Thermo
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Model

3060
Portable IR CO_2 Controller

Operating and Maintenance Manual
Manual No: 7003060 Rev. 1

Read This Instruction Manual.

Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance.

CAUTION! All internal adjustments and maintenance must be performed by qualified service personnel.

The material in this manual is for information purposes only. The contents and the product it describes are subject to change without notice. Thermo Fisher Scientific makes no representations or warranties with respect to this manual. In no event shall Thermo be held liable for any damages, direct or incidental, arising out of or related to the use of this manual.

IMPORTANT USER INFORMATION

Caution! Stored product should be protected by a redundant 24 hour/day monitoring system with alarm capability. An interconnect jack and thermocouple are installed for centralized monitoring, should on-board system fail.

MANUAL NUMBER 7003060

REV	ECR/ECN	DATE	DESCRIPTION	By
1	--	12/04/2018	Changed IR sensor	TFI

Important operating and/or maintenance instructions. Read the accompanying text carefully.

Ce symbole attire l'attention de l'utilisateur sur des instructions importantes de fonctionnement et/ou d'entretien. Il peut être utilisé seul ou avec d'autres symboles de sécurité. Lire attentivement le texte d'accompagnement.

Wichtige Betriebs- und/oder Wartungshinweise. Lesen Sie den nachfolgenden Text sorgfältig.

Importante instruccions de operacion y/o mantenimiento. Lea el texto acompanante cuidadosamente.

Potential electrical hazards. Only qualified persons should perform procedures associated with this symbol.

Ce symbole attire l'attention de l'utilisateur sur des risques électriques potentiels. Seules des personnes qualifiées doivent appliquer les instructions et les procédures associées à ce symbole.

Gefahr von Stromschlägen. Nur qualifizierte Personen sollten die Tätigkeiten ausführen, die mit diesem Symbol bezeichnet sind.

Potencial de riesgos electricos. Solo personas das capacitadadas deben ejecutar los procedimientos asociadas con este simbulo.

Equipment being maintained or serviced must be turned off and locked off to prevent possible injury.

Risques potentiels liés à l'énergie. L'équipement en entretien ou en maintenance doit être éteint et mis sous clé pour éviter des blessures possibles.

Geräte, an denen Wartungs- oder Servicearbeiten durchgeführt werden, müssen abgeschaltet und abgeschlossen werden, um Verletzungen zu vermeiden.

El equipo recibiendo servicio o mantenimiento debe ser apagado y segurado para prevenir danos.

Hot surface(s) present which may cause burns to unprotected skin, or to materials which may be damaged by elevated temperatures.

Présence de surface(s) chaude(s) pouvant causer des brûlures sur la peau non protégée, ou sur des matières pouvant être endommagées par des températures élevées.

Heiße Oberfläche(n) können ungeschützter Haut Verbrennungen zufügen oder Schäden an Materialien verursachen, die nicht hitzebeständig sind.

Superficias calientes que pueden causar quemaduras a piel sin proteccion o a materiales que pueden estar danados por elevadas temperaturas.

- √ Always use the proper protective equipment (clothing, gloves, goggles, etc.)
- √ Always dissipate extreme cold or heat and wear protective clothing.
- √ Always follow good hygiene practices.
- √ Each individual is responsible for his or her own safety.

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Our **Sales Support** staff can provide information on pricing and give you quotations. We can take your order and provide delivery information on major equipment items or make arrangements to have your local sales representative contact you. Our products are listed on the Internet and we can be contacted through our Internet home page.

Our **Service Support** staff can supply technical information about proper setup, operation or troubleshooting of your equipment. We can fill your needs for spare or replacement parts or provide you with on-site service. We can also provide you with a quotation on our Extended Warranty for your Thermo Scientific products.

Whatever Thermo Scientific products you need or use, we will be happy to discuss your applications. If you are experiencing technical problems, working together, we will help you locate the problem and, chances are, correct it yourself...over the telephone without a service call.

When more extensive service is necessary, we will assist you with direct factory trained technicians or a qualified service organization for on-the-spot repair. If your service need is covered by the warranty, we will arrange for the unit to be repaired at our expense and to your satisfaction.

Regardless of your needs, our professional telephone technicians are available to assist you Monday through Friday from 8:00 a.m. to 6:00 p.m. Eastern Time. Please contact us by telephone or fax. If you wish to write, our mailing address is:

Thermo Fisher Scientific (Asheville) LLC
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Section 1 - Receiving

1.1 Preliminary Inspection

This item was thoroughly inspected and carefully packed prior to shipment and all necessary precautions were taken to ensure safe arrival of the merchandise at its destination. Immediately upon receipt, before the unit is moved from the receiving area, carefully examine the shipment for loss or damage. Unpack the shipment and inspect both interior and exterior for any in-transit damage.

1.2 Visible Loss or Damage

If any loss or damage is discovered, note any discrepancies on the delivery receipt. Failure to adequately describe such evidence of loss or damage may result in the carrier refusing to honor a damage claim. Immediately call the delivering carrier and request that their representative perform an inspection. Do not discard any of the packing material and under no circumstances move the shipment from the receiving area.

