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KUSAM-MECO®

An ISO 9001:2015 Company

CLAMP METER 2700 / 2790

OPERATION MANUAL

KUSAM-MECO

WARRANTY

Each “KUSAM-MECO” product is warranted to be free from defects in material and workmanship under normal use & service. The warranty period is one year (12 months) and begins from the date of despatch of goods. In case any defect occurs in functioning of the instrument, under proper use, within the warranty period, the same will be rectified by us free of charges, provided the to and fro freight charges are borne by you. This warranty extends only to the original buyer or end-user customer of a “KUSAM-MECO” authorized dealer.

This warranty does not apply for damaged Ic’s, fuses, disposable batteries, carrying case, test leads, or to any product which in “KUSAM-MECO’s” opinion, has been misused, altered, neglected, contaminated or damaged by accident or abnormal conditions of operation or handling.

“KUSAM-MECO” authorized dealer shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of “KUSAM-MECO”.

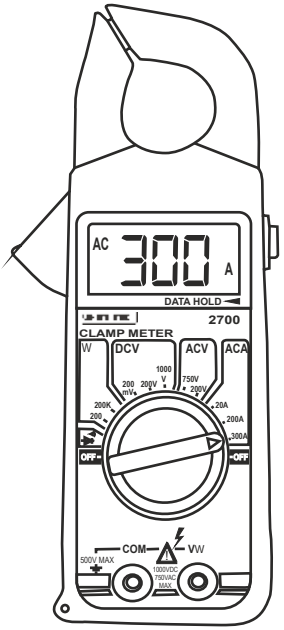
“KUSAM-MECO’s” warranty obligation is limited, at option, free of charge repair, or replacement of a defective product which is returned to a “KUSAM-MECO” authorized service center within the warranty period.

THIS WARRANTY IS BUYER’S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. “KUSAM-MECO” SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING LOSS OF DATA, ARISING FROM ANY CAUSE WHATSOEVER.

All transaction are subject to Mumbai Jurisdiction.

KUSAM-MECO

CLAMP METER
2700 / 2790



TAKE MEASUREMENT CAREFULLY AND YOU'LL SPARE YOUR METER AND YOURSELF, SOME PAIN

Nearly every electrical engineer has a hand held digital multimeter (DMM). We sometimes take them for granted, until we damage them or "burn them out" if you incorrectly connect your DMM to a circuit, or if you have the DMM on wrong setting, you damage the meter and possibly hurt yourself. You can also get into trouble if you try to measure the voltage across a charged capacitor.

DMM users frequently burn their meters by trying to measure current the same way as they measure voltage, Remember, you measure voltage across a circuit, and current through a circuit. When you use the current input, your DMM becomes a lower impedance circuit element. If you accidentally connect this low impedance path across your circuit, you'll effectively short-circuit it. You can, therefore send high current through your meter and severely damage it. Unless the meter has a fused input, you can even get an explosion or fire.

Even if you correctly insert your DMM into the circuit, you can still damage your meter. Don't try to measure current in excess of your meter's capacity. Handheld DMMs usually have a maximum current rating of 10A or 20A.

If you are measuring current in industrial environment, you can easily exceed those ratings. The best way to avoid damage is to use a clamp meter or to connect a clamp attachment to your DMM.

To prevent excess current from flowing through your meter, always disconnect the test leads from the circuit under test whenever you change DMM functions, Set your meter to the correct function, say current and its highest range for the setting, say 10A. Next, connect the test leads before you apply power to the circuit. To be safe, start by setting your meter to its highest range first.

KUSAM-MECO

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Overview

⚠ Warning

To avoid electric shock or personal injury, read the "Safety Information" and "Rules for Safe Operation"carefully before using the Meter.

Digital Clampmeter Model - 2700/2790 (hereafter referred to as "the Meter") is a 3½ digits Clampmeter with steady operations, and highly reliable hand-held measuring instrument having different measurement positions. The Clampmeter not only can measure AC/DC Voltage, AC Current, Resistance, Diodes and Continuity, Frequency (in model 2790) but also has Data Hold, Full Icon Display.

