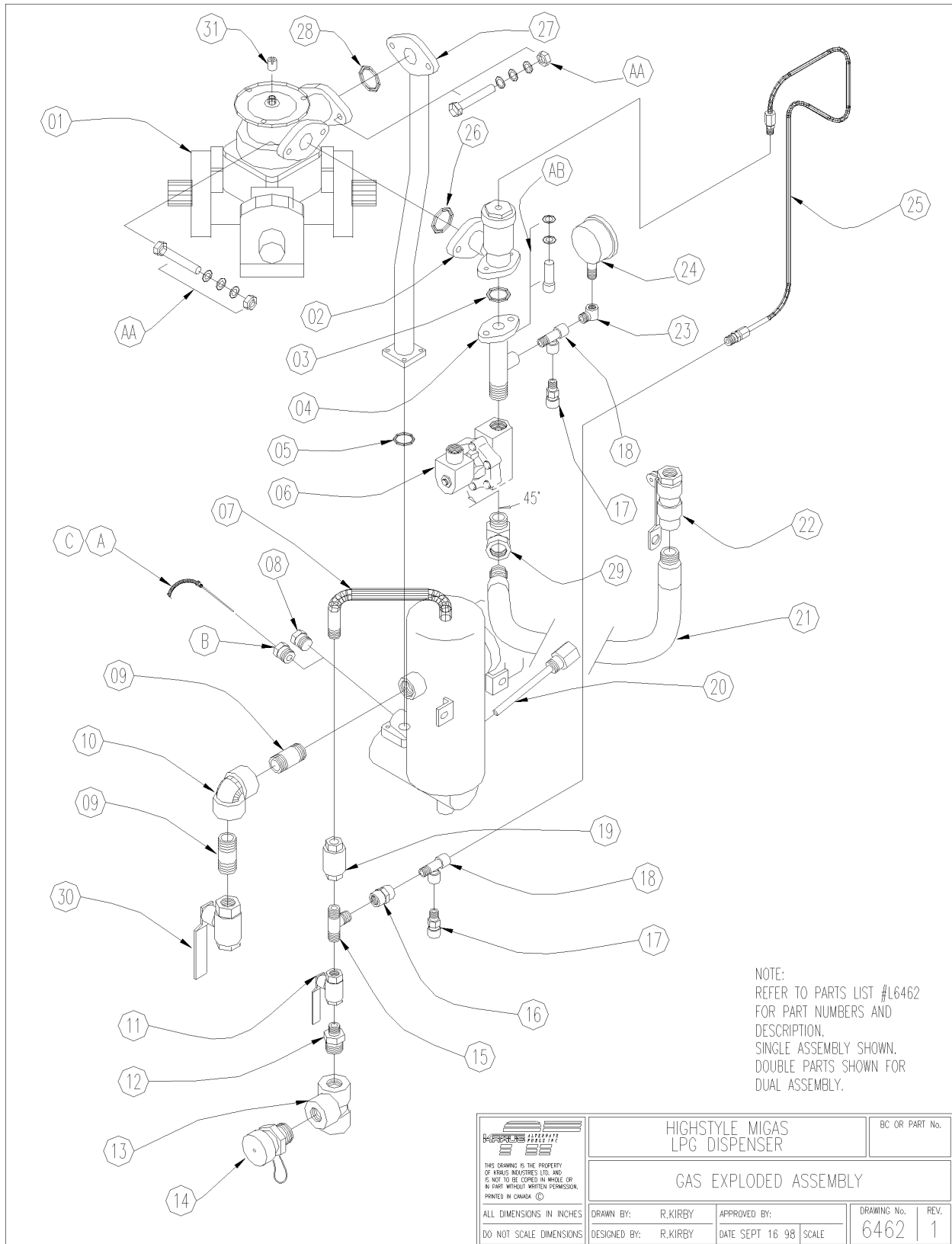


PARTS					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG. No.	QTY
1.	MICON 500	234AY11	234AY11		1
2.	MICON BASE/CHAIR ASSEMBLY	011AY03	011AY03		1
3.	DISPLAY PANEL ASSEMBLY				2
	-BOARD (SKIL-444 STANDARD BACKLIT)		SKIL-444 or SKIL-444B		1
	-PLEXI	BC1307	BC1307		1
	-BACKPLATE	BC1308	BC1308		1
	-GASKET	BC0426	BC0426		1
	#6 x 5/16 LG PLASTIC SPACERS				4
	#6 x 1/4 LG PLASTIC SPACERS				4
	#6-32 HEX NUTS				4
4.	1.0"NPT TO 3/4" NPT REDUCER	RE32	RE32*		2
5.	3/4"NPT CONDUIT CLOSE NIPPLE	ENP34X00*	ENP34X00*		2
6.	3/4"NPT CONDUIT UNION		UNF205*		2
7.	3/4"NPT CAPPED ELBOW	Y-2*	Y-2*		2
			LBY25		
8.	3/4"NPT x 4" LG CONDUIT NIPPLE	ENP34X4*	ENP34X4*		3
9.	3/4"NPT CONDUIT SEAL		EYS21-SA*		1
10.	3/4"NPT x 13 3/4" LG CONDUIT (+/- 1.0')				1
11.	JUNCTION BOX	11641	BC1900	6352	1
12.	JUNCTION BOX LID	BC0629	BC0629	3776	1
13.	JUNCTION BOX NAMEPLATE	BC1717	BC1717	5981	1
14.	ELECTRICAL STRIP	76018	76018		1
15.	3/4"NPT PLUG	PLG2*	PLG2*		1
16.	PYROTENAX CABLE ASSY	BC1980	BC1980	6495	1
17.	1/2"NPT JUNCTION BOX	GEML-1	GEML-1		1
18.	1/2"NPT CONDUIT CLOSE NIPPLE	ENP12X00*	ENP12X00*		1
19.	SOLENOID VALVE W/120V COIL	14624	#73212BN52NP1N0H148P3		1

NOTE:

1) ABOVE QUANTITIES ARE FOR **SINGLE** ONLY. FOR **DUAL**, MULTIPLY QUANTITIES BY TWO.
 2) ALL FACTORY CUT CONDUIT LENGTHS TO BE RIGID ALUMINUM. ALL OTHER CONDUIT/NIPPLES CAN BE PLATED STEEL.

3) * PARTS CAN BE REPLACED WITH EQUIVALENT PARTS FROM DIFFERENT MANUFACTURERS.



L6462-1 (E.R. No. 0000)

PARTS LIST

DATE: 21-Jul-04

PROJECT REF.: HIGHSTYLE MIGAS LPG DISPENSER GAS PIPING EXPLODED ASSEMBLYDWG. REF.: 6462-1

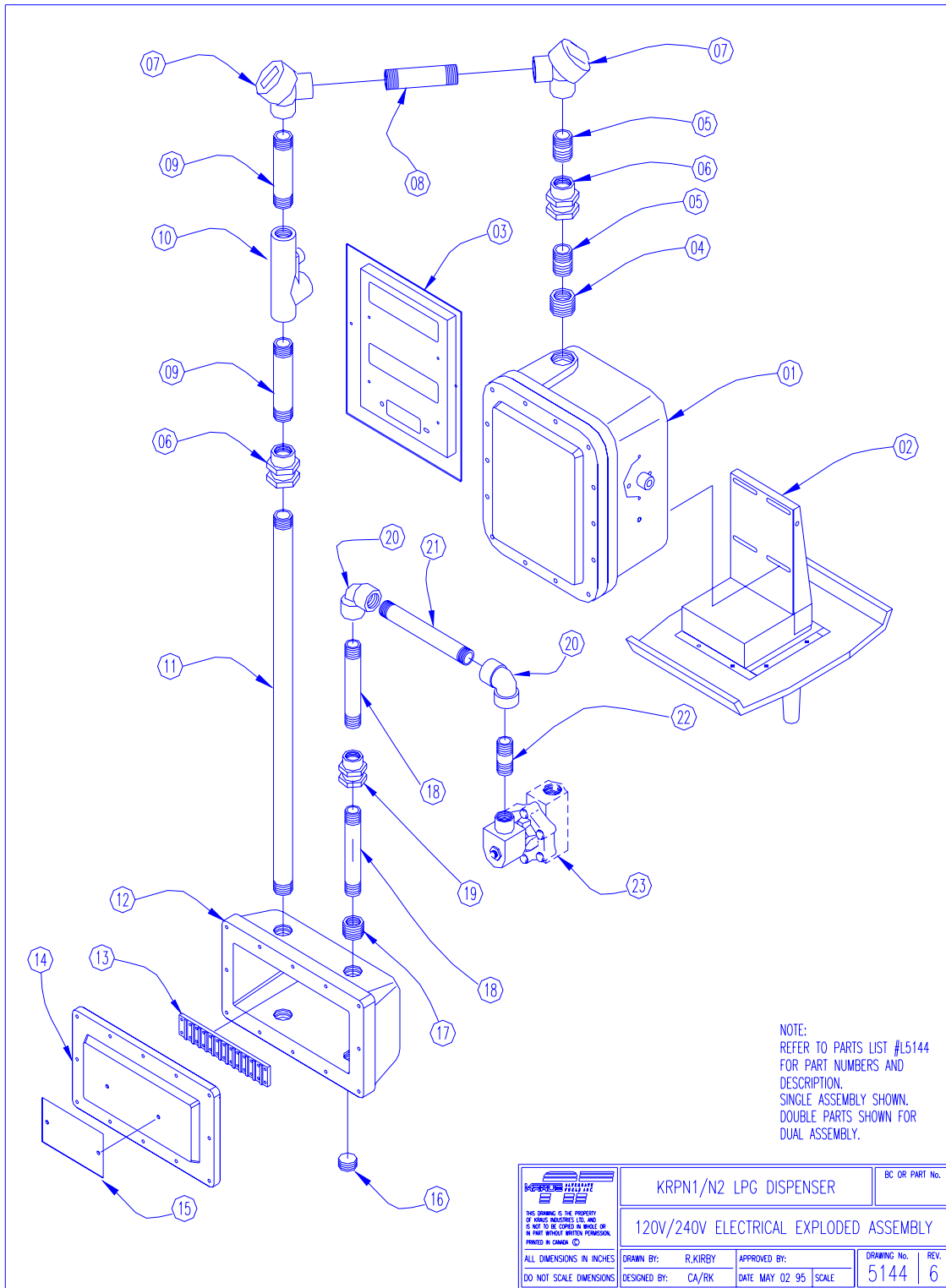
PARTS					
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>MRP NUMBER</i>	<i>BC/PART No.</i>	<i>DWG.</i>	<i>QTY</i>
32.	MIGAS LPG METER	1174-A	1174-A		1
33.	DOUBLE FLANGE DIFFERENTIAL VALVE	16644	1189-B		1
34.	O-RING	OR-4112*	OR-4112*		1
35.	3/4 " NPT TEE STUB FLANGE	1271-A	1271-A		1
36.	O-RING	OR-3100*	OR-3100*		1
37.	SOLENOID VALVE W/ 120V COIL ONLY (220V NOT AVAILABLE)		SEE DWG 6345 or 6441 FOR SOLENOID SPECS		1
38.	MIGAS SEPERATOR	1269-A	1269-A		1
39.	3/4" NPT PLUG (OMIT WHEN OPTION B IS USED)	0361301005*	0361301005*		1
40.	3/4"NPT x 2 1/2 LG NIPPLE	0332619204*	0332619204*		2
41.	3/4" NPT ELBOW 3000lbs FS	0361101009*	0361101009*		1
42.	3/8" NPT FULL PORT SHUTOFF VALVE	BV2103-C-CGA*	BV2103-C-CGA* 80-102-01 R250UY002		1
43.	3/8"NPT MALE TO 3/4"NPT FEMALE NPT REDUCER	16908	24SA12X06*		1
44.	3/4" NPT TEE 3000lbs FS	0361119803*	0361119803*		1
45.	3/4" NPT FILL VALVE	PV1855-SD*	PV1855-SD*		1
46.	3/8" NPT STREET TEE (ALL MALE)	M101-C*	M101-C*		1
47.	3/8" TO 1/4" NPT FEMALE REDUCER	S1003-CB*	S1003-CB*		1
48.	1/4" NPT RELIEF VALVE	RE-3125L* or PV3865400*	RE-3125L* or PV3865400*		2
49.	1/4" NPT STREET TEE (2 female, 1 male)	107-B*	107-B*		2
50.	3/8" NPT BACKCHECK VALVE	1-145	1-145		1
51.	BRASS THERMOWELL		WT92-08-BRS-004.5-00- 00		1
52.	3/4"NPT x 84" HOSE		I12C84MP12MP12		1
53.	3/4"NPT BREAKAWAY	A2141A6	A2141A6		1
54.	1/4" NPT STREET ELBOW	116-B*	116-B*		1
55.	1/4" NPT GAUGE	8345805	8345805		1
56.	1/4" COPPER RETURN LINE ASSEMBLY	16641	BC1897	6348	1
57.	O-RING	OR-4137*	OR-4137*		1
58.	3/4" x 21" LONG BENT DOUBLE FLANGE	1148-A	1148-A		1
59.	O-RING	OR-4175*	OR-4175*		1
60.	3/4" NPT STREET ELBOW (PLATED)		FAIS1016-E*or 2102-12-12*		1

PARTS					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG.	QTY
61.	3/4"NPT FULL PORT BALL VALVE	80-104-01*	80-104-01*		1
		R850UY104	R850UY104		
62.	METER COUPLER	14585	BC1978	6490	1

OPTIONAL PARTS					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG.	QTY
D	ATC PROBE	W199	W199		1
E	3/4" NPT MALE TO 1/8" NPT FEMALE BUSHING				1
F	3/8" BLUE LOOM x 42" LG	38362	38362		1

HARDWARE					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG.	QTY
AC	8mm x 2" LG HEX HEAD BOLT				4
	8mm NUT				4
	8mm FLATWASHER				8
	8mm LOCKWASHER				4
AD	8mm x 7/8 LG SOCKET HEAD CAP SCREW				2
	8mm FLATWASHER				2
	8mm LOCKWASHER				2

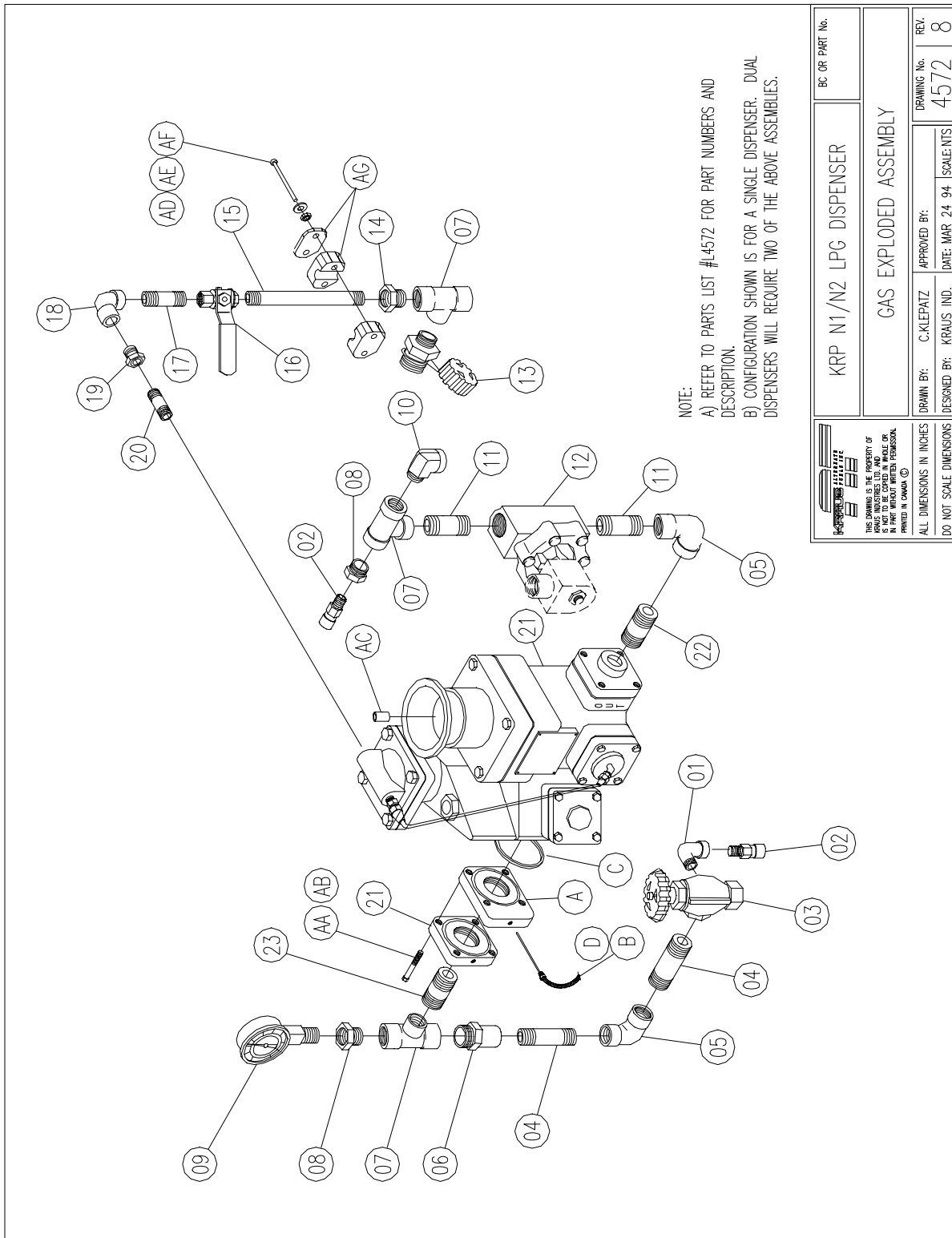
- NOTE:** 1) ABOVE QUANTITIES ARE FOR **SINGLE** ONLY. FOR **DUAL**, MULTIPLY QUANTITIES BY TWO.
2) ALL PIPE FITTINGS ARE 3000lbs FORGED STEEL UNLESS OTHERWISE SPECIFIED.
3) ALL PIPE IS SCHEDULE 80 EXTRA HEAVY SEAMLESS.
4) * PARTS CAN BE REPLACED WITH EQUIVALENT PARTS FROM DIFFERENT MANUFACTURERS.