1.3 Responsibility for Shipping Damage

For products shipped F.O.B. Marietta, Ohio, the responsibility of Thermo Fisher Scientific ends when themerchandise is loaded onto the carrier's vehicle.

On F.O.B. Destination shipments, Thermo and the carrier's responsibility ends when your Receiving Department personnel sign a free and clear delivery receipt.

Whenever possible, Thermo will assist in settling claims for loss or in-transit damage.

Section 2 - Installation and Start-Up

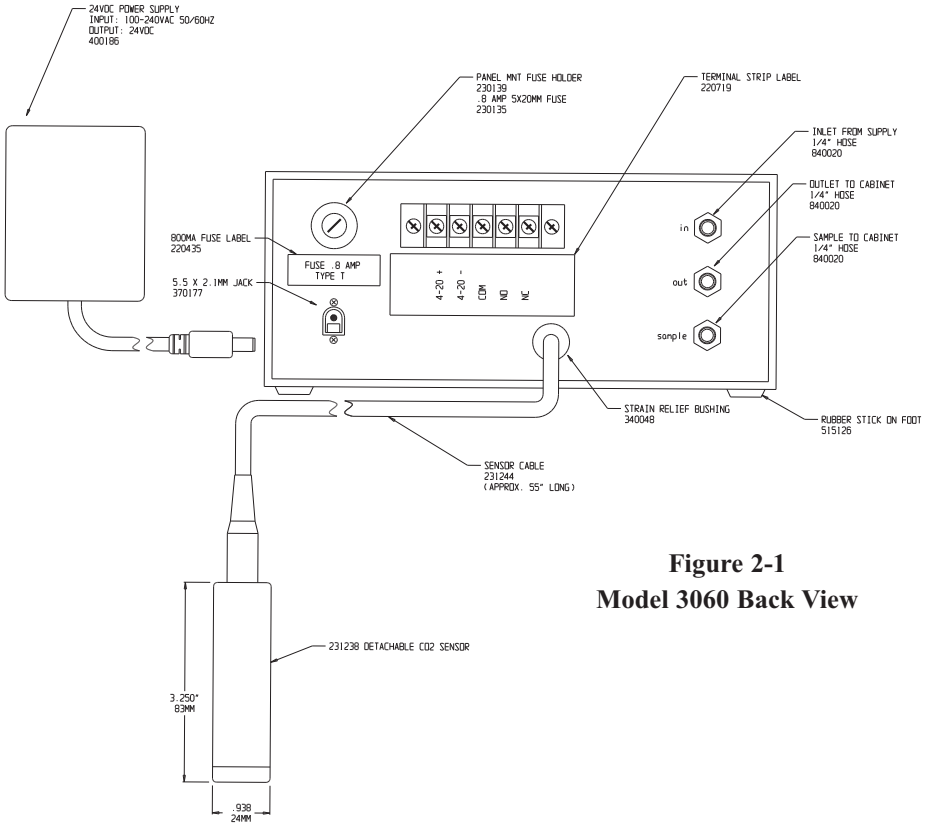


Figure 2-1
Model 3060 Back View

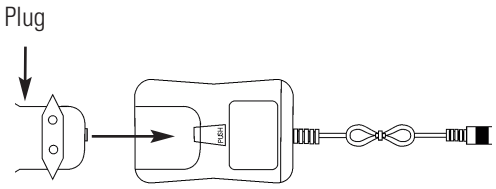


Figure 2-2

2.1 Introduction

The Model 3060 is a portable system designed to add CO_2 control to any incubator with stable temperature and humidity. This unit contains an IR (infrared) sensor.

2.2 Installing the CO_2 Control and Sensor

Install the CO_2 control near the incubator cabinet. Route the power supply to the nearest outlet. Select the appropriate plug and attach it to the power supply as shown in figure 2-2. The power supply is rated for 100-240 VAC, 50/60 Hz.

Route the sensor into the cabinet through an available access port and attach it to an interior wall using the bracket proviided. The sensor should be located in the airflow near the positive pressure of the blower motor. Any slack in the cable should be taken up on the outside of the unit.

2.3 CO_2 Outlet (Refer to Figure 2-1)

The CO_2 outlet tubing should be connected to the port labeled *Out*. Route the outlet tubing into the chamber and locate close to the blower motor negative pressure side. This location will help mix the air and CO_2 to promote uniformity. Avoid severely bending the tubing.

2.4 CO_2 Sample Tube (Refer to Figure 2-1)

The sample tubing connects to the sample port on the back of the controller. Route the open end of the tubing into the incubator chamber so that the end of the tube is positioned near the center of the chamber. To determine the degree of CO_2 distribution uniformity, samples may be taken from a number of locations within the chamber.

Use the sample port located on the front of the control panel to check the CO_2 percentage in the chamber by an independent instrument such as a Fyrite..

Do not locate the end of the sample tubing near the CO2 sensor or the inject tubing. If the sample is taken while CO2 injection is occurring, an abnormally high reading will be obtained.

2.5 Connecting the CO_2 Source (Refer to Figure 2-1)

For the most economical use, the liquid CO_2 supply tanks should be without siphon tubes, so that only CO_2 gas enters the incubator injection system. Two tanks may be joined together with a manifold to ensure a continuous CO_2 supply.