Terms in this manual

⚠ **Warning :** identifies conditions and actions that could result in serious injury or even death to the user.

⚠ **Caution :** identifies conditions and Actions that could cause damage or malfunction in the instrument.

Unpacking Inspection

Open the package case and take out the Clampmeter. Check the following items carefully to see any missing or damaged part :

Item	Description	Qty.
1	User Manual	1
2	Test Lead	1pair

In the event you find any Part missing or damaged, please contact your dealer immediately.

Rules For Safe Operation (1)

⚠**Warning**

To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules :

- Before using the Meter inspect the case. Do not use the Meter if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic. Pay attention to the insulation around the connectors and Clamps.
- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for Continuity. Replace damaged test leads with identical electrical Specifications before using the Meter.
- Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and grounding.
- The rotary switch should be placed in the right position and no any changeover of range shall be made while measurement is conducted to prevent damage of the Meter.
- When measurement is taken at an effective voltageover 60V in DC or 30V rms in AC, special care should be taken for there is danger of electricshock.
- Use the proper terminals, function, and range for your measurements.
- Do not use or store the Meter in an environment of high temperature, humidity, explosive, inflammable and strong magnetic field. The performance of the Meter may deteriorate after the meter is dampened.
- When using the test leads, keep your fingers behind the finger guards.

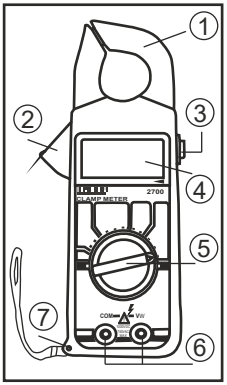
Rules For Safe Operation (2)

- Disconnect circuit power and discharge all high -voltage capacitors before testing resistance, continuity, diodes, or current.
- Replace the battery as soon as the battery indicator  appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- Turn the Meter power off when it is not in use and take out the battery when not using for a long time.
- Constantly check the battery as it may leak when it has not been used for some time, replace the battery as soon as leaking appears. A leaking battery will damage the Meter.

International Electrical Symbols

~	AC (Alternating Current).
⎓	DC (Direct Current).
≂	Both DC & AC.
⏚	Grounding.
⧈	Double Insulated.
- +	Deficiency of Built-In Battery.
•)))	Continuity Test.
→|	Diode.
⎓	Fuse.
⚠	Warning! Refer to the Operating Manual.
⚠	Caution ! Risk of Electric Shock.

The Clampmeter Structure (see figure 1)



(Figure 1)

1) TRANSFORMER JAWS :
Pick up the AC current flowing through the conductor.

2) TRIGGER : Press the lever to open the transformer jaws When the lever is released, the jaws will close again.

3) DATA HOLD SWITCH : A push switch (push ON/OFF) Data-Hold switch will freeze reading when pressed.

4) LCD DISPLAY : A 3½ digit display (maximum reading 1999) indicates measured values, and features symbols indicating function, Data - Hold, Low Battery, Continuity, Diode.

5) FUNCTION SELECTOR : To Select ACV, ACA, DCV, RESISTANCE,FREQUENCY (in model 2790).

6) INPUT JACKS (VW and COM) :

Test leads are inserted into these jacks for Voltage, Resistance, Frequency (in Model - 2790) measurements and Continuity & Diode Checks.

7) DROP- PROOF WRIST STRAP :

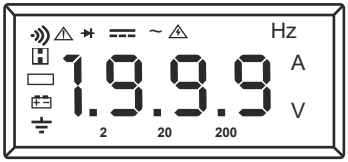
Prevents the instrument from slipping off the hand while in use.

Functional Buttons

Below table indicates the functional button operations

Buttons	Operation Performed
POWER (Yellow Switch)	Turn the Meter on and off. ● Rotate the **SWITCH** to turn on the Meter. ● Rotate the **SWITCH** to turn off the Meter.
DATA HOLD (Yellow Button)	● Press **DATA HOLD** once to enter hold mode. ● Press **DATA HOLD** again to exit hold mode. ● In Hold mode, H is displayed and the present value is shown.