PARTS					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG. No.	QTY.
1.	MICON		120V= 234AY11 or 240V = 234AY15		1
2.	MICON BASE/CHAIR ASSEMBLY	011AY03	011AY03		1
3.	DISPLAY PANEL ASSEMBLY				2
	-BOARD (SKIL-444 STANDARD BACKLIT)	SKIL-444 or SKIL-444B	SKIL-444 or SKIL-444B		1
	-PLEXI	BC1307	BC1307		1
	-BACKPLATE	BC1308	BC1308		1
	-GASKET		BC0426		1
	#6 x 5/15 LG PLASTIC SPACERS				4
	#6 x 1/4 LG PLASTIC SPACERS				4
	#6-32 HEX NUTS				4
4.	1.0"NPT TO 3/4"NPT REDUCER	RE32*	RE32*		2
5.	3/4"NPT CONDUIT CLOSE NIPPLE	ENP34x00*	ENP34x00*		2
6.	3/4"NPT CONDUIT UNION	15726	UNF205*		2
7.	3/4"NPT CAPPED ELBOW	15727	Y-2		2
8.	3/4"NPT x 5" LG CONDUIT NIPPLE	15728	ENP34X5*		1
9.	3/4"NPT x 4 1/2" LG CONDUIT NIPPLE		ENP34X412*		2
10.	3/4"NPT CONDUIT SEAL		EYS21-SA		1
11.	3/4"NPTx 23" LG RIGID CONDUIT (+/-1.0")				1
12.	JUNCTION BOX	BC628	BC0628	3775	1
13.	ELECTRICAL STRIP		76018		1
14.	JUNCTION BOX LID	BC629	BC0629	3776	1
15.	JUNCTION BOX NAMEPLATE	BC1717	BC1717	5981	1
16.	3/4"NPT PLUG	PLG2*	PLG2*		1
17.	3/4"NPT TO 1/2"NPT CONDUIT REDUCER	RE21*	RE21*		1
18.	1/2"NPT x 6" LG CONDUIT NIPPLE	15738	ENP12X6*		2
19.	1/2"NPT CONDUIT UNION	15739	UNF105*		1
20.	1/2"NPT CONDUIT ELBOW	EL19*	EL19*		2
21.	1/2"NPT x 5 1/2" LG CONDUIT NIPPLE	15740	ENP12X512*		1
22.	1/2"NPT x 2" LG RIGID CONDUIT	ENP12X2*	ENP12X2*		1
23.	SOLENOID VALVE W/COIL	14624	120V = #73212BN52NP1N0H148P3 or 240V= 16323	#73212BN52NP1N0H148Q3	1

NOTE:

- 1) ABOVE QUANTITIES ARE FOR **SINGLE** ONLY. FOR **DUAL**, MULTIPLY QUANTITIES BY TWO.
- 2) ALL FACTORY CUT CONDUIT LENGTHS TO BE RIGID ALUMINUM. ALL OTHER CONDUIT/NIPPLES CAN BE PLATED STEEL.
- 3) * PARTS CAN BE REPLACED WITH EQUIVALENT PARTS FROM DIFFERENT MANUFACTURERS.



L4572-8 (E.C.O. No.0737)

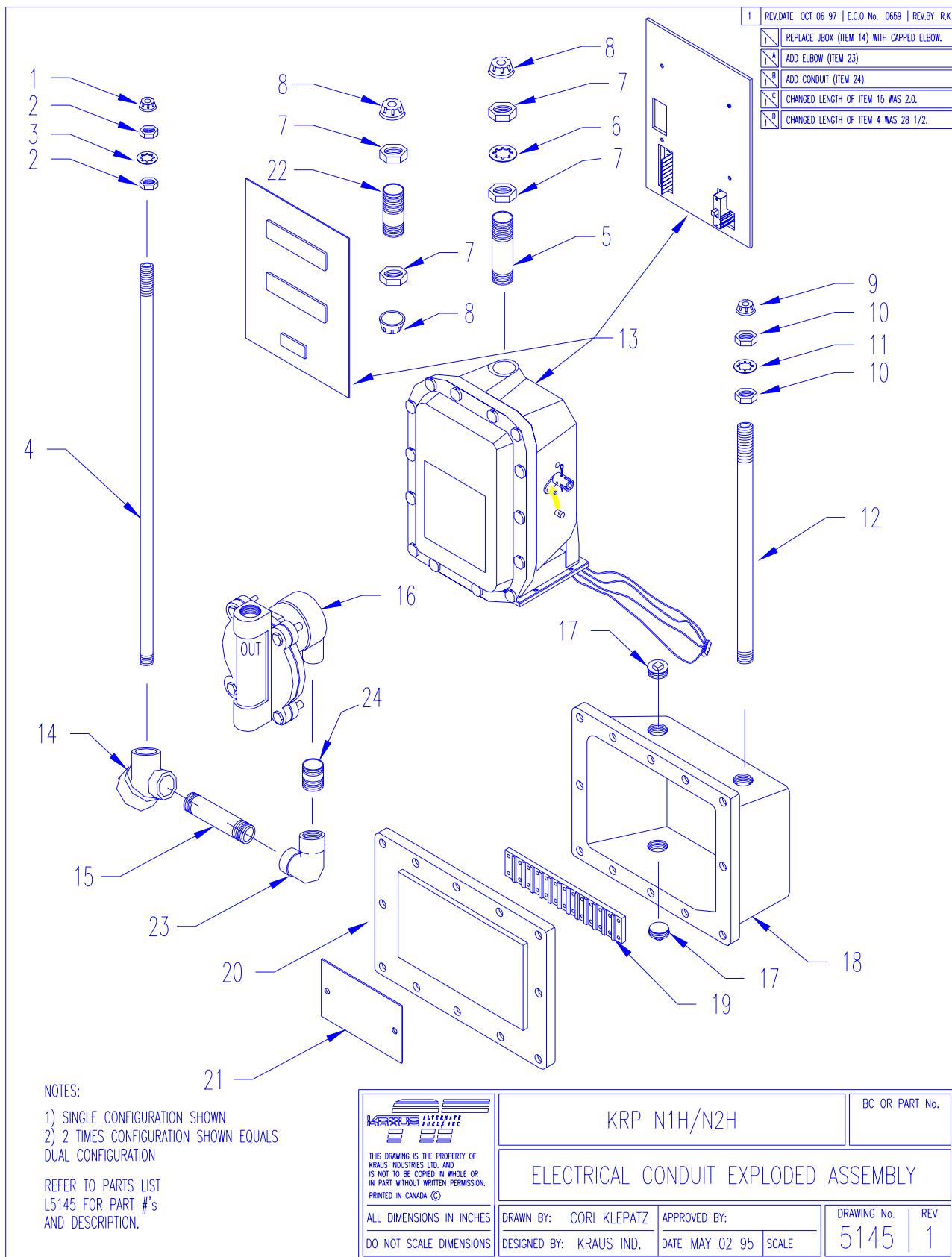
PARTS LIST

DATE: 21-Jul-04

PROJECT REF.: KRP N1/N2 LPG DISPENSER GAS PIPING EXPLODED ASSEMBLY DWG. REF.:
4572-7

PARTS					
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>MRP NUMBER</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
1.	1/4 x 3-1/2" NIPPLE XHSL	GRINNELL	0332605807		1
2.	3/4" DOUBLE BACK CHECK VALVE	D211	D-211		1
			OR		
			PV1855SPD		
3.	3/4 x 3-1/2" NIPPLE XHSL	0332619600	0332619600		2
4.	213.53 2.5" 0-600 PSI PRESSURE GAUGE	8345805	8345805		1
5.	3/4" TO 1/4" HEX BUSHING FS	0361330707	0361330707		2
6.	3/4" TEE 3000LB FS THRD	0361119803	0361119803		3
7.	3/8" TO 1/4" HEX BUSHING FS	0361119803	0361119803		1
8.	3/8" ELBOW 90° 3000LB FS	0361100605	0361100605		1
9.	3/8" x 2-1/2" NIPPLE XHSL	0332610005	0332610005		1
10.	3/8" BALL VALVE	BV2103-C-CGA	BV2103-C-CGA/BRS - B16.33		1
11.	3/8" x 8-1/2" NIPPLE XHSL				1
12.	3/4" DOUBLE BACK-CHECK FILLER VALVE	PV1855-SD	RE-7647DC or PV1855		1
13.	3/4" TO 3/8" HEX BUSHING FS	0361330806	0361330806		1
14.	3/4" ELBOW 90° 3000LB FS	0361101009	0361101009		1
15.	3/4" MANUAL GATE VALVE	RE7706P	RE-7706P		1
16.	1/4" HYDROSTATIC RELIEF VALVE	3865 or 3125L	3865 or 3125L		2
17.	1/4" STREET ELBOW 90° 3000LB FS	0361109358	0361109358		1
18.	FLANGE ADAPTER (NOT USED ON ATC)	BC822	BC822	4035	1
19.	METER	0-98534-610-1/4.35	0-98534-610-1/4.35 GEAR TRAIN(GALLON) 0-9534-610-2/11.6 GEAR TRAIN (LITRE)		1
20.	3/4" STREET ELBOW 90° 3000LB FS	0361109507	0361109507		1
21.	3/4 x 2-1/2" NIPPLE XHSL	0332619204	0332619204		2
22.	3/4" SOLENOID VALVE BODY	73212BN52NPINO	#73212BN52NP1NO		1
23.	ATC PROBE (NOT USED WITH ATC)	W199	W199		
24.	3/4" STREET ELBOW (PLATED)	2102-12-12	2102-12-12		1
25.					

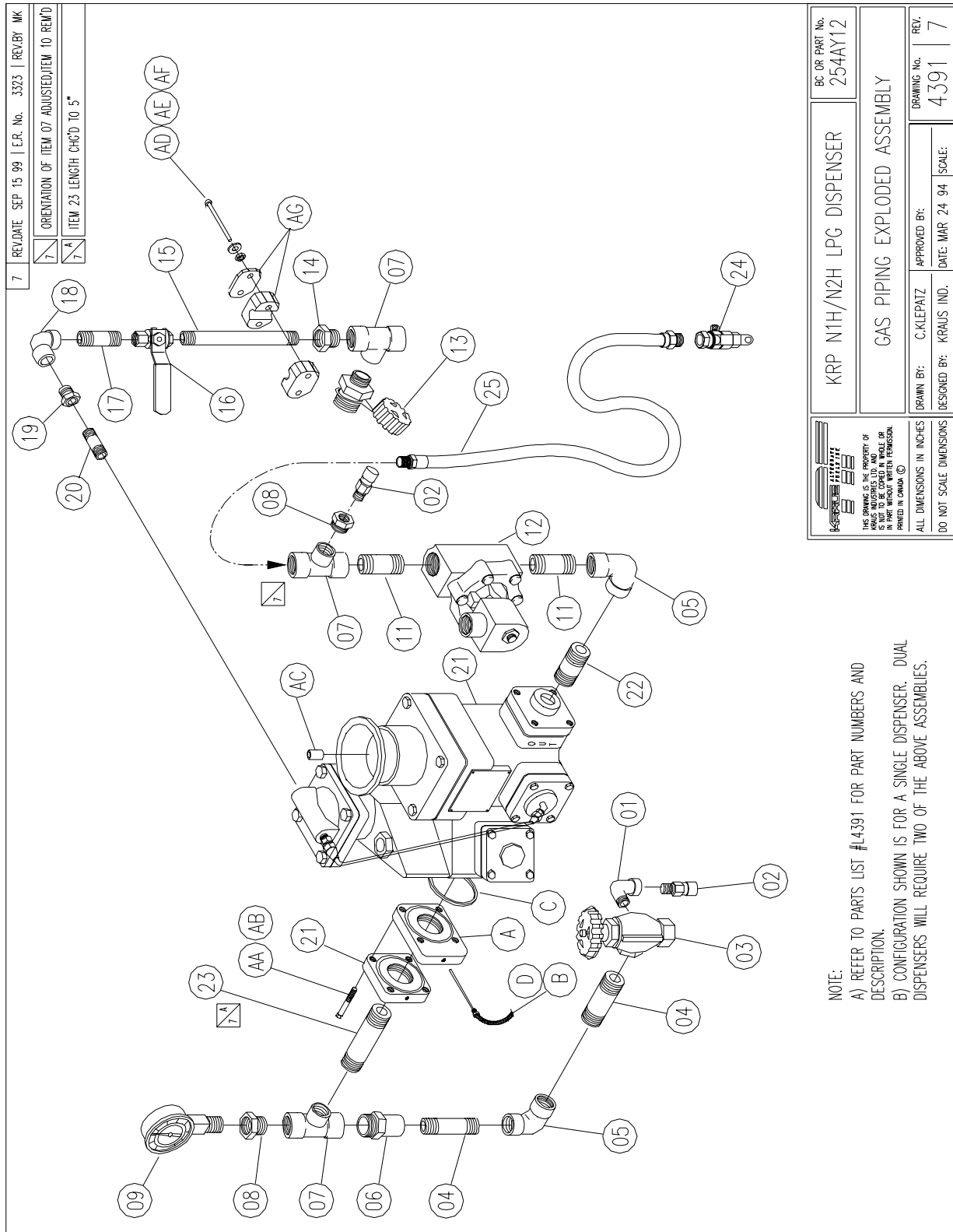
NOTE: ABOVE QUANTITIES ARE FOR **MODEL KRPN1** ONLY. FOR **MODEL KRPN2** MULTIPLY QUANTITIES BY TWO.



PARTS					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG. No.	QTY
1.	1/2" PLASTIC BUSHING	ZEN2603	ZEN 2603		1
2.	1/2" LOCKNUT	0318913449	0318913449		2
3.	7/8" TOOTH LOCKWASHER	B-919	B-919		1
4.	1/2" x 28" RIGID CONDUIT	1/2 X 28 CONNPL	1/2 X 28 CONNPL		1
5.	1" x 5 1/2" MICON RIGID CONDUIT	1 X 5 1/2 CONNPL	1 X 5 1/2 CONNPL		1
6.	1 1/8" TOOTH LOCKWASHER	B-859	B-859		1
7.	1" LOCKNUT	0318913522	0318913522		4
8.	1" PLASTIC BUSHING	ZEN 2605	ZEN 2605		3
9.	3/4" PLASTIC BUSHING	ZEN 2604	ZEN 2604		1
10.	3/4" LOCKNUT	0318913480	0318913480		2
11.	1 5/16" TOOTH LOCKWASHER	14843	B-860		1
12.	3/4" x 37" RIGID CONDUIT	3/4 X 37 CONNPL	3/4 X 37 CONNPL		1
13.	MICON 200 with		M200-C3NASA-**-0-*		1
			(**s to be determined at time of order.)		
	9 PIN DISPLAY EXTENSION	W109E-39I	W109E-39I		
	9 PIN SPLICE	MWWS156-9	MWWS156-9		
	3 PIN ATC EXTENSION	W111-39I	W111-39I		
	3 PIN SPLICE	MWWS156-3	MWWS156-3		
14.	CAPPED ELBOW	LBY15	LBY15SA		1
15.	1/2" x 5 5/16" CONDUIT NIPPLE	1/2 X 5 5/16 CONNPL	1/2 X 5 5/16 CONNPL		1
16.	SOLENOID VALVE 120VAC 60Hz	226-787-1-120	226-787-1		1
17.	3/4" PLUG CONDUIT	CHPLG-2P	CHPLG-2P		2
18.	JUNCTION BOX	BC628	BC628	3775	1
19.	ELECTRICAL STRIP	76018	76018		1
20.	JUNCTION BOX LID	BC629	BC629	3776	1
21.	JUNCTION BOX NAMEPLATE	BC1717	BC1717	5981	1
22.	1" x 2" CONDUIT NIPPLE	1 X 2 CONNPL	1 X 2 CONNPL		1
23.	CONDUIT ELBOW	EL-19	EL-19		1
24.	CLOSE CONDUIT NIPPLE	ENP12X00	ENP12X00		1

OPTIONAL PARTS					
ITEM	DESCRIPTION	MRP NUMBER	BC/PART No.	DWG. No.	QTY
A.					

NOTE: ABOVE QUANTITIES ARE FOR **MODEL KRPN1H** ONLY. FOR **MODEL KRPN2H**, MULTIPLY QUANTITIES BY TWO.



(This drawing is included in this addendum for the purpose of easy reference only.)

