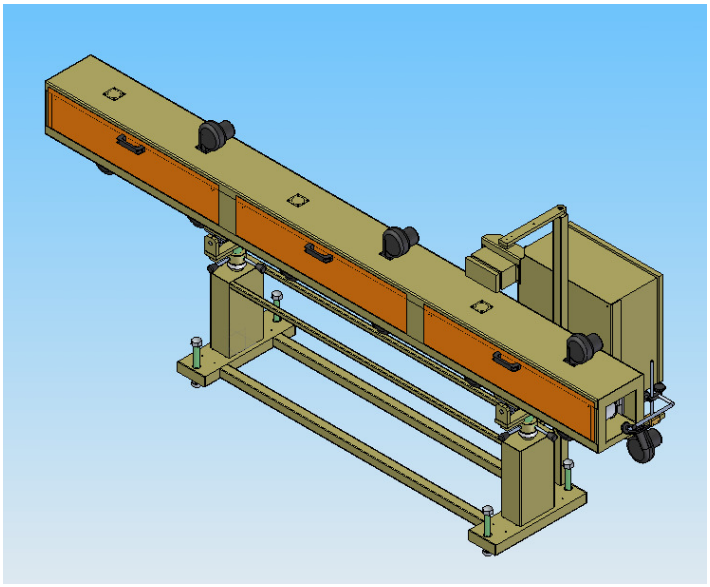
CICO Series

INSTALLATION AND OPERATION MANUAL
INFRARED CONVECTION OVEN
Model CICO12-12
Document Version 1.1



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For more information concerning this or our other manuals, please contact our support department toll-free at 1-877-633-1993, by fax 514-633-5944, or by Email to support@cdsmachines.com.

For sales inquiries, please contact our sales department at 1-877-633-1993 or by Email to info@cdsmachines.com.

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OVERVIEW

Thank you for your purchase of the **CICO Series, Infrared Convection Oven**. Great care has been put into the manufacturing of all our equipment, rendering it highly durable and productive.

This manual gives step-by-step instructions on how to install and operate this machine. It assumes that the readers are working in a plastics production facility and are already familiar with machinery, in order to understand the terms presented herein.

Make certain that you have read and understood all instructions within this manual before using the machine.

SERIOUS INJURY or DEATH may result from any equipment modification. Do NOT by-pass any built-in security measures or features.

Do NOT operate the machine in case of safety consideration, operation malfunction, component failure or technical problem. The machine is considered HAZARDOUS. Follow the Shutdown Procedure (ref. section 1.3) and report to CDS.

Moving Parts inside the machine. NEVER place your hands or any part of your body inside the machine. STOP and SECURE the machine before troubleshooting (see section 3.0).

Hazardous Voltage.
Follow the Shutdown Procedure (ref. section 1.3), then STOP and SECURE the electrical power supply before opening the electrical box.

DANGER: Hot Surfaces. DO NOT touch or get in contact with the machine surfaces.

Do NOT operate the machine without safety guards.

Recommended tools and materials

- Plumb line and/or spirit level
- Allen key set
- Open-box wrenches
- Ratchet set
- Flat-blade screwdriver
- Grease gun and grease

Conventions

The typographic conventions used in this manual are as follows:

START	Reference to a button or switch
ON	Change of a button or switch's status
Note:	Notes
Parker	Reference to supplementary documents or sources

1.0 SET-UP

1- Align the machine with the downstream production line and make sure that it is at the proper centerline height. Testing with a plumb line or spirit level is recommended.

2- Level the machine using the jack screws. Begin on the inlet side and apply equal turns to each screw to keep the unit level. Repeat for the exit side, and lock the check-nuts to ensure stable operation.

3- Ensure that all cables and connectors are in good shape.

1.1 Main Parts

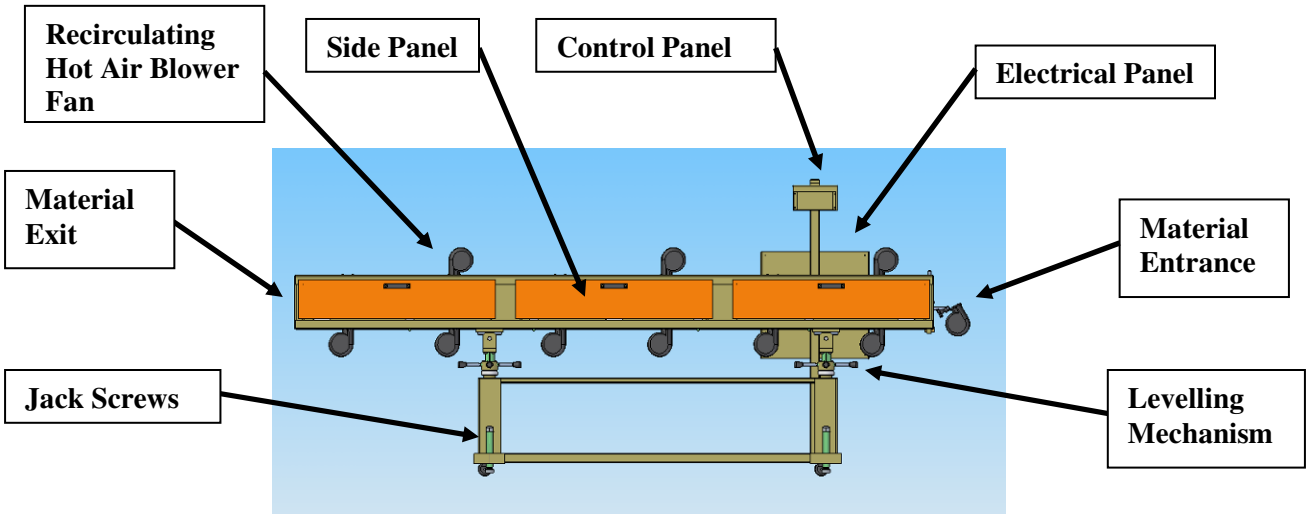


Figure 1: Machine Main Parts

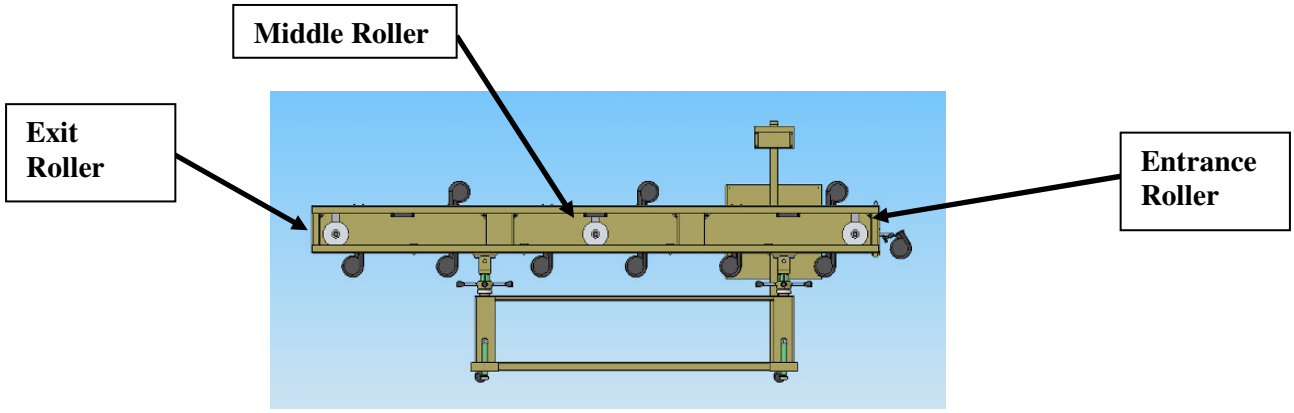


Figure 2: Machine Side View (Panels Opened)

1.2 Technical Specifications

SPECIFICATIONS:

- Operating temperature from 20 degrees Celsius to 100 degrees Celsius
- Insulated Oven
- No cooling capacity
- Oven will not operate if ambient temperature is greater than the required temperature range
- Infrared heaters
- Heavy duty welded construction and solid platform
- Digital temperature with thermocouple
- Enclosure with safety disconnect switch
- Emergency stop palm button
- Solid state relay for heaters
- Six (6) - recirculating blower fans for bottom (variable blowers)
- Three (3) - recirculating blower fans for top (variable blowers)
- One (1) - recirculating blower fan located at the entrance of the oven (variable blowers)
- Dimension of the oven is 12 inches high x 12 inches wide x 12 feet long
- The oven will have the capability to add three additional top blowers
- Three (3) - 6 inch diameter aluminum rollers
- One (1) - roller at entrance 6 inch diameter roller
- One (1) - roller in middle 6 inch diameter roller
- One (1) - roller at the exit 6 inch diameter roller
- All three rollers will be free driven
- Bulkhead opening will be 8-1/2 inches long x 8 inches wide
- Control panel will be swivel type
- Center line is 40 inches plus 10 inches at the entrance and exit
- Capability to lift one side higher than the other side (Example: entrance side is 40 inches and exit side is 50 inches)
- Machine mounted on 3 inch casters
- Three (3) - access doors with hinges mounted on the operator side to have the capability to string up the line from the right to the left side

LINE DIRECTION:

- Capable of running RIGHT TO LEFT or LEFT TO RIGHT via swivel-mounted
- Operator Control Station

INFRARED HEATERS:

- Able to run one heater at a time (which ever heater the customer wants to use) or run both heaters at the same time

ADD ONS:

- Add rollers at the bottom of the oven so that the product does not touch the bottom of the oven
- Add infrared heater as close to the back of the oven as possible
- Add Three (3) dividers in the tank so that when the customer is using the double pass edge band they are separated from each other

- One main switch to turn all blowers on and off
- One fan holding bar at the exit of the infrared oven
- Repositioning of the electrical cabinet

SIZE OF EDGEBAND:
- 7/8 inch
- 1-1/8 inch
- 1-1/2 inch

CSA-CANADA STANDARDS:
- CSA Approval
- Finger safe electrical panels

COLOR:
- Green MTL # 1562
- B11-01-078

ELECTRICS:
- All wires numbered
- 575 Volts / 3 phase / 60 cycle

1.3 Shutdown Procedure

Do NOT operate the machine in case of safety consideration, operation malfunction, component failure or technical problem. The machine is considered HAZARDOUS. Contact CDS.

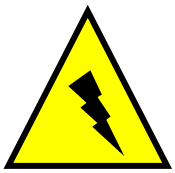
1- **For process line shutdown only, let the processed material (if any) run out of the machine exit;**

2- **STOP the machine by selecting the OFF position on the ON/OFF main selector located on the Operator Control Panel;**

3- **Press on the Emergency-Stop button located on the side of the Operator Control Panel;**

4- **Turn OFF and secure (as per your internal safety procedures) the main power supplies.**

1.4 Electrical Connection



Hazardous Voltage.
Follow the Shutdown Procedure (ref. section 1.3), then STOP and SECURE the electrical power supply before opening the electrical box.

Caution: **Prevent component damage** by ensuring that the power source meets the requirements indicated on the electrical schematics (see Appendix).

Caution: Ensure that the timer is turned off before connecting the power.

1- Connect the power-in wire to the shop electrical supply according to the following three phase connections:

1.	Black wire to L1
2.	**Red wire to L2**
3.	**White wire to L3**
4.	**Green wire to ground**

Caution: If the machine does **NOT** work at start-up, follow the Shutdown Procedure (see section 1.3).

1.5 Pre-operation Adjustments

1- Make sure that the machine is **STOPPED** by pushing the Emergency-STOP button located onto the Operator control panel.

DANGER: Hot Surfaces. DO NOT touch or get in contact with the machine surfaces. Let the machine cool-down before following this procedure.

2- Open the side panels.

3- Manually insert the processed material product through the machine entrance and **underneath the entrance roller**.

Figure 3: Roller

4- Bring the product **over the guide rolls** and **underneath the middle and exit rollers**.

Figure 4: Guide Roll

Caution: Keep the processed material product on the same side of the dividers per pass, in order to prevent overlap around the different rollers.

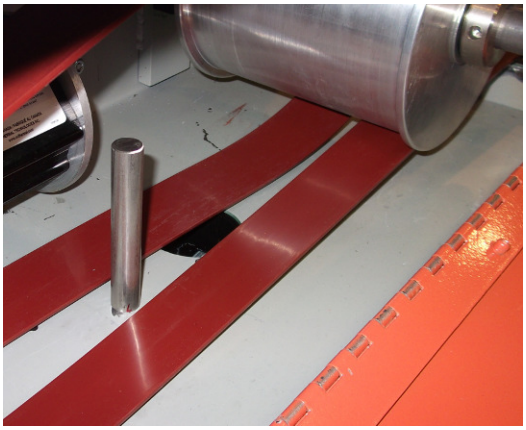


Figure 5: Divider

5- **SINGLE PASS only**. Bring the product out of the machine exit.

6- **DOUBLE PASS only**. Turn the product all **around the exit roller** and bring it back **over the middle roller**.

7- **DOUBLE PASS only**. Turn the product all **around the entrance roller** and bring it forward again **underneath the middle and exit rollers**, then through the machine exit.

8- Adjust the rollers side-to-side positions to suite product, after loosening their respective set-screws, and then tighten them in place prior to starting operation.

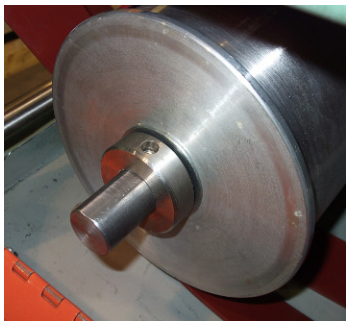


Figure 6: Roller Adjustment

9- Adjust the machine entrance and exit sides to accommodate process height, by turning the levelling mechanism hand-wheels.

Figure 7: Levelling Mechanism Hand-Wheel

10- Close the side panels.

11- Turn ON the Disconnect Power switch located onto the electrical panel and pull the Emergency-STOP button.

12- Set the Timer (see operating instructions in Appendix).

13- Set the Temperature Controller (see operating instructions in Appendix).

14- Start the needed blower fans by switching to ON the related switch (identified by its respective number) located onto the Operator control panel.

15- Start the infrared heaters by placing to On the ON/OFF selector located onto the Operator control panel.

16- Adjust the blower fan speeds by turning the button located at the back of each of them.

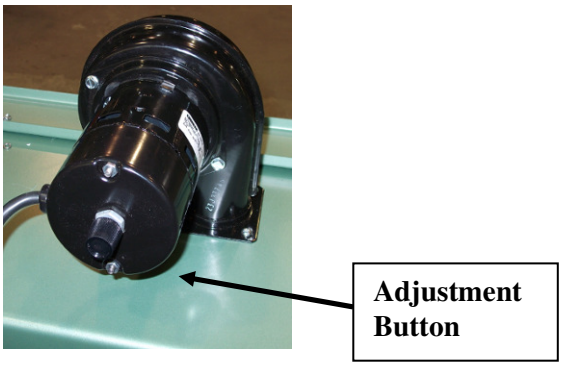


Figure 8: Blower Fan Adjustment Button

17- Adjust the position and angle of the entrance blower fan to suite the processed material product.

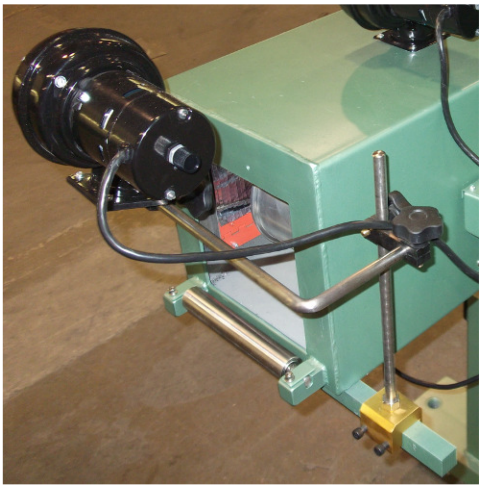


Figure 9: Entrance Blower Fan Adjustment Support

IMPORTANT: Verify that the safety feature is adequately working. The machine operation **must absolutely be blocked** after pushing inward the **EMERGENCY STOP** (E-Stop) palm button.

Do NOT operate the machine if the Emergency Stop button does NOT work. The machine is considered HAZARDOUS. Follow the Shutdown Procedure (ref. section 1.3). Contact CDS.

2.0 OPERATION

SERIOUS INJURY or DEATH may result from any equipment modification.
Do NOT by-pass any built-in security measures or features.

Do NOT operate the machine in case of safety consideration, operation malfunction, component failure or technical problem. The machine is considered HAZARDOUS. Follow the Shutdown Procedure (ref. section 1.3) and contact CDS.

Moving Parts inside the machine.
NEVER place your hands or any part of your body inside the machine.

Hazardous Voltage.
DO NOT open the electrical box and keep it locked.

DANGER: Hot Surfaces. DO NOT touch or get in contact with the machine surfaces.

Do NOT operate the machine without safety guards.

2.1 Operator Station

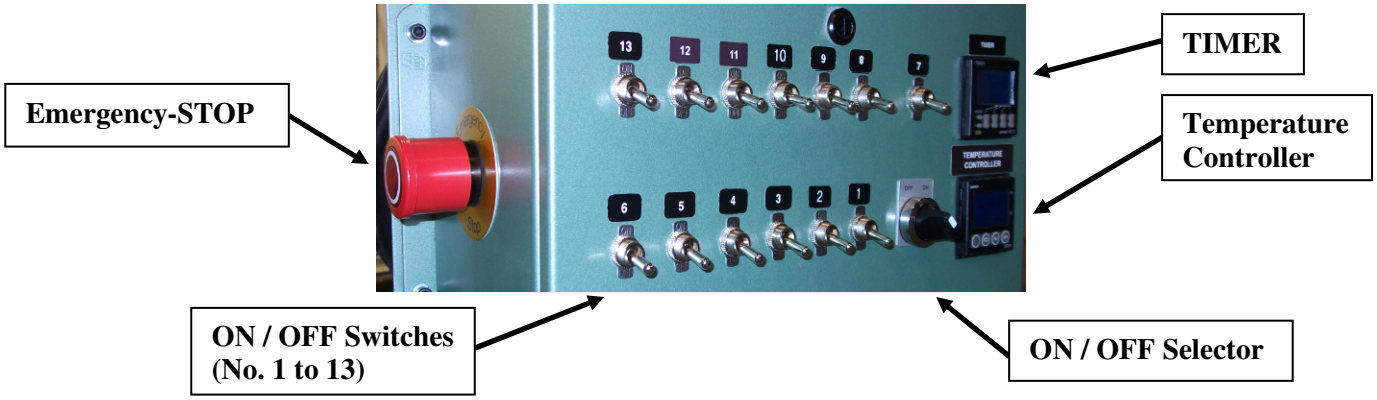


Figure 10: Operator Station

Power Disconnect ON/OFF switch	Located on the main electrical box. Applies or disengages power from the unit.
EMERGENCY STOP Palm-button	Cuts the electrical power in case of an emergency.
Heater Selection 1/1+2/2	Located on the side of the main electrical box (see next figure). Selects the infrared heaters to be in operation, either no.1 only, both or no.2 only.
ON/OFF Selector	Provides or cuts the electrical power to the infrared heaters.
TIMER	Sets the operation cycle time for the infrared heaters. See appendix for more information on how to program the timer equipment.
Temperature Controller	Sets the operation cycle temperature for the infrared heaters. See appendix for more information on how to program the controller equipment.
ON/OFF Switch #	Provides or cuts the electrical power to the corresponding blower fan #. Note: There are some spare switches to allow the addition of more blower fans. Refer to the tagged numbers located next to the blower fans.

Figure 11: Heater Selection

3.0 TROUBLESHOOTING

The procedures described within this section are to be accomplished by certified technicians who have previously read and understood this manual.

Moving Parts inside the machine. STOP and SECURE the machine before executing some of the solutions presented herein.