Install a two-stage pressure regulator, with indicating gauges, at the supply cylinder outlet. The high-pressure gauge should have an indicating range of 0 to 2000 psig to monitor tank pressure. The low-pressure gauge should have an indicating range of 0 to 30 psig to monitor input pressure to the incubator injection system. A suitable two-stage pressure regulator is available.

The CO_2 source must be regulated at a pressure level between 5 and 10 psig. Higher pressure levels may damage the CO_2 control system. The user should determine the most economical pressure level, between 5 and 10 psig appropriate for the desired CO_2 percentage in the chamber. Use only sufficient pressure to maintain recovery time after door openings.

To connect the CO_2 supply:

1. Connect the CO_2 tubing to the 1/4” hose fitting on the back of the 3060 labeled *In*.
2. Check the tubing connection for leaks.

2.6 Power Connection

The power supply is the mains disconnect. See the electrical schematic for exact electrical specifications.

2.7 Sealing the Incubator Cabinet

All sample ports and access holes in the incubator cabinet must be capped. If the chamber is not properly sealed, CO_2 will drain from the chamber and the temperature and humidity control will be affected.

2.8 Remote Alarm Contacts and 4-20 mA

The controller is equipped with 4-20mA output for the remote transmission of CO_2 data. A terminal strip is located on the back of the controller for convenience. Refer to Figure 2-3 for terminal pin identification. The output is scaled for 0 - 20% CO_2.

Remote alarm connections are also included on the terminal strip (Figure 2-3) providing Normally Open (N.O.) and Normally Closed (N.C.) contacts. C is the Common terminal. The remote alarm will activate when the CO_2 percentage moves outside of the set alarm limits in the event of a power outage..

Figure 2-3 Remote Alarm Contacts

Section 3 - Control Panel Operation

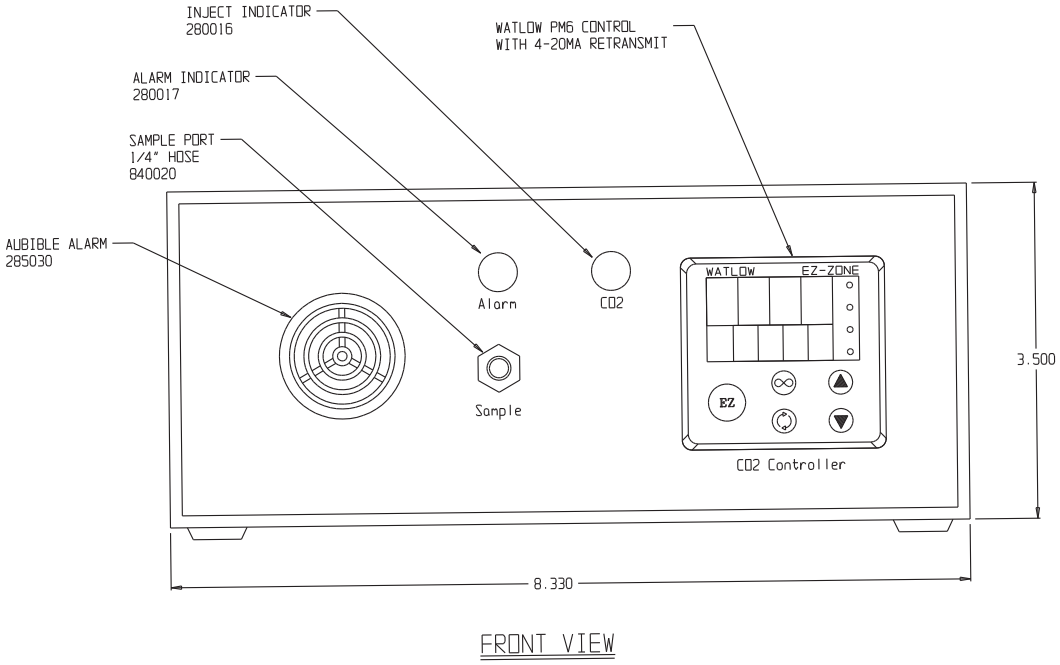


Figure 3-1 Model 3060 Control Panel

3.1 CO_2 Controller and Indicator

The controller provides for both setpoint adjustment and readout of actual CO_2 percentage in the chamber. During normal operation, the upper display on the Watlow PM controller indicates the actual CO_2 percentage in the chamber. The lower display indicates the CO_2 set point.

3.2 Setting the CO_2 Content

To set the CO_2 content (0% to 20%), press the Up or Down Arrow keys on the Watlow PM Controller. The content is set in 1% increments and is shown in the lower display.

3.3 CO_2 Alarm

The CO_2 alarm is factory set to activate when the chamber CO_2 content deviates from configured alarm set points (see configuration record). When a CO_2 alarm occurs, the CO_2 Alarm indicator on the control panel lights and the audible alarm sounds.

The CO_2 alarm high and low setpoints are established through the Watlow PM CO_2 controller (ALO, and AHI). Refer to the Configuration Record included at the end of Section 4.

3.4 CO_2 Inject

The amber CO_2 light will illuminate when CO_2 gas is being injected into the incubator.