L4391-5 (E.R. 3323)

PARTS LIST

DATE: 21-Jul-04

PROJECT REF.: KRP N1H1/N2H DISPENSER GAS PIPING EXPLODED ASSEMBLY

DWG. REF.: 4391-7

PARTS

ITEM	DESCRIPTION	MFG/SUPPLIER	BC/PART No.	DWG.	QTY
26.	1/4"NPT STREET ELBOW 3000lbs FS	GRINNELL	0361109358*		1
27.	1/4"NPT HYDROSTATIC RELIEF VALVE	REGO or SHERWOOD	RE-3125L* or PV3865400*		2
28.	3/4"NPT MANUAL GATE VALVE	REGO	RE7706P		1
29.	3/4"NPT x 3 1/2" LG NIPPLE	GRINNELL	0332619600*		2
30.	3/4"NPT ELBOW 3000lbs FS	GRINNELL	0361101009*		2
31.	3/4" NPT DOUBLE BACK CHECK VALVE	SHERWOOD / RNG	PV1855SPD / D211		1
32.	3/4"NPT TEE 3000lbs FS	GRINNELL	0361119803*		3
33.	3/4"NPT TO 1/4" NPT HEX BUSHING FS	GRINNELL	0361330707*		2
34.	0-600 PSI PRESSURE GAUGE	WIKA	8345805		1
35.					
36.	3/4"NPT x 2 1/2" LG NIPPLE	GRINNELL	0332619204		2
37.	SOLENOID VALVE W/COIL	HONEYWELL	SEE DWG 6441 or 5145 FOR SOLENOID SPEC		
38.	3/4"NPT DOUBLE BACKCHECK FILLER VALVE	SHERWOOD	PV1855-SD		1
39.	3/4"NPT TO 3/8"NPT HEX BUSHING FS	GRINNELL	0361330608*		1
40.	3/8"NPT x 8 1/2" LG NIPPLE	GRINNELL	NPO6X136-80		1
41.	3/8"NPT FULL PORT BALL VALVE	JOMAR/FAIRVIEW or APOLLO or GIACOMINI	BV2103-C-CGA* or 80-102-01* or R250UY002*		1
42.	3/8"NPT x 2 1/2" LG NIPPLE	GRINNELL	0332610005*		1
43.	3/8"NPT ELBOW 3000lbs FS	GRINNELL	0361100605*		1
44.	3/8"NPT TO 1/4" NPT HEX BUSHING FS	GRINNELL	0361330202*		1
45.	1/4"NPT x 3 1/2" LG NIPPLE	GRINNELL	0332605807*		1
46.	NEPTUNE METER	SHLUMBERGER /NEPTUNE	400051-011		1
47.	3/4"NPT x 2" LG NIPPLE	GRINNELL	0332619006		1
48.	3/4"NPT x 5" LG NIPPLE (FOR SINGLE & DUAL)	GRINNELL	0332619006		1
49.	BREAK-AWAY	REGO/INTERQUIP	A2141A6		1
50.	3/4" x 84" LPG HOSE	FAIRVIEW OR DOMINION GAS	I12C84MP12MP12 DSS284-12		1

L4391-5 (E.R. 3323)

PARTS LIST

DATE: 21-Jul-04

PROJECT REF.: KRP N1H1/N2H DISPENSER GAS PIPING EXPLODED ASSEMBLY

DWG. REF.: 4391-7

OPTIONAL PARTS

ITEM	DESCRIPTION	MFG/SUPPLIER	BC/PART No.	DWG.	QTY
A	ATC TEMPERATURE PROBE ADAPTER PLATE	SPECTRUM	BC0822	4035	1
B	ATC PROBE	KRAUS	W199		1
C	ADAPTER PLATE O-RING		N70-223		1
D	3/8" BLUE LOOM x 42" LG	KRAUS	38362		1

HARDWARE (PLATED UNLESS SPECIFIED)

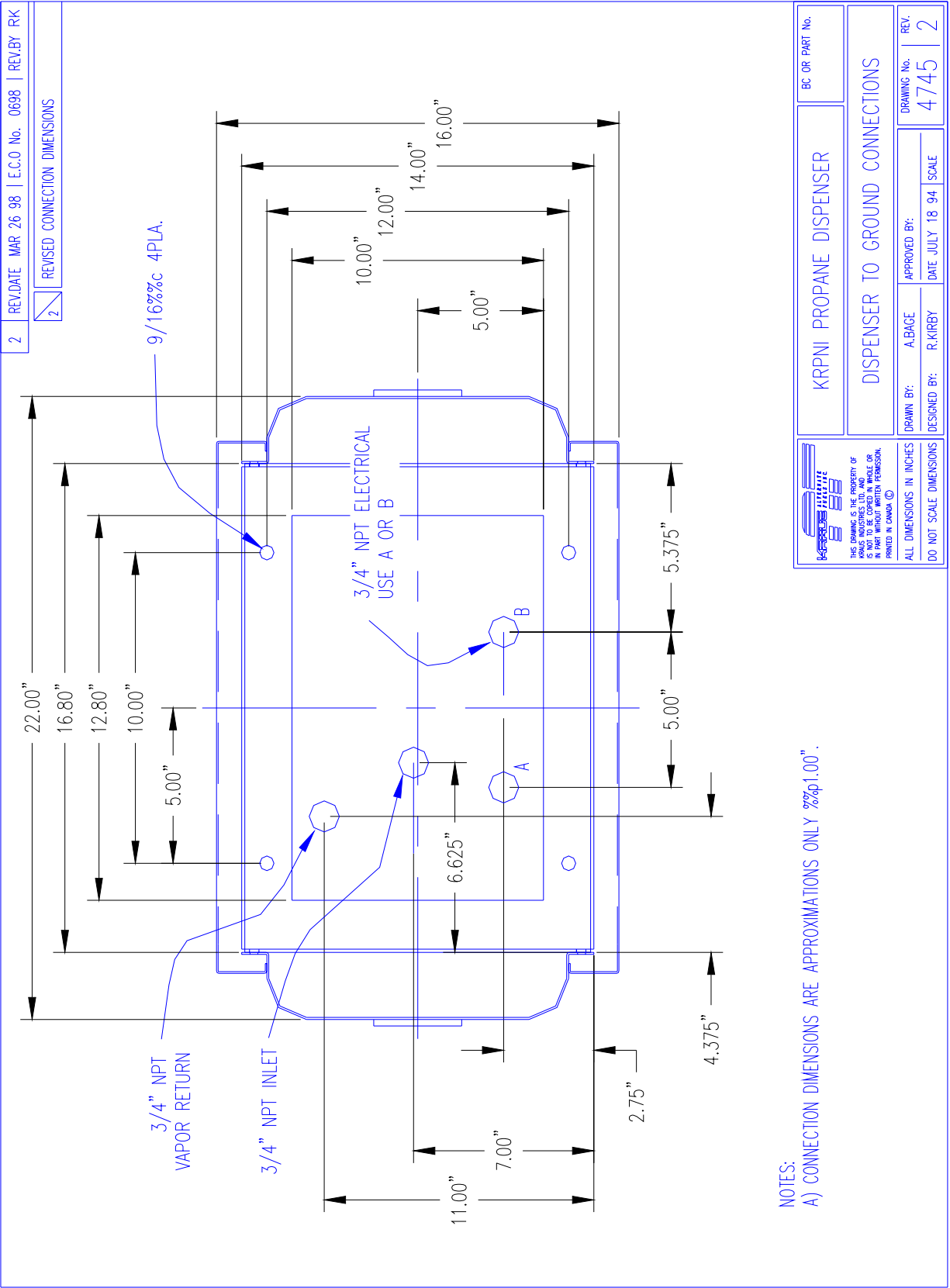
ITEM	DESCRIPTION	MFG/SUPPLIER	BC/PART No.	DWG.	QTY
AA	5/16 NC x 1 1/2 LG HEX BOLT (FOR ATC OPTION ONLY)				4
AB	5/16 LOCKWASHERS (FOR ATC OPTION ONLY)				4
AC	COUPLER	KRAUS	BC0351	3407	1
AD	#10-32 K-LOK NUT				2
AE	#10 FLATWASHER				2
AF	#10 x 3" LG SLOT HEAD SCREWS				2
AG	PARKER CLAMP	PARKER	#2127PP (1/2" OD)		1
	PARKER COVER PLATE		#CP2 (1/2")		1

NOTE: 1) ABOVE QUANTITIES ARE FOR **SINGLE** ONLY. FOR **DUAL**, MULTIPLY QUANTITIES BY TWO.

2) ALL PIPE FITTINGS ARE 3000lbs FORGED STEEL UNLESS OTHERWISE SPECIFIED.

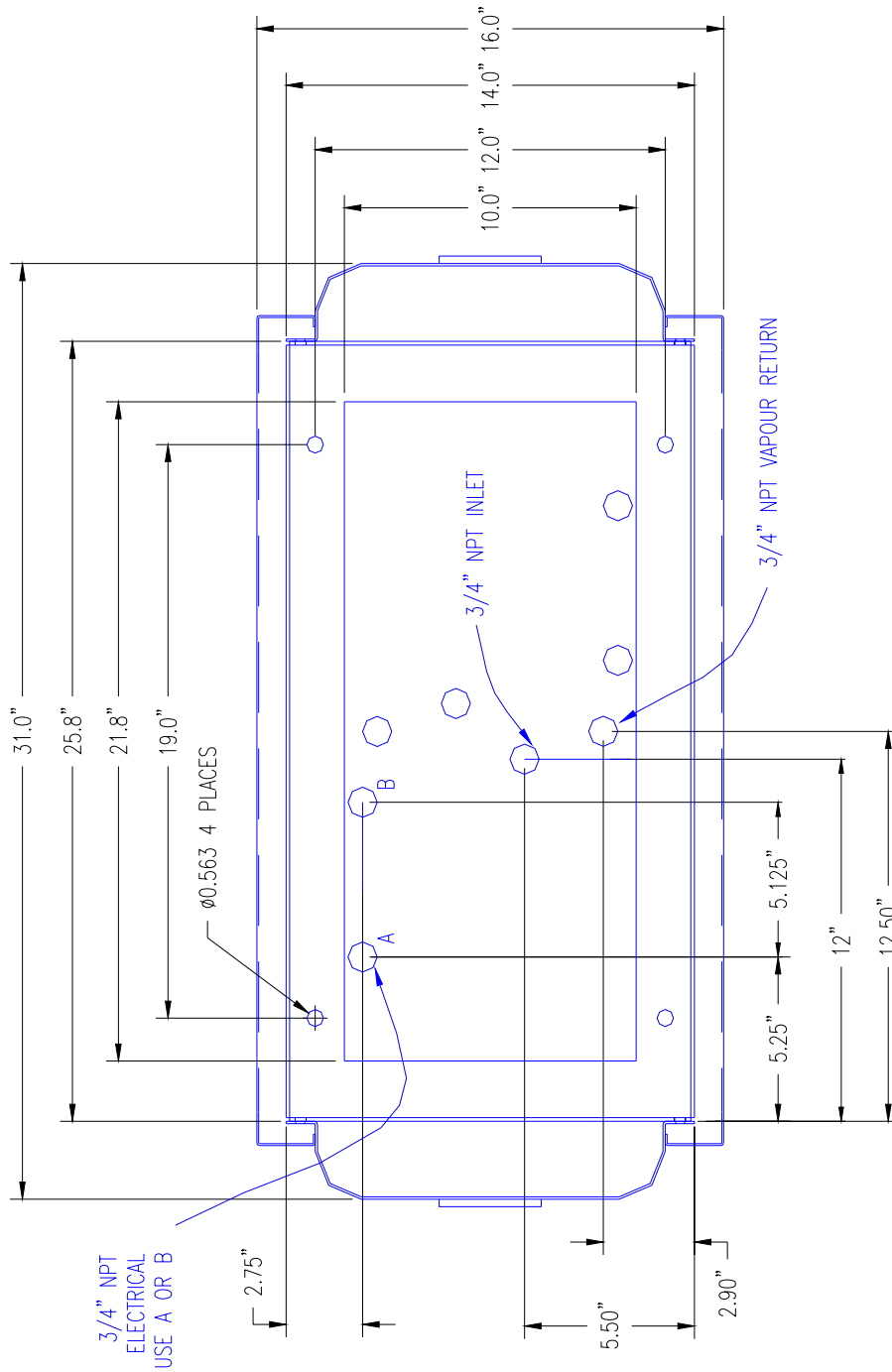
3) ALL PIPE IS SCHEDULE 80 EXTRA HEAVY SEAMLESS.

4) * PARTS CAN BE REPLACED WITH EQUIVALENT PARTS FROM DIFFERENT MANUFACTURERS.



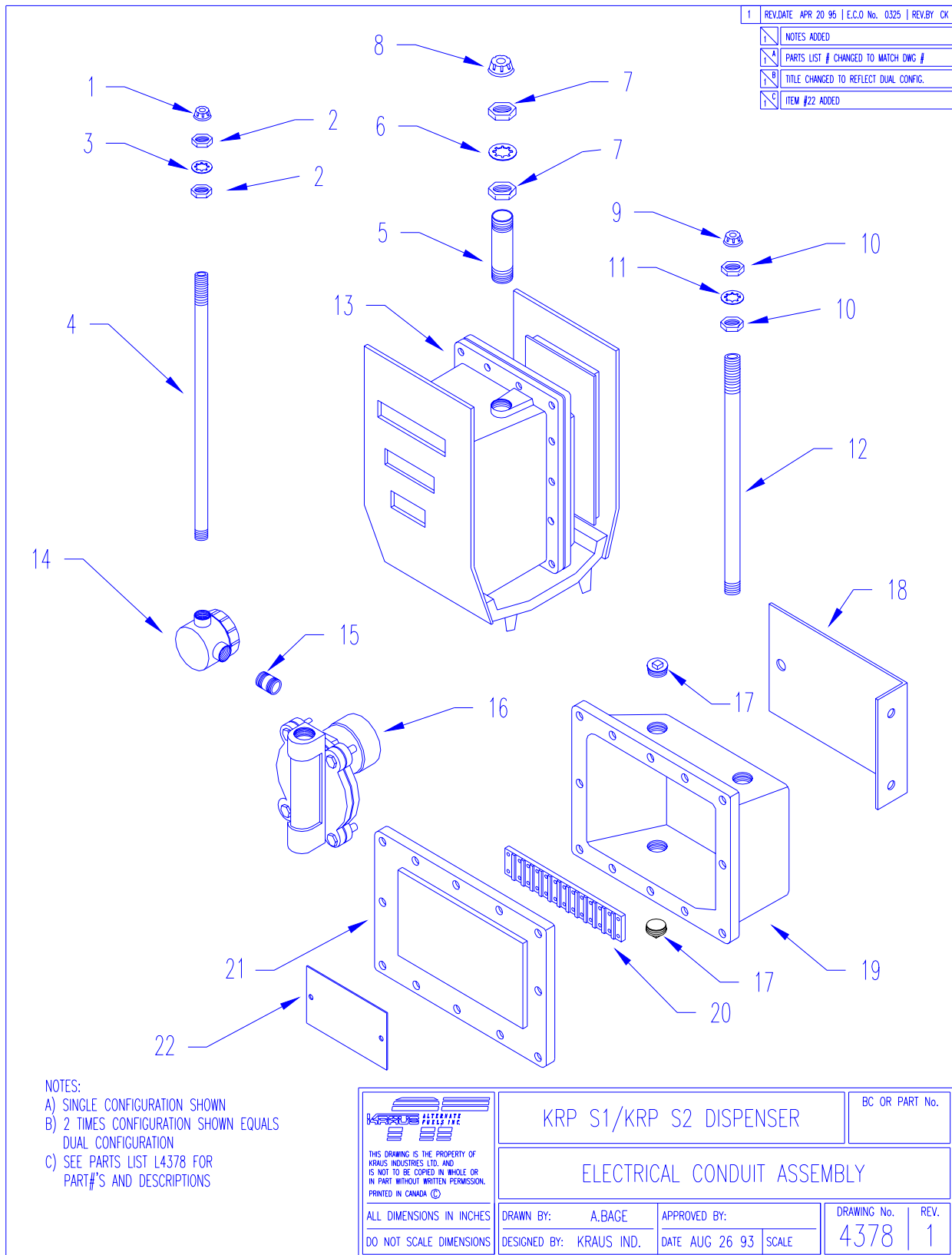
1 REV/DATE APR 13 98 | E.C.O No. 0708 | REV/BY RK

1 ALL CONNECTIONS MOVED.



KRP N2 LPG DISPENSER		EC OR PART No. 0000
DISPENSER TO GROUND CONNECTIONS		
DRAWN BY: GAREN PHEIFER	APPROVED BY:	DRAWING No. 5957
DESIGNED BY: RAY DUECK	DATE: FEB 11 97	SCALE: NTS 1

NOTES:
A) DIMENSIONS FOR INLET, VAPOR RETURN, AND ELECTRICAL CONDUIT ARE TYPICAL BOTH SIDES.
B) CONNECTION DIMENSIONS ARE APPROXIMATIONS ONLY.



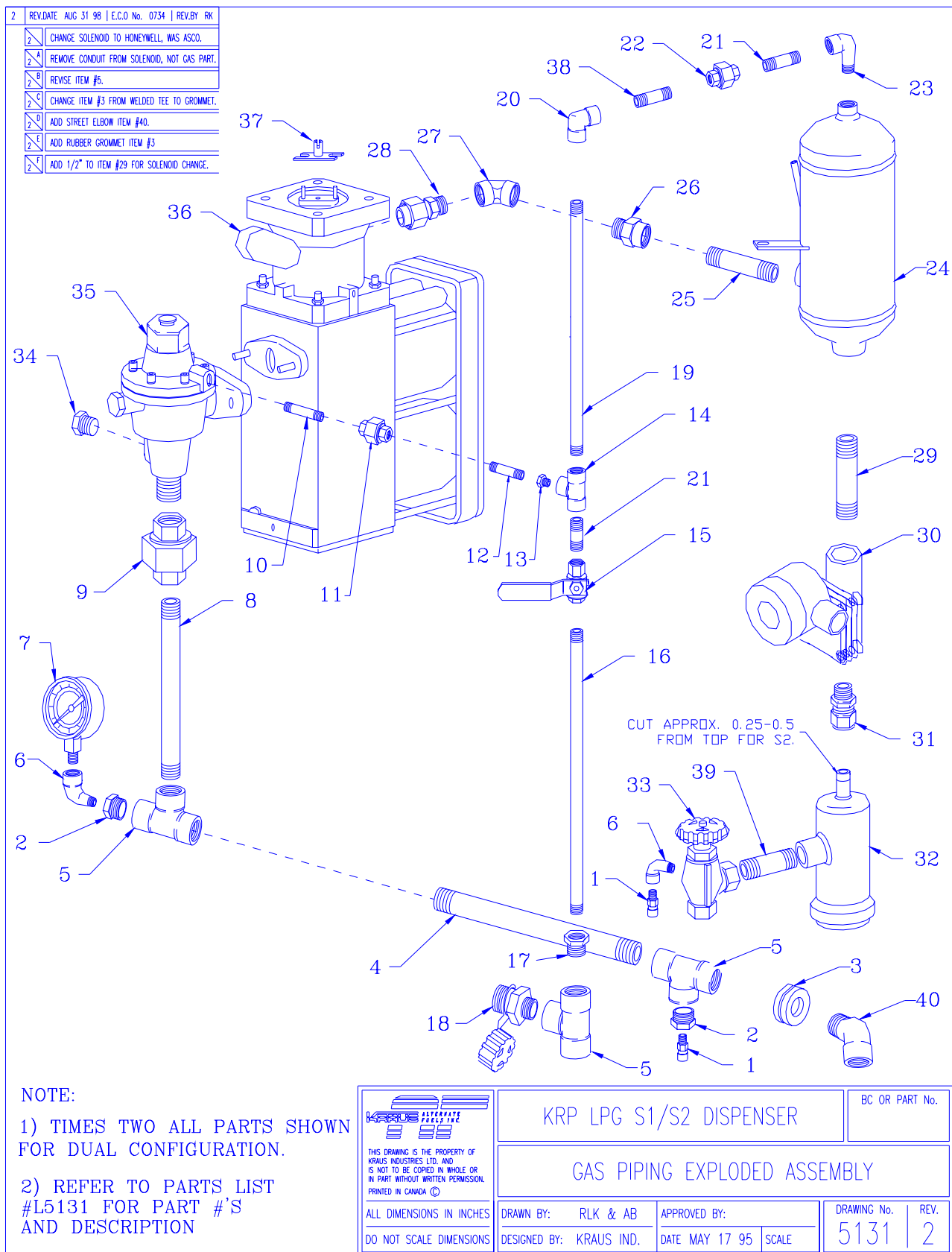
L4378-2 (E.C.O. No.0568)	PARTS LIST	DATE: 21-Jul-04
PROJECT REF.: KRP S1/S2 DISPENSER ELECTRICAL EXPLODED ASSEMBLY		DWG. REF.: 4378-1

PARTS				
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
1.	1/2" PLASTIC BUSHING	ZEN 2603		1
2.	1/2" LOCKNUT	0318913449		2
3.	7/8" TOOTH LOCKWASHER	B-919		1
4.	1/2" x 30" RIGID CONDUIT (SINGLE)	1/2 X 30 CONNPL		1
	1/ 2" x 25 1/ 2" RIGID CONDUIT (DUAL)	1/ 2 X 30 CONNPL		2
5.	1" x 8" MICON RIGID CONDUIT	1 X 8 CONNPL		1
6.	1 1/8" TOOTH LOCKWASHER	B-859		1
7.	1" LOCKNUT	0318913522		2
8.	1" PLASTIC BUSHING	ZEN 2605		1
9.	3/4" PLASTIC BUSHING	ZEN 2604		1
10.	3/4" LOCKNUT	0318913480		2
11.	1 5/16" TOOTH LOCKWASHER	B-860		1
12.	3/4" x 40" RIGID CONDUIT	3/4 X 40 CONNPL		1
13.	MICON 200	M200-S3W*SA-**-0-*		1
		(**s to be determined at time of order.)		
14.	KILLARK "J" BOX	GEML-1		1
15.	1/2" x 1 1/2" CONDUIT NIPPLE	1/2 X 1 1/2 CONNPL		1
16.	SOLENOID VALVE 120VAC 60Hz	226-787-1		1
17.	3/4" PLUG CONDUIT	CHPLG-2P		2
18.	JUNCTION BOX BRACKET	BC615	3729	1
19.	JUNCTION BOX	BC628	3775	1
20.	ELECTRICAL STRIP	76018		1
21.	JUNCTION BOX LID	BC629	3776	1
22.	JUNCTION BOX NAMEPLATE	BC1717	5981	1

OPTIONAL PARTS				
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
A.				