Hazardous Voltage.
STOP and SECURE the electrical power supply before opening the electrical box.

DANGER: Hot Surfaces. DO NOT touch or get in contact with the machine surfaces. Let the machine cool-down before troubleshooting it.

Problem	Cause	Solution
The operator controls do not light up at start-up.	No power to the machine.	Follow the Shutdown Procedure (see section 1.3). Check the power source. Connect the power-in wire. Turn the power switch on.
	Emergency Stop pressed.	Pull the Emergency Stop button outward.
	Fuses are absent, incorrect, or blown.	Follow the Shutdown Procedure (see section 1.3). Ensure that fuses with the correct values are installed.

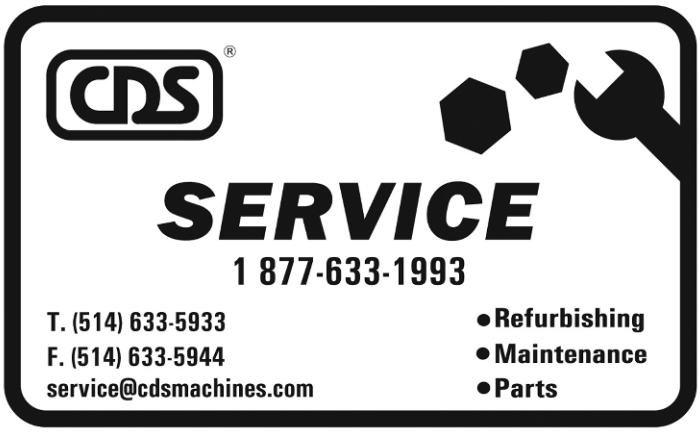
Problem	Cause	Solution
Intermittent operation.	Fuses are loose or have incorrect voltages.	Follow the Shutdown Procedure (see section 1.3). Ensure that fuses with the correct values are installed.
	Loose wiring in electrical box.	Follow the Shutdown Procedure (see section 1.3). Disconnect the power and check the wiring. Call CDS technical support.
	Blower and/or Heater failure.	Follow the Shutdown Procedure (see section 1.3). Check the source voltage. Call CDS technical support.

APPENDIX

LIABILITY AND WARRANTY
ELECTRICAL BOM
MECHANICAL DRAWINGS
ELECTRICAL SCHEMATICS
ELECTRONIC COMPONENTS DATA SHEETS

The above-mentioned parts

are always available at:



LIABILITY AND WARRANTY

INTELLECTUAL PROPERTY

Any intellectual property resulting from this project belongs to CDS. The customer recognizes that CDS has exclusive rights to claim the appropriations of credit taxes with the scientific research and the experimental development which would be attributed or available on the design, the development or experimentation of the equipment or parts equipment in order to solve any technical uncertainties identified in this project.

LIABILITY

CDS will not be, under any circumstances, liable to the customer or any other person for any loss of use, loss of production, loss of income or profit (anticipated or otherwise), loss of markets, economic loss, special, indirect, or consequential loss or damage or punitive damages, whether in contract, tort or under any other Theory of Law or Equity, arising from, in connection with, or relating to the use of CDS Products and/or Services by the customer or any other person, and regardless of any negligence or other fault or wrong doing by CDS withstanding that CDS or any person that may have been advised of the possibility of such loss or damages being incurred by the customer or any person.

This agreement shall be governed by and interpreted in accordance with the laws of the Province of Quebec and the laws of Canada applicable therein and the parties hereto agree to submit all matters pertaining to this agreement to the exclusive jurisdiction of the Courts of the Province of Quebec.

WARRANTY

1. The warranty will cover all parts and craftsmanship for a period of 12 months from CDS ship date or a maximum of 4000 hours of operation; whichever comes first.

2. With the exception of defective parts, caused by:
   - Manipulation from non-authorized persons
   - Improper use
   - Foreign influence
   - Damage because of faulty operation and failure to repair and/or service (lack of maintenance)

3. There is no warranty on tools/tooling.

4. There is no warranty on parts subject to wear such as, but not limited to:
   - Sealing and seal assembly, brushes, O-rings, sealing rings.
   - Mechanical and Electrical safety device (fuse, shear pin, mechanical clutch…)
   - Technical rubber (i.e. haul off pads, belts,)
   - Working tools (saw blades, cutting knives, Punch sets...)
   - Consumer goods (glow lamps, dust bag, filters, LED's, heating elements, measuring sensor, thermocouple, pressure sensors.)

5. Following requirements have to be fulfilled by the customer:
   - The customer is obliged to inform immediately and in writing of the damaged / defective parts or machinery.
   - Pictures of damaged parts or machinery have to be sent to CDS together with a written explanation to the CDS Service Department.
   - Damaged/ defective parts or machinery have to be returned to CDS with an RMA (Return Merchandise Authorization Number) provided by CDS Service Department.

6. Unless otherwise agreed to in writing, CDS will only pay the costs of the damaged/replacement parts. Any costs related to shipping, labor, travel, lodging, car rental, and meals are extra. The original CDS period of warranty (see item 1) will not be prolonged due to fault correction.

Mechanical Parts List

Dwg: 200-000996-001

Machine: CICO12-12

Qty	Unit	No.Item CDS	Description
4	UN	B01-05-045	SOCKET HEAD CAP SCREW UN 3/8 X 1-1/2
2	UN	B01-05-100	SOCKET SET SCREW UNC 5/16-18X 3/4
4	UN	B01-05-171	SOCKET HEAD CAP SCREW UN 1/4 -20 X 1/2" LG S.S.
4	UN	B01-05-172	SOCKET HEAD CAP SCREW SST 1/4-20 NC X 3/4" LG
2	UN	B01-05-173	SOCKET HEAD CAP SCREW UN 1/4 X 1 SST
48	UN	B01-05-802	BUTTON HEAD SCREW 1/2 LG STAINLESS STEEL 10-24UNC
2	UN	B01-06-133	BEARING
4	UN	B01-06-141	BEARING-SS PLATSIC FLANGE
2	UN	B01-06-440	FLANGED BALL BEARING RF163216 PP
1	UN	B01-12-006	BLACK PLASTIC KNOB
1	UN	B01-12-009	BLACK PLASTIC HANDLE PLAIN HOLE
3	UN	B01-12-046	KNOB BLACK PLASTIC 5/16-18 X 1
2	UN	B01-15-014	CASTER 3 X 2 PHENOLIC SWIVEL
0,83	po	b01-23-019	THREAD ROD(NC) 1-1/4"
48	UN	B01-24-080	HEX MACHINE SCREW NUT ZI 10/24
4	UN	B01-24-086	EXTERNAL RETAINING RING 1/2
8	UN	B01-24-098	FLAT WASHER S.S. 18-8 1/4
6	UN	B99-01-003	MAGNET

Mechanical Parts List

Dwg: 200-000996-001

Machine: CICO12-12

Qty	Unit	No.Item CDS	Description

Electrical Parts List

Dwg: 300-000064-999

Machine: CICO12-12

Qty	Unit	No.Item CDS	Description	Note
4	M	B02-04-029	WIRE THERMOCOUPLE. 20-2C PVC.300V TYPE J	CBL2, 3
6	M	B02-04-041	CABLE SOOW 10-4/C 600V	CBL1
8	M	B02-04-110	WIRE HIGH TEMP #14 BLACK	CBL4, 5
1	UN	B02-16-355	THERMOCOUPLE 3/16" TYPE J	T/C1
1	UN	B02-19-076	ENCLOSURE 1/4 TURN LOCK 14 X 8 X 6	ENC2
1	UN	B02-19-081	ENCLOSURE SINGLE DOOR 24 X 24 X 8	ENC1
1	UN	B02-19-092	INNER PANEL FOR EN4SD 24 X 24	ENC1
1	UN	B02-21-002	TERMINAL FUSE HOLDER 13MM BLACK	FUB5
1	UN	B02-21-003	END SECTION 1.5MM BLACK USE WITH B02-21-002	FUB4
1	UN	B02-21-057	FUSE CC TIME-DELAY 15 AMPERE	FU7
2	UN	B02-21-089	FUSE CC TIME-DELAY 6AMP	FU1, 2
4	UN	B02-21-116	FUSE MIDGET FAST-ACTING 10AMP	FU3, 4, 5, 6
1	UN	B02-21-137	FUSE GLASS TIME-DELAY 2.5AMP	FU8
7	UN	B02-21-150	FUSE HOLDER CLASS CC 1 POLES, 30 AMP, MODULAR	FUB1, 2, 3, 4
2	UN	B02-23-004	LUG COOPER 14-6AWG	LUG1, 2
2	UN	B02-24-154	INFRARED HEATER LAMP	H1, 2
10	UN	B02-31-211	BLOWER VARIABLE SPEED 100CFM 115V .8AMP	MTR1 - 10
1	UN	B02-32-015	CONTACTOR 1xNO 120V 15HP / 600V	MC1
1	UN	B02-32-032	SURGE SUPPRESSOR 110-250VAC "A" CONTACTOR	MC1
2	UN	B02-39-107	NAMEPLATE ALUMINUM 22MM OFF / ON 90 DEG	SS1, 2
1	UN	B02-39-108	NAMEPLATE ALUMINUM 22MM BLANK	SS3
1	UN	B02-39-125	NAMEPLATE ROUND YELLOW EMERGENCY STOP	PBL1
3	UN	B02-39-178	HOLDER FOR THREE BLOCKS	SS1, 2, 3
1	UN	B02-39-180	HOLDER LAMP MAX. 2WATTS USE WITH B02-39-209	PBL1
1	UN	B02-39-209	LAMP BULB 120V AC/DC	PBL1
2	UN	B02-39-213	SELECTOR SWITCH 2POS 22MM MAINTENED, A-C, BLACK	SS1, 2
1	UN	B02-39-218	SELECTOR SWITCH 3POS 22MM MAINTAINED, A-B-C, BLACK	SS3
3	UN	B02-39-223	CONTACT 1 X NC 22MM ABB BUTTON	PBL1, SS3
2	UN	B02-39-224	CONTACT 1xNO 22MM ABB BUTTON	SS1, 2
1	UN	B02-39-225	CONTACT DOUBLE 1xNO 1xNC FOR PUSH BUTTON	PBL1
1	UN	B02-39-226	HOLDER FOR FIVE BLOCKS	PBL1
1	UN	B02-39-237	MUSHROOM PUSH-PULL, ILLUM RED, 40MM	PBL1
2	UN	B02-56-013	RELAY SOLID STATE 25AMP 3PH, 4-32VDC, 48-660VAC	SSR1, 2
1	UN	B02-58-050	SHAFT 6x6x330MM USE WITH HANDLE	DISC1
1	UN	B02-58-053	HANDLE, DISCONNECT SWITCH BLACK,USEWITH 6X6MM SHAFT	DISC1
1	UN	B02-58-055	DISCONNECT SWITCH NO-FUSE 25HP, 600V	DISC1
1	UN	B02-59-150	TRANSFORMER CONTROL1500VA 600-480/120-240V, 60HZ	T1
1	UN	B02-60-004	TEMPERATURE CONTROLLER TRANSISTOR OUTPUT	DISP1
1	UN	B02-60-014	SOCKET 11 PIN CONN IN THE BACK	TR1
2	UN	B02-60-039	TEMPERATURE LIMIT SWITCH 300F / 149C	TS1, 2
1	UN	B02-62-011	TIMER 120 VOLT	TR1
1	UN	B02-99-159	MOUNTING ADAPTER FLUSH FOR B02-62-011	TR1
6	UN	B02-99-236	BODY CONNECTOR CLIP RED FOR FUSEHOLDER	FUB1, 2, 3

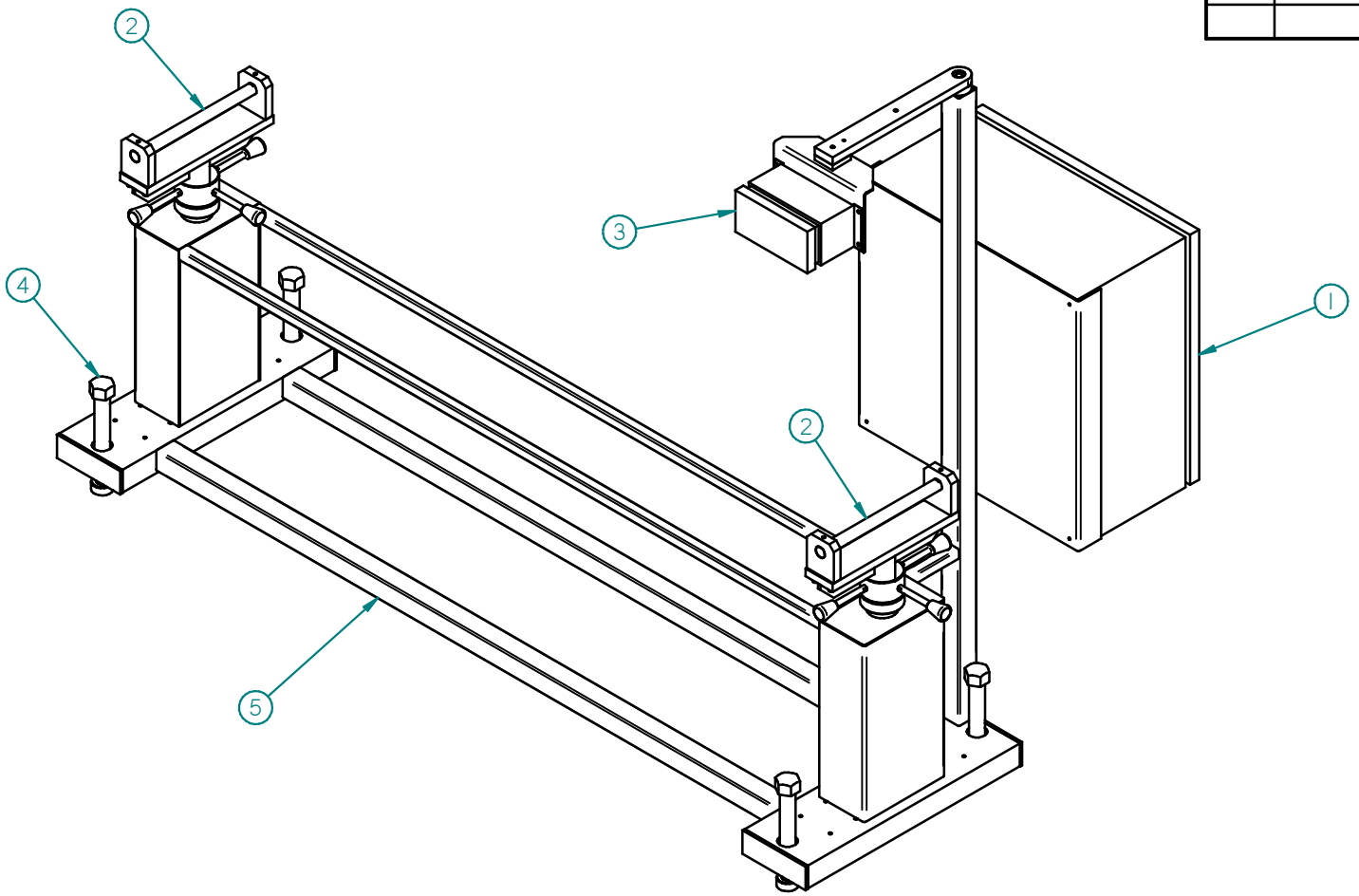
Electrical Parts List

Dwg: 300-000064-999

Machine: CICO12-12

Qty	Unit	No.Item CDS	Description	Note
3	UN	B02-99-237	HANDLE LEVER CONNECTOR PACKAGE 12 UN	FUB1, 2, 3
1	UN	B02-99-339	WATERPROOF PACKING FOR B02-62-011	TR1

Revisions			
Rev	Description	Date	App.



5	1	BATI DE MACHINE	FRAME		100-000813-001
4	4	VIS VÉRIN 10 PO	JACK SCREW 10 IN		200-000023-999
3	1	BOÎTE DE CONTRÔLE	SMALL CONTROL BOX		200-000484-999
2	2	ASSEMBLAGE DE MOUVEMENT	MOVEMENT ASSEMBLY		200-002113-999
1	1	BOITIER SIMPLE PORTE	ENCLOSURE SINGLE DOOR		B02-19-080
NO	QTY	TITRE	Title	REV	NO-NR

NOTE : NETTOYER LES ARÊTES VIVES
DE-BURR AND BREAK ALL SHARP EDGES

TOLÉRANCES SI NON-SPÉCIFIÉ
TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTION	DECIMALS
± 1/32	.X = ± 0.015
	.XX = ± 0.010
	.XXX = ± 0.005
ANGLE-ANGULAIRE = ± 1/2°	
BÂTI-STRUCTURAL = ± 1/16	

FINI SI NON-SPÉCIFIÉ
FINISH UNLESS OTHERWISE SPECIFIED

NA

MTL.

FINI DE SURFACE
SURFACE FINISH

Date

11/03/2011

Dessinateur - Drafter: dsaraga

Vérifié - Vérified:

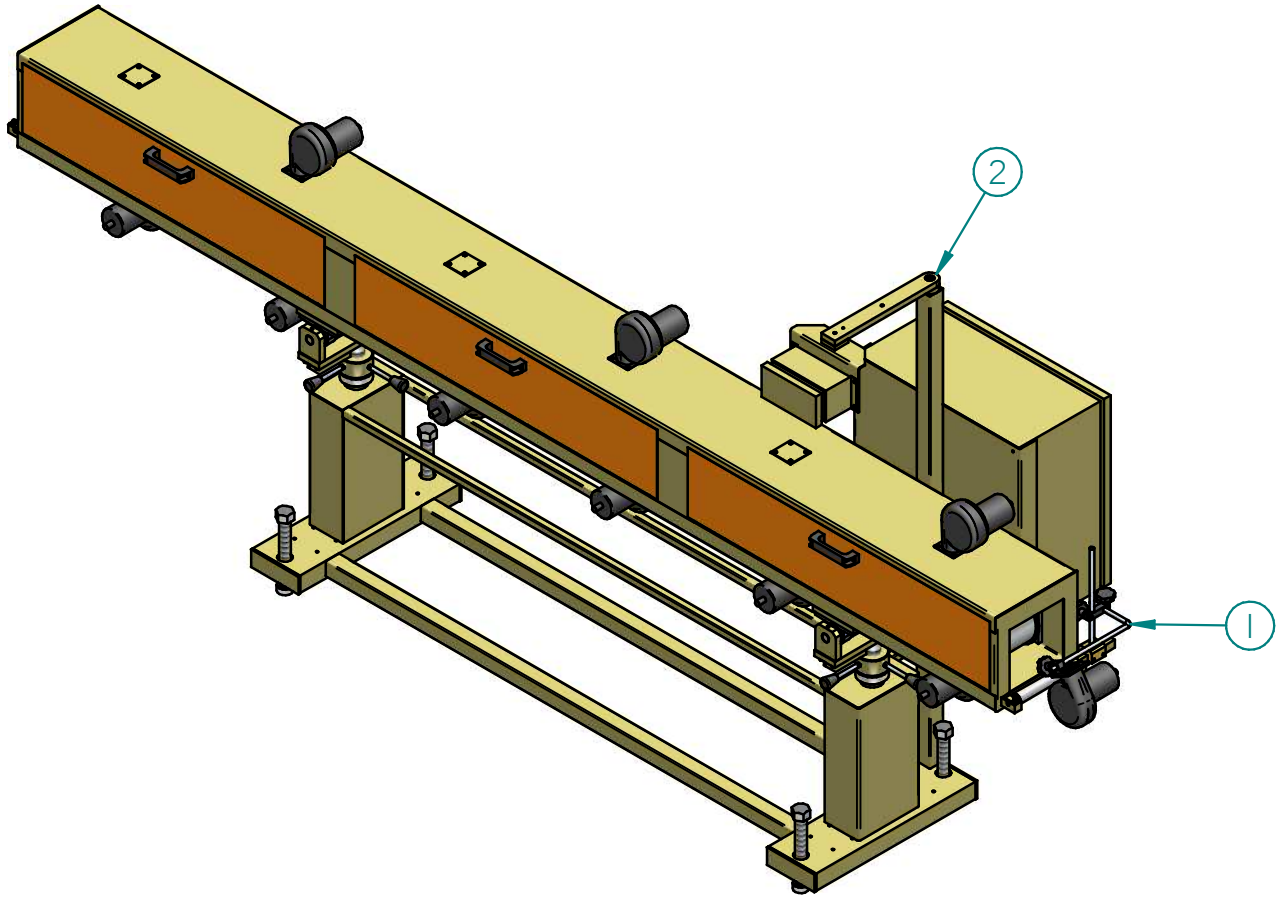
1930 52ième Avenue
Lachine,QC, H8T 2Y3
www.cdsmachines.com

TITRE: ASSEMBLAGE DE BATI

TITLE: FRAME ASSEMBLY

GRANDEUR-SIZE: A	NO - NR: 200-000995-001	REV:
ÉCHELLE-SCALE: NTS	POIDS-WEIGHT: 0.0 lbm	1-1

Revisions			
Rev	Description	Date	App.