3.5 Sample Port

A sample port is located on the control panel for checking CO_2 percentage in the incubator chamber by independent means, as with a Fyrite, or similar CO_2 test instrument.

To prevent CO_2 loss, the sample port must be capped when it is not in use.

Section 4 - Service

Servicing is to be performed by qualified service personnel only.

4.1 Program CO_2 Controller

The Watlow CO_2 controller has been set at the factory to operate the incubator within the specifications listed in the Specifications section of this manual. Reference copies of the Watlow configuration records are included at the end of this section.

To prevent tampering, software lockouts are employed in the system. These lockouts must only be removed by persons skilled in configuring controller software.

CAUTION! Re-programming either the temperature or humidity controllers alters the factory defaults and will seriously alter the performance of the incubator. This may also void the warranty . Do not re-configure the controllers without first consulting the Technical Services Department.

4.2 Remote Software Lockout

1. Press the Advance and Infinity Key at the same time and hold them for about six seconds. The word “Fcty” (factory) will appear in the bottom display. If numbers in the bottom display begin to scroll up or down, the keys have not been pressed simultaneously. Try again.
2. Press the Up Arrow until “LOC” (lock) appears in the upper display. The word “Fcty” will remain in the lower display.
3. Press the Advance key to scroll through the menus as follows.

Lower Display	Upper Display	Key Strokes
LoC.o	1	Change to 3 = Unlocked
LoC.P	1	No changes required
PAS.E	1	No changes required
rLoC	1	Change to 5 = Unlocked
sLoC	1	Change to 5 = Unlocked

4.3 Restore Software Lockout

To turn the software lockout back on.

1. Set Lock Values back to previous setting.

4.4 Controller Configuration

Copies of the Watlow configuration record is included at the end of this section.

CAUTION! Do not re-configure the controller without first consulting the Techincal Services Department.

4.5 Offset Calibration

It may be necessary to calibrate the controller to match an independent measurement. To do so, follow the next few steps.

1. Press the “Remote Software Lockout” procedure in this section.
2. Verify actual CO_2 chamber content with an independent instrument of known accuracy.
3. Allow approximately 30 minutes for the incubator to stabilize.
4. Press Up and Down Arrow keys simultaneously for 3 seconds. The word “OPEr” appears in the lower display.
5. Press Down arrow until “Ai” appears in the upper display.
6. Press the Advance Key until “i.CA” appears in the lower display. Press Up or Down arrow Key to either add or subtract an offset value. The Value is the difference between the actual value shown on the controller, and the reference sensor value.
7. Press the Infinity Key until the display reverts to normal operation.
8. Perform the “Restore Software Lockout” procedure in this section.

4.6 Electrical Servicing

No internal electrical servicing should be required for the unit under conditions of normal use. If electrical servicing should become necessary, it should be performed by qualified electrical service personnel.

Refer to the electrical schematics, and wiring diagrams provided in this manual.

CO2 CONFIGURATION RECORD (WATLOW PM6)

MODELS: 3060
JOB NUMBER:
UNT SERIAL NUMBER:
CONTROL TYPE: CO2
PREPARED BY: GLS **DATE** 7-Mar-2018

Program Page
See Programming Sheets if required.*

Operations Page: (Press "UP" & "DN" keys for 3 sec.)

Mon:	C.MA	*	h.Pr	*	C.SP	*	Pu.A	*
LOOP:	C.M	**AUto**	C.SP	*	ti	**8000**	o.SP	**0.0**
	A.tSP	**90**	id.S	**5.0**	td	**1**		
	Aut	**no**	h.Pb	**2.0**	db	**0.0**		

ALM:	ALM 1		ALM 2		ALM 3		ALM 4	
	A.Lo	**-1.0**	A.Lo	**32.0**	A.Lo	**32.0**	A.Lo	**32.0**
	A.hi	**21.0**	A.hi	**300.0**	A.hi	**300.0**	A.hi	**300.0**
	¹(A.Sir)	**AL.L**	¹(A.St)	*	¹(A.St)	*	¹(A.St)	*
	¹(A.St)	*						

Ai:	Ain	*	i.Er	*	i.CA	@

Lnr:	Lnr 1	
	Su.A	*
	ofSt	@
	o.u	*

Pu:	Pu 1	
	Su.A	*
	ofSt	@
	o.u	*

Setup Page: (Press "UP" & "DN" keys for 6 sec.)

Ai:	Sen	**Volt**	r.Lo	**0.0**	i.Er	**oFF**	¹(i.Er)	*
	Unit	**Pro**	r.hi	**20.0**	dEC	**0.0**		
	S.Lo	**0.00**	P.EE	**oFF**	¹(i.CA)	@		
	S.hi	**1.00**	FiL	**2.0**	¹(Ain)	*		

Lnr:	Lnr 1	
	fn	**off**

(All other perameters at default values)