Display Symbols (see figure 2)



(Figure 2)

No.	Symbol	Meaning
1	⚡	Dangerous Voltages.
2	- +	The battery is low. ⚠ Warning : To avoide false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator appears.
3	~	Indicator for AC voltage or current, The displayed value is the mean value.
4	—	Indicates negative reading.
5	→|	Test of diode.
6	H	Data Hold is active.
7	•)))	The continuity buzzer is on.
8	A	A : Amperes (amps). The unit of current.
9	V	V : Volts. The unit of voltage.
10	Hz	Hz : frequency. The unit of frequency (in Model 2790)

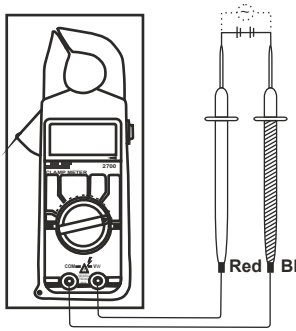
Display Symbols (see figure 2)

NO.	Symbol	Meaning
11	W, kW,	W: Ohm. The unit of resistance. KW: kilohm. 1 x 10^3 or 1000 ohms.

Measurement Operation

- Make sure the Low Battery display [-+] is not on, otherwise false readings may be provided.
- Pay extra attention to the ⚠ symbol which is located besides the input terminals of the Meter before carrying out measurement.

A. DC voltage measurement (see figure 3)



(Figure 3)

⚠ **Warning**

To avoid harm to you or damages to the Meter from electric shock, please do not attempt to measure voltages higer than 1000V DC or 750V AC rms although readings may be obtained.

The DC Voltage ranges are : 2V, 200V and 1000V. To measure DC voltage, connect the Meter as follows :

1) Insert the red test lead into the **V**W →|← input terminal and the black test lead into the **COM** input terminal

2) Set the rotary switch to an appropriate measurement position in V ⎓ range.

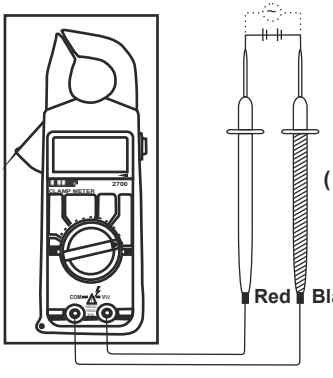
3) Connect the test leads across with the object being measured.

The measured value shows on the display.

⚠ Caution :

- If the value of voltage to be measured is unknown, use the maximum measurement position (1000V) and reduce the range step by step until a satisfactory reading is obtained.
- The LCD displays “1” indicating the existing selected range is overloaded, it is required to select a higher range in order to obtain a correct reading.
- In each range, the Meter has an input impedance of approx. 10MW. This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to 10kW, the error is negligible (0.1% or less).
- When DC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

B. AC Voltage Measurement (see figure 4)



(figure 4)

⚠ Warning :

To avoid harm to you or damages to the Meter from electric shock, please do not attempt to measure voltages higher than 1000V or 750V rms although readings may be obtained.

The AC voltage measurement has 2 measurement positions on the rotary switch : 200V and 750V

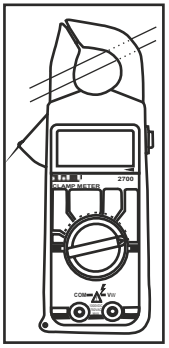
To measure AC Voltage, connect the Meter as follows :

1) Insert the red test lead into the VW →|← Terminal and the black test lead into the **COM** terminal.
2) Set the rotary switch to an appropriate measurement position in V ~ range.
3) Connect the test leads across with the object being measured.
The measured value shown on the display, is effective value of sine wave (mean value response).