2	1	ASSEMBLAGE DE BATI	FRAME ASSEMBLY		200-000995-001
1	1	ASSEMBLAGE DE FOUR	OVEN ASSEMBLY		200-002101-999
NO	QTY	TITRE	Title	REV	NO-NR

NOTE : NETTOYER LES ARÊTES VIVES
DE-BURR AND BREAK ALL SHARP EDGES

TOLÉRANCES SI NON-SPÉCIFIÉ
TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTION	DECIMALS
± 1/32	.X = ± 0.015
	.XX = ± 0.010
	.XXX = ± 0.005
ANGLE-ANGULAIRE = ± 1/2°	
BÂTI-STRUCTURAL = ± 1/16	

FINI SI NON-SPÉCIFIÉ
FINISH UNLESS OTHERWISE SPECIFIED

NA

MTL.

FINI DE SURFACE
SURFACE FINISH

Date

11/03/2011

Dessinateur - Drafter: dsaraga

Vérifié - Vérified:

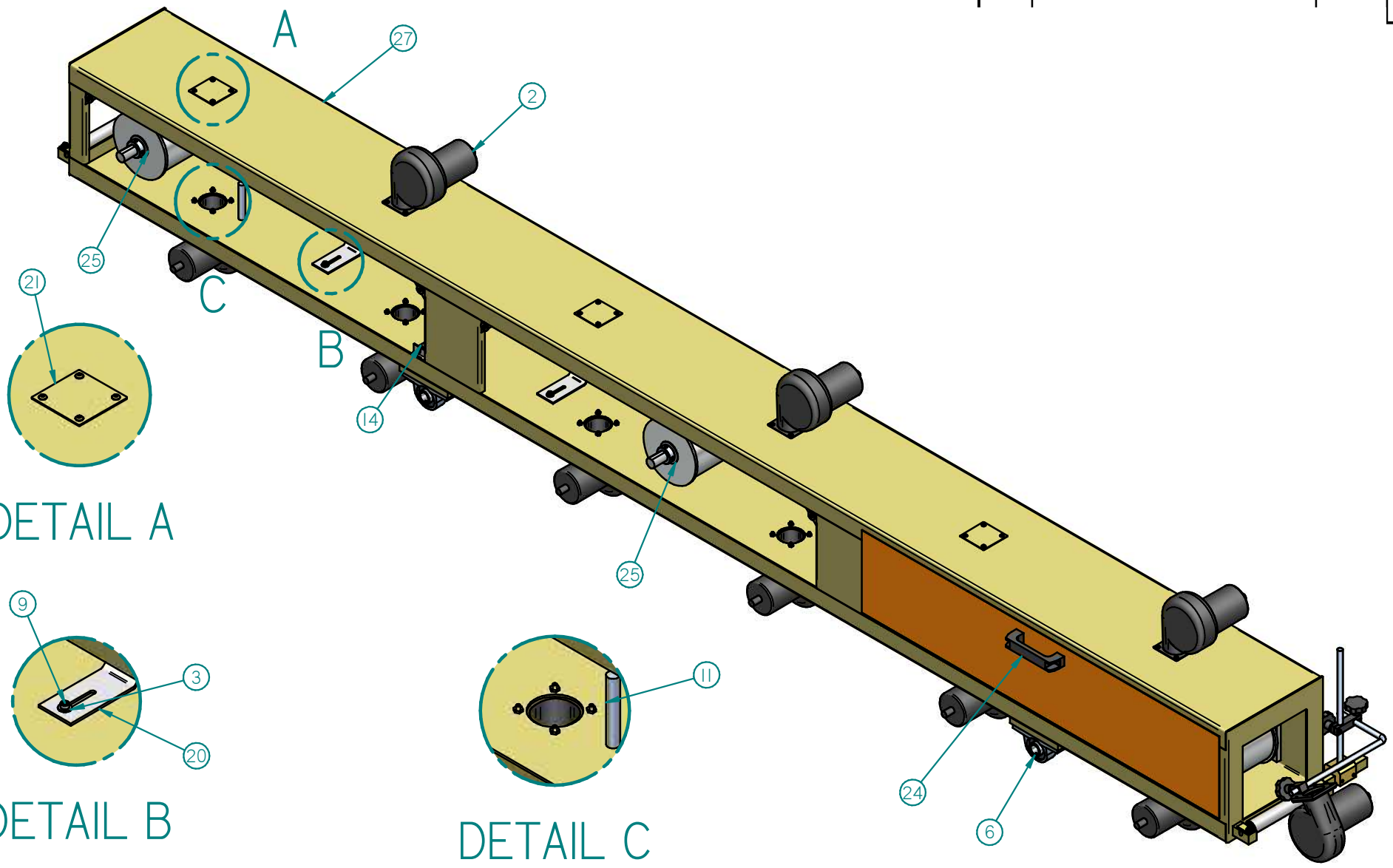
1930 52ième Avenue
Lachine,QC, H8T 2Y3
www.cdsmachines.com

TITRE: ASSEMBLAGE DE MACHINE

TITLE: OVERALL ASSEMBLY

GRANDEUR-SIZE: A	NO - NR: 200-000996-001	REV:
ÉCHELLE-SCALE: NTS	POIDS-WEIGHT: 0.0 lbm	1-1

Revisions			
Rev	Description	Date	App.



NOTE : NETTOYER LES ARÊTES VIVES
DE-BURR AND BREAK ALL SHARP EDGES

TOLÉRANCES SI NON-SPÉCIFIÉ
TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTION	DECIMALS
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	.XX = ± 0.010
	.XXX = ± 0.005
ANGLE-ANGULAIRE = ± 1/2°	
BÂTI-STRUCTURAL = ± 1/16	

FINI SI NON-SPÉCIFIÉ
FINISH UNLESS OTHERWISE SPECIFIED

NA

MTL.

FINI DE SURFACE
SURFACE FINISH

Date

11/03/2011

Dessinateur - Drafter: dsaraga

Vérifié - Vérified:

1930 52ième Avenue
Lachine,QC, H8T 2Y3
www.cdsmachines.com

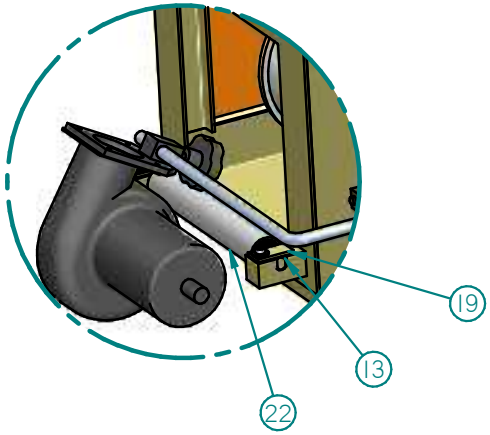
TITRE: ASSEMBLAGE DE FOUR

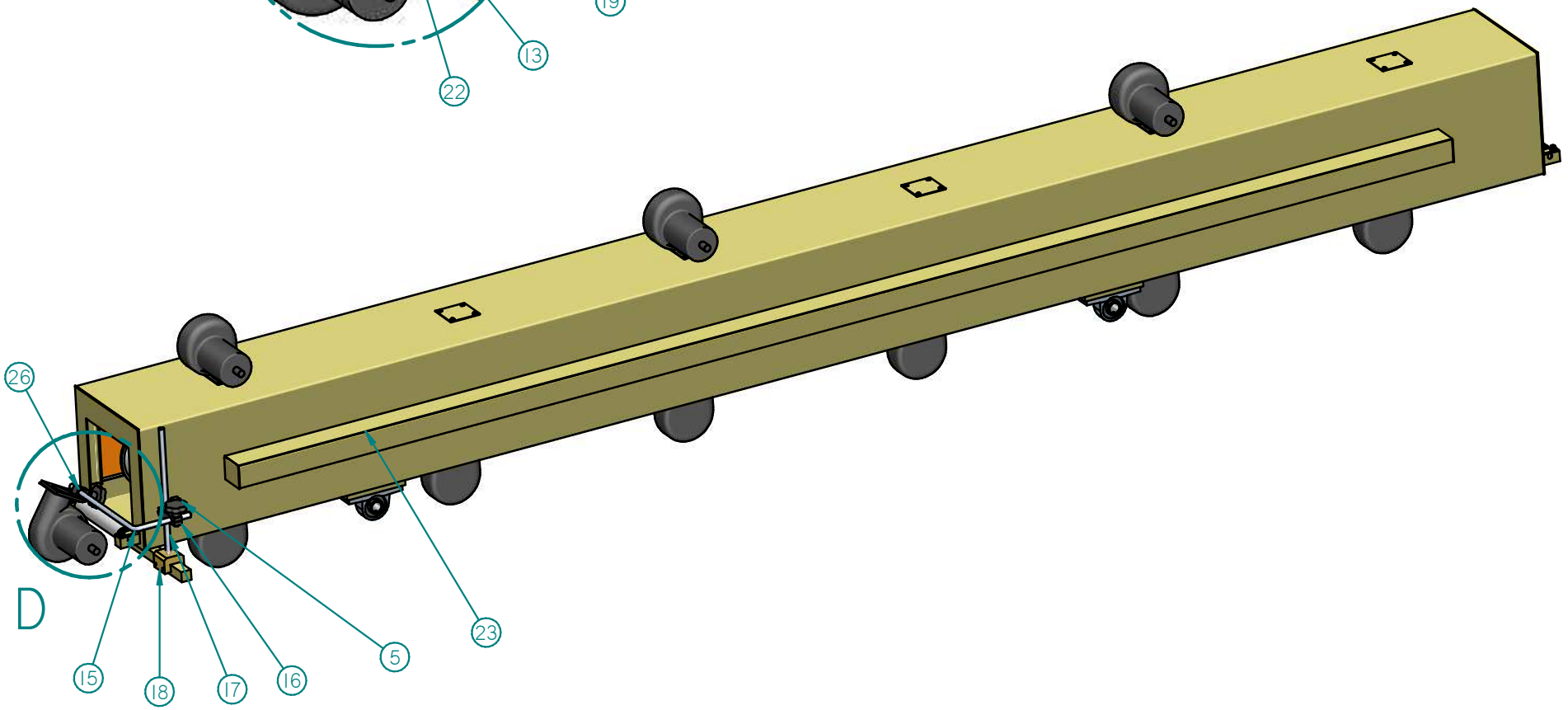
TITLE: OVEN ASSEMBLY

GRANDEUR-SIZE: A	NO - NR: 200-002101-999	REV:
ÉCHELLE-SCALE: NTS	POIDS-WEIGHT: 0.0 lbm	1-3

Revisions			
Rev	Description	Date	App.

DETAIL D





NOTE : NETTOYER LES ARÊTES VIVES
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TOLERANCES UNLESS OTHERWISE SPECIFIED

FRACTION	DECIMALS
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	.XX = ± 0.010
	.XXX = ± 0.005
ANGLE-ANGULAIRE = ± 1/2°	
BÂTI-STRUCTURAL = ± 1/16	

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FINISH UNLESS OTHERWISE SPECIFIED

NA

MTL.

FINI DE SURFACE
SURFACE FINISH

Date

11/03/2011

Dessinateur - Drafter: dsaraga

Vérifié - Vérified:

1930 52ième Avenue
Lachine,QC, H8T 2Y3
www.cdsmachines.com

TITRE: ASSEMBLAGE DE FOUR

TITLE: OVEN ASSEMBLY

GRANDEUR-SIZE: A | NO - NR: 200-002101-999 | REV:

ÉCHELLE-SCALE: NTS | POIDS-WEIGHT: 0.0 lbm | 2-3

Revisions			
Rev	Description	Date	App.

NO	QTY	TITRE	Title	REV	NO-NR
28*	48	ECROU 10-24	NUT 10-24 NC		
27	1	FOUR SOUDEE	WELDED OVEN		100-002432-999
26	1	PIVOT SOUDEE	PIVOT ASSEMBLY		100-002436-999
25	3	ASSEMBLAGE DE POULIE	PULLEY ASSEMBLY		200-002100-999
24	3	ASSEMBLAGE DE COUVERCLE	COVER ASSEMBLY		200-002102-999
23	1	ASSEMBLAGE DE CONDUIT	CABLE DUCT ASSEMBLY		200-002117-999
22	2	ASSEMBLAGE DE ROULEAU	ROLLER ASSEMBLY		200-002136-999
21	3	COUVERCLE DE TROUS	HOLE COVER		600-005127-999
20	4	MONT D'ELEMENT	ELEMENT MOUNT		600-005129-999
19	4	PLAQUE DE SERRAGE	LOCK PLATE		600-005176-999
18	1	BLOQUE AJUSTEMENT A	SLIDING BLOCK A		700-004741-999
17	1	ARBRE BLOQUE AJUSTEMENT	SHAFT ADJUSTEMENT BLOCK		700-004742-999
16	1	ATTACHE AJUSTABLE	ADJUSTABLE CLAMP		700-004747-999
15	1	SUPPORT DE SOUFLEUSE	BLOWER SUPPORT		700-011885-999
14	2	ROULEAU EN NYLON	NYLON ROLLER		700-012047-999
13	2	ARBRE DE ROULEAU	PRODUCT ROLLER SHAFT		700-012049-999
12*	2	ARBRE DE ROULEAU	PRODUCT ROLLER SHAFT		700-012052-999
11	2	PIN DE GUIDAGE	GUIDE PIN		700-012062-999
10*	4	VIS CAL. TETE CYL. 6 PANS	SOCKETHEAD CAP SCREW SS		B01-05-171
9	4	VIS CAL. TETE CYL. 6 PANS	SOCKETHEAD CAP SCREW ALOY		B01-05-172
8*	2	VIS CAL. TETE CYL. 6 PANS	SOCKETHEAD CAP SCREW ALOY		B01-05-173
7*	48	VIS À TÊTE ARRONDIE 10-24	BUTTON HEAD SCREW		B01-05-802
6	4	BEARING-SS	BEARING-SS		B01-06-141
5	3	POIGNÉE EN PLASTIQUE	KNOB BLACK PLASTIC		B01-12-046
4*	4	ANNEAU DE SERRAGE EXTERNE	EXTERNAL RETAINING RING		B01-24-086
3	8	RONDELLE PLATE INOX. 18-8	FLAT WASHER S.S. 18-8		B01-24-098
2	10	SOUFFLANTE 115 V	BLOWER 115 V		B02-31-111
1*	6	AIMANT	MAGNET		B99-01-003

NOTE : NETTOYER LES ARÊTES VIVES
DE-BURR AND BREAK ALL SHARP EDGES

TOLÉRANCES SI NON-SPÉCIFIÉ
TOLERANCES UNLESS OTHERWISE SPECIFIED

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	.XX = ± 0.010
	.XXX = ± 0.005
ANGLE-ANGULAIRE = ± 1/2°	
BÂTI-STRUCTURAL = ± 1/16	

FINI SI NON-SPÉCIFIÉ
FINISH UNLESS OTHERWISE SPECIFIED

NA

MTL.

FINI DE SURFACE
SURFACE FINISH

Date

11/03/2011

Dessinateur - Drafter: dsaraga

Vérifié - Vérified:

1930 52ième Avenue
Lachine,QC, H8T 2Y3
www.cdsmachines.com

TITRE: ASSEMBLAGE DE FOUR

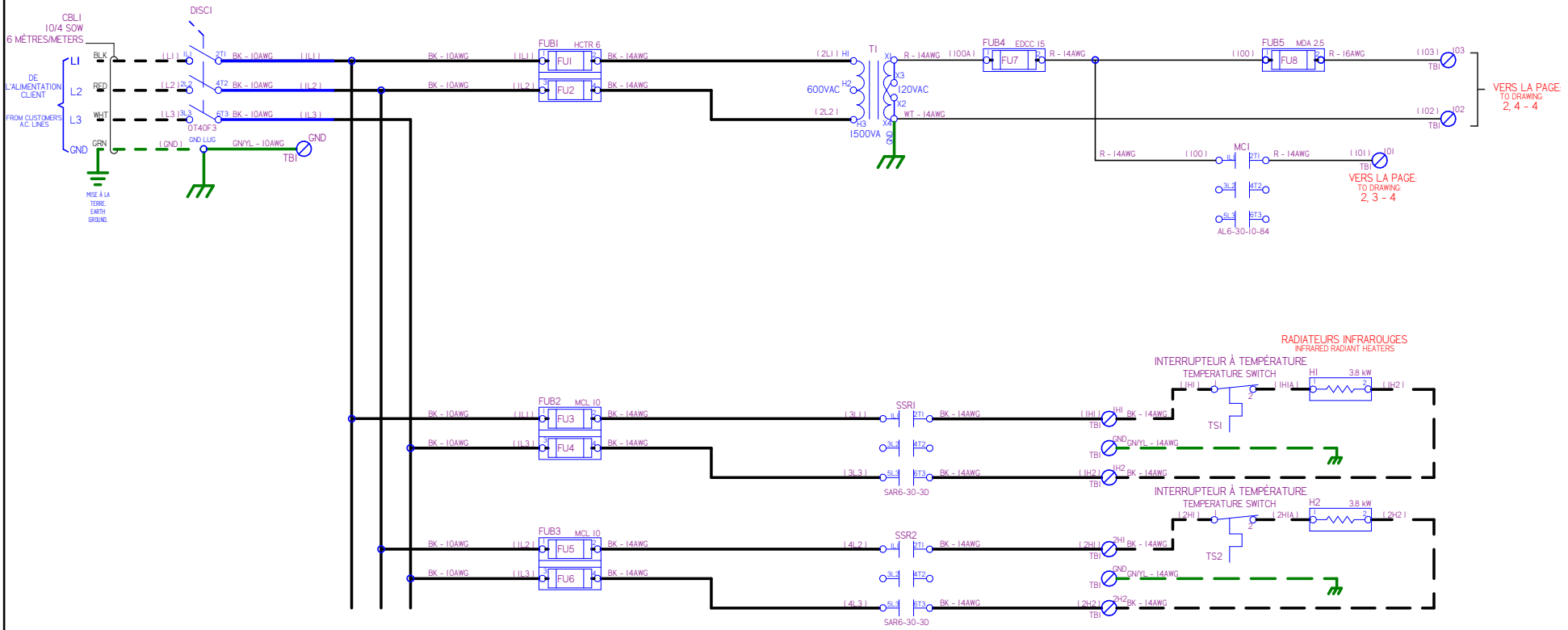
TITLE: OVEN ASSEMBLY

GRANDEUR-SIZE: A | NO - NR: 200-002101-999 | REV: 3-3

ÉCHELLE-SCALE: NTS | POIDS-WEIGHT: 0.0 lbm

575/3/60
FLA 19 AMP

Revisions			
Rev	Description	Date	Approuvé



1. POUR ÉVITER LE RETOUR DE COURANT DE FUITE, LES CÂBLES BLINDÉS DOIVENT ÊTRE CÂBLÉ COMME INDIQUÉ SUR LE SCHÉMA.
2. RESPECTER L'ORDRE DES PHASES COMME INDIQUÉ SUR LE SCHÉMA.
3. LE CLIENT DOIT ENLEVER LES CAVALIERS POUR L'INTÉGRATION À UN CONTRÔLE EXTÉRIEUR.