REFERENCE INFORMATION				
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
A.				

NOTE: ABOVE QUANTITIES ARE FOR **MODEL KRPS1** ONLY. FOR **MODEL KRPS2** MULTIPLY QUANTITIES BY TWO.



PARTS				
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
1.	1/4" HYDROSTATIC RELIEF VALVE	3865 or 3125L		2
2.	3/4" x 1/4" HEX BUSHING	0361330707		2
3.	1 1/8 x 1 7/8 x 3/8 TH RUBBER GROMMET	MET LP622		1
4.	3/4" x 10 1/2" EH NIPPLE	0000001099		1
5.	3/4" TEE	0310516208		3
6.	1/4" 90° STREET ELBOW	0310507405		2
7.	213.53 2.5" 0-600 PSI PRESSURE GAUGE	8345805		1
8.	3/4" x 8 1/2" EH NIPPLE	0000001099		1
9.	3/4" UNION CLASS 300	0312701006		1
10.	1/4" x 3" NIPPLE	0330505603		1
11.	1/4" UNION CLASS 300	0361500408		1
12.	1/4" x 2" NIPPLE	0330505207		1
13.	3/8" x 1/4" HEX BUSHING	0361330202		1
14.	3/8" TEE	0310515804		1
15.	3/8" BALL VALVE	BU2103-C-CGA		1
16.	3/8" x 13" NIPPLE	0000001099		1
17.	3/4" x 3/8" HEX BUSHING	0361330806		1
18.	DOUBLE BACK-CHECK FILLER VALVE	RE7647DC or PV1855		1
19.	3/8" x 10 1/2" NIPPLE	0000001099		1
20.	3/8" 90° ELBOW	0310500400		1
21.	3/8" x 2 1/2" NIPPLE	0330510009		1
22.	3/8" UNION CLASS 300	0312700602		1
23.	3/8" 90° STREET ELBOW	0310507603		1
24.	AIR ELIMINATOR	856001		1
25.	3/4" x 2 3/4" NIPPLE	0000001099		1
26.	3/4" DOUBLE BACK CHECK VALVE	D-211 OR PVD1855SPD		1
27.	3/4" 90° ELBOW	0361101009		1
28.	3/4" NPT TO 22MM PIPE FITTING	EVGE22-L-3/4 NPT		1
29.	3/4" x 2" NIPPLE (S2)	0330518804		1
	3 /4" x 6 1/2" LG NIPPLE (S1)			
30.	3/4" SOLENOID VALVE BODY	#73212BN52NP1NOH COIL120V-#H111P3 COIL220V-#H111Q3		1
31.	3/4" MALE CONNECTOR	GE22-PL3/4-NPT		1
32.	COMPLETE LPG FILTER	650001		1

PARTS

ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
33.	3/4" MANUAL GATE VALVE	7706P		1
34.	1/4" NPT PLUG	PART OF 7706P		1
35.	PRESSURE DIFFERENTIAL VALVE	8000710		1
36.	SCHWELM PISTON METER 3/4"	840705		1
37.	SCHWELM COUPLER	BC246	3319	1
38.	3/8" x 2.0" LG NIPPLE XHSL	0330010208		1
39.	3 /4" x 1 1 /2" LG NIPPLE			1
40.	3/4 STREET ELBOW (PLATED)	2102-12-12		1

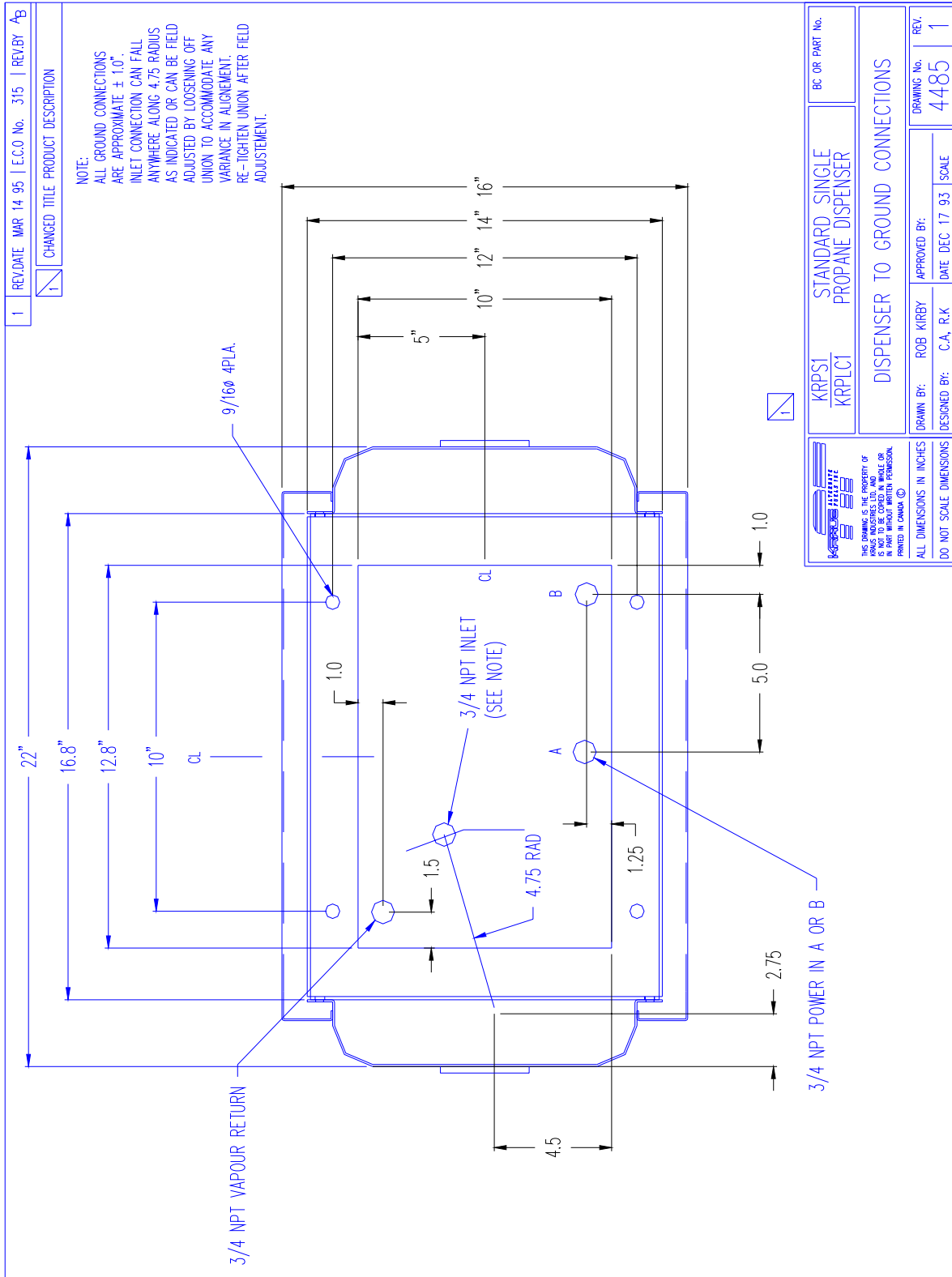
NOTE: ABOVE QUANTITIES ARE FOR **MODEL KRPS1** ONLY. FOR **MODEL KRPS2**, MULTIPLY QUANTITIES BY TWO.

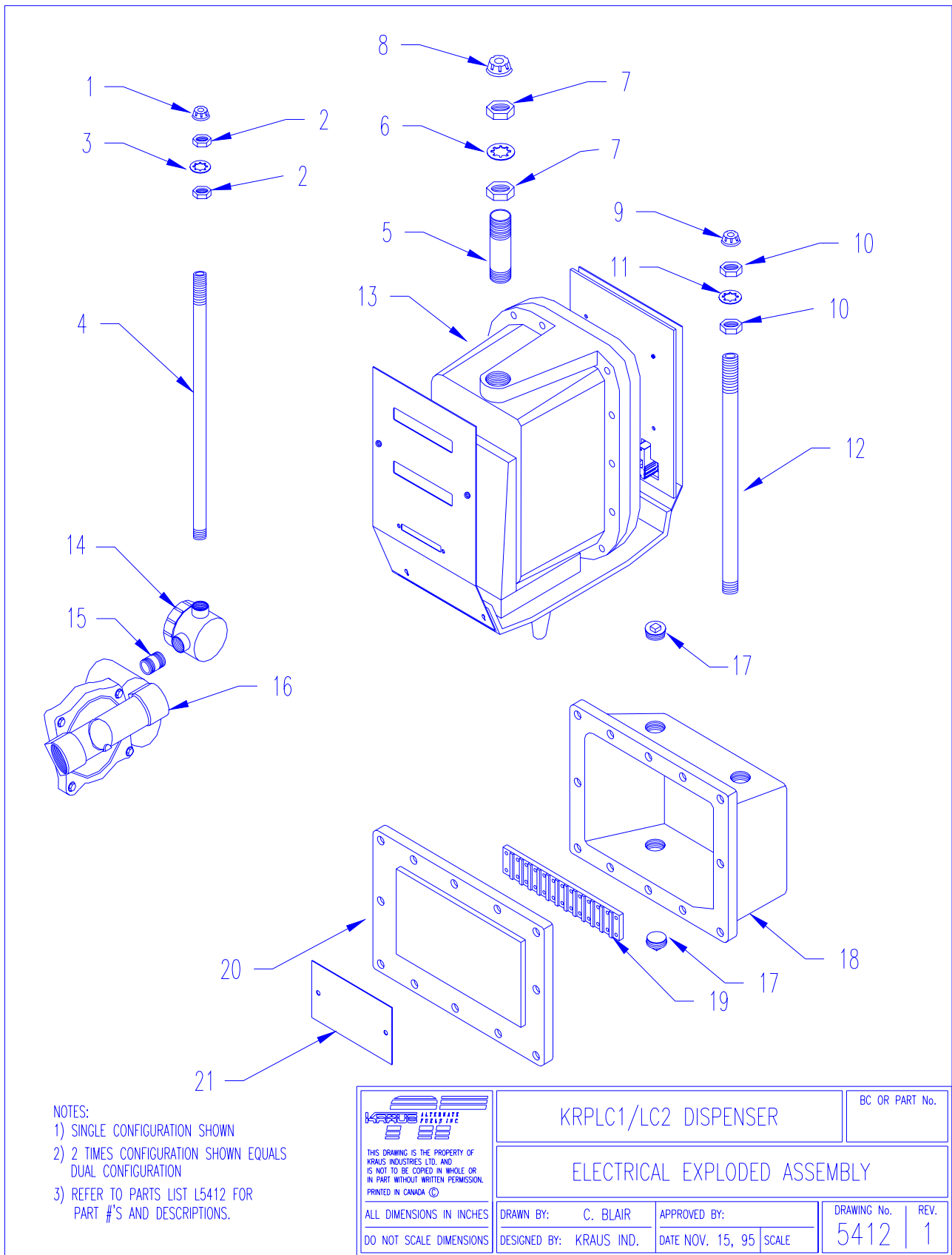
OPTIONAL PARTS

ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
A.				

REFERENCE INFORMATION

ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
A.				



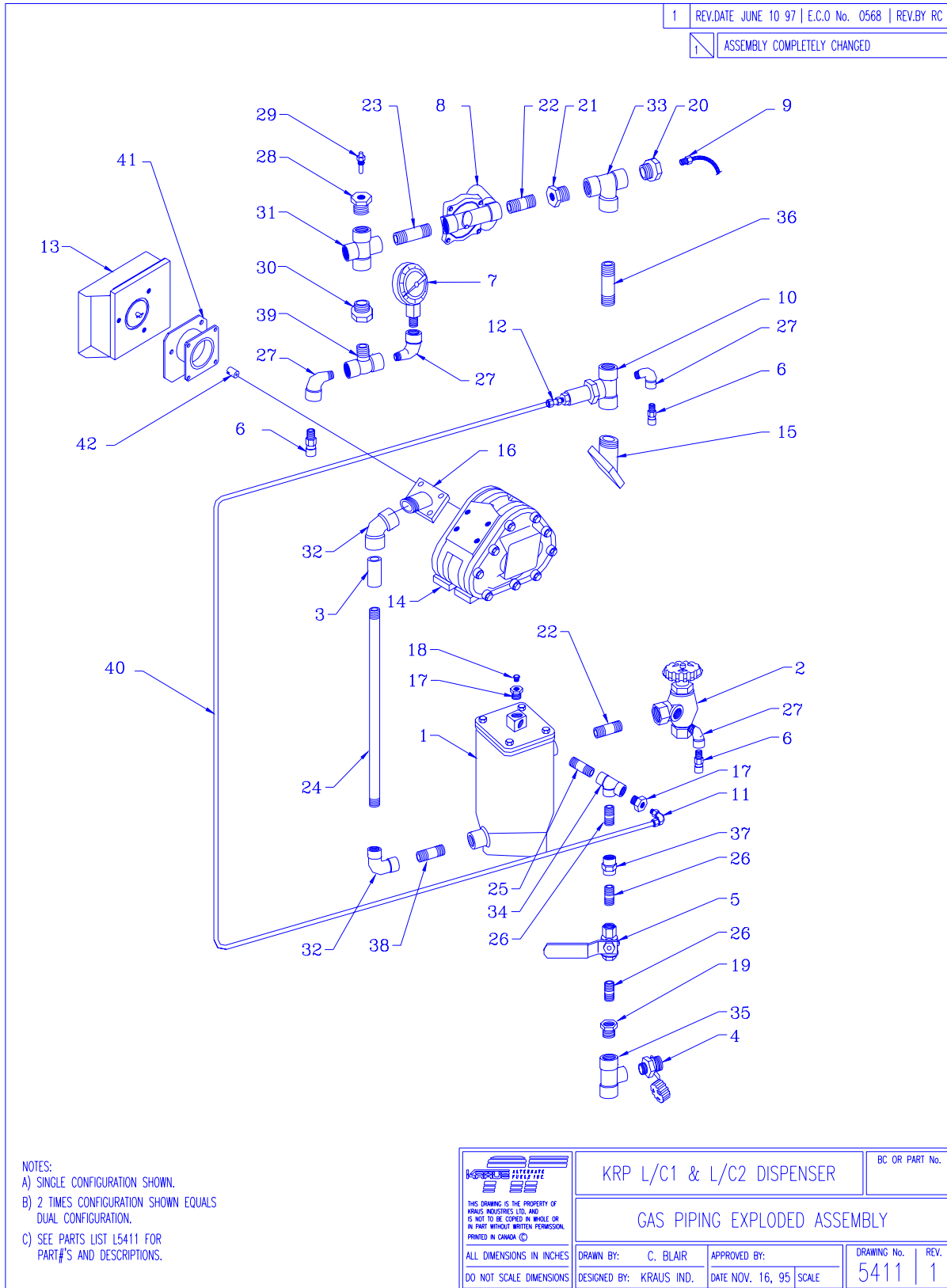


PARTS				
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
1.	1/2" PLASTIC BUSHING	ZEN 2603		1
2.	1/2" LOCKNUT	0318913449		2
3.	7/8" TOOTH LOCKWASHER	B-919		1
4.	1/2" x 19 3/4" RIGID CONDUIT	1/2 X 19 3/4 CONNPL		1
5.	1" x 8" MICON RIGID CONDUIT	1 X 8 CONNPL		1
6.	1 1/8" TOOTH LOCKWASHER	B-859		1
7.	1" LOCKNUT	0318913522		2
8.	1" PLASTIC BUSHING	ZEN 2605		1
9.	3/4" PLASTIC BUSHING	ZEN 2604		1
10.	3/4" LOCKNUT	0318913480		2
11.	1 5/16" TOOTH LOCKWASHER	B-860		1
12.	3/4" x 36 1/2" RIGID CONDUIT	3/4 X 36 1/2 CONNPL		1
13.	MICON 200	M200-X3S*SA-**-0- (*s to be determined at time of order.)		1
14.	JUNCTION BOX	GEML-1		1
15.	1/2" x 2" CONDUIT NIPPLE	1/2 X 2 CONNPL		1
16.	SOLENOID VALVE 120VAC 60Hz	226-787-1		1
17.	3/4" PLUG CONDUIT	CHPLG-2P		2
18.	JUNCTION BOX	BC628	3775	1
19.	ELECTRICAL STRIP	76018		1
20.	JUNCTION BOX LID	BC629	3776	1
21.	JUNCTION BOX NAMEPLATE	BC1717	5981	1

OPTIONAL PARTS				
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
A.				

REFERENCE INFORMATION				
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
A.				

NOTE: ABOVE QUANTITIES ARE FOR **MODEL KRPLC1** ONLY. FOR **MODEL KRPLC2** MULTIPLY QUANTITIES BY TWO.