⚠ Caution :

- If the value of voltage to be measured is unknown, use the maximum measurement position (750V) & reduce the range step by step until a satisfactory reading is obtained.
- The LCD displays “ 1 “ indicating the existing selected range is overloaded, it is required to select a higher range in order to obtain a correct reading.
- When AC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

C. AC Current Measurement (see figure 5)



(figure 5)

Warning

Never attempt an in-circuit current measurement where the voltage between terminals and ground is greater than 60V.

Use proper function, and range for the current measurement.

The AC Current measurement has 3 measurement positions on the rotary Switch: 20A, 200A, 300A, 600A* (in Model - 2790)

To measure AC Current :

1) Open the jaw and place the conductor in the center of the jaw for accurate measurement.

2) Set the rotary switch to an appropriate measurement position in AC current range. The measured value is shown on the display.

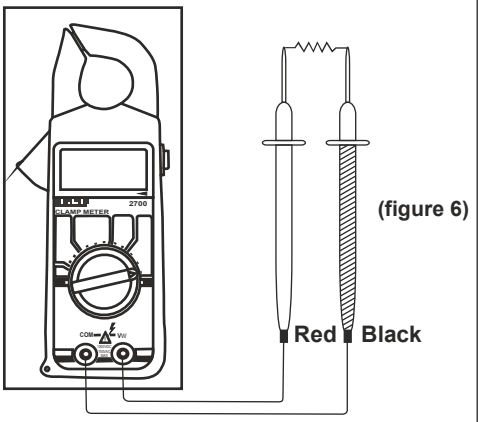
Caution :

1) Place the switch in the 300A range position if the measured current is unknown. Rotate the switch to lower positions to get more accurate readings.

2) The LCD displays " 1 " indicating the existing selected range is overloaded, it is required to select a higher range in order to obtain a correct reading.

3) When AC Current measurement has been completed, Open the jaw to remove the conductor & then Switch off the meter.

D. Resistance Measurement (see figure 6)



(figure 6)

Warning

To avoid damages to the Meter or to the devices under test, disconnect circuit power and discharge all the high-voltage capacitors before measuring resistance.

The resistance range has 2 measurement positions on the rotary switch : 200W, 200kW

To measure resistance, connect the meter as follows

1) Insert the red test lead into the VW→|← terminal and the black test lead into the **COM** terminal.

2) Set the rotary switch to an appropriate measurement position in Wrange.

3) Connect the test leads across with the object being measured.
The measured value shows on the display,

Note :

- The test leads can add 0.1Wto 0.3Wof error to the Resistance measurement. To obtain precision readings in low-resistance, that is the range of 200W, short-circuit the input terminals before hand & record the reading obtained (call this reading asX).(X) is the additional resistance from the test lead.
- Then use the equation :
  Measured resistance value (Y) - (X) = precision readings of resistance.
- When there is no input, for example in open circuit condition, the Meter displays " 1 ". When resistance measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

⚠ Caution:

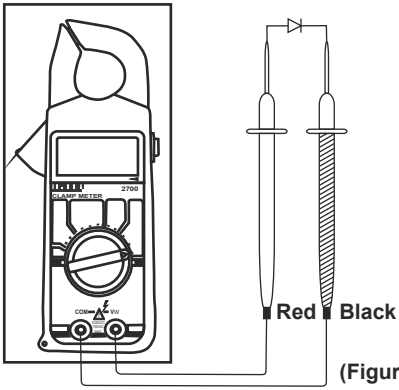
1) Never connect high voltage to the input sockets with the switch in Resistance range.

2) Using Resistance measurement function in a live circuit will produce false results and may damage the instrument. In many cases the suspect component must be disconnected from the circuit to obtain an accurate reading.

E. Measuring Diodes & Continuty (See figure 7)

⚠ Warning

To avoid damage to the Meter or to the equipment under test, disconnect circuit power & discharge all high-voltage capacitors before measuring diodes and continuity.



(Figure 7)

Testing Diodes

Use the diode test function to check diodes,The diode test sends a current through the semiconductor junction, and then measures the voltage drop across the junction. A good silicon junction drops between 0.5V and 0.8V.