1. To prevent ground loops, shielded wire should be wired only as shown on drawing.
2. Maintain proper phasing as shown on drawing.
3. Customer to remove jumper for wiring to external control logic, if applicable.

NOTE : NETTOYER LES ARÊTES VIVES.
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TOLÉRANCES SI NON-SPÉCIFIÉ
TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTION DECIMALS
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ANGLE-ANGULAIRE = ± 1/2°
BATI-STRUCTURAL = ± 1/16

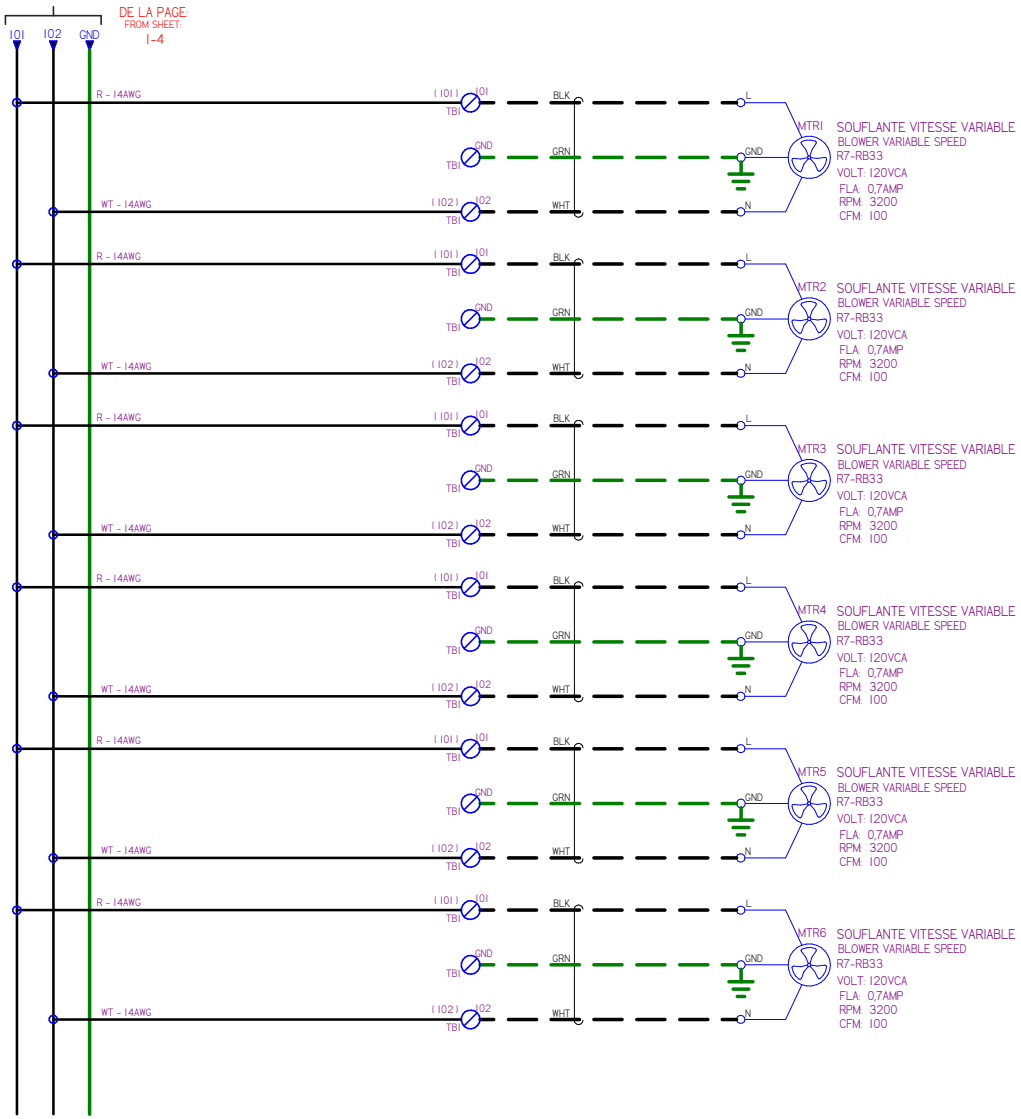
FINI SI NON-SPÉCIFIÉ
FINISH UNLESS OTHERWISE SPECIFIED
125

DEPARTEMENT: DIVERS / misc
CATÉGORIE, CATEGORY: CICO

Date	
5/4/2011	
Dessinateur-Drafter:	achindris
Vérifié -Vérified:	flachaine
Approuvé-Approved:	TBD

1930 52ième Avenue
Lachine,QC, H8T 2Y3
www.cdsmachines.com

TITRE: FOUR A CONVECTION INFRAROUGE CICO12-12
TITLE: INFRARED CONVECTION OVEN CICO12-12
GRANDEUR-SIZE: B
NO - NR: 310-000558-999
REV:
ÉCHELLE-SCALE: NTS
IMPRIMER - LAST PRINTED: 3/15/2019
PAGE. SHEET: 1-4



Revisions			
Rev	Description	Date	Approuvé

1. POUR ÉVITER LE RETOUR DE COURANT DE FUITE, LES CÂBLES BLINDÉS DOIVENT ÊTRE CÂBLÉ COMME INDIQUÉ SUR LE SCHÉMA.
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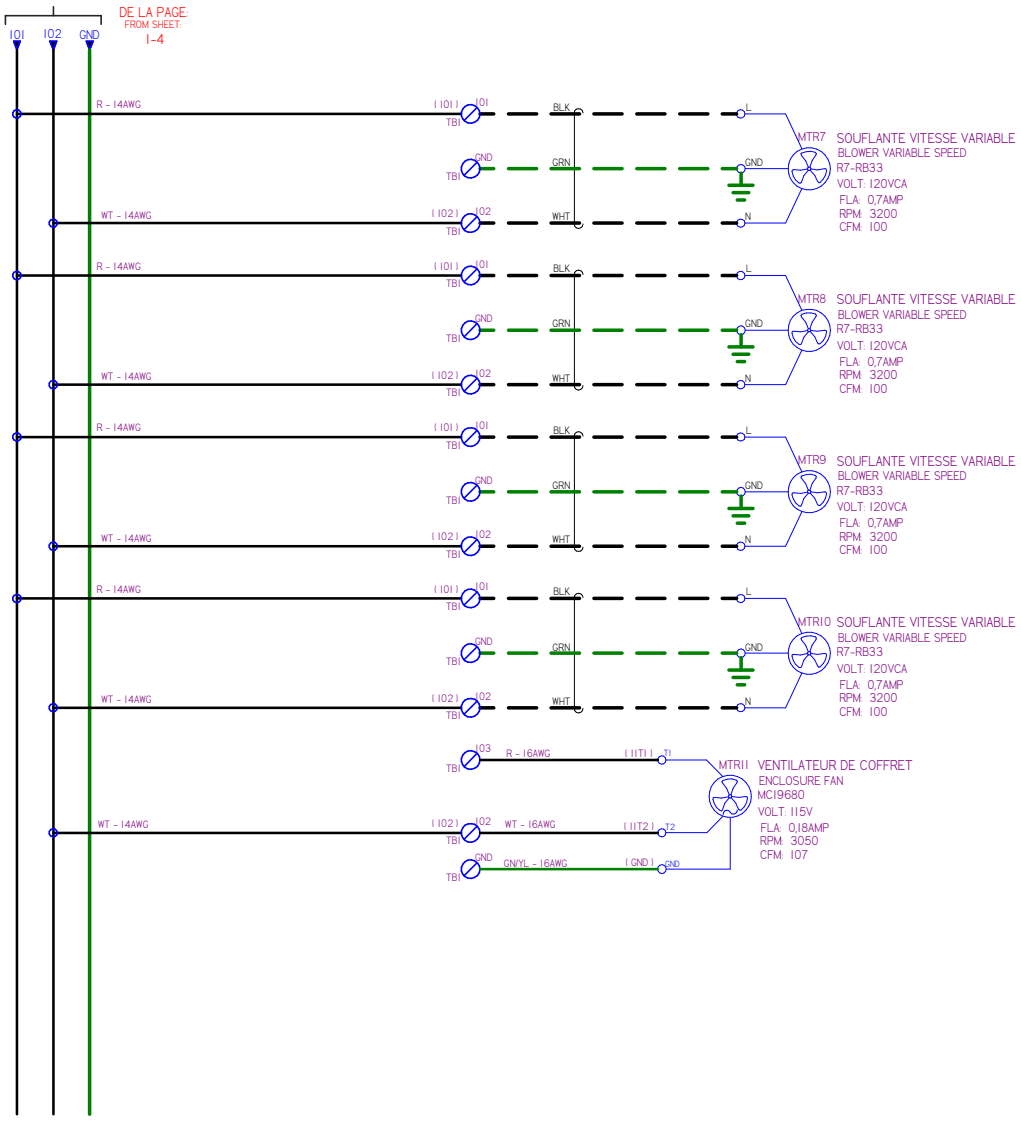
FINI SI NON-SPÉCIFIÉ
FINISH UNLESS OTHERWISE SPECIFIED
125

DEPARTEMENT: DIVERS / misc
CATÉGORIE, CATEGORY: CICO

Date	5/4/2011
Dessinateur-Drafter:	achindris
Vérifié -Vérified:	flachaine
Approuvé-Approved:	TBD

1930 52ième Avenue
Lachine,QC, H8T 2Y3
www.cdsmachines.com

TITRE: FOUR A CONVECTION INFRAROUGE CICO12-12
TITLE: INFRARED CONVECTION OVEN CICO12-12
GRANDEUR-SIZE: B
NO - NR: 310-000558-999
REV:
ÉCHELLE-SCALE: NTS
IMPRIMER - LAST PRINTED: 3/15/2019
PAGE SHEET: 2-4



Revisions			
Rev	Description	Date	Approuvé

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125

DEPARTEMENT: DIVERS / misc
CATÉGORIE, CATEGORY: CICO

Date: 5/4/2011
Dessinateur-Drafter: achindris
Vérifié -Vérified: flachaine
Approuvé-Approved: TBD

1930 52ième Avenue
Lachine,QC, H8T 2Y3
www.cdsmachines.com

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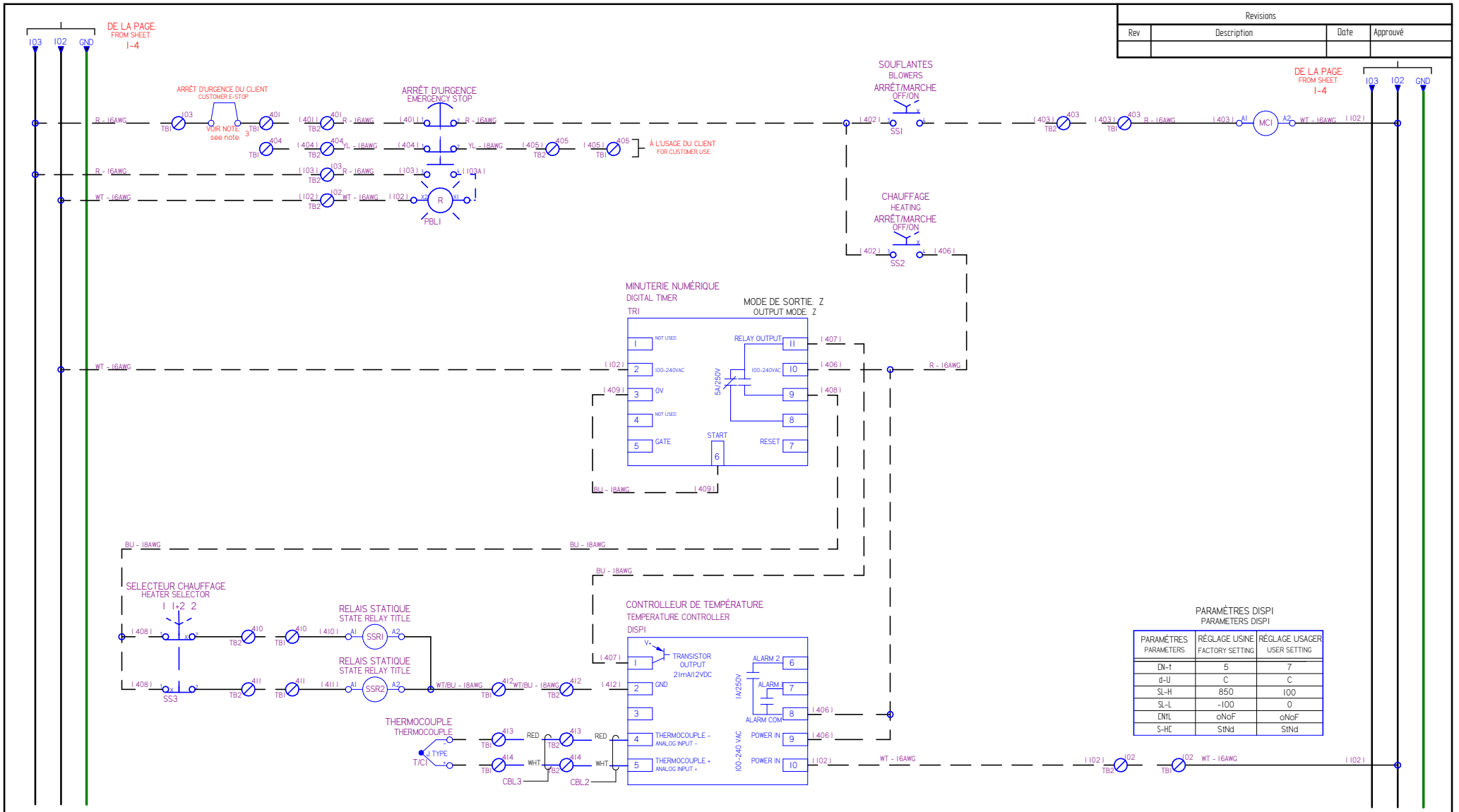
TITLE: INFRARED CONVECTION OVEN CICO12-12
GRANDEUR-SIZE: B
NO - NR: 310-000558-999
REV:
ÉCHELLE-SCALE: NTS
IMPRIMER - LAST PRINTED: 3/15/2019
PAGE SHEET: 3-4



Revisions			
Rev	Description	Date	Approuvé

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DEPARTEMENT: DIVERS / misc
CATÉGORIE, CATEGORY: CICO

Date: 5/4/2011
Dessinateur-Drafter: achindris
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REV:
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IMPRIMER - LAST PRINTED: 3/15/2019
PAGE SHEET: 4-4

Operation for E5□N/E5□N-H/E5□N-HT

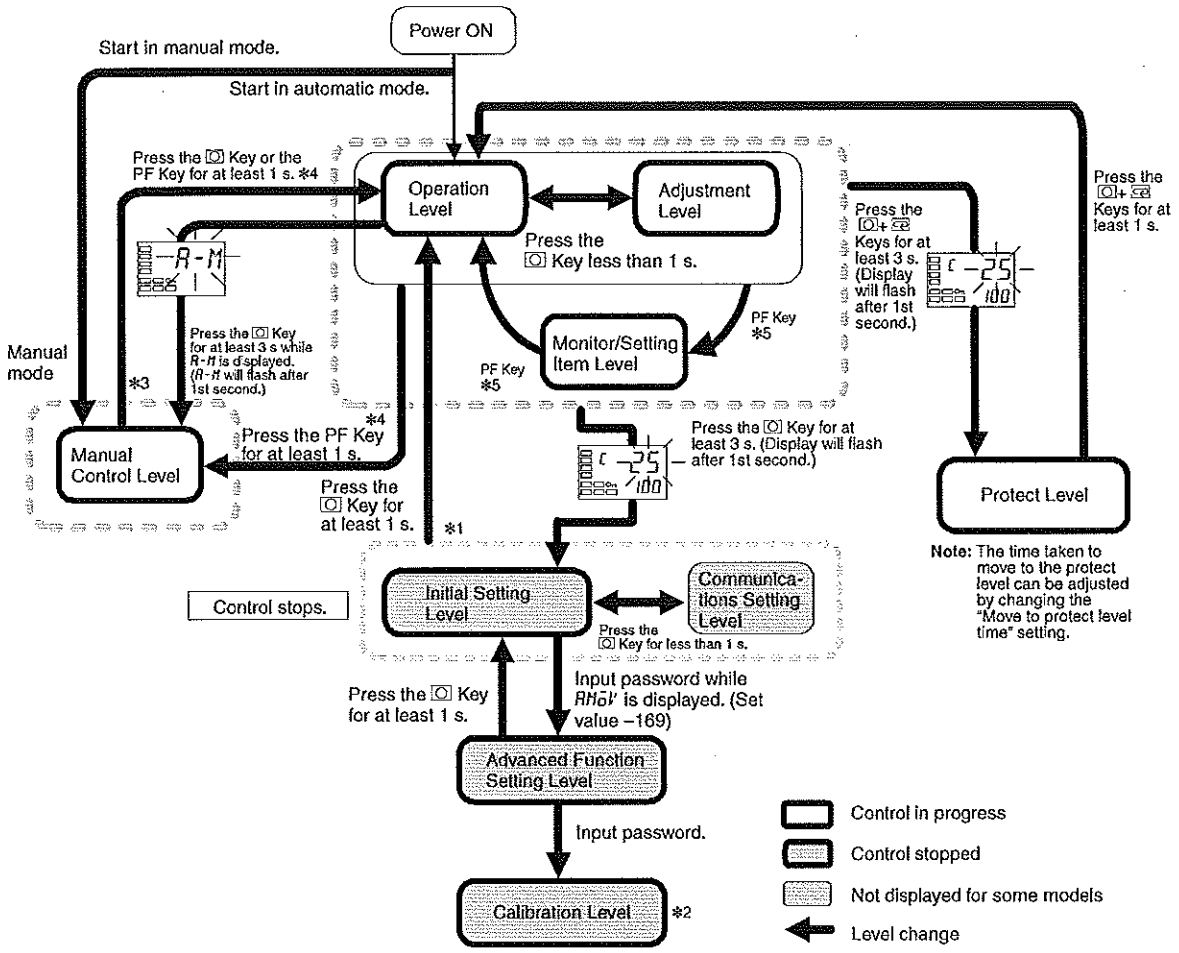
CSM_E5_N_E5_N-H_operation_TG_E_3_3

Operation

Setting Levels Diagram

This diagram shows all of the setting levels. To move to the advanced function setting level and calibration level, you must enter passwords. Some parameters are not displayed depending on the protect level setting and the conditions of use.
Control stops when you move from the operation level to the initial setting level.

Basic Type
E5CN/E5CN-U/E5AN/E5EN/E5GN



*1. You can return to the operation level by executing a software reset.
*2. It is not possible to move to other levels from the calibration level by operating the keys on the front panel. It can be done only by first turning OFF the power.
*3. From the manual control level, key operations can be used to move to the operation level only.
*4. When the PF Setting parameter is set to A-M for a Controller with a PF Key (E5AN/E5EN).
*5. When the PF Setting parameter is set to PFDP for a Controller with a PF Key (E5AN/E5EN).