PARTS				
ITEM	DESCRIPTION	BC/PART No.	DWG. No.	QTY
1.	BROOKS VAPOUR ELIMINATOR	CS027Z008-AAA		1
2.	3/4" MANUAL GATE VALVE	RE-7706P		1
3.	1-1/4" CHECK VALVE	G101		1
4.	3/4" DOUBLE BACK-CHECK FILLER VALVE	RE7647DC OR PV1855		1
5.	3/8" BALL VALVE	BU2103-C-CGA		1
6.	1/4" HYDROSTATIC RELIEF VALVE	3125L		3
7.	213.53. 2.5" 0-600 PSI PRESSURE GAUGE	8345805		1
8.	3/4" SOLENOID VALVE	XL2LB5350		1
9.	TEMPERATURE PROBE	18115 N/S		1
10.	3/4" DIFFERENTIAL VALVE	N-120-08-03		1
11.	1/4" TO 1/4" TUBE FITTING	DLN-4-4		1
12.	1/4" STRAIGHT TUBE FITTING	DCT4-4		1
13.	REMOTE PULSER	RP648LC		1
14.	LC METER	MA4A10		1
15.	1" LC METER FLANGE FS	BC1486	5462	1
16.	1-1/4" LC METER FLANGE FS	BC1485	5461	1
17.	3/8" TO 1/4" HEX BUSHING FS	0361330202		2
18.	1/4" NPT PLUG	PART OF RE-7706P		1
19.	3/4" TO 3/8" 3000 lb HEX BUSHING FS	0361330806		1
20.	1" TO 1/8" 3000 lb HEX BUSHING FS			1
21.	1" TO 3/4" HEX BUSHING FS			1
22.	3/4" x 1-1/2" NIPPLE XHSL	0332618800		2
23.	3/4" x 2-1/2" NIPPLE XHSL	0332619204		1
24.	1-1/4" x 1" NIPPLE XHSL	0000001099		1
25.	3/8" x 2" NIPPLE XHSL	0332609809		1
26.	3/8" x 1-1/2" NIPPLE XHSL	0332609601		1
27.	1/4" STREET ELBOW 90° 3000LB FS	0361109358		3
28.	3/4" TO 1/8" HEX BUSHING FS	0361330608		4
29.	1/8" THERMOWELL	BC0407	3574	1
30.	3/4" TO 1/4" HEX BUSHING FS	0361330707		1
31.	3/4" CROSS TEE 3000LB FS	0361129802		1
32.	1-1/4" 3000 lb ELBOW			2
33.	1-1/4" 3000 lb TEE			1
34.	3/8" TEE 3000LB FS THRD	0361119407		1
35.	3/4" TEE 3000LB FS THRD	0361119803		1
36.	1" X1-1/2" XHSL NIPPLE			1
37.	3/8" UNION 3000LB FS THRD	0361500606		1
38.	1-1/4" X1-1/2" XHSL NIPPLE			1

L5411-1 (E.C.O. No.0568)	PARTS LIST	DATE: 21-Jul-04
PROJECT REF.: KRP LC1/ LC2 LPG DISPENSER GAS PIPING EXPLODED ASSY.		DWG. REF.: 5411-1

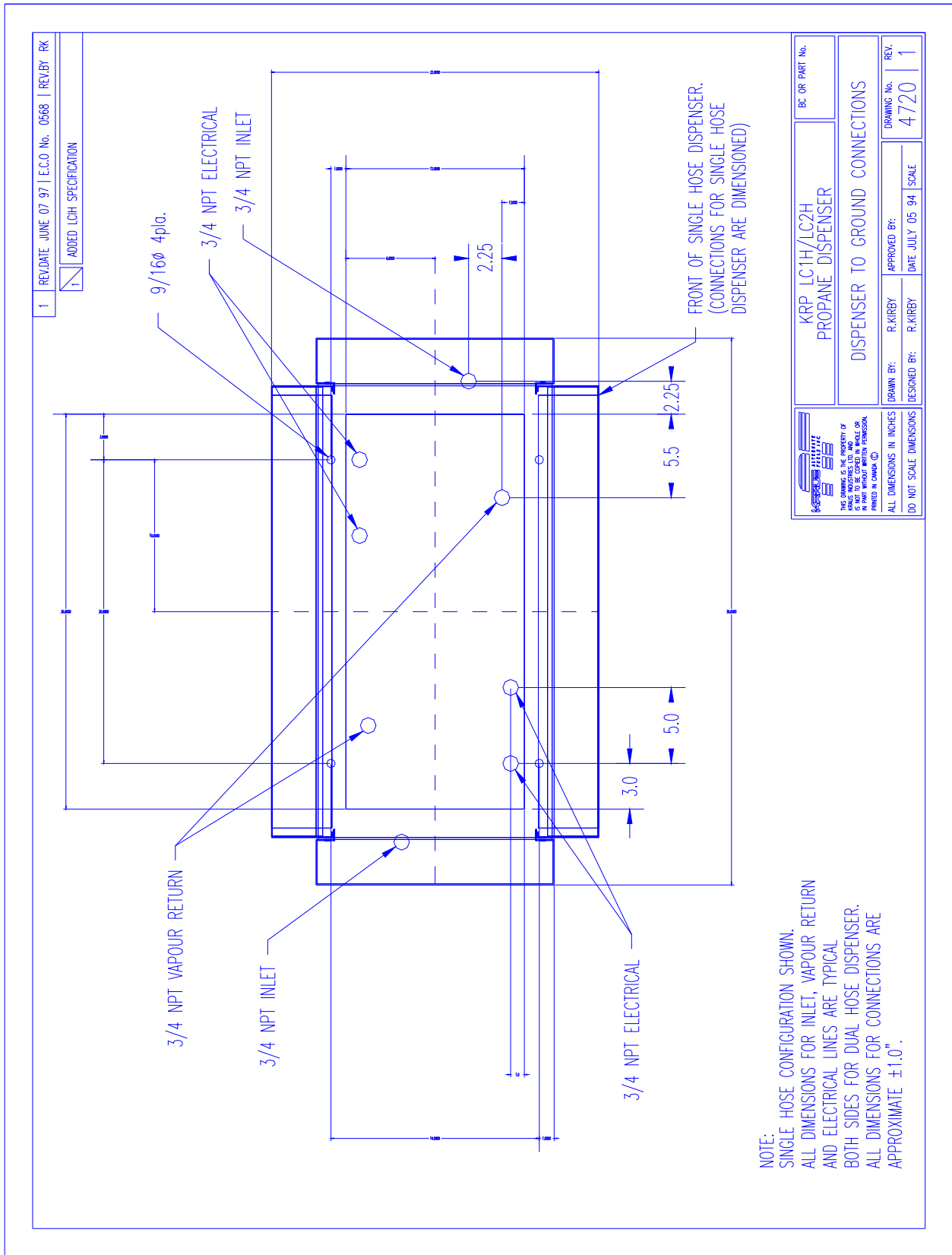
PARTS				
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
39.	1/4 MALE BRANCH TEE			1
40.	1/4" STAINLESS STEEL TUBE			1
41.	REMOTE PULSER SPACER	BC0846	4092	1
42.	REMOTE PULSER COUPLER	BC0845	4143	1

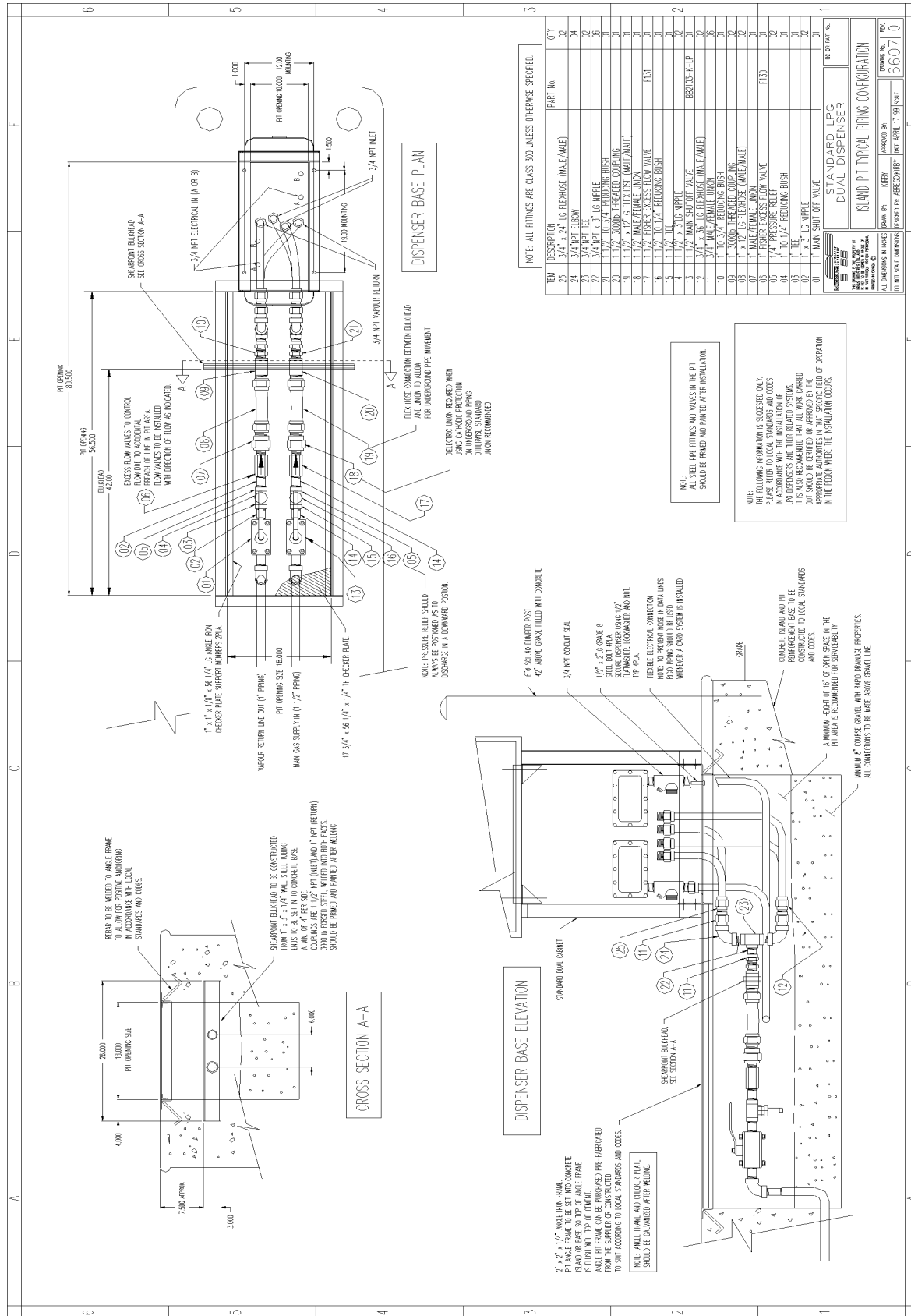
OPTIONAL PARTS				
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
A.				
B.				

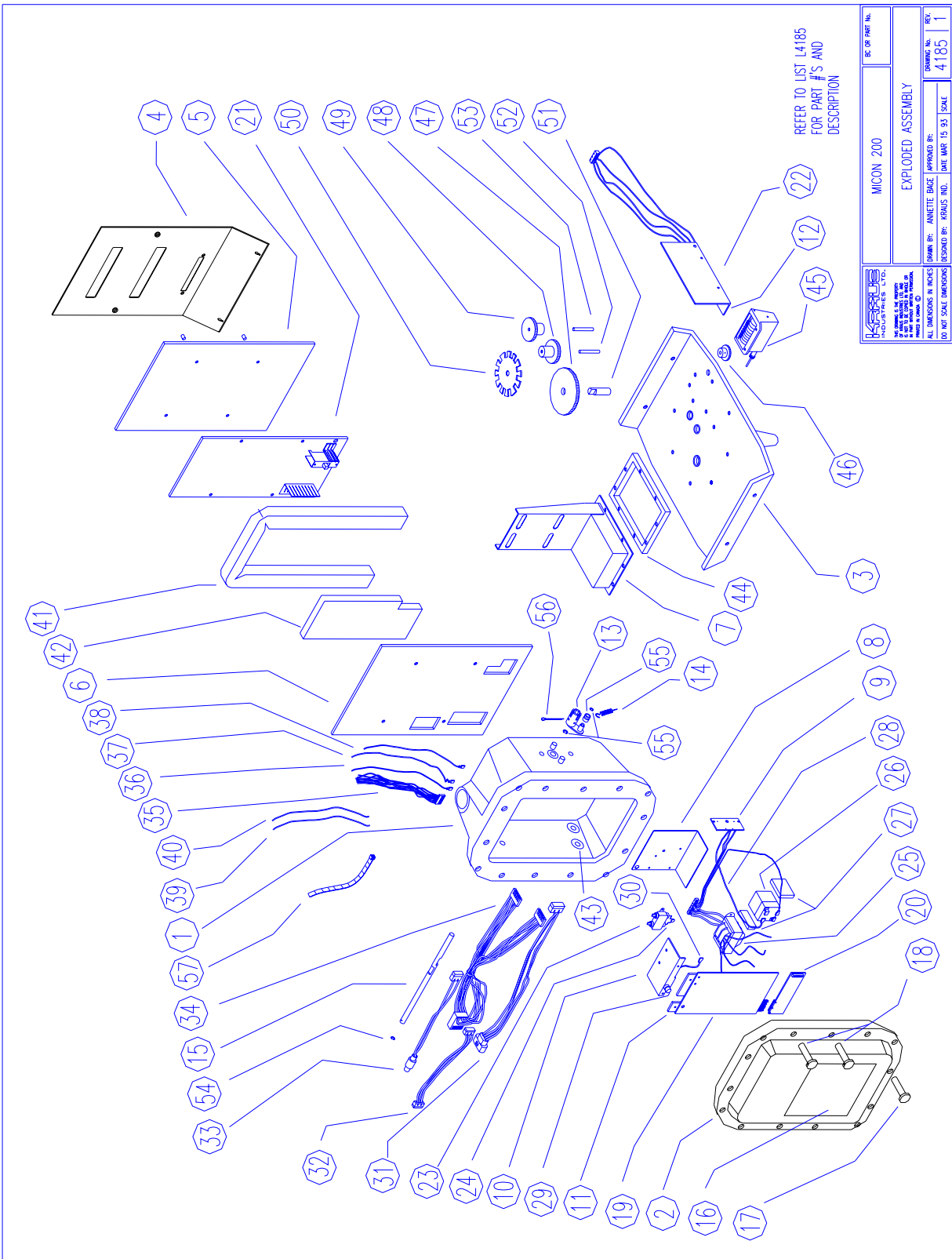
REFERENCE INFORMATION				
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
A1.				
A2.				

HARDWARE (PLATED UNLESS SPECIFIED)				
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
AA.				
AB.				

NOTE: ABOVE QUANTITIES ARE FOR **MODEL KRP LC1** ONLY. FOR **MODEL KRP LC2** MULTIPLY QUANTITIES BY TWO.