Pu:	Pu 1	
	fn	**off**
	FiL	**0.0**

LooP:	h.Ag	**Pid**	t.tUn	**no**	rP	**oFF**	SP.hi	**100.0**
	C.Ag	**oFF**	¹(A.tSP)	**90**	L.SP	**0.0**	¹(o.SP)	**0.0**
	¹(h.Pb)	**2.0**	t.Agr	**Cr it**	h.SP	**20.0**	¹(C.M)	**Auto**
	¹(ti)	**8000**	UFA	**USEr**	¹(C.SP)	*		
	¹(td)	**1**	FAiL	**oFF**	¹(id.S)	**5.0**		
	¹(db)	**0.0**	L.dE	**no**	SP.Lo	**-100.0**		

otPt:	otPt 1		otPt 2		otPt 3		S.hi	**20.00**
	Fn	**hEAt**	Fn	**ALM**	o.ty	**MA**	r.Lo	**0.0**
	o.tb	**10.0**	Fi	**1**	fn	**rMt**	r.hi	**20.0**
	o.Lo	**0**			r.Sr	**Ai**	o.CA	**0.0**
	o.hi	**100**			Fi	**1**		
					S.Lo	**4.00**		

ALM:	ALM 1		ALM 1		ALM 1		ALM 2	
	A.ty	**Pr.AL**	¹(A.Lo)	**-1.0**	A.dSP	**on**	A.ty	**oFF**
	Sr.A	**Ai**	¹(A.hi)	**21.0**	¹(A.dL)	**0**	ALM 3	
	A.hy	**0.3**	A.LA	**nLAt**	¹(A.Sir)	**SiL**	A.ty	**oFF**
	A.Lg	**AL o**	A.bL	**oFF**	¹(A.St)	**AL.L**	ALM 4	
	A.Sd	**both**	A.Si	**on**			A.ty	**oFF**

FUn:	Lev	**high**	Fn	**SiL**	Fi	**1**

gLbL:	C-F	**C**	Zone	**oFF**	d.ti	**0**
	AC.LF	**60**	ChAn	**oFF**	Usr.S	**nonE**
	C.Led	**oFF**	d.PrS	**1**	Usr.r	**nonE**

CoM:	Ad.S	**1**	MAP	**1**	nU.S	**yES**

Factory Page: (Press "Infinity" & "Advance" kry for 6 sec.)

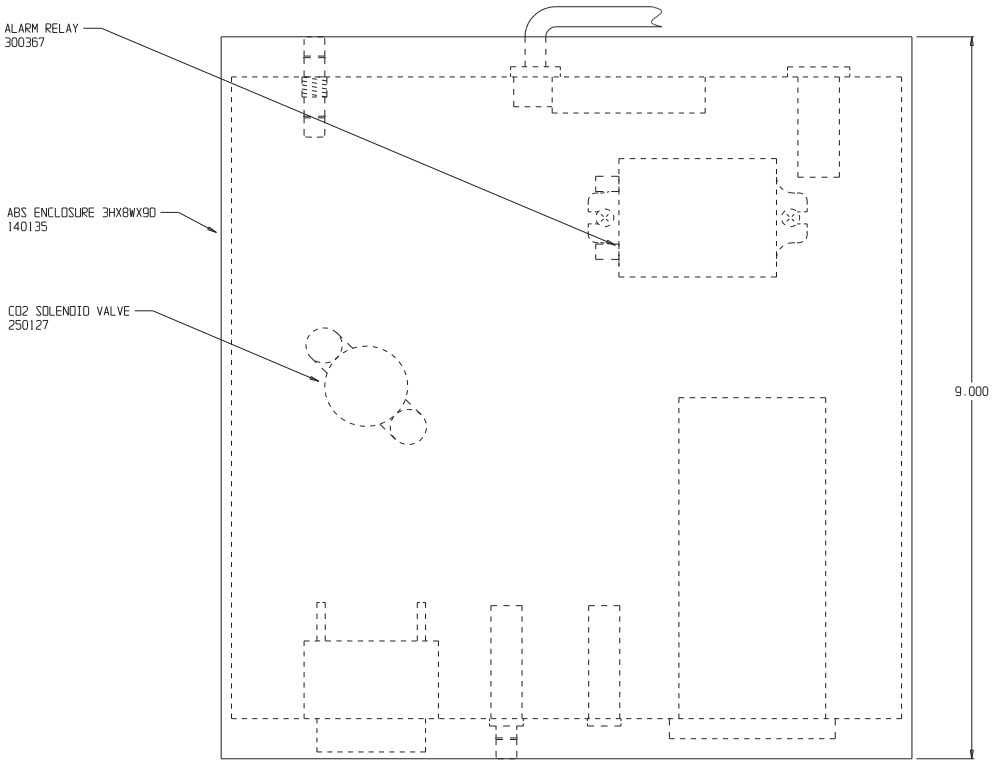
LOC:	LoC.o	**2**	PaS.E	**oFF**	rLoC	**1 $**	SLoC	**1 $**

CUSt:	CUSt: 1		CUSt: 2		CUSt: 3 thru 20	
	PAr	**AC.Pu**	PAr	**AC.SP**	PAr	**nonE**