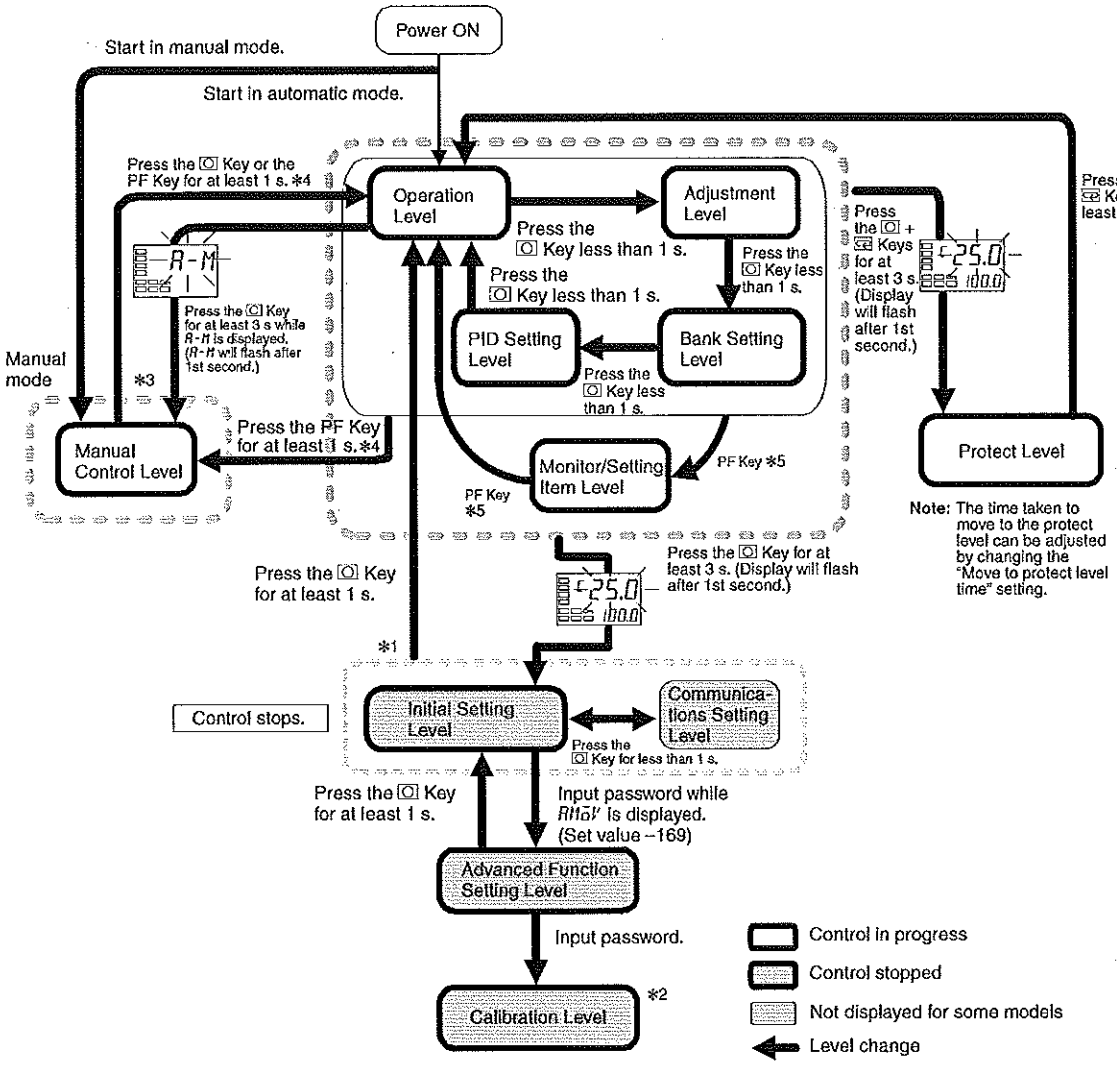
Error Displays (Troubleshooting)

When an error occurs, the No.1 display shows the error code. Take necessary measure according to the error code, referring the table below.

No.1 display	Meaning	Action	Status at error	
			Control output	Alarm output
S.ERR (S. Err)	Input error *	Check the setting of the input type. Also check the input wiring and check for broken wires or short-circuits in the temperature sensor.	OFF	Operates as above the upper limit.
E333 (E333)	A/D converter error	Turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF	OFF
E111 (E111)	Memory error	Turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF	OFF

Note: If the input value exceeds the display limit (-1999 to 9999), though it is within the control range, CCCC will be displayed under -1999 and DDDD above 9999. Under these conditions, control output and alarm output will operate normally.
For details on the control range, refer to the *E5CN/E5AN/E5EN/E5GN Digital Temperature Controllers User's Manual Basic Type* (Cat. No. H156).
* Errors are shown only when the display is PV, PV/SV, or PV/MV. Errors are not shown for any other status.

Advanced Type
E5CN-H/E5AN-H/E5EN-H



*1. You can return to the operation level by executing a software reset.
*2. It is not possible to move to other levels from the calibration level by operating the keys on the front panel. It can be done only by first turning OFF the power.
*3. From the manual control level, key operations can be used to move to the operation level only.
*4. When the PF Setting parameter is set to A-M for a Controller with a PF Key (E5AN-H/E5EN-H).
*5. When the PF Setting parameter is set to PFDP for a Controller with a PF Key (E5AN-H/E5EN-H).

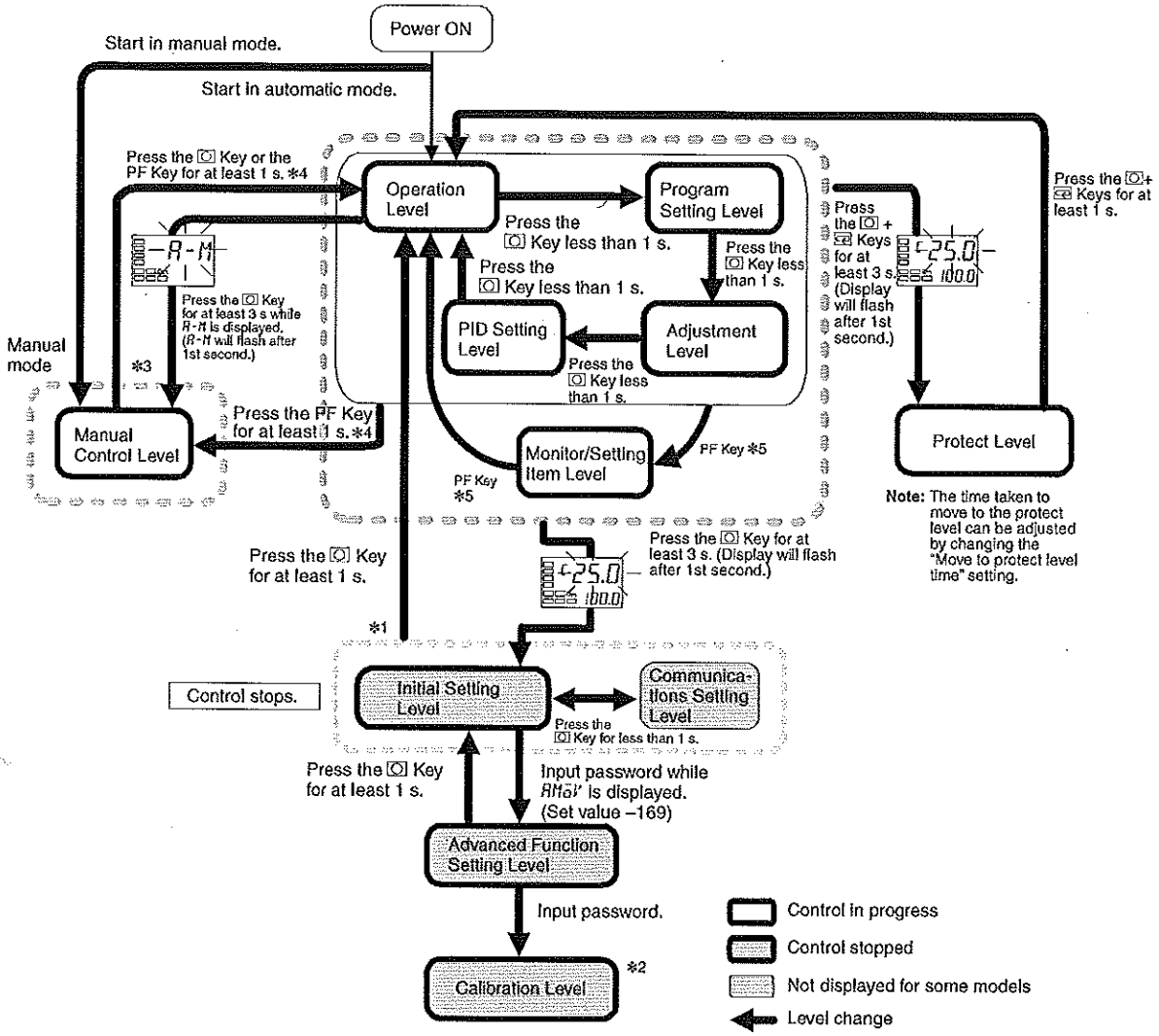
Error Displays (Troubleshooting)

When an error occurs, the No.1 display shows the error code. Take necessary measure according to the error code, referring the table below.

No.1 display	Meaning	Action	Status at error	
			Control output	Alarm output
S.ERR (S. Err)	Input error *	Check the setting of the input type. Also check the input wiring and check for broken wires or short-circuits in the temperature sensor.	OFF	Operates as above the upper limit.
E333 (E333)	A/D converter error	Turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF	OFF
E111 (E111)	Memory error	Turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF	OFF

Note: If the input value exceeds the display limit (-19999 to 32400), though it is within the control range, CCCC will be displayed under -19999 and DDDD above 32400. Under these conditions, control output and alarm output will operate normally.
For details on the control range, refer to the *E5CN-H/E5AN-H/E5EN-H Digital Controllers User's Manual Advanced Type* (Cat. No. H157).
* Errors are shown only when the display is PV, PV/SV, or PV/MV. Errors are not shown for any other status.

Programmable Type
E5CN-HT/E5AN-HT/E5EN-HT



*1. You can return to the operation level by executing a software reset.
*2. It is not possible to move to other levels from the calibration level by operating the keys on the front panel. It can be done only by first turning OFF the power.
*3. From the manual control level, key operations can be used to move to the operation level only.
*4. When the PF Setting parameter is set to A-M. For the E5CN-HT, press the + Keys at the same time to implement the PF Key.
*5. When the PF Setting parameter is set to PFDP. For the E5CN-HT, press the + Keys at the same time to implement the PF Key.

Error Displays (Troubleshooting)

When an error occurs, the No.1 display shows the error code. Take necessary measure according to the error code, referring the table below.

No.1 display	Meaning	Action	Status at error	
			Control output	Alarm output
S.ERR (S. Err)	Input error *	Check the setting of the input type. Also check the input wiring and check for broken wires or short-circuits in the temperature sensor.	OFF	Operates as above the upper limit.
E333 (E333)	A/D converter error	Turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF	OFF
E111 (E111)	Memory error	Turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF	OFF

Note: If the input value exceeds the display limit (-19999 to 32400), though it is within the control range, CCCC will be displayed under -19999 and DDDD above 32400. Under these conditions, control output and alarm output will operate normally.
For details on the control range, refer to the *E5CN-HT/E5AN-HT/E5EN-HT Digital Controllers User's Manual Programmable Type* (Cat. No. H169).

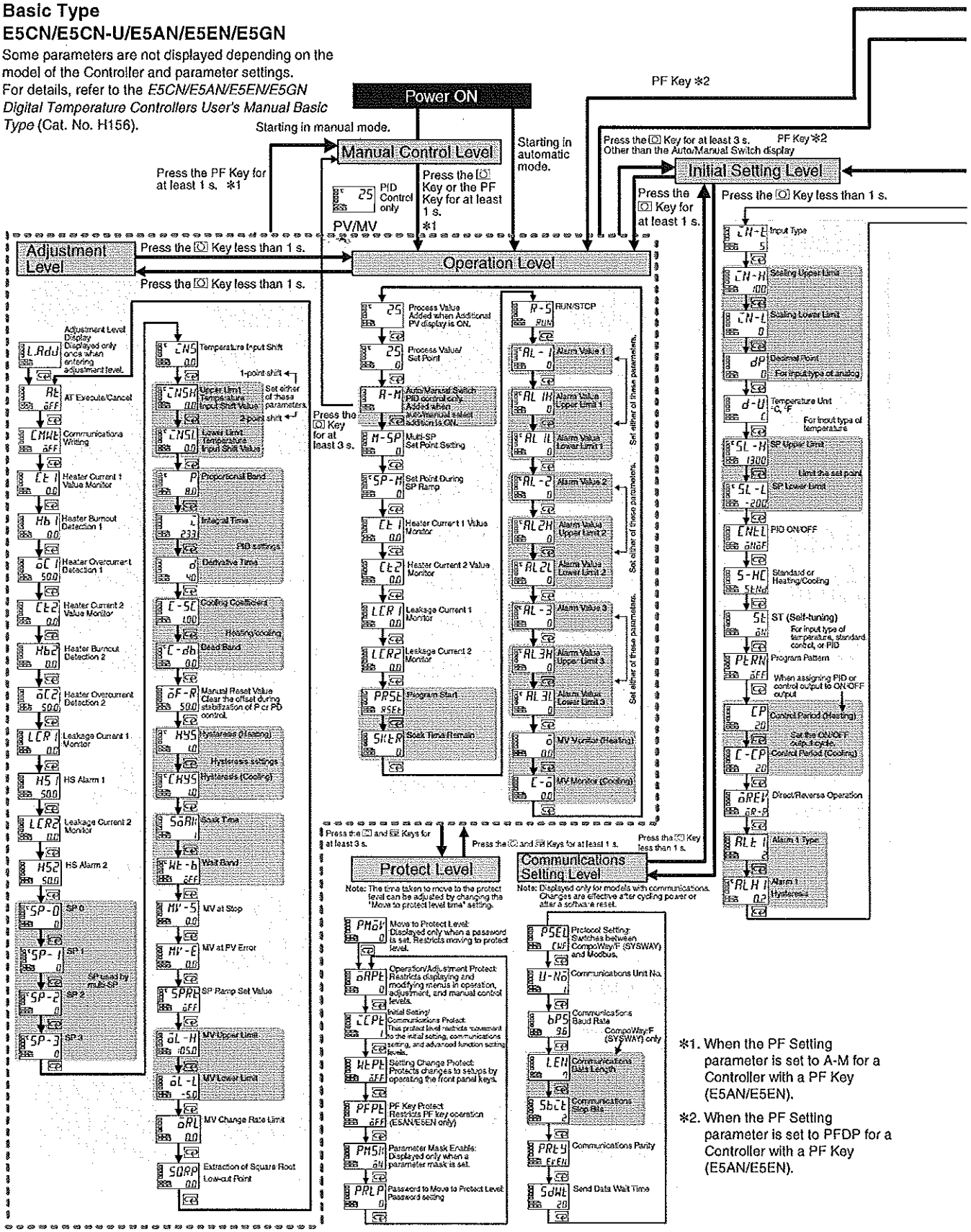
* Errors are shown only when the display is PV, PV/SV, or PV/MV. Errors are not shown for any other status.

Parameters

Basic Type

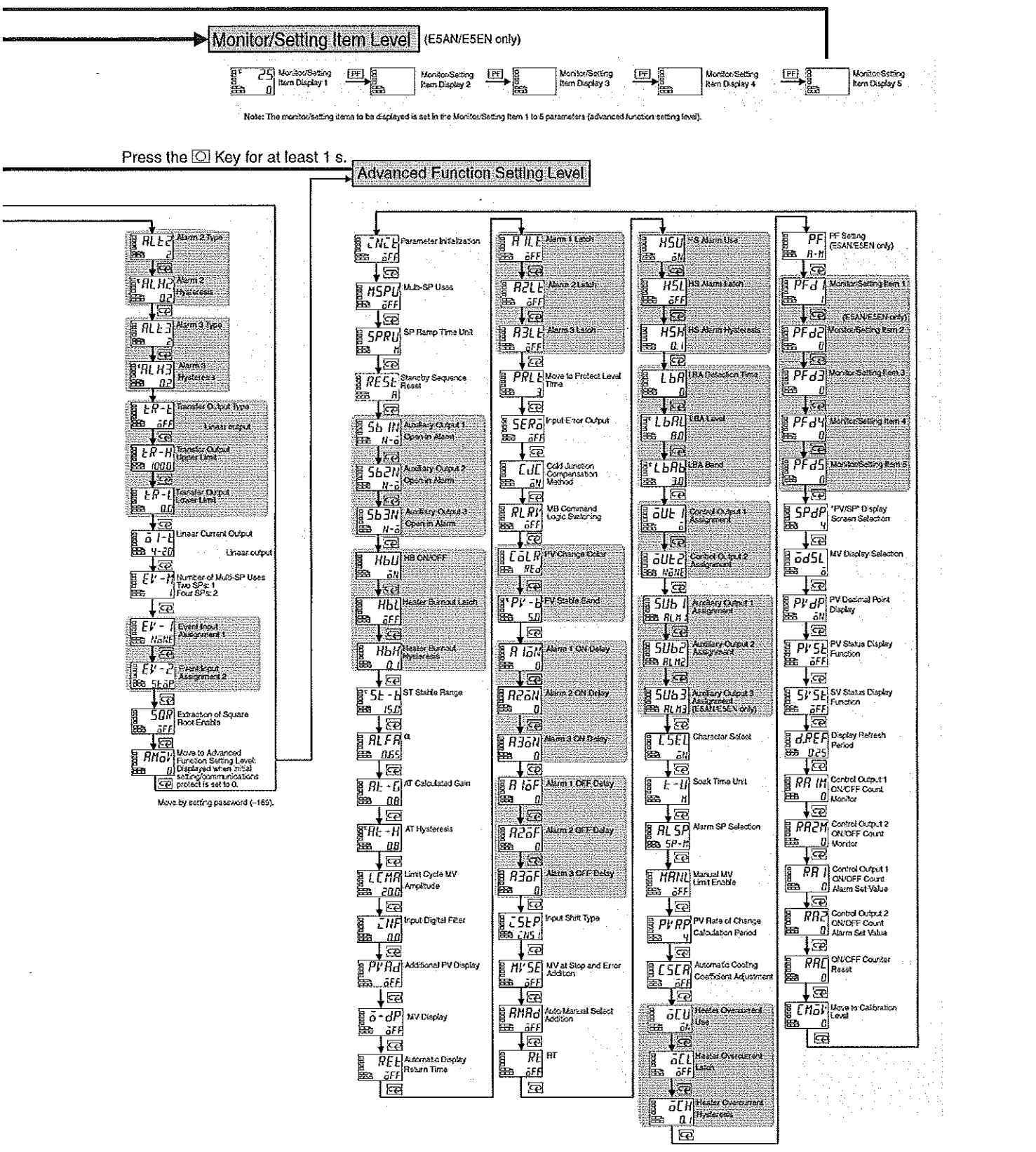
E5CN/E5CN-U/E5AN/E5EN/E5GN

Some parameters are not displayed depending on the model of the Controller and parameter settings. For details, refer to the *E5CN/E5AN/E5EN/E5GN Digital Temperature Controllers User's Manual Basic Type* (Cat. No. H156).