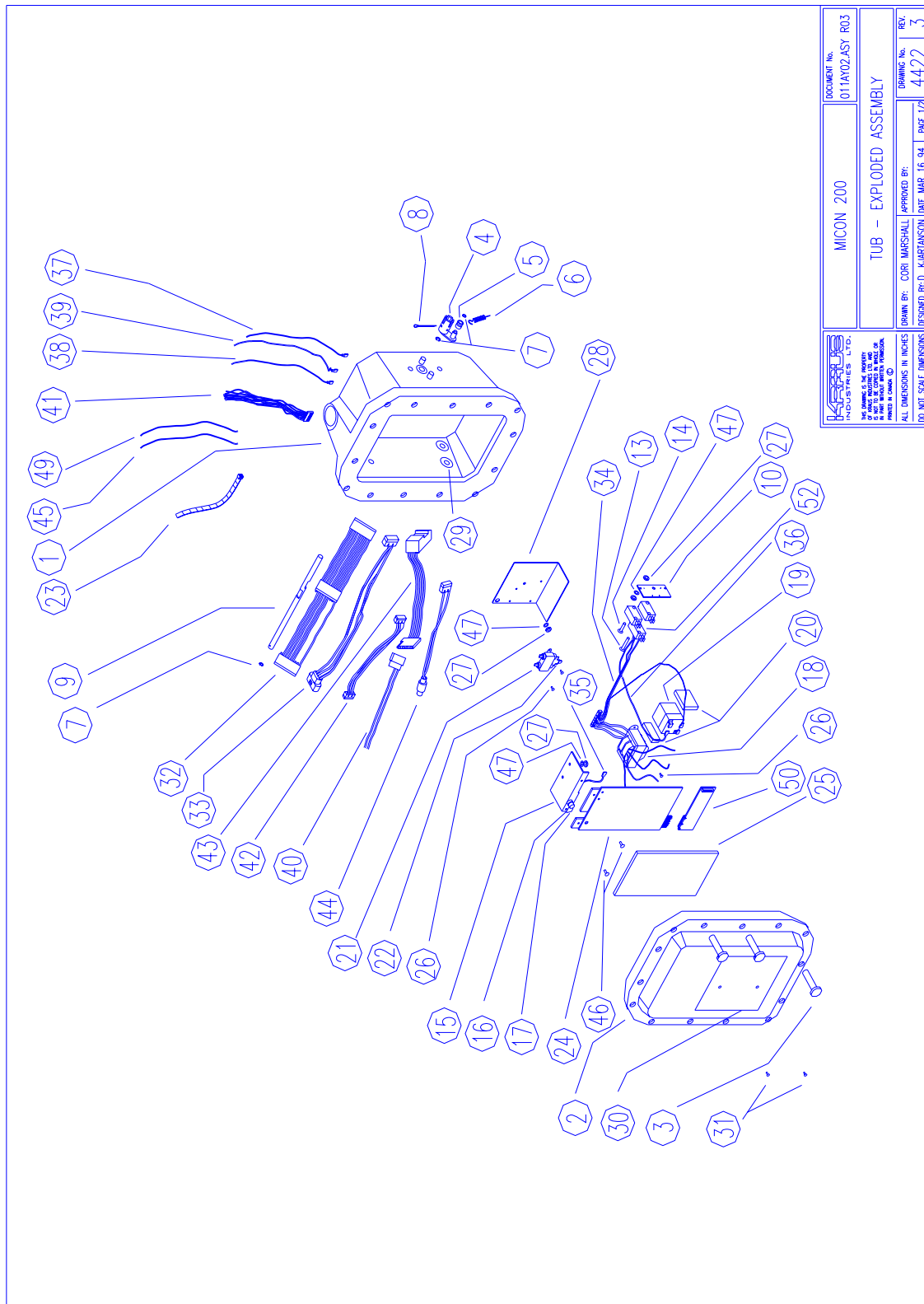




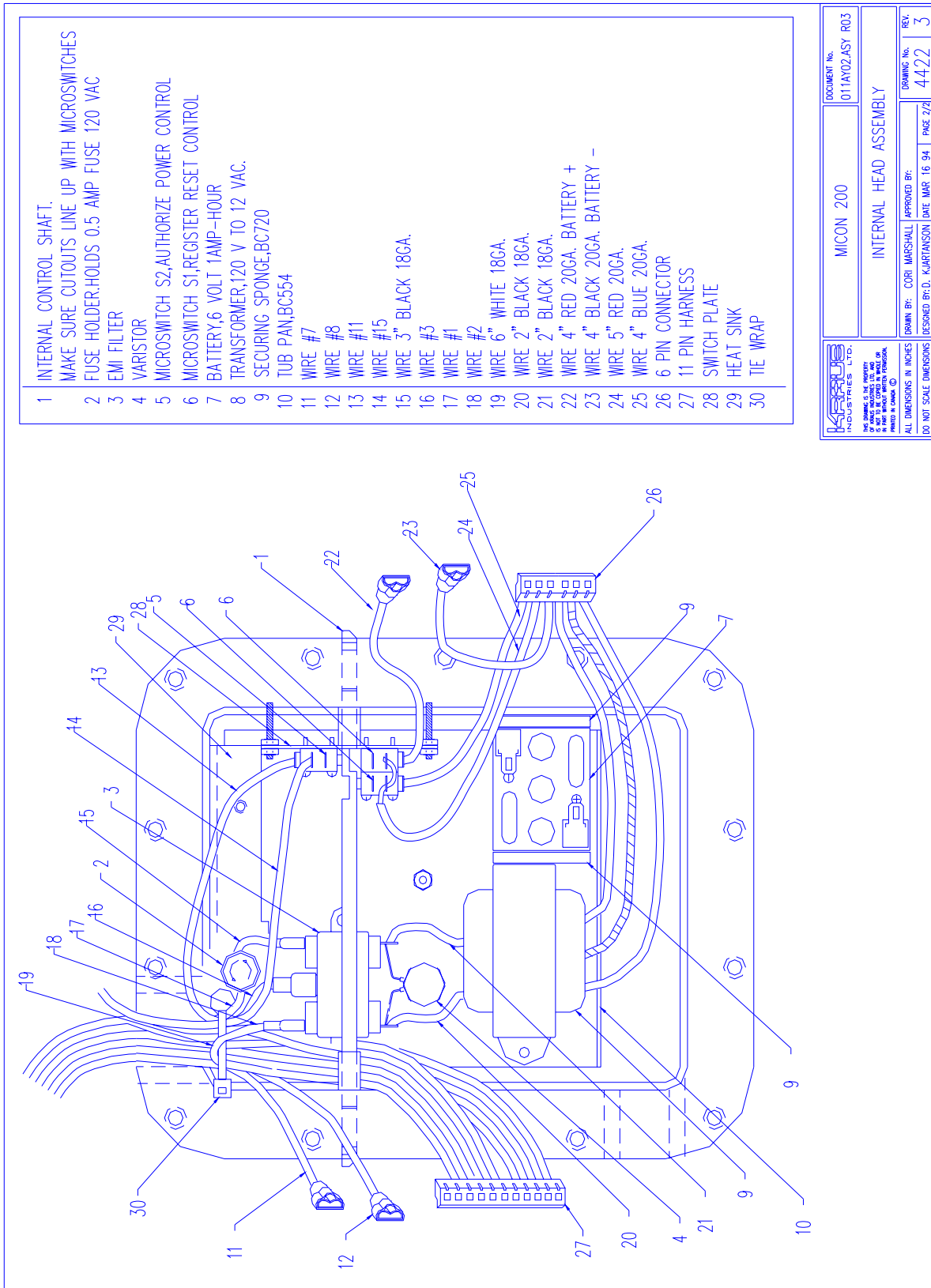



PARTS				
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY.</i>
1.	TUB	BC0081		1
2.	TUB LID	BC0083		1
3.	BASE	BC0051		1
4.	FACEPLATE	BC0011		2
5.	DISPLAY LENS	BC0429		2
6.	DISPLAY BACKING PLATE	BC0428		2
7.	MICON CHAIR	BC0116		1
8.	CHASSIS	BC0554		1
9.	SWITCH PLATE ASSEMBLY	BC0032		1
10.	MAIN HEATSINK	BC0179		1
11.	MAIN BOARD HEATSINK	BC0893		1
12.	PULSER BOARD BRACKET	BC0076		1
13.	HANDLE COUPLER	BC0103		1
14.	COUPLER SPRING	BCO103S		1
15.	HANDLESHAFT	BC0181		1
16.	NAMEPLATE	BC1007		1
17.	LID BOLTS	5/16 x 1 1/4 NC GR 2		12
18.	LID SEAL BOLTS (ATC ONLY)	BC1066		2
19.	MAIN BOARD	SK252		1
20.	ATC/CALIBRATION BOARD	SK291		1
21.	DISPLAY BOARD	BC0427		1
22.	PULSER BOARD	SK246		1
23.	EMI FILTER	GA1A-1		1
24.	VARISTOR PIN	V140LAIOA		1
25.	12V TRANSFORMER	25A		1
26.	6V BATTERY	1AH		1
27.	BATTERY SPONGES	BC0719		1
28.	POSITIVE BATTERY WIRE	W116		1
29.	FUSE HOLDER	342012L		1
30.	FUSE HOLDER WIRE	W115		1
31.	PULSER HARNESS	W110		1
32.	ATC HARNESS	W87-201		1
33.	PROBE HARNESS	W120		1
34.	DISPLAY HARNESS	W109		1
35.	CUSTOMER HARNESS	W112		1
36.	ORANGE WIRE #7	W117		1
37.	BLACK WIRE #8	W118		1
38.	GREEN GROUND WIRE	W119		1
39.	18 AWG TEW WIRE #1	W67-3F/BLK		1

PARTS				
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY.</i>
40.	18 AWG TEW WIRE #14	W67-3F/BRN		1
41.	DISPLAY GASKET	BC0426		2
42.	DISPLAY BACKING SPONGE	BC0427		2
43.	RUBBER PLUGS	BC0190		2
44.	PULSER COVER GASKET	BC0568		1
45.	COUNTER ASSEMBLY	41825-400		1
46.	COUNTER BEVEL GEAR	1M4RL7148		1
47.	MAIN SPUR GEAR	1M2RL7148-5		1
48.	IDLER SPUR GEAR	1M2RL7148-3		1
49.	COUNTER SPUR GEAR	1M2RL7148-3		1
50.	PULSER DISK	BC0182		1
51.	MAIN SHAFT	BC0241		1
52.	IDLER/PULSER DISK SHAFT	BC0241		1
53.	COUNTERSHAFT	BC0241		1
54.	RETAINING RING	0.25		1
55.	COUPLER ROLLER	BC0103R		1
56.	COTTER PIN	0.125 x 1" LG		1
57.	TIE WRAP	GENERIC		1



INDUSTRIES LTD.	MICON 200	DOCUMENT No. 011AY02.ASY R03
BY: C. MARSHALL DATE: 16 MAR 94	TUB - EXPLODED ASSEMBLY	DRAWING No. 4422
DESIGNED BY: C. MARSHALL DATE: 16 MAR 94	APPROVED BY: C. MARSHALL DATE: 16 MAR 94	REV. 3



	DOCUMENT No. MICON 200	011AY02.ASY R03
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ALL DIMENSIONS IN INCHES DO NOT SCALE DIMENSIONS	DESIGNED BY: D. KJARTANSON DATE MAR 16 94	REV. 3



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Winnipeg, Manitoba
CANADA R2J 3V9

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ADDENDUM TO:

KRP™ LPG DISPENSER

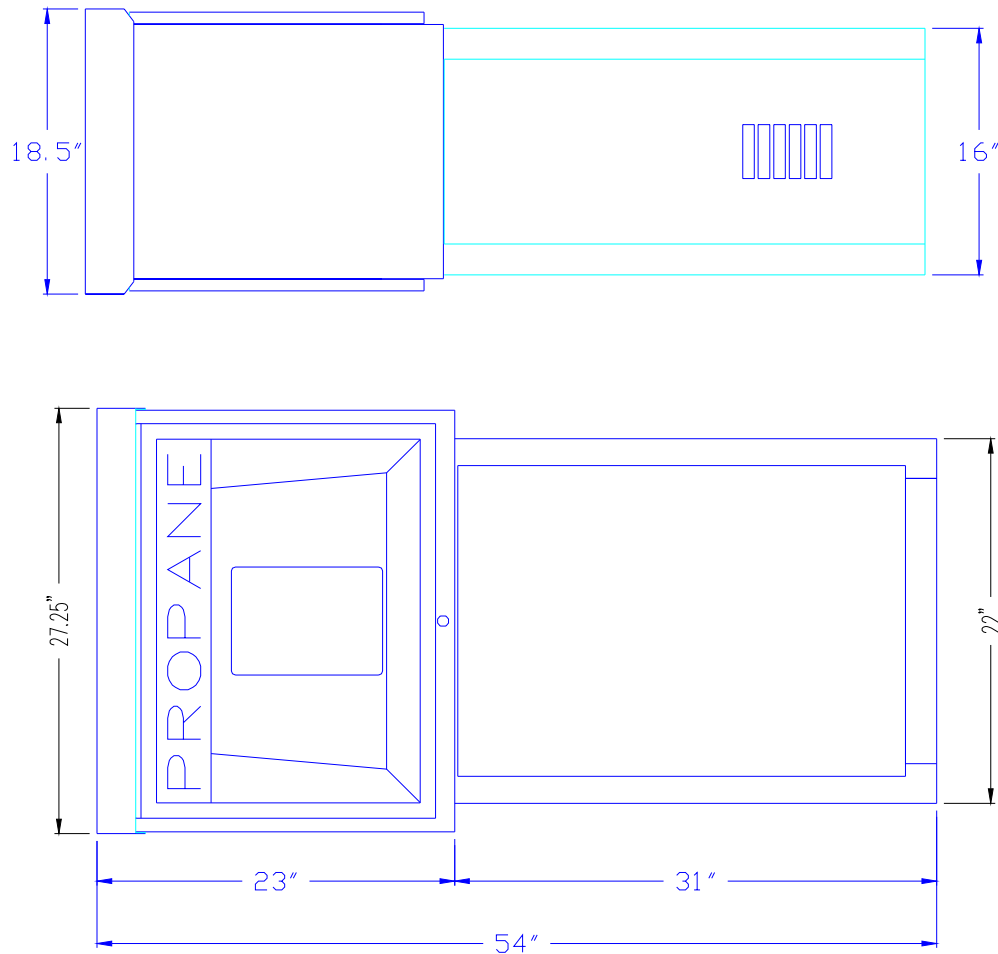
INSTALLATION AND MAINTENANCE GUIDE 254AY00.INS R02


NORTH AMERICAN AND EUROPEAN

Changes:

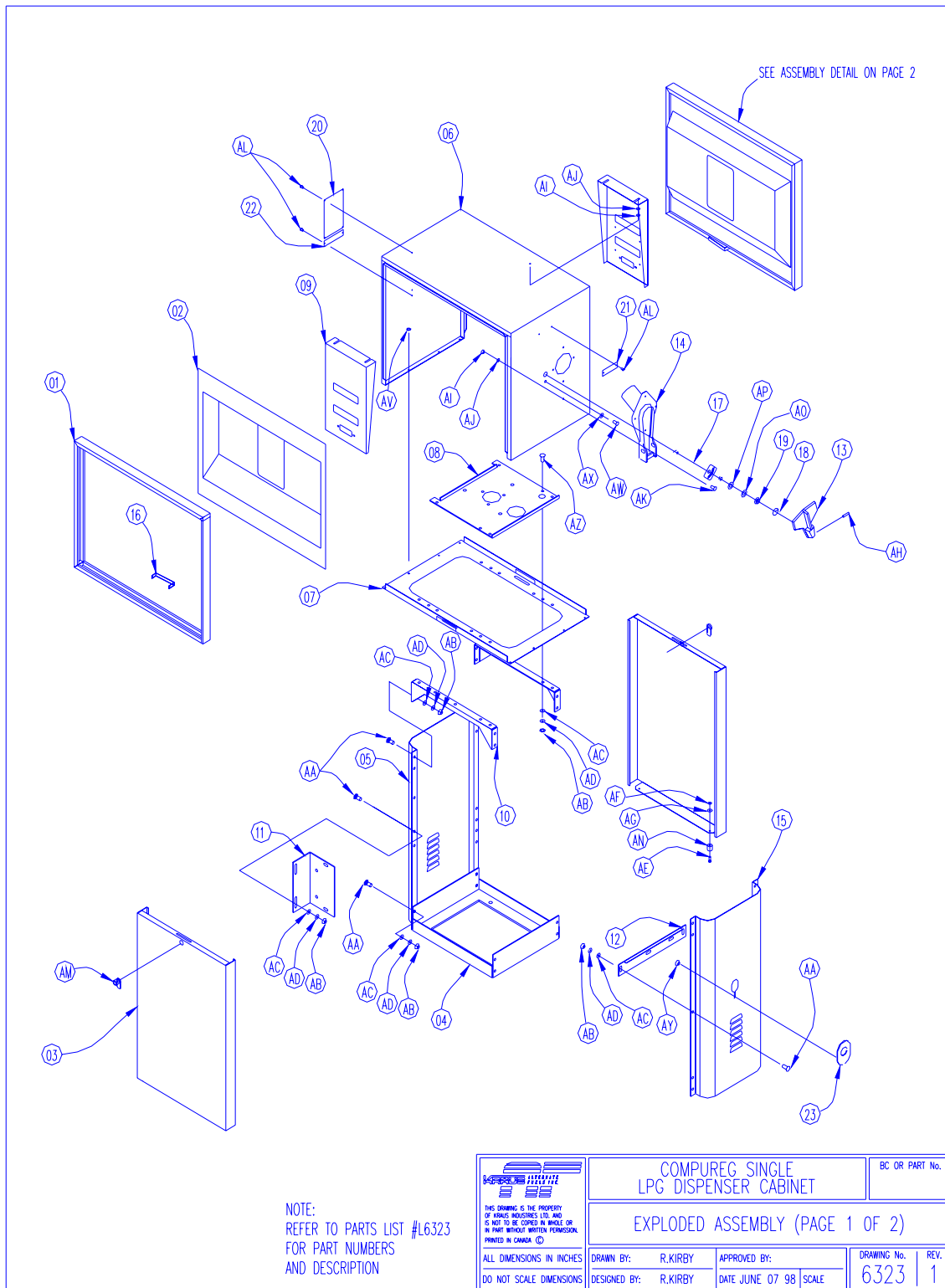
- | | |
|----------|---|
| Page 87 | Replace Drawing. 4119 – lines on side view of dispenser were not clear enough. |
| Page 105 | Replaced Parts, Hardware, and Reference Information for Drawing No. 6323 Rev.1. |
| Page 109 | Replaced Parts, Reference and Hardware Information for Drawing No. 6340 Rev. 1. |
| Page 117 | Replaced Parts, Reference, Optional Parts and Hardware Information for Drawing No. 6462 Rev. 1. |
| Page 126 | Replaced Parts, Optional Parts, and Hardware Information for Drawing 4391 Rev.7. |



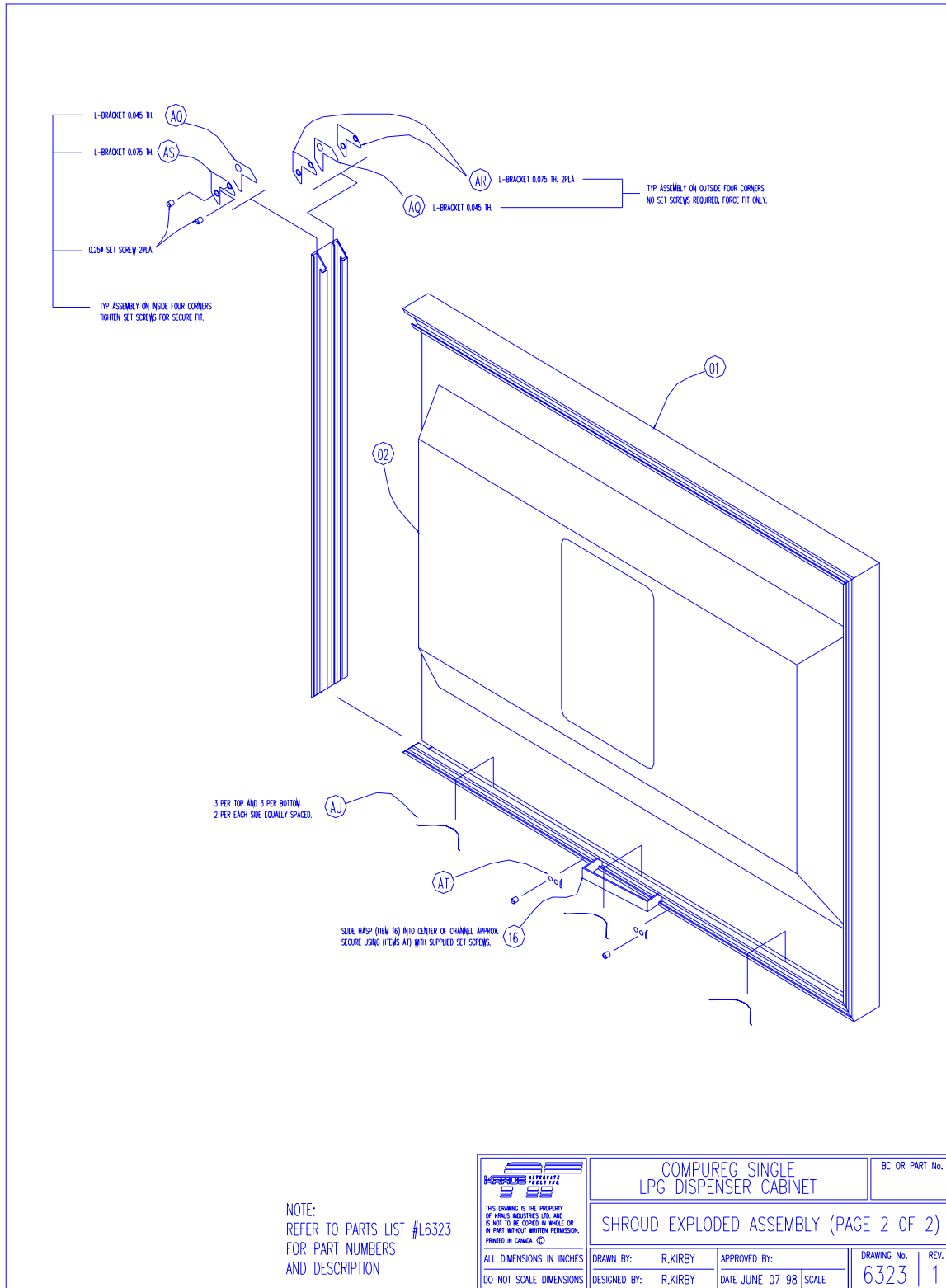


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	OVERALL DIMENSIONS PAGE 1 OF 2		
DRAWN BY: ROB KIRBY	APPROVED BY:	DRAWING No. 4119	REV. 0
DESIGNED BY: C.A. R.K.	DATE AUG 24 93	SCALE	
ALL DIMENSIONS IN INCHES DO NOT SCALE DIMENSIONS			