To test a diode out of a circuit, connect the Meter as follows :

1) Insert the red test lead into the VW→|← terminal and the black test lead into the COM terminal.

2) Set the rotary switch to →|← •))) position.

3) For forward voltage drop reading on any Semi-conductor component, place the red test lead on the component's anode and place the black test lead on the component's cathode.
The measured value shows on the display.

⚠ Caution :

- In a circuit, a good diode will produce a forward voltage drop reading of 0.5V to 0.8V; howerver; the reverse voltage drop reading can vary depending on the resistance of other pathways between the probe tips.
- Connect the test leads to the proper terminals as said above, to avoid error display. The LCD will display "1" indicating open-circuit for wrong connection. The unit of diode is Volt (V),displaying the positive connection voltage-drop value.
- When diode testing has been completed,disconnect the connection between the testing leads and the circuit under test.

Testing for Continuity

To test for continuity, connect the Meter as below :

1. Insert the red test lead into VW terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to position.
3. Connect the test leads across with the object being measured.

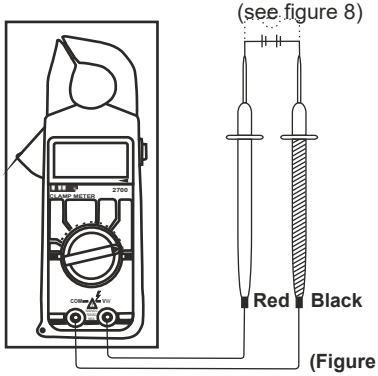
The buzzer sounds if the resistance of the circuit under test is less than 30W.
The LCD displays the resistance value of the circuit under test.

⚠ Caution :

- The LCD displays "1" indicating the circuit being tested is open.

- When continuity testing has been completed, disconnect the connection between the testing leads and the circuit under test.

F: Frequency Measurement Logic Level (in model 2790)



(Figure 8)

⚠ Warning :

To avoid harm to you or damages to the Meter, do not attempt to measure voltages higher than 60V in DC or 30V rms in AC although reading may be obtained.

When the frequency signal to be tested is higher than 30Vrms, the Meter cannot guarantee accuracy of the measurement.

The frequency measurement ranges is 20kHz.

To measure frequency, connect the Meter as follows :

1) Insert the red test lead into the VWterminal & the black test lead into the **COM** Terminal.

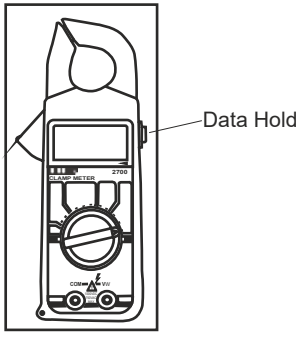
2) Set the rotary switch in the Hz range.

3) Connect the test leads across with the object being measured. The measured value shows on the display.

⚠ Caution :

- When Hz measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

G. Frequency Measurement Line Level (in model 2790)



Keep the switch in 750V AC Position, Press Data Hold switch for 2 seconds. The meter will show the line level frequency.

FEATURES :

- HIGH - ACCURACY, DIGITAL READING.
- LARGE LCD FOR EASY READING.
- INSTANT CONTINUITY BUZZER.
- OVERLOAD PROTECTION ON ALL RANGES.
- RECESSED SAFETY DESIGNED INPUT JACKS.
- "DATA - HOLD " SWITCH FREEZES READING.

GENERAL SPECIFICATIONS :

Display : 3½ digit LCD. maximum reading 1999 with automatic sign and Function annunciators.

Overange indication : MSB (highest) digit OL (1) or (-1) is displayed.

Low battery : "🔋" is displayed when the battery voltage drops below the operating voltage.

Measurement rate : 3 measurements per second, nominal.

Operating temperature :0°C to + 50°C, 0-70% RH.

Storage temperature : -20°C to 60°C, 0-80% RH with battery removed.

Accuracy: Accuracy specifications at 23 ± 5°C less than 75% RH.

Power: 1.5V x 2 AA Battery

Dimension : 19.2(L) x 8.2(W) x 3.3(H) cm.