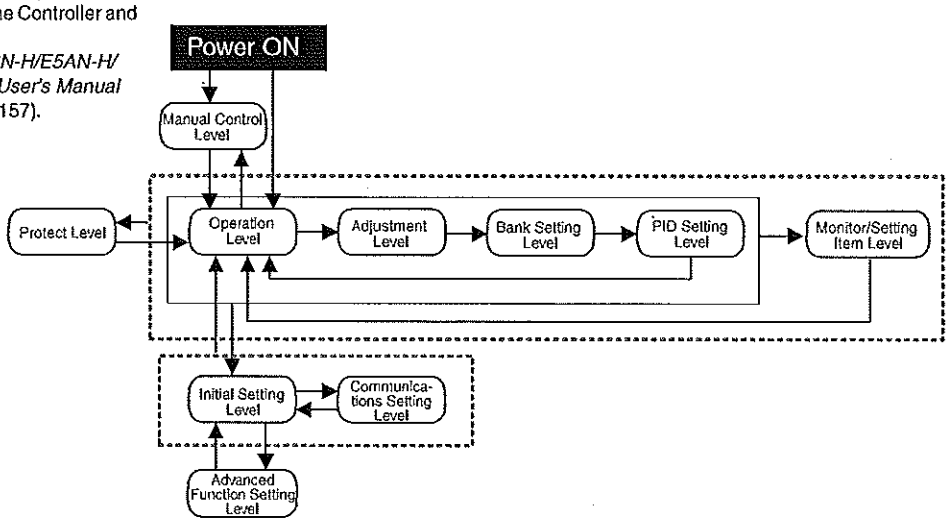
*1. When the PF Setting parameter is set to A-M for a Controller with a PF Key (E5AN/E5EN).

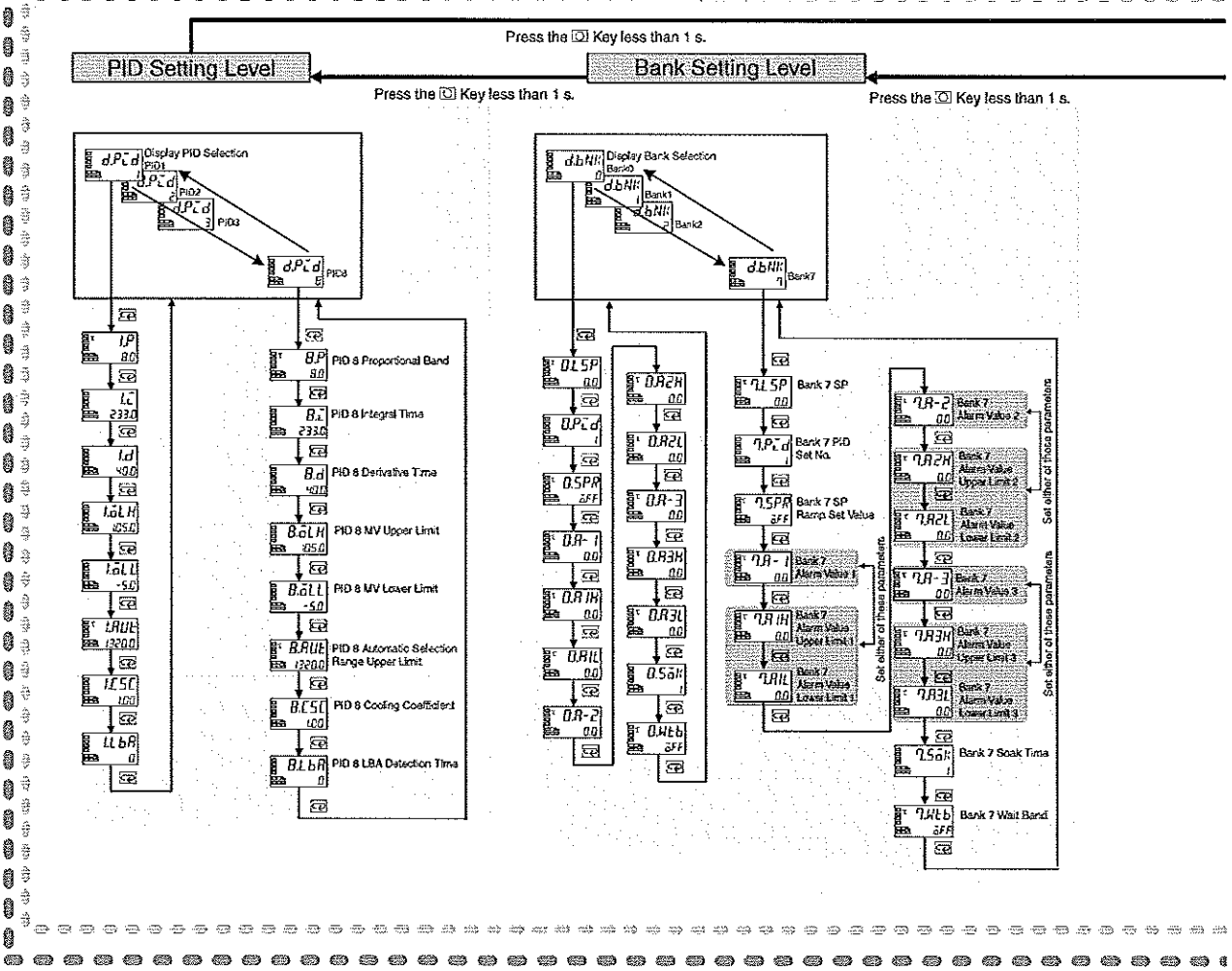
*2. When the PF Setting parameter is set to PFDP for a Controller with a PF Key (E5AN/E5EN).

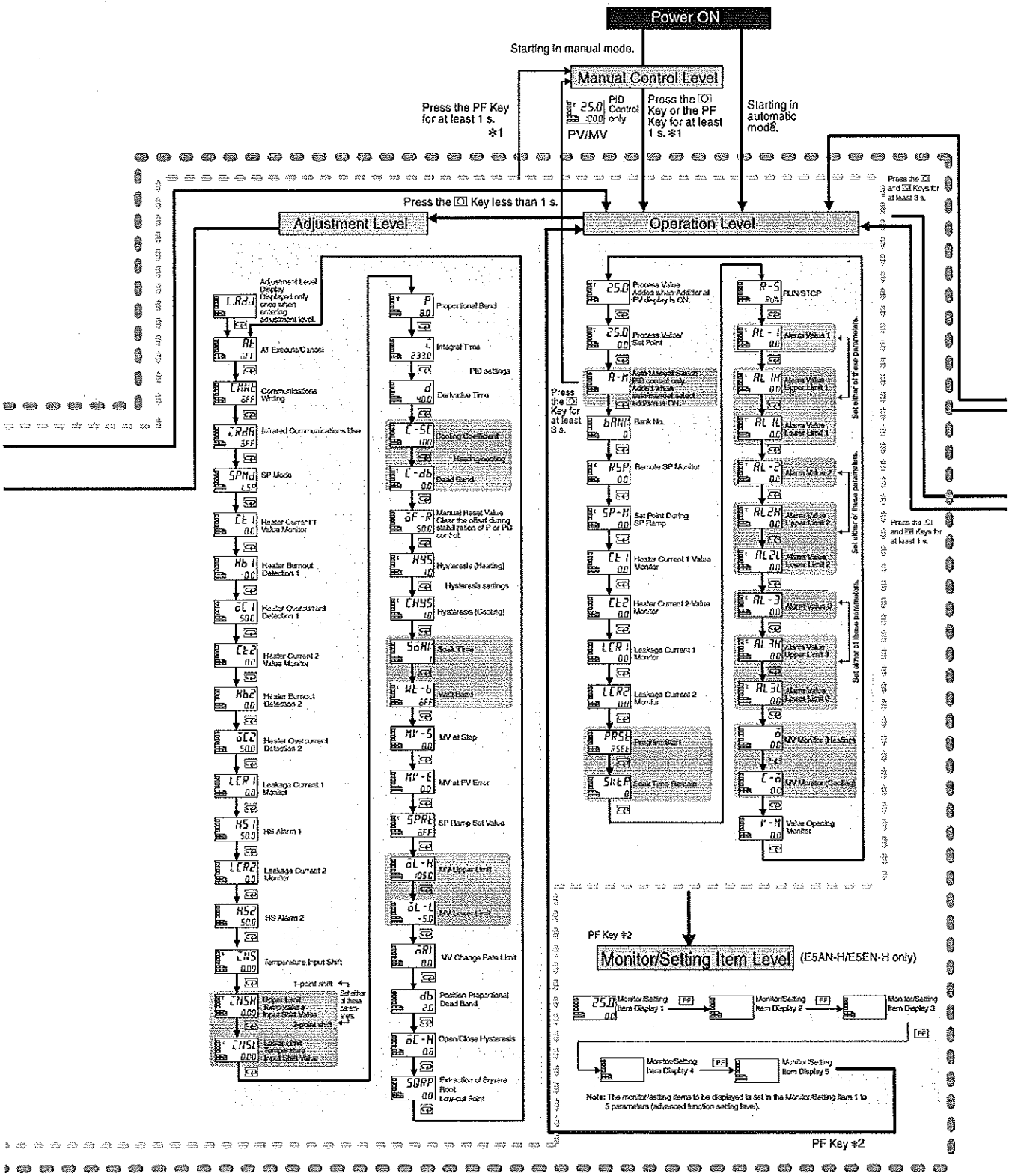

Monitor/Setting Item Level
(E5AN/E5EN only)
Monitor/Setting Item Display 1
Monitor/Setting Item Display 2
Monitor/Setting Item Display 3
Monitor/Setting Item Display 4
Monitor/Setting Item Display 5
Note: The monitor/setting items to be displayed is set in the Monitor/Setting Item 1 to 5 parameters (advanced function setting level).
Press the O Key for at least 1 s.
Advanced Function Setting Level
Alarm 2 Type
Alarm 2 Hysteresis
Alarm 3 Type
Alarm 3 Hysteresis
Transfer Output Type
Linear output
Transfer Output Upper Limit
Transfer Output Lower Limit
Linear Current Output
Linear output
Number of Multi-SP Uses
Two SPs: 1
Four SPs: 2
Event Input Assignment 1
Event Input Assignment 2
Extraction of Square Root Enable
Move to Advanced Function Setting Level
Displayed when initial setting/communications protect is set to 0.
Move by setting password (−169).
Parameter Initialization
Multi-SP Uses
SP Ramp Time Unit
Standby Sequence Reset
Auxiliary Output 1 Open in Alarm
Auxiliary Output 2 Open in Alarm
Auxiliary Output 3 Open in Alarm
HB ON/OFF
Heater Burnout Latch
Heater Burnout Hysteresis
ST Stable Range
α
AT Calculated Gain
AT Hysteresis
Limit Cycle MV Amplitude
Input Digital Filter
Additional PV Display
MV Display
Automatic Display Return Time
Alarm 1 Latch
Alarm 2 Latch
Alarm 3 Latch
Move to Protect Level Time
Input Error Output
Cold Junction Compensation Method
MB Command Logic Switching
PV Change Color
PV Stable Band
Alarm 1 ON Delay
Alarm 2 ON Delay
Alarm 3 ON Delay
Alarm 1 OFF Delay
Alarm 2 OFF Delay
Alarm 3 OFF Delay
Input Shift Type
MV at Stop and Error Addition
Auto Manual Select Addition
RT
HS Alarm Use
HS Alarm Latch
HS Alarm Hysteresis
LBA Detection Time
LBA Level
LBA Band
Control Output 1 Assignment
Control Output 2 Assignment
Auxiliary Output 1 Assignment
Auxiliary Output 2 Assignment
Auxiliary Output 3 Assignment (E5AN/E5EN only)
Character Select
Soak Time Unit
Alarm SP Selection
Manual MV Limit Enable
PV Rate of Change Calculation Period
Automatic Cooling Coefficient Adjustment
Heater Overcurrent Use
Heater Overcurrent Latch
Heater Overcurrent Hysteresis
PF Setting (E5AN/E5EN only)
Monitor/Setting Item 1
Monitor/Setting Item 2 (E5AN/E5EN only)
Monitor/Setting Item 3
Monitor/Setting Item 4
Monitor/Setting Item 5
"PV/SP" Display Screen Selection
MV Display Selection
PV Decimal Point Display
PV Status Display Function
SV Status Display Function
Display Refresh Period
Control Output 1 ON/OFF Count Monitor
Control Output 2 ON/OFF Count Monitor
Control Output 1 ON/OFF Count Alarm Set Value
Control Output 2 ON/OFF Count Alarm Set Value
ON/OFF Counter Reset
Move to Calibration Level

Advanced Type
E5CN-H/E5AN-H/E5EN-H

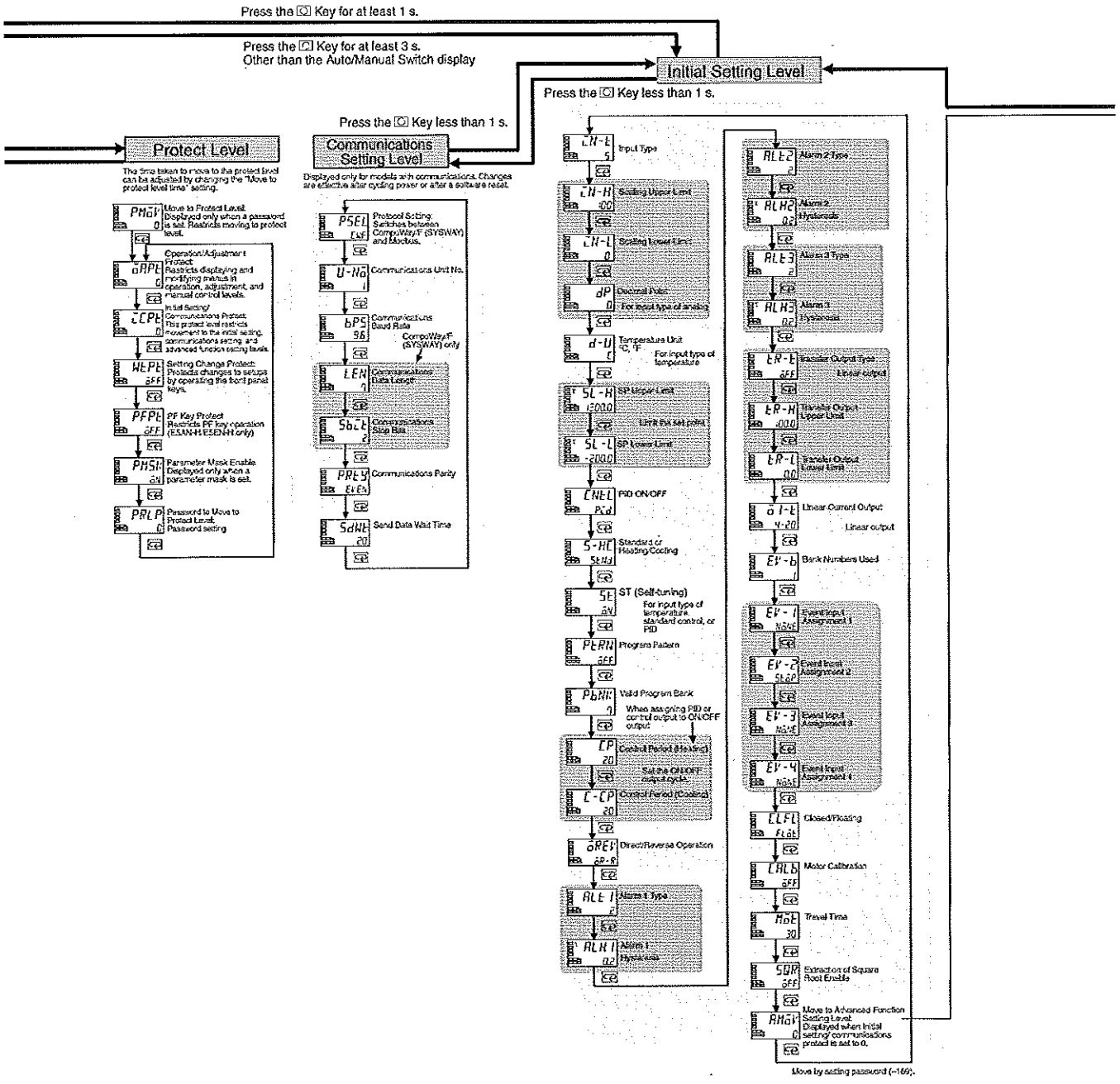
Some parameters are not displayed depending on the model of the Controller and parameter settings.
For details, refer to the *E5CN-H/E5AN-H/E5EN-H Digital Controllers User's Manual Advanced Type* (Cat. No. H157).

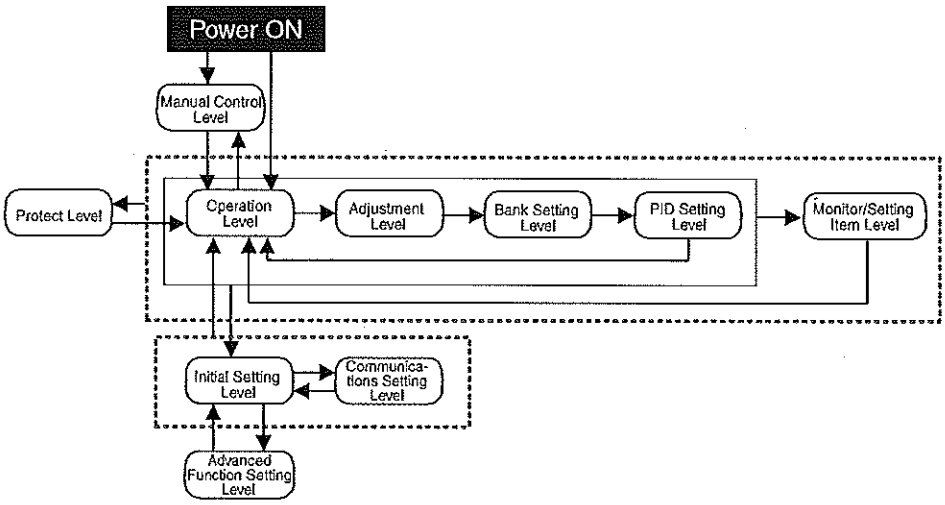






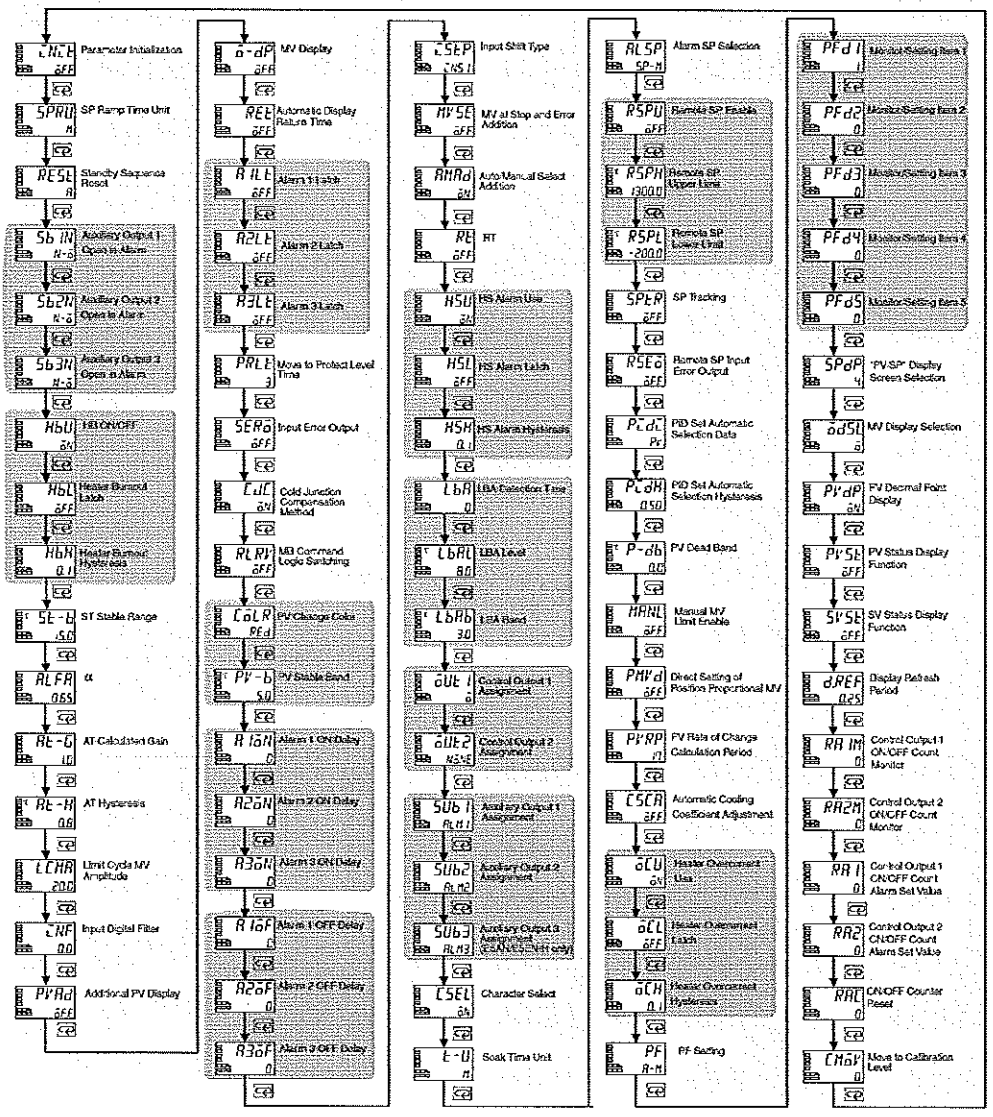
*1. When the PF Setting parameter is set to A-M for a Controller with a PF Key (E5AN-H/E5EN-H).
*2. When the PF Setting parameter is set to PFDP for a Controller with a PF Key (E5AN-H/E5EN-H).