(This page replaces Pg. 87)



(This Drawing is included in this addendum for easy reference only)



(This Drawing is included in this addendum for easy reference only)

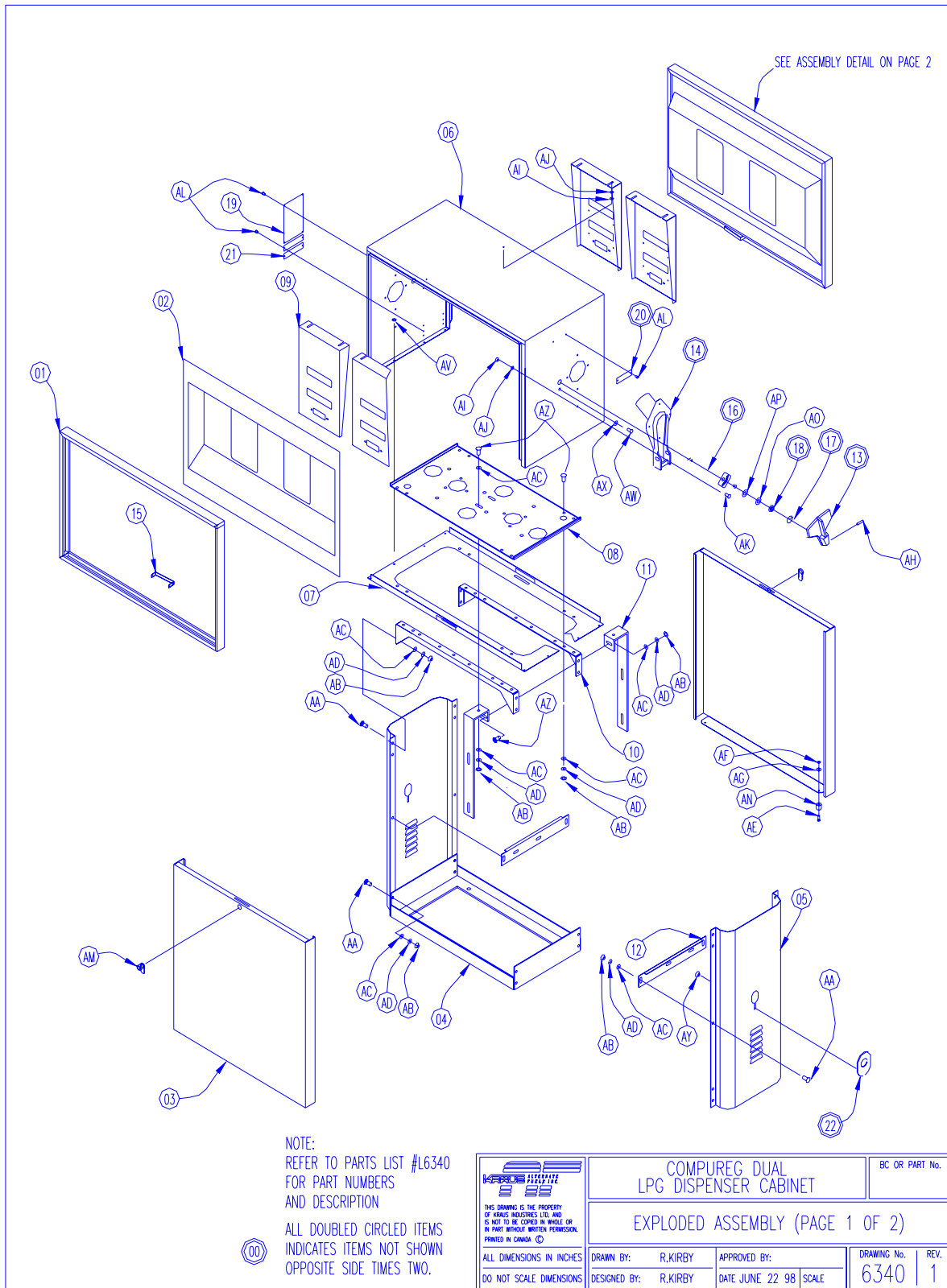
The following pages replace Parts, Reference and Hardware Information starting at Page 105 for DWG No. 6323 Rev. 1

PARTS					
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>MFR/SUPPLIER</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
1.	WINDOW FRAME	HALL VISUAL SYSTEMS, CALGARY	BC1882	6327-0	2
2.	PLASTIC SHROUD	JENTEL MNFG,CALGARY	BC1883	6328-1	2
3.	FRONT PANEL	SPECTRUM	BC1895	6341-0	2
4.	BOTTOM FRAME	SPECTRUM	BC0602	3717-3	1
5.	SIDE PANEL	SPECTRUM	BC0867	4131-4	1
6.	TOP FRAME	SPECTRUM	BC1879	6324-1	1
7.	TOP FRAME BOTTOM PANEL	SPECTRUM	BC1880	6325-1	1
8.	MICON BASE SUPPORT	SPECTRUM	BC1881	6326-1	1
9.	DISPLAY PANEL	SPECTRUM	BC1884	6329-1	2
10.	CROSS BRACE	SPECTRUM	BC1911	6369-0	2
11.	J BOX BRACKET	SPECTRUM	BC1892	6338-1	1
12.	SEPERATOR SUPPORT BRACKET	SPECTRUM	BC1891	6337-1	1
13.	ON/OFF HANDLE	DURAPRENE IND, CALGARY	BC1886	6332-0	1
14.	NOZZLE HOLSTER	DURAPRENE IND, CALGARY	BC1885	6331-1	1
15.	SIDE PANEL OUTLET	SPECTRUM	BC1988	6504-0	1
16.	LOCK CATCH	SPECTRUM	BC1893	6330-1	2
17.	HANDLE SHAFT -HANDLE SHAFT DETENT	SPECTRUM	BC1887	6333-1 6336-1	1
18.	HANDLE SPACER	SPECTRUM	BC1888	6334-1	1
19.	HANDLE BUSHING	SPECTRUM	BC1889	6335-1	1
20.	SPECIFICATIONS PLATE	ARISTOPRINT OR INTERGRAPHICS	BC0887	4151-4	1
21.	ON/OFF PLATE	ARISTOPRINT OR INTERGRAPHICS	BC0489	3596	1
22.	MICON APPROVAL PLATE	ARISTOPRINT OR INTERGRAPHICS	BC1672	5903-1	1
23.	OUTLET HOLE COVER PLATE	SPECTRUM	BC1967	6471-1	1

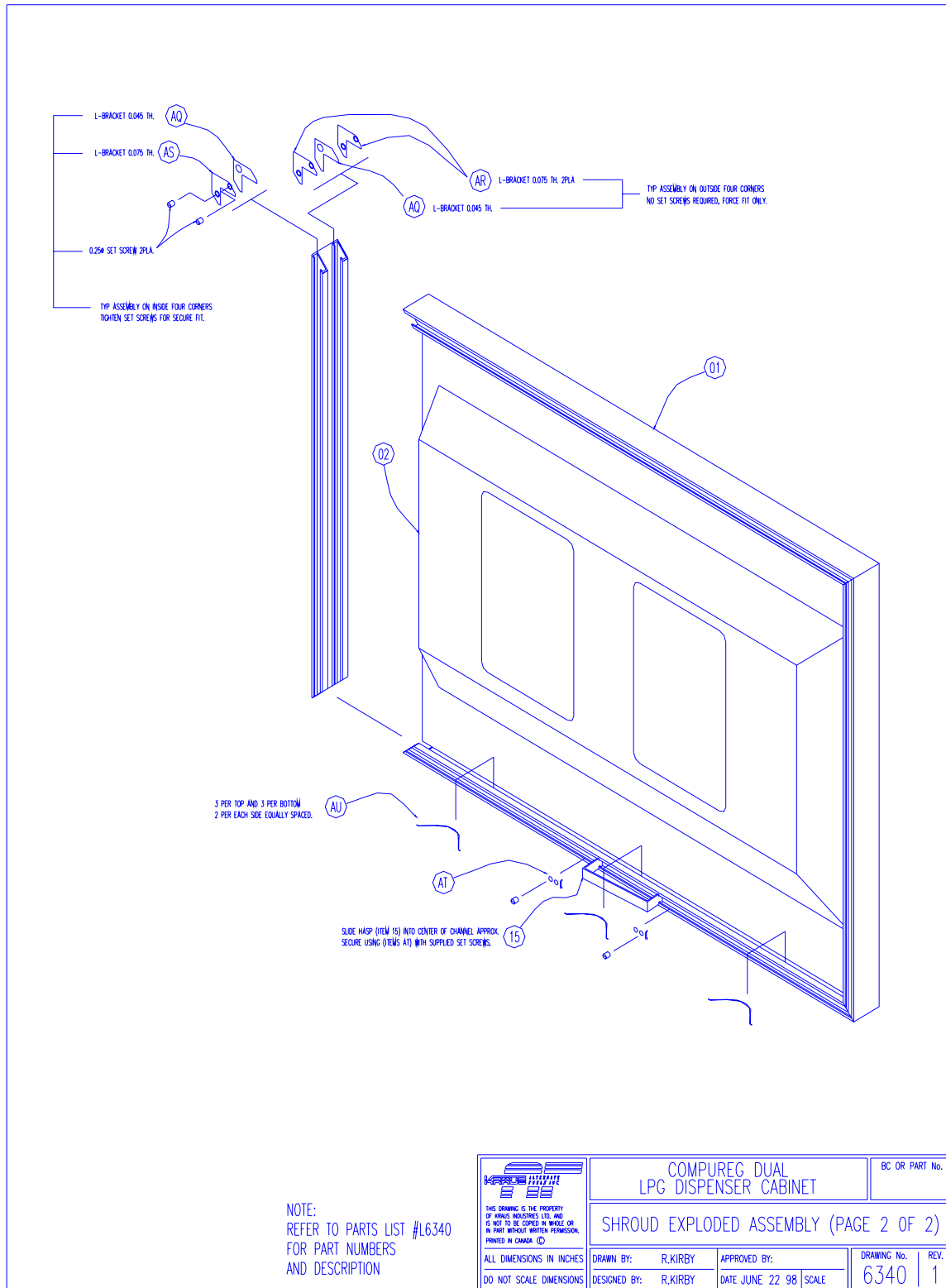
REFERENCE INFORMATION					
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>MFR/SUPPLIER</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
A 1	ELECTRICAL EXPLODED ASSY.	KRAUS		6345	
A 2	GAS EXPLODED ASSY.	KRAUS		6344	
A 3	GROUND CONNECTIONS.	KRAUS		6346	
A 4	MANUFACTURING PLAN	KRAUS		00000	
A 5	MOUNTING AND OVERALL DIMENSIONS	KRAUS		6347	
A 6	3D ASSEMBLY DWG	KRAUS		6216	

REFERENCE INFORMATION					
ITEM	DESCRIPTION	MFR/SUPPLIER	BC/PART No.	DWG. No.	QTY
A 7	DISPLAY PANEL ARTWORK	SIGN GROUP CALGARY		6505	

HARDWARE (PLATED UNLESS SPECIFIED)					
ITEM	DESCRIPTION	MFR/SUPPLIER	BC/PART No.	DWG. No.	QTY
AA.	5/16" N.C x 3/4 LG BOLT				26
AB.	5/16" N.C NUT				30
AC.	5/16" FLAT WASHER				30
AD.	5/16" LOCK WASHER				30
AE.	#10-32 x 1/2 LG PAN HEAD SLOT SCREWS STAINLESS				4
AF.	#10-32 NUT STAINLESS				4
AG.	#10-32 LOCKWASHER STAINLESS				4
AH.	SPRING PIN 3/16 x 1.0 LG				1
AI.	#10-32 NUTS K-LOK				9
AJ.	#10 FLATWASHER				9
AK.	#10 x 3/4 LG COUNTERSUNK ROBERTSON				5
AL.	1/8 x 3/16 LG ALUMINUM POP RIVET				8
AM.	7/16 UTILITY LOCK	SHIELD SUPPLY	MFW23038		2
AN.	RUBBER FEET	SPAE-NAUR	31S-466		4
AO.	E-CLIP EXTERNAL	SPAE-NAUR	R1000-62		1
AP.	BOWED SPRING TENSION WASHER	SPAE-NAUR	W270		1
AQ.	L-BRACKET 0.045 TH ONE HOLE	HALL VISUAL SYSTEMS, CALGARY	METBP		16
AR.	L-BRACKET 0.075 TH TWO HOLE (NO SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METTCNS		16
AS.	L-BRACKET 0.075 TH TWO HOLE (1/4 SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METTCWS		8
AT.	LOCK HASP CLAMP (1/4 SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METRH		4
AU.	SPRING CLIP	HALL VISUAL SYSTEMS, CALGARY	METFS		20
AV.	1/4-20 NUT K-LOK				8
AW.	1/4-20 x 3/8 LG BOLT				1
AX.	1/4 LOCKWASHER				1
AY.	#6-32 NYLOCK NUT				1
AZ.	5/16" N.C x 1.0 LG BOLT				4



(This Drawing is included in this addendum for easy reference only)



(This Drawing is included in this addendum for easy reference only.)

The following pages replace Parts, Reference and Hardware Information starting at Page 109 for DWG No. 6340 Rev. 1

PARTS					
ITEM	DESCRIPTION	MFR/SUPPLIER	BC/PART No.	DWG. No.	QTY
1.	WINDOW FRAME	HALL VISUAL SYSTEMS, CALGARY	BC1904	6356-0	2
2.	PLASTIC SHROUD	JENTEL MNFG,CALGARY	BC1905	6357-1	2
3.	FRONT PANEL	SPECTRUM	BC1908	6360-0	2
4.	BOTTOM FRAME	SPECTRUM	BC0644	3794-4	1
5.	SIDE PANEL OUTLET	SPECTRUM	BC1988	6504-0	2
6.	TOP FRAME	SPECTRUM	BC1901	6353-1	1
7.	TOP FRAME BOTTOM PANEL	SPECTRUM	BC1902	6354-1	1
8.	MICON BASE SUPPORT	SPECTRUM	BC1903	6355-1	1
9.	DISPLAY PANEL	SPECTRUM	BC1884	6329-1	4
10.	CROSS BRACE	SPECTRUM	BC1912	6370-0	2
11.	J BOX BRACKET	SPECTRUM	BC1907	6359-1	2
12.	SEPERATOR SUPPORT BRACKET	SPECTRUM	BC1891	6337-1	2
13.	ON/OFF HANDLE	DURAPRENE IND, CALGARY	BC1886	6332-0	2
14.	NOZZLE HOLSTER	DURAPRENE IND, CALGARY	BC1885	6331-1	2
15.	LOCK CATCH	SPECTRUM	BC1893	6330-1	2
16.	HANDLE SHAFT -HANDLE SHAFT DETENT	SPECTRUM	BC1906	6358-1 6336-1	2
17.	HANDLE SPACER	SPECTRUM	BC1888	6334-1	2
18.	HANDLE BUSHING	SPECTRUM	BC1889	6335-1	2
19.	SPECIFICATIONS PLATE	ARISTOPRINT OR INTERGRAPHICS	BC0887	4151-4	1
20.	ON/OFF PLATE	ARISTOPRINT OR INTERGRAPHICS	BC0489	3596	2
21.	MICON APPROVAL PLATE	ARISTOPRINT OR INTERGRAPHICS	BC1672	5903-1	2
22.	OUTLET HOLE COVER PLATE	SPECTRUM	BC1967	6471-1	2

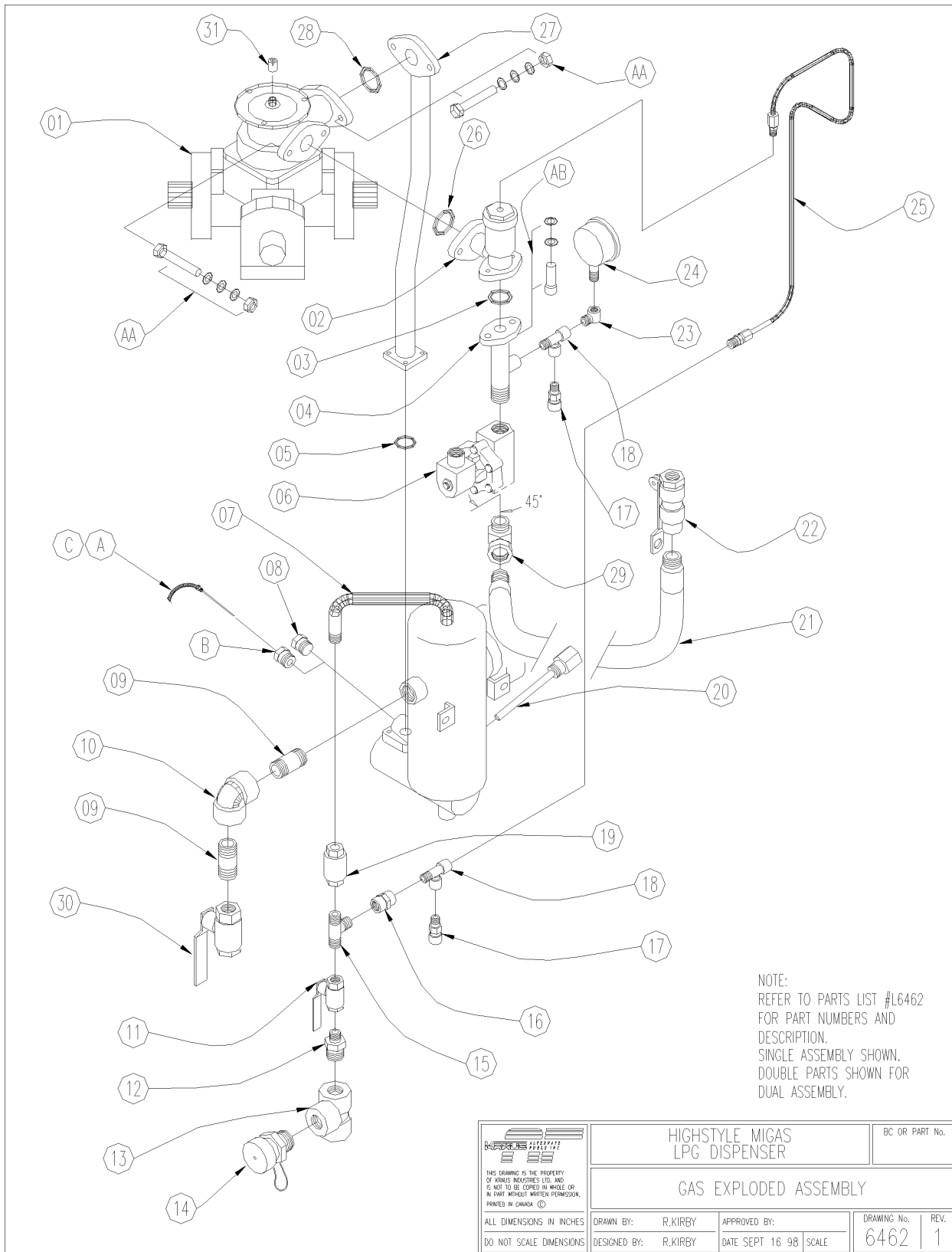
REFERENCE INFORMATION					
ITEM	DESCRIPTION	MFR/SUPPLIER	BC/PART No.	DWG. No.	QTY
A 1	ELECTRICAL EXPLODED ASSY.	KRAUS		6345	
A 2	GAS EXPLODED ASSY.	KRAUS		6344	
A 3	GROUND CONNECTIONS	KRAUS		6361	
A 4	MANUFACTURING PLAN	KRAUS		00000	
A 5	MOUNTING AND OVERALL DIMENSIONS	KRAUS		6362	
A 6	3D ASSEMBLY DWG	KRAUS		6228	
A 7	DISPLAY PANEL ARTWORK	SIGN GROUP		6506	