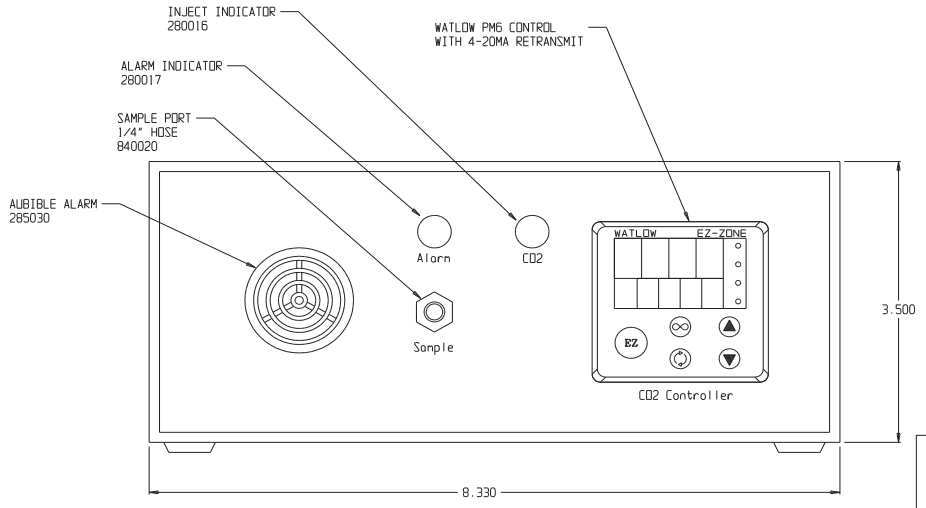
* Displays current controller value. (Display only)
$ LOC should be set at 5 until factory testing and calibration is complete.
@ This is a calibration factor and will vary from unit to unit.
¹ Indicates parameters added in version 11.00 control firmware. Not present in ver. 10.00

Section 5 - Specifications

Exterior Size	8.000" wide x 3.000" high x 9.000" front to back
Exterior Material	ABS Plastic, beige color
Paint Slate	Slate Blue Insert, Powder Coated
CO_2 Range	0 to 20%
CO_2 Connection	1/4" Barbed Hose Fitting, 10-15 psi
CO_2 Sensor	231238 Vaisala, 0.985" X 3.780", 4.5" leads leads
CO_2 Sensor Temperature Range	-20°C to +60°C
CO_2 Sensor Humidity Range	0 to 100%, non-condensing
Electrical	100-250V, 1 PH, 2W, 50/60HZ, .7 FLA, Changeable AC plug
Controller	231235 Watlow PM Microprocessor



TOP VIEW



FRONT VIEW

Assembly Drawing

3060 Portable

IR CO2 controller

3060-00-0-D Rev 7

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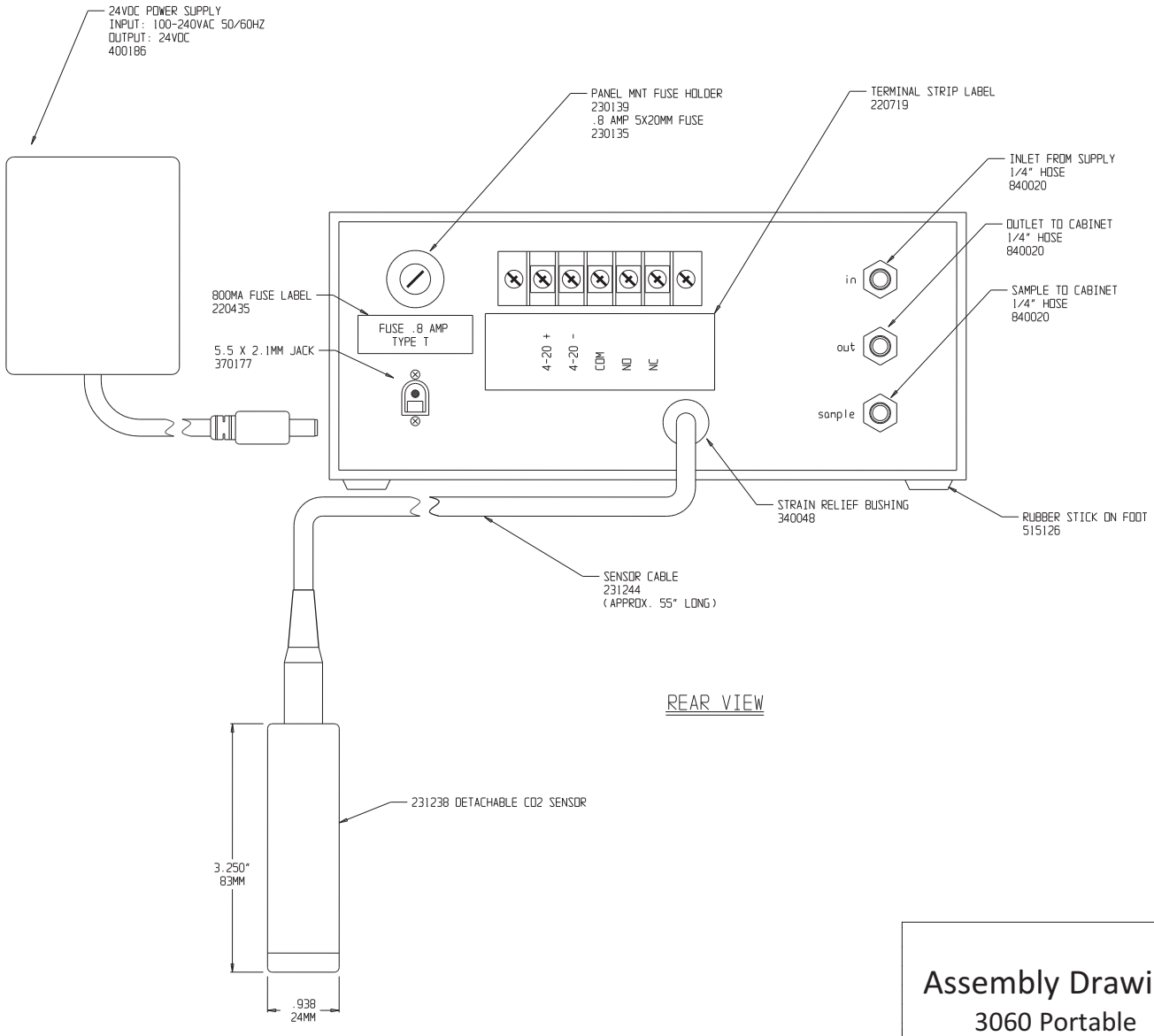
SPECIFICATIONS