Press the Key for at least 1 s.
Press the Key for at least 3 s.
Other than the Auto/Manual Switch display
Initial Setting Level
Press the Key less than 1 s.
Protect Level
Communications Setting Level
Press the Key less than 1 s.
Displayed only for models with communications. Changes are effective after cycling power or after a software reset.
Move by setting password (−169).



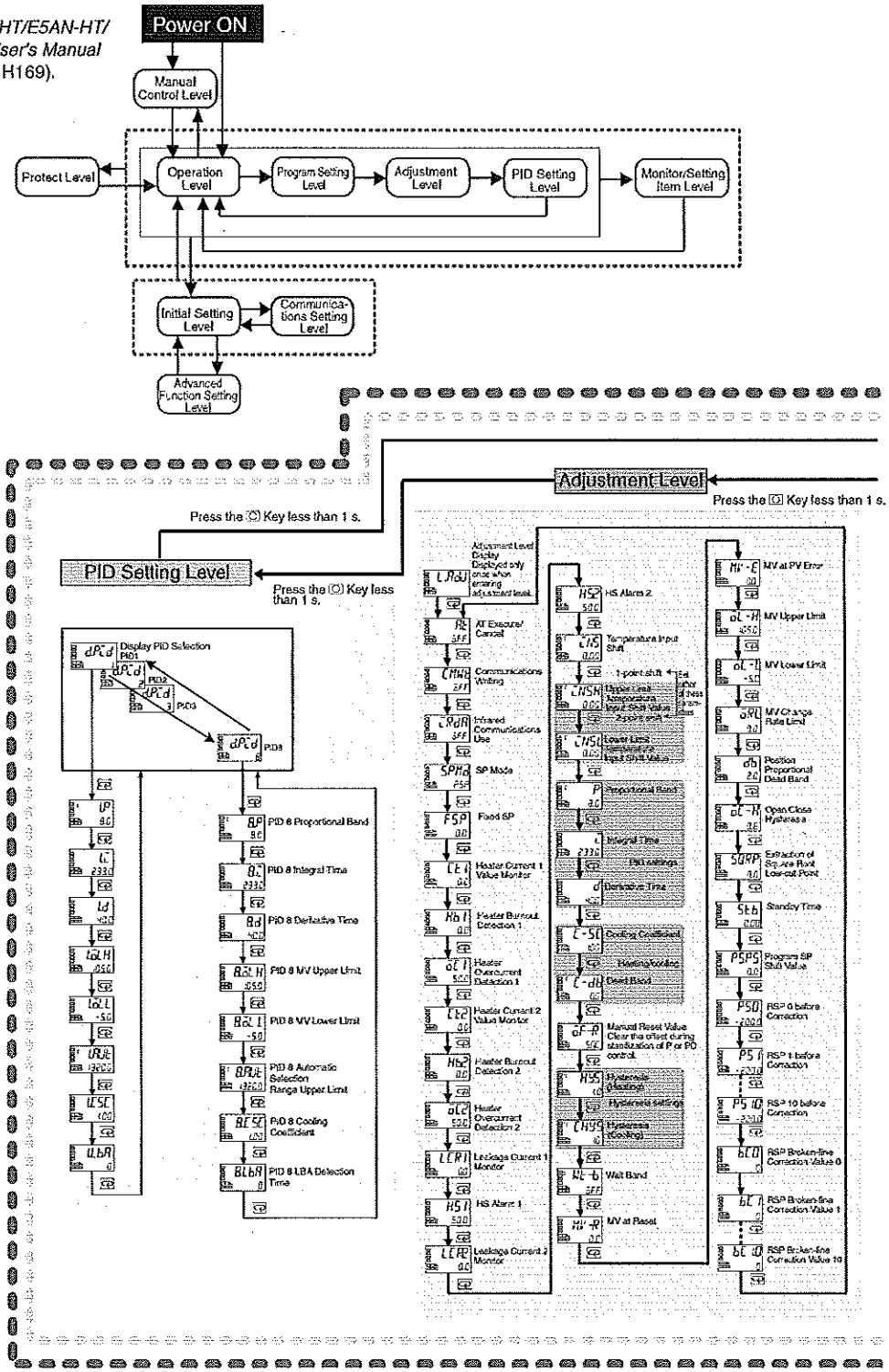
Press the O Key for at least 1 s.

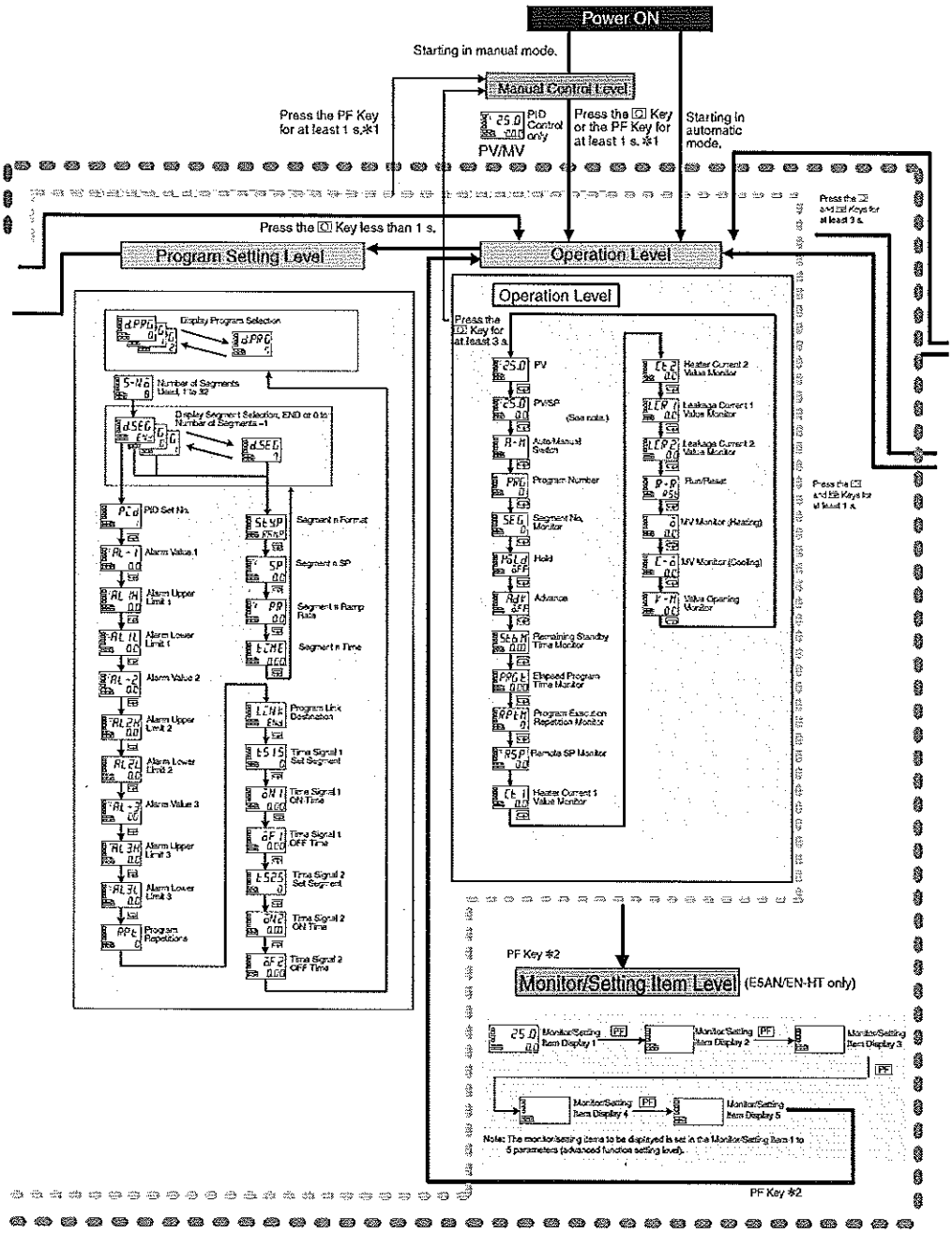
Advanced Function Setting Level



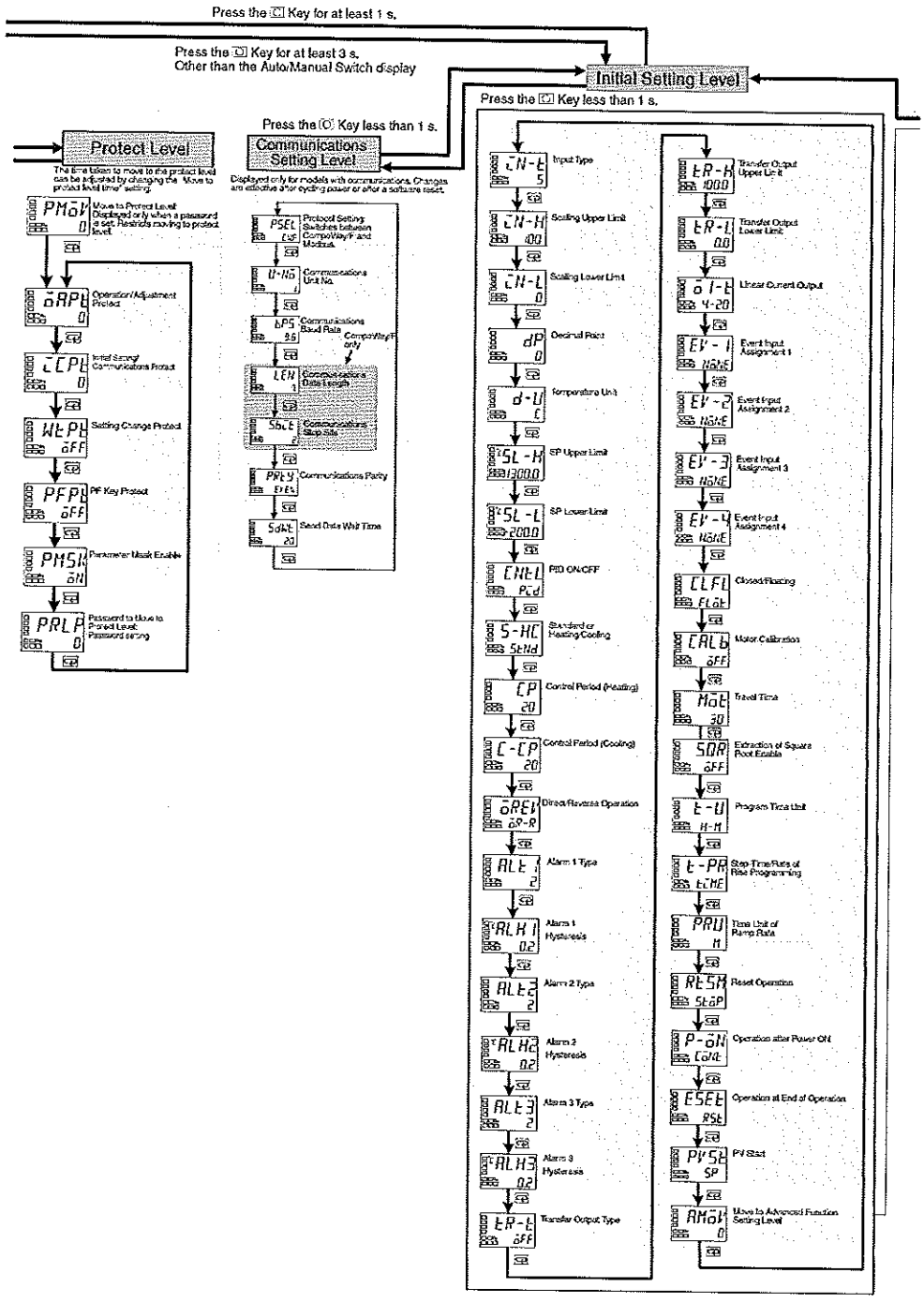
Programmable Type
E5CN-HT/E5AN-HT/E5EN-HT

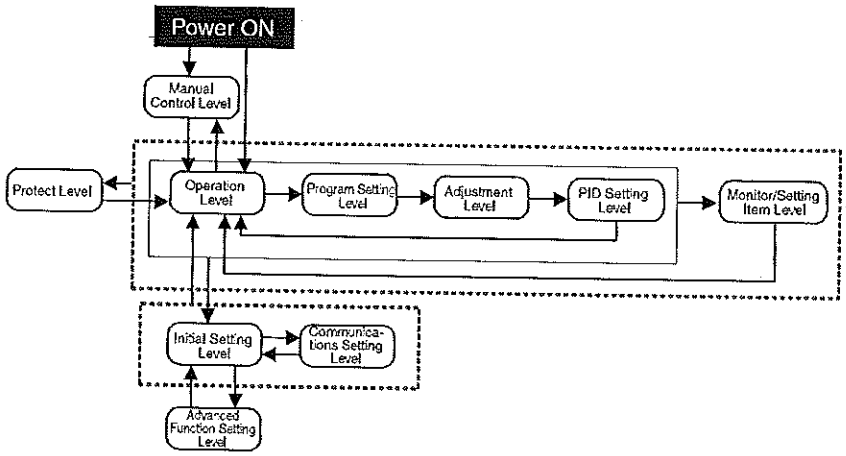
Some parameters are not displayed depending on the model of the Controller and parameter settings.
For details, refer to the *E5CN-HT/E5AN-HT/E5EN-HT Digital Controllers User's Manual Programmable Type* (Cat. No. H169).



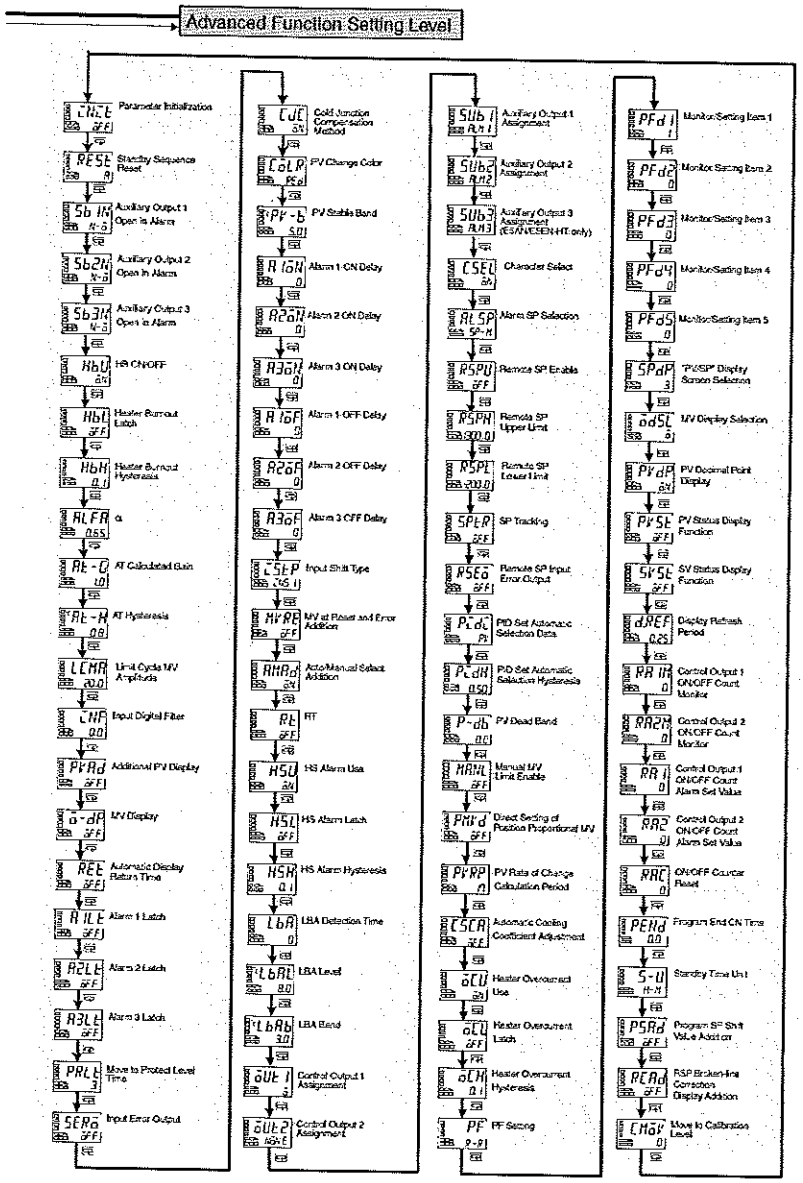


*1. When the PF Setting parameter is set to A-M for a Controller with a PF Key (E5AN/EN-HT).
*2. When the PF Setting parameter is set to PFDP for a Controller with a PF Key (E5AN/EN-HT).


Press the M Key for at least 1 s.
Press the O Key for at least 3 s.
Other than the Auto/Manual Switch display
Initial Setting Level
Press the M Key less than 1 s.
Press the O Key less than 1 s.
Protect Level
Communications Setting Level
Displayed only for models with communications. Changes are effective after cycling power or after a software reset.
Input Type
Scaling Upper Limit
Scaling Lower Limit
Decimal Point
Temperature Unit
SP Upper Limit
SP Lower Limit
PID ON/OFF
Standard or Heating/Cooling
Control Period (Heating)
Control Period (Cooling)
Direct/Reverse Operation
Alarm 1 Type
Alarm 1 Hysteresis
Alarm 2 Type
Alarm 2 Hysteresis
Alarm 3 Type
Alarm 3 Hysteresis
Transfer Output Type
Transfer Output Upper Limit
Transfer Output Lower Limit
Linear Current Output
Event Input Assignment 1
Event Input Assignment 2
Event Input Assignment 3
Event Input Assignment 4
Closed/Floating
Motor Calibration
Travel Time
Extraction of Square Root Enable
Program Time Unit
Ramp Time Rate of Rise Programming
Time Unit of Ramp Rate
Reset Operation
Operation after Power ON
Operation at End of Operation
PV Start
Move to Advanced Function Setting Level
Move to Protect Level
Operation/Adjustment Protect
Initial Setting/Communications Protect
Setting Change Protect
PF Key Protect
Parameter Mask Enable
Password to Move to Protect Level/Password setting
Protocol Setting
Communications Unit No.
Communications Baud Rate
Communications Data Length
Communications Stop Bits
Communications Parity
Send Data Wait Time



Press the [O] Key for at least 1 s.