REFERENCE INFORMATION

<i>ITEM</i>	<i>DESCRIPTION</i>	<i>MFR/SUPPLIER</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
	CALGARY				

HARDWARE (PLATED UNLESS SPECIFIED)

<i>ITEM</i>	<i>DESCRIPTION</i>	<i>MFR/SUPPLIER</i>	<i>BC/PART No.</i>	<i>DWG. No.</i>	<i>QTY</i>
AA.	5/16" N.C x 3/4 LG BOLT				20
AB.	5/16" N.C NUT				30
AC.	5/16" FLAT WASHER				30
AD.	5/16" LOCK WASHER				30
AE.	#10-32 x 1/2 LG PAN HEAD SLOT SCREWS STAINLESS				4
AF.	#10-32 NUT STAINLESS				4
AG.	#10-32 LOCKWASHER STAINLESS				4
AH.	SPRING PIN 3/16 x 1.0 LG				2
AI.	#10-32 NUTS K-LOK				18
AJ.	#10 FLATWASHER				18
AK.	#10 x 3/4 LG COUNTERSUNK ROBERTSON				10
AL.	1/8 x 3/16 LG ALUMINUM POP RIVET				12
AM.	7/16 UTILITY LOCK	SHIELD SUPPLY	MFW23038		2
AN.	RUBBER FEET	SPAE-NAUR	31S-466		4
AO.	E-CLIP EXTERNAL	SPAE-NAUR	R1000-62		2
AP.	BOWED SPRING TENSION WASHER	SPAE-NAUR	W270		2
AQ.	L-BRACKET 0.045 TH ONE HOLE	HALL VISUAL SYSTEMS, CALGARY	METBP		16
AR.	L-BRACKET 0.075 TH TWO HOLE (NO SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METTCNS		16
AS.	L-BRACKET 0.075 TH TWO HOLE (1/4 SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METTCWS		8
AT.	LOCK HASP CLAMP (1/4 SET SCREW)	HALL VISUAL SYSTEMS, CALGARY	METRH		4
AU.	SPRING CLIP	HALL VISUAL SYSTEMS, CALGARY	METFS		20
AV.	1/4-20 NUT K-LOK				8
AW.	1/4-20 x 3/8 LG BOLT				2
AX.	1/4 LOCKWASHER				2
AY.	#6-32 NYLOCK NUT				2
AZ.	5/16" N.C x 1.0 LG BOLT				11



(This drawing is included in this addendum for the purpose of easy reference only.)

The following pages replace Parts, Reference, Optional Parts and Hardware Information starting at Page 117 for DWG No. 6462 Rev. 1.

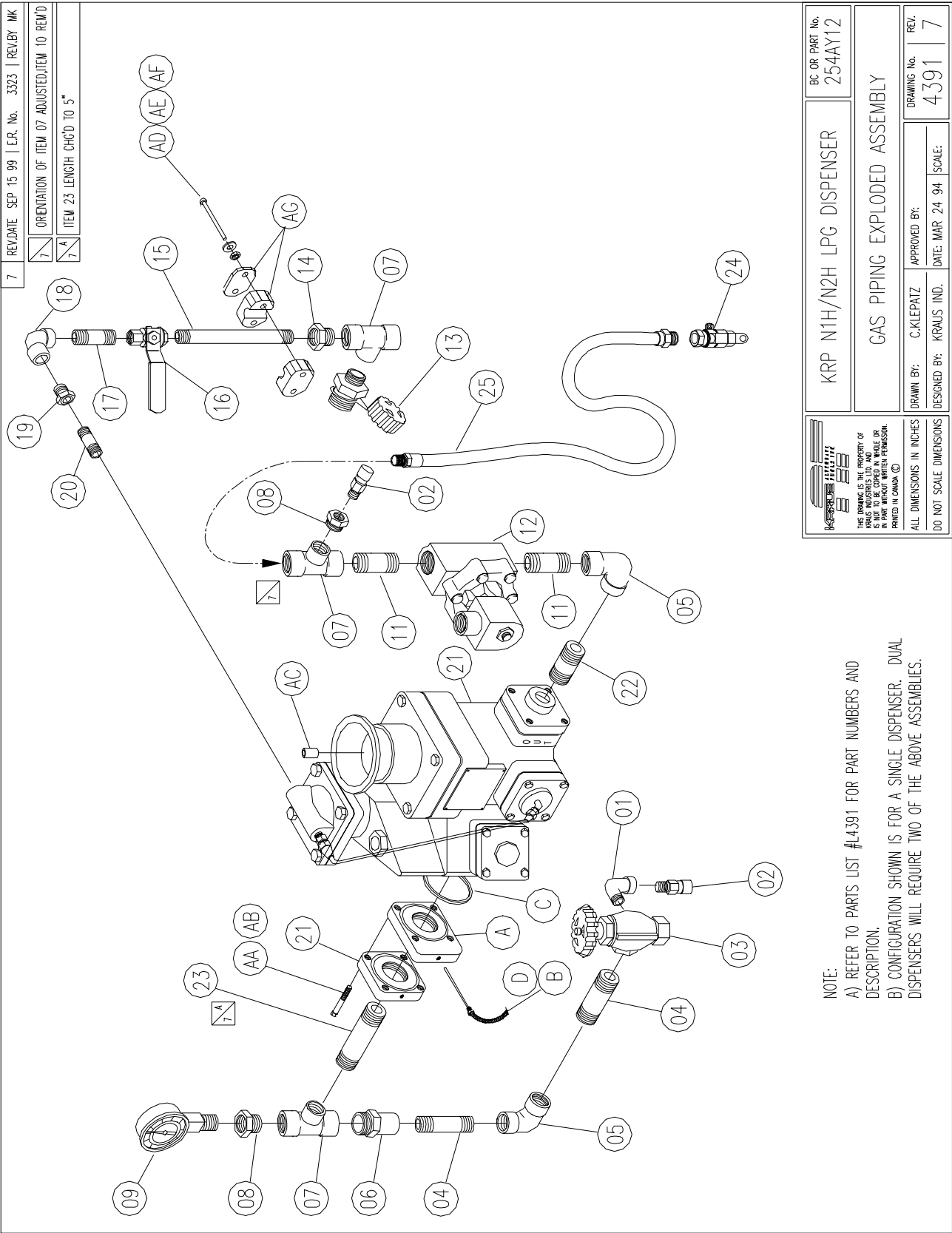
PARTS					
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>MFG/SUPPLIER</i>	<i>BC/PART No.</i>	<i>DWG.</i>	<i>QTY</i>
1.	MIGAS LPG METER	MIGAS	1174-A		1
2.	DOUBLE FLANGE DIFFERENTIAL VALVE	MIGAS	1189-B		1
3.	O-RING	MIGAS	OR-4112*		1
4.	3/4 " NPT TEE STUB FLANGE	MIGAS	1271-A		1
5.	O-RING	MIGAS	OR-3100*		1
6.	SOLENOID VALVE W/ 120V COIL ONLY (220V NOT AVAILABLE)	HONEYWELL	SEE DWG 6345 or 6441 FOR SOLENOID SPECS		1
7.	MIGAS SEPERATOR	MIGAS	1269-A		1
8.	3/4" NPT PLUG (OMIT WHEN OPTION B IS USED)	GRINNELL	0361301005*		1
9.	3/4"NPT x 2 1/2 LG NIPPLE	GRINNELL	0332619204*		2
10.	3/4" NPT ELBOW 3000lbs FS	GRINNELL	0361101009*		1
11.	3/8" NPT FULL PORT SHUTOFF VALVE	JOMAR/FAIRVIEW or APOLLO or GIACOMINI	BV2103-C-CGA* 80-102-01 R250UY002		1
12.	3/8"NPT MALE TO 3/4"NPT FEMALE NPT REDUCER	FAIRVIEW	24SA12X06*		1
13.	3/4" NPT TEE 3000lbs FS	GRINNELL	0361119803*		1
14.	3/4" NPT FILL VALVE	SHERWOOD	PV1855-SD*		1
15.	3/8" NPT STREET TEE (ALL MALE)	FAIRVIEW	M101-C*		1
16.	3/8" TO 1/4" NPT FEMALE REDUCER	FAIRVIEW	S1003-CB*		1
17.	1/4" NPT RELIEF VALVE	REGO or SHERWOOD	RE-3125L* or PV3865400*		2
18.	1/4" NPT STREET TEE (2 female, 1 male)	FAIRVIEW	107-B*		2
19.	3/8" NPT BACKCHECK VALVE	VALVOLA EUROPA	1-145		1
20.	BRASS THERMOWELL		WT92-08-BRS-004.5-00- 00		1
21.	3/4"NPT x 84" HOSE	FAIRVIEW	I12C84MP12MP12		1
22.	3/4"NPT BREAKAWAY	REGO	A2141A6		1
23.	1/4" NPT STREET ELBOW	FAIRVIEW	116-B*		1
24.	1/4" NPT GAUGE	WIKA	8345805		1
25.	1/4" COPPER RETURN LINE ASSEMBLY	KAF	BC1897	6348	1
26.	O-RING	MIGAS	OR-4137*		1
27.	3/4" x 21" LONG BENT DOUBLE FLANGE	MIGAS	1148-A		1
28.	O-RING	MIGAS	OR-4175*		1
29.	3/4" NPT STREET ELBOW (PLATED)	FAIRVIEW or PARKER	FAIS1016-E*or 2102-12-12*		1
30.	3/4"NPT FULL PORT BALL VALVE	APOLLO or GIACOMINI	80-104-01* R850UY104		1
31.	METER COUPLER	SPECTRUM	BC1978	6490	1

OPTIONAL PARTS					
ITEM	DESCRIPTION	MFG/SUPPLIER	BC/PART No.	DWG.	QTY
A	ATC PROBE	KRAUS	W199		1
B	3/4" NPT MALE TO 1/8" NPT FEMALE BUSHING	GRINNELL			1
C	3/8" BLUE LOOM x 42" LG	KRAUS	38362		1

HARDWARE					
ITEM	DESCRIPTION	MFG/SUPPLIER	BC/PART No.	DWG.	QTY
AA	8mm x 2" LG HEX HEAD BOLT				4
	8mm NUT				4
	8mm FLATWASHER				8
	8mm LOCKWASHER				4
AB	8mm x 7/8 LG SOCKET HEAD CAP SCREW	UNBRAKO			2
	8mm FLATWASHER				2
	8mm LOCKWASHER				2

- NOTE:** 1) ABOVE QUANTITIES ARE FOR **SINGLE** ONLY. FOR **DUAL**, MULTIPLY QUANTITIES BY TWO.
2) ALL PIPE FITTINGS ARE 3000lbs FORGED STEEL UNLESS OTHERWISE SPECIFIED.
3) ALL PIPE IS SCHEDULE 80 EXTRA HEAVY SEAMLESS.
4) * PARTS CAN BE REPLACED WITH EQUIVALENT PARTS FROM DIFFERENT MANUFACTURERS.

(This drawing is included in this addendum for the purpose of easy reference only.)



7 REV/DATE SEP 15 99 | E.R. No. 3323 | REV.BY MK

7 ☒ ORIENTATION OF ITEM 07 ADJUSTED/ITEM TO REM'D

7 ☒ ITEM 23 LENGTH CHG'D TO 5"

BC OR PART No. 254AY12

KRP N1H/N2H LPG DISPENSER

GAS PIPING EXPLORED ASSEMBLY

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ALL DIMENSIONS IN INCHES

DO NOT SCALE DIMENSIONS

DRAWN BY: C.KLEPATZ
DESIGNED BY: KRAUS IND.

APPROVED BY: 4391

REV. 7

NOTE:
A) REFER TO PARTS LIST #4391 FOR PART NUMBERS AND DESCRIPTION.
B) CONFIGURATION SHOWN IS FOR A SINGLE DISPENSER. DUAL DISPENSERS WILL REQUIRE TWO OF THE ABOVE ASSEMBLIES.

The following pages replace Parts, Reference, Optional Parts and Hardware Information starting at Page 126 for DWG No. 4391 Rev. 1.

PARTS					
<i>ITEM</i>	<i>DESCRIPTION</i>	<i>MFG/SUPPLIER</i>	<i>BC/PART No.</i>	<i>DWG.</i>	<i>QTY</i>
1.	1/4"NPT STREET ELBOW 3000lbs FS	GRINNELL	0361109358*		1
2.	1/4"NPT HYDROSTATIC RELIEF VALVE	REGO or SHERWOOD	RE-3125L* or PV3865400*		2
3.	3/4"NPT MANUAL GATE VALVE	REGO	RE7706P		1
4.	3/4"NPT x 3 1/2" LG NIPPLE	GRINNELL	0332619600*		2
5.	3/4"NPT ELBOW 3000lbs FS	GRINNELL	0361101009*		2
6.	3/4" NPT DOUBLE BACK CHECK VALVE	SHERWOOD / RNG	PV1855SPD / D211		1
7.	3/4"NPT TEE 3000lbs FS	GRINNELL	0361119803*		3
8.	3/4"NPT TO 1/4" NPT HEX BUSHING FS	GRINNELL	0361330707*		2
9.	0-600 PSI PRESSURE GAUGE	WIKA	8345805		1
10.					
11.	3/4"NPT x 2 1/2" LG NIPPLE	GRINNELL	0332619204		2
12.	SOLENOID VALVE W/COIL	HONEYWELL	SEE DWG 6441 or 5145 FOR SOLENOID SPEC		
13.	3/4"NPT DOUBLE BACKCHECK FILLER VALVE	SHERWOOD	PV1855-SD		1
14.	3/4"NPT TO 3/8"NPT HEX BUSHING FS	GRINNELL	0361330608*		1
15.	3/8"NPT x 8 1/2" LG NIPPLE	GRINNELL	NPO6X136-80		1
16.	3/8"NPT FULL PORT BALL VALVE	JOMAR/FAIRVIEW or APOLLO or GIACOMINI	BV2103-C-CGA* or 80-102-01* or R250UY002*		1
17.	3/8"NPT x 2 1/2" LG NIPPLE	GRINNELL	0332610005*		1
18.	3/8"NPT ELBOW 3000lbs FS	GRINNELL	0361100605*		1
19.	3/8"NPT TO 1/4" NPT HEX BUSHING FS	GRINNELL	0361330202*		1
20.	1/4"NPT x 3 1/2" LG NIPPLE	GRINNELL	0332605807*		1
21.	NEPTUNE METER	SHLUMBERGER /NEPTUNE	400051-011		1
22.	3/4"NPT x 2" LG NIPPLE	GRINNELL	0332619006		1
23.	3/4"NPT x 5" LG NIPPLE (FOR SINGLE & DUAL)	GRINNELL	0332619006		1
24.	BREAK-AWAY	REGO/INTERQUIP	A2141A6		1
25.	3/4" x 84" LPG HOSE	FAIRVIEW OR DOMINION GAS	I12C84MP12MP12 DSS284-12		1

OPTIONAL PARTS

ITEM	DESCRIPTION	MFG/SUPPLIER	BC/PART No.	DWG.	QTY
A	ATC TEMPERATURE PROBE ADAPTER PLATE	SPECTRUM	BC0822	4035	1
B	ATC PROBE	KRAUS	W199		1
C	ADAPTER PLATE O-RING		N70-223		1
D	3/8" BLUE LOOM x 42" LG	KRAUS	38362		1

HARDWARE (PLATED UNLESS SPECIFIED)

ITEM	DESCRIPTION	MFG/SUPPLIER	BC/PART No.	DWG.	QTY
AA	5/16 NC x 1 1/2 LG HEX BOLT (FOR ATC OPTION ONLY)				4
AB	5/16 LOCKWASHERS (FOR ATC OPTION ONLY)				4
AC	COUPLER	KRAUS	BC0351	3407	1
AD	#10-32 K-LOK NUT				2
AE	#10 FLATWASHER				2
AF	#10 x 3" LG SLOT HEAD SCREWS				2
AG	PARKER CLAMP	PARKER	#2127PP (1/2" OD)		1
	PARKER COVER PLATE		#CP2 (1/2")		1

NOTE: 1) ABOVE QUANTITIES ARE FOR **SINGLE** ONLY. FOR **DUAL**, MULTIPLY QUANTITIES BY TWO.

2) ALL PIPE FITTINGS ARE 3000lbs FORGED STEEL UNLESS OTHERWISE SPECIFIED.

3) ALL PIPE IS SCHEDULE 80 EXTRA HEAVY SEAMLESS.

4) * PARTS CAN BE REPLACED WITH EQUIVALENT PARTS FROM DIFFERENT MANUFACTURERS.