Weight : Approx (250 g rams) including battery.

Accessories : Test leads(pair), Battery, Manual, Carrying Case.

ELECTRICAL SPECIFICATION

- Accuracies are ± (%reading + number of digits). at 23 ± 5°C less than 75% R.H.

AC CURRENT (50~60 Hz)

Range	Resolution	Accuracy
20 A	0.01 A	± (3% rdg + 4 dgts.)
200 A	0.1 A	± (2% rdg + 4 dgts.)
300 A	1 A	
600 A*	1 A	± (1.5% rdg + 4 dgts.)

*** 600A range in Model - 2790**

AC VOLTAGE(50~500 Hz)

Range	Resolution	Accuracy
200 V	0.1 V	± (1.2% rdg + 4 dgts.)
750 V	1 V	± (1.5% rdg + 4 dgts.)

ACCURACY : 2790 : ±(3%rdg+4dgts) for 200V & 750V range
INPUT IMPEDANCE : 10 MW
OL - PROTECTION : 1200 VDC/800 VAC ON ALL RANGES.

DC VOLTAGE(2700)

Range	Resolution	Accuracy
2 V	1 mV	± (0.5% rdg + 1 dgt)
200 V	0.1 V	
1000 V	1 V	

DC VOLTAGE(2790)

Range	Resolution	Accuracy
200 V	0.1 V	± (1.5% rdg + 1 dgt)
1000 V	1 V	

INPUT IMPEDANCE : 10MW
OL - PROTECTION : 500VDC/350VAC ON 200mV RANGE
1200VDC/800VAC ON OTHER RANGE.

RESISTANCE

Range	Resolution	Accuracy
200 W	0.1 W	± (1% rdg + 1 dgt)
200 KW	100 W	

TEST VOLTAGE : 200WRANGE 3.2V MAX.
200K WRANGE 0.3V MAX.
OL - PROTECTION : 500VDC/350VAC ON ALL RANGE

DIODE TEST

TEST CURRENT	1.0 ± 0.6mA
TEST VOLTAGE	3.2V MAX.

OL - PROTECTION : 500VDC/350VAC.

CONTINUITY BEEPER

THRESHOLD	< 30W
RESPONSE TIME	< 100mS

OL - PROTECTION : 500VDC/350VAC.

FREQUENCY (Autoranging) Logic Level

Frequency function in Model - 2790

Function	Range	Accuracy
Hz	10/100/1000	± (0.5% rdg + 3 dgts)
KHz	10k / 100k	
MHZ	1M / 4M	

SENSITIVITY : 80Vrms min.
OL - PROTECTION : 500VDC or 350VAC rms

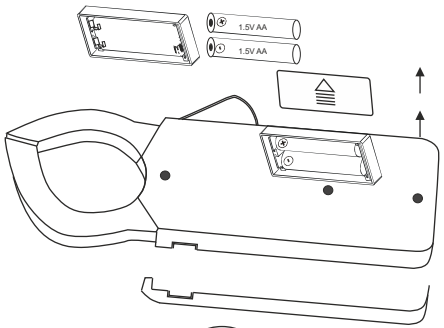
Maintenance

⚠Warning

To avoid false reading, replace the battery as soon as the battery indicator appears.

To replace battery :

- Disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.
- Turn the Meter OFF.
- Remove the screws from the battery compartment, & separate the battery compartment from the case bottom.
- Remove the battery from the battery compartment.
- Replace the battery with a new 1.5V x 2 AA Battery.
- Rejoin the battery compartment and the case bottom, and install the screw.



MUMBAI.

TEST CERTIFICATE

DIGITAL CLAMPMETER

This Test Certificate warrantees that the product has been inspected and tested in accordance with the published specifications.

The instrument has been calibrated by using equipment which has already been calibrated to standards traceable to national standards.

MODEL NO. **2700 / 2790**

SERIAL NO. _____

DATE: _____

ISO 9001
REGISTERED

QC
KUSAM-MECO
PASS