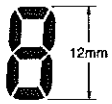


Nomenclature

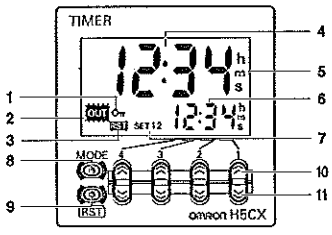
Display Section

1. **Key Protect Indicator** (orange)
2. **Control Output Indicator** (orange)
3. **Reset Indicator** (orange)
4. **Present Value Display** (Main display)
   (Character height: 12 mm, red *)
   * Characters on models with screw terminals (H5CX-A□) can be switched between red, green, and orange.
5. **Time Unit Indicators**
   (Color is same as present value display.)
   (If the time range is 0 min, 0 h, 0.0 h, or 0 h 0 min, these indicators flash to indicate timing operation.)
6. **Set Value Display** (Sub-display)
   (Character height: 6 mm, green)
7. **Set Value 1, 2 Indicator** (green)

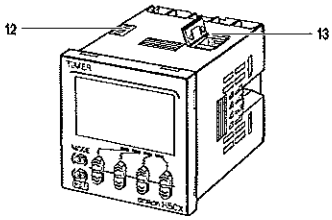
Character Size for Present Value Display



Character Size for Set Value Display



Front View

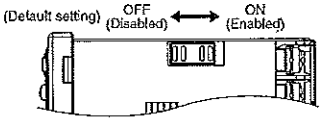


Operation Key

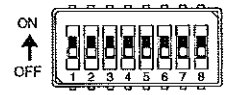
8. **Mode Key**
   (Changes modes and setting items)
9. **Reset Key**
   (Resets present value and output)
10. **Up Keys 1 to 4**
11. **Down Keys 1 to 4**

Switches

12. **Key-protect Switch**



13. **DIP Switch**



Note: There is no DIP switch on the H5CX-L8□.

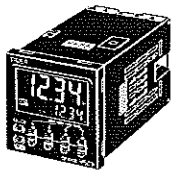
Dimensions

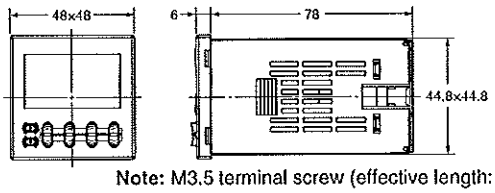
(unit: mm)

Digital Timers

Digital Timers

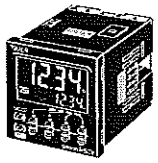
H5CX-A-N/-AS-N (Flush Mounting Models)

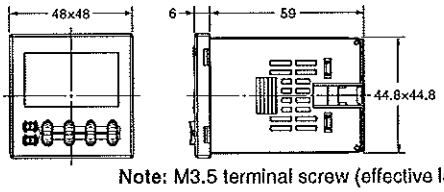




Note: M3.5 terminal screw (effective length: 6 mm)

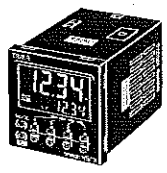
H5CX-AD-N/-ASD-N (Flush Mounting Models)

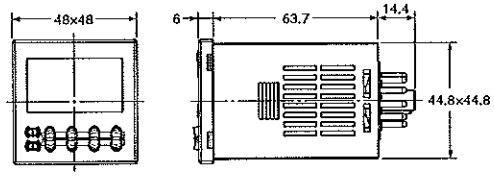




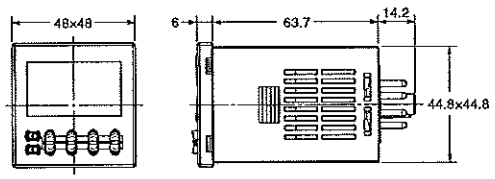
Note: M3.5 terminal screw (effective length: 6 mm)

H5CX-A11□-N
(Flush Mounting/Surface Mounting Models)





H5CX-L8□-N (Flush Mounting/Surface Mounting Models)



Operating Procedures

Setting Procedure Guide

Settings for Timer Operation *

Use the following settings.

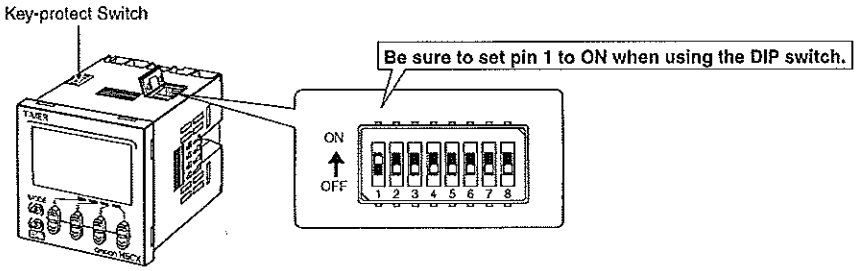
Settings for Twin Timer Operation *

Refer to **page 25.**

* It is not necessary to mount the Waterproof Packing if waterproof construction is not required.

Operating Procedures for Timer Function

Step1 Settings for basic functions can be performed with just the DIP switch.
Note: There is no DIP switch on the H5CX-L8□. Go to **Step2**.



	Item	OFF	ON
1	DIP switch settings	Disabled	Enabled
2	Time range	Refer to the table on the right.	
3			
4			
5	Output modes	Refer to the table on the right.	
6			
7	Timer mode	UP	DOWN
8	Input signal width	20 ms	1 ms

Note: All the pins are factory-set to OFF.

- Be sure to turn ON pin 1 of the DIP switch.
- Changes to DIP switch settings are enabled when the power is turned ON.
  (Set the DIP switch while the power is OFF.)

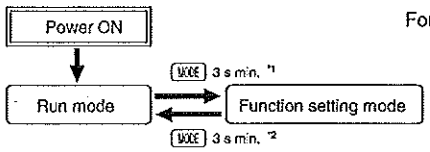
Pin 2	Pin 3	Pin 4	Time range
ON	ON	ON	0.001 s to 9.999 s
OFF	OFF	OFF	0.01 s to 99.99 s
ON	OFF	OFF	0.1 s to 999.9 s
OFF	ON	OFF	1 s to 9999 s
ON	ON	OFF	0 min 01 s to 99 min 59 s
OFF	OFF	ON	0.1 min to 999.9 min
ON	OFF	ON	0 h 01 min to 99 h 59 min
OFF	ON	ON	0.1 h to 999.9 h

Pin 5	Pin 6	Output mode
OFF	OFF	Mode A: Signal ON delay 1 (Timer resets when power comes ON.)
ON	OFF	Mode A-2: Power ON delay 1 (Timer resets when power comes ON.)
OFF	ON	Mode E: Interval (Timer resets when power comes ON.)
ON	ON	Mode F: Cumulative (Timer does not reset when power comes ON.)

After making DIP switch settings for basic operation, advanced functions can be added using the operation keys on the front panel. Refer to **Step2** on **page 16** for details.

Step2 Settings that cannot be performed with the DIP switch are performed with the operation keys.

• Change to Function Setting Mode.



For details on operations in run mode, refer to **page 19.**

*1. If the mode is switched to the function setting mode during operation, operation will continue.
*2. Changes made to settings in function setting mode are enabled for the first time when the mode is changed to run mode. Also, when settings are changed, the timer is reset (time initialized and output turned OFF).

The characters displayed in reverse video are the default settings.
When performing settings with operation keys only, set pin1 of the DIP switch to OFF (factory setting).
If pin 1 of the DIP switch is set to ON, the setting items indicated in ☐ will not be displayed.

Function setting mode

Time range (tLmr)

- Set the time range using the ▲ ▼ keys.

0.01 s ↔ 99.99 s ↔ 0.1 s ↔ 999.9 s ↔ 1 s ↔ 9999 s ↔ 0 min 01 s ↔ 99 min 59 s ↔ 0.1 min ↔ 999.9 min ↔ 1 min ↔ 9999 min ↔ 0 h 01 min ↔ 99 h 59 min ↔ 0.1 h ↔ 999.9 h ↔ 1 h ↔ 9999 h ↔ 0.001 s ↔ 9.999 s

➡ For details, refer to the **Time Range List.**

Timer mode (tLmm)

- Set the timer mode using the ▲ ▼ keys.

UP (UP) ↔ dOWn (DOWN)

Output modes (oUtm)

- Set the output mode using the ▲ ▼ keys.

R (A) ↔ R-1 (A-1) ↔ R-2 (A-2) ↔ R-3 (A-3) ↔ b (b) ↔ b-1 (b-1) ↔ d (d) ↔ E (E) ↔ F (F) ↔ Z (Z) ↔ S (S)

Note: Only modes A-2, b, E, and Z can be selected for models with instantaneous contact outputs.

Output time (otLm)

- Set each digit for the output time using the corresponding ▲ ▼ keys.

HoLd (Output hold) / 0.01 (0.01s) ~ 99.99 (99.99s)

(If the output time is set to 0.00, HoLd is displayed.)

Note: Displayed for modes A, A-1, A-2, A-3, b, b-1 and S only.

Input signal (iFLt)

- Set the input signal width using the ▲ ▼ keys.

20mS (20ms) ↔ 1mS (1ms)

Note: Not displayed for models with instantaneous contact outputs.

NPN/PNP input (inPt)

- Set the NPN/PNP mode using the ▲ ▼ keys.

nPn (NPN input) ↔ PnP (PNP input)

Note: Only displayed for the H5CX-A□ and H5CX-A11□.

Display color (CoLr)

- Set the display color using the ▲ ▼ keys.

rEd (Red) ↔ Grn (Green) ↔ orG (Orange) ↔ r-G (Red-green) ↔ G-r (Green-red) ↔ r-o (Red-orange) ↔ o-r (Orange-red) ↔ G-o (Green-orange) ↔ o-G (Orange-green)

Note: Displayed only for models with terminal screws (H5CX-A□).

Instantaneous/time-limit (otmd)

- Set the function (instantaneous or time-limit operation) for the instantaneous output (output 1) using the ▲ ▼ Keys.

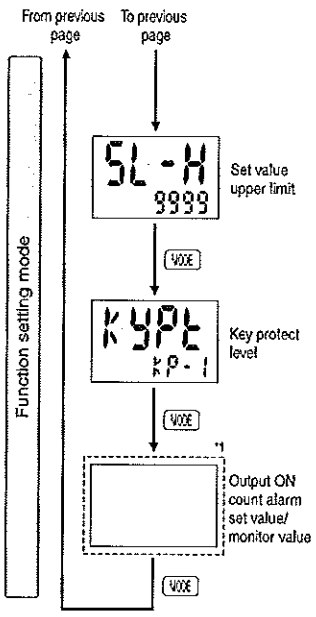
IC IC (Instantaneous) ↔ 2C (Time-limit)

Note: Displayed only for models with instantaneous contact outputs.

Time Range List

Display	Set Value
- - - -	0.01 s to 99.99 s (default setting)
- - - -	0.1 s to 999.9 s
- - - -	1 s to 9999 s
- -:- -	0 min 01 s to 99 min 59 s
- - - -	0.1 min to 999.9 min
- - - -	1 min to 9999 min
- -:- -	0 h 01 min to 99 h 59 min
- - - -	0.1 h to 999.9 h
- - - -	1 h to 9999 h
- - - -	0.001 s to 9.999 s

From next page To next page



▪ Set the digits for the set value limit using the corresponding ⌃⌄ keys.

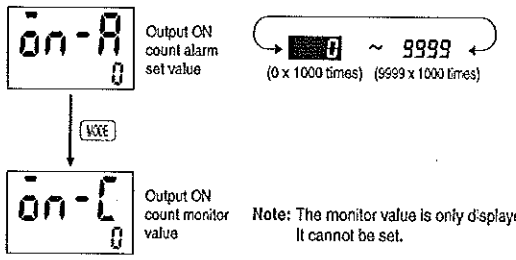
1 ↔ 9999
(1) (9999)

▪ Set the key protect level using the ⌃⌄ keys.

KP-1 ↔ KP-2 ↔ KP-3 ↔ KP-4 ↔ KP-5 ↔ KP-6 ↔ KP-7
(KP-1) (KP-2) (KP-3) (KP-4) (KP-5) (KP-6) (KP-7)

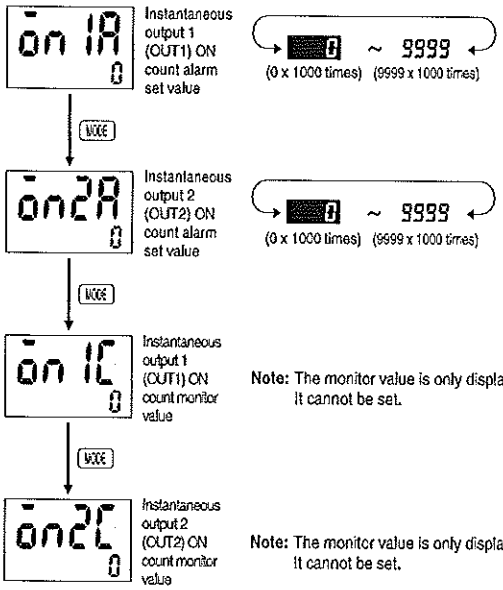
*1. Set each digit for the output time using the corresponding ⌃⌄ keys.

• Models without Instantaneous Contact Outputs



Note: The monitor value is only displayed. It cannot be set.

• Models with Instantaneous Contact Outputs



Note: The monitor value is only displayed. It cannot be set.

Note: The monitor value is only displayed. It cannot be set.

Explanation of Functions

Operating Procedures for Timer Function

Items marked with stars (★) can be set using the DIP switch.

Time Range (tim)★

Set the range to be timed in the range 0.001 s to 9,999 h.
Settings of type ---- h (9,999 h) and ---- min (9,999 min) cannot be made with the DIP switch. Use the operation keys if these settings are required.

Timer Mode (tmd)★

Set either the elapsed time (UP) or remaining time (DOWN) mode.
In UP mode, the elapsed time is displayed, and in DOWN mode, the remaining time is displayed.

Output Mode (oUtd)★

Set the output mode.
The possible settings are A, A-1, A-2, A-3, b, b-1, d, E, F, Z and S.
Only output modes A, A-2, E, and F can be set using the DIP switch. Use the operation keys if a different setting is required.
(For details on output mode operation, refer to **"Timing Charts"** on **page 20.**)

Output Time (otm)

When using one-shot output, set the output time for one-shot output (0.01 to 99.99 s).
One-shot output can be used only if the selected output mode is A, A-1, A-2, A-3, b, b-1 or S.
If the output time is set to 0.00, Hold is displayed, and the output is held.

Input Signal Width (inP)★

Set the minimum signal input width (20 ms or 1 ms) for signal, reset, and gate inputs.
The same setting is used for all external inputs (signal, reset, and gate inputs).
If contacts are used for the input signal, set the input signal width to 20 ms.
Processing to eliminate chattering is performed for this setting.

NPN/PNP Input Mode (Pmod)

Select either NPN input (no-voltage input) or PNP input (voltage input) as the input format.
Set an NPN input when using a 2-wire sensor.
For details on input connections, refer to **"Input Connections"** on **page 9.**

Display Color (Colr)
(Terminal block model: H5CX-A□ only)

Set the color used for the present value.

	Output OFF	Output ON
rEd	Red (fixed)	
Grn	Green (fixed)	
orG	Orange (fixed)	
r-G	Red	Green
G-r	Green	Red
r-o	Red	Orange
o-r	Orange	Red
G-o	Green	Orange
o-G	Orange	Green

Key Protect Level (KyPt)

Set the key protect level.
Refer to **"Key Protect Level"** on **page 32.**

Instantaneous/Time-limit (otmd)

Set the contact output to time-limit SPDT + instantaneous SPDT or time-limit SPDT operation.

Set Value Upper Limit (SL-H)

Set the upper limit for the set value when it is set in Run Mode.
The limit can be set to between 1 and 9999.
This setting does not apply to the ON duty in Z mode.

Output ON Count Alarm Set Value (on-A)

Set the alarm value for the output ON count.
The limit can be set to between 0 x 1000 (0 times) and 9999 x 1000 (9,999,000 times). Only the underlined values are set. The alarm will be disabled if 0 is set.
If the total ON count of the output exceeds the alarm set value, E3 will be displayed on the Timer to indicate that the output ON count alarm value was exceeded. Refer to **"Self-diagnostic Function"** on **page 32** for information on the E3 display.

ON Count Alarm Set Values for Outputs 1 and 2 (OUT1 and OUT2) (on1A and on2A)

Set the ON count alarm values for the outputs 1 and 2.
The limit can be set to between 0 x 1000 (0 times) and 9999 x 1000 (9,999,000 times). Only the underlined values are set. The alarm will be disabled if 0 is set.
If the total ON count of instantaneous output 1 or 2 exceeds the alarm set value, E3 will be displayed on the Timer to indicate that the output ON count alarm value was exceeded. Refer to **"Self-diagnostic Function"** on **page 32** for information on the E3 display.

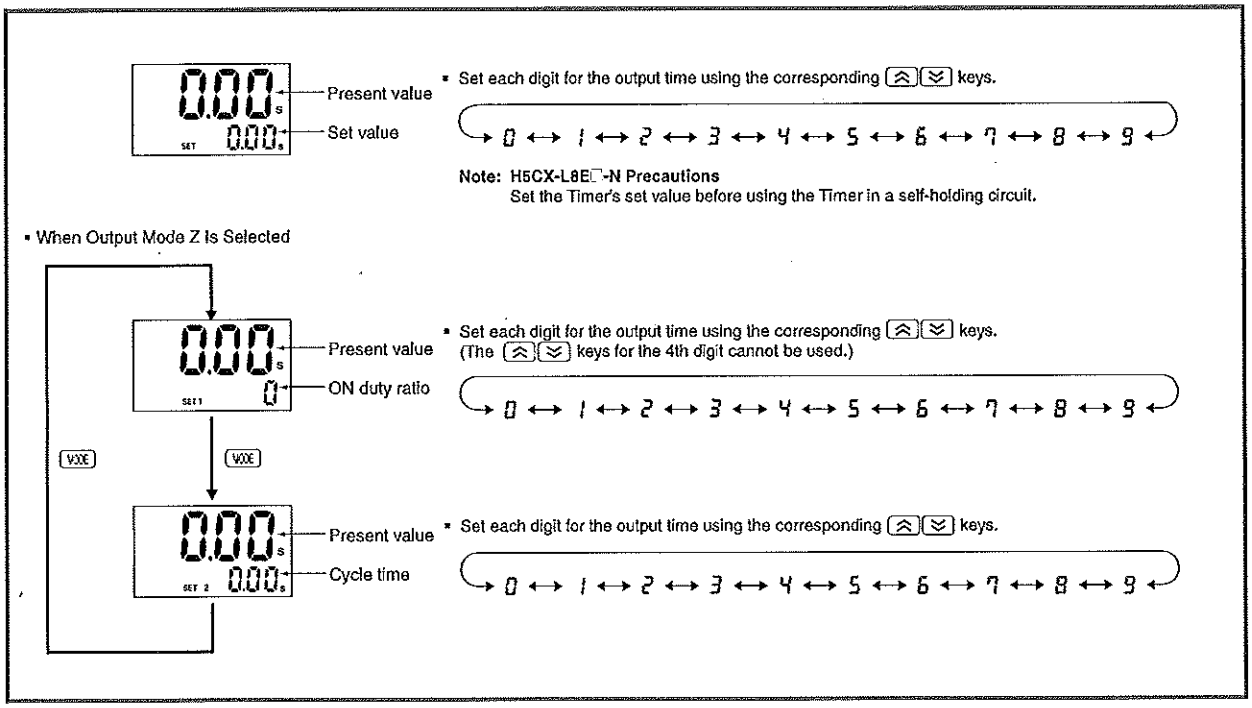
Output ON Count Monitor Value (on-C)

The monitor value is only displayed. It cannot be set.
The output ON count will be 1,000 times the displayed value.

ON Count Monitor Values for Outputs 1 and 2 (OUT1 and OUT2) (on1