MODEL: 3060 PORTABLE IR CO2 CONTROLLER
EXTERIOR MATERIAL: 14 GA. C.R.S. END PLATES W/
ABS PLASTIC WRAP.
PAINT: BLUE FRONT/REAR END PLATE, POWDER COATED
OPERATING TEMPERATURE RANGE: -18°C TO 60°C
OPERATING HUMIDITY RANGE: PROBE - 0 TO 100%RH (NON-CONDENSING)
CONTROL: +/-0.1% CO2
OPERATING PRESSURE: 10 - 15 PSI
ELECTRICAL: 100-250V, 1PH, 2P, 50/60HZ, .2FLA

NOTE: INTERCHANGABLE PLUG KIT INCLUDED. 400179 KIT
CONTAINS PLUGS FOR: USA (120V, 15AMP), EUROPEAN
CEE 7/16 (230V, 2.5AMP), AUSTRALIAN AS3112 (CLASS II
UNGROUNDED), UNITED KINGDOM BS1363 (250V, 13AMP).



Assembly Drawing
3060 Portable
IR CO2 controller
3060-00-0-D Rev 7
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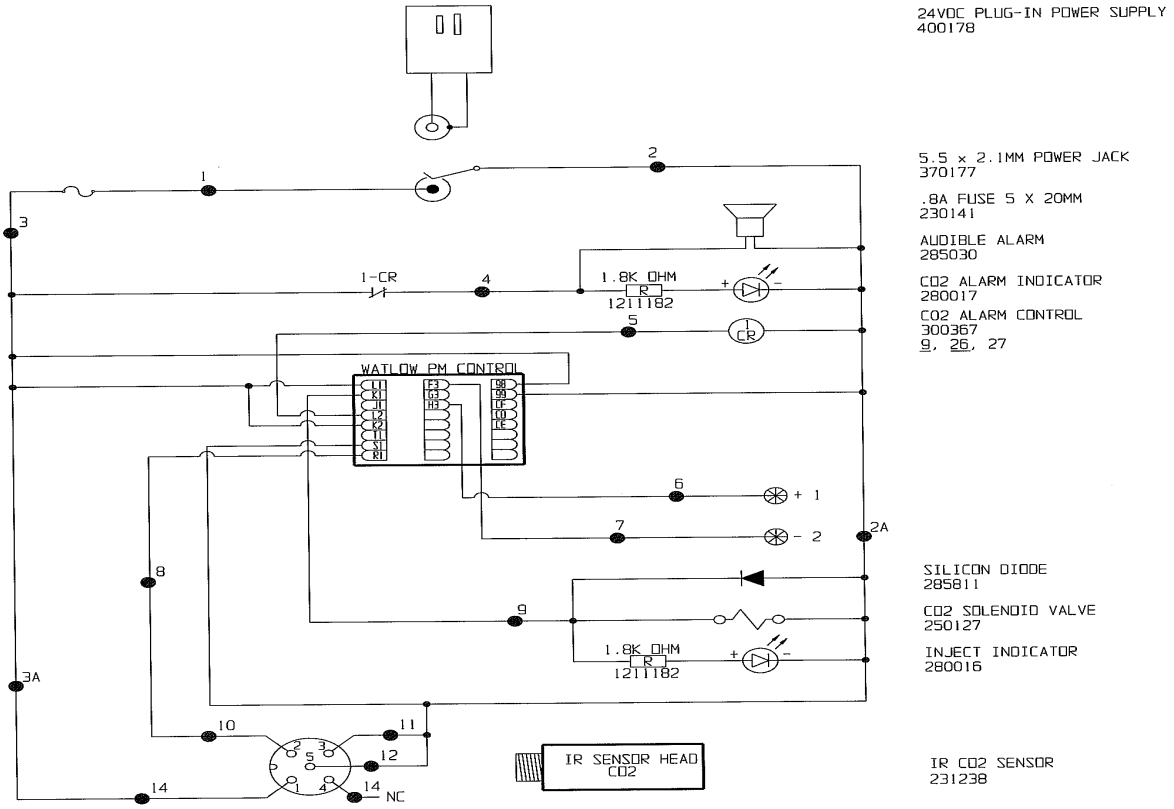
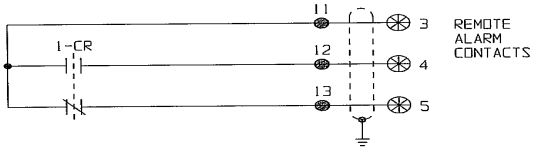
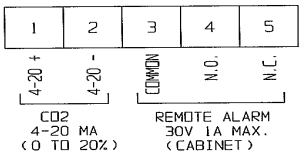
Section 6 - Parts List

230141	Fuse 1.8 amp TD 5 x 20 mm
231238	I/R CO2 Sensor 0 to 20%
231235	Watlow PM Controller, 24V, Re-xmit
250127	Solenoid Valve 24 VDC 1/8”
300367	Relay 3 PDT, 10A 24 VDC Enclosed
400002	Sonalert, 6-28 VDC, Pulsing
400179	Interchangeable AC plugs
400186	Wall Power Supply 24 VDC 20W
290190	Two meter CO_2 cable

POWER CONNECTION
100-250V, 1Ø, 2W, 50/60HZ, .2 FLA







Terminal Strip Connection

WIRE CHART

WIRE NO.	GAUGE	COLOR
1	20	RED
2	20	BLACK
2A	22	BLACK
3	20	RED
3A	22	RED
4	20	YELLOW
5	20	ORANGE
6	20	BLACK
7	20	WHITE
8	22	RED
9	20	BLUE
10	22	WHITE
11	22	BLUE
12	22	GRAY
13	22	BROWN
14	22	BLACK

Electrical Schematic

Model:
3060
IR CO2 controller

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Appendix A

Handling Liquid CO_2

CO_2 Gas Can Cause Suffocation Without Warning!

Store and use liquid CO_2 only in a well-ventilated place.
As the liquid evaporates, the resulting gas tends to displace the normal air from the area. In closed areas, excessive amounts of CO_2 gas reduce the concentration of oxygen and can result in asphyxiation. Because CO_2 gas is colorless, odorless and tasteless, it cannot be detected by the human senses and will be breathed as if it were air. Breathing an atmosphere that contains less than 18% oxygen can cause dizziness and quickly result in unconsciousness and death.

Note: The cloudy vapor that appears when liquid CO_2 is exposed to the air is condensed moisture; not the gas itself. The issuing gas is invisible.

Never dispose of liquid CO_2 in confined areas or places where others may enter.
Disposal of liquid CO_2 should be done outdoors in a safe place. Pour the liquid slowly on gravel or bare earth where it can evaporate without causing damage. Do not pour the liquid on pavement.

First Aid

If a person seems to become dizzy or loses consciousness while working with liquid CO_2, move to a well-ventilated area immediately. If breathing has stopped, apply artificial respiration. If breathing is difficult, give oxygen. Call a physician. Keep warm and at rest.

If exposed to liquid or cold gas, restore tissue to normal body temperature (98.6°F) as rapidly as possible, followed by protection of the injured tissue from further damage and infection. Remove or loosen clothing that may constrict blood circulation to the frozen area. Call a physician. Rapid warming of the affected part is best achieved by using water at 108°F. Under no circumstance should the water be over 112°F, nor should the frozen part be rubbed either before or after rewarming. The patient should neither smoke nor drink alcohol.

THERMO FISHER SCIENTIFIC STANDARD PRODUCT WARRANTY

The Warranty Period starts two weeks from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the first year warranty period.

During the first year, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor included. Installation and calibration are not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, glass, filters and gaskets are excluded from this warranty.

Replacement or repair of components parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original warranty period. The Technical Services Department must give prior approval for return of any components or equipment. At Thermo's option, all non-conforming parts must be returned to Thermo Fisher Scientific postage paid and replacement parts are shipped FOB destination.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. Thermo shall not be liable for any indirect or consequential damages including, without limitation, damages relating to lost profits or loss of products.

Your local Thermo Sales Office is ready to help with comprehensive site preparation information before your equipment arrives. Printed instruction manuals carefully detail equipment installation, operation and preventive maintenance.

If equipment service is required, please call your Technical Services Department at 1-800-438-4851 (USA and Canada) or 1-740-373-4763. We're ready to answer your questions on equipment warranty, operation, maintenance, service and special application. Outside the USA, contact your local distributor for warranty information.

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THERMO FISHER SCIENTIFIC INTERNATIONAL DEALER WARRANTY

The Warranty Period starts two months from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the first year warranty period. Dealers who stock our equipment are allowed an additional six months for delivery and installation, provided the warranty card is completed and returned to the Technical Services Department.

During the first year, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor excluded. Installation and calibration are not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, glass, filters, reagents, tubing, and gaskets are excluded from this warranty.

Replacement or repair of components parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original warranty period. The Technical Services Department must give prior approval for return of any components or equipment. At Thermo's option, all non-conforming parts must be returned to Thermo postage paid and replacement parts are shipped FOB destination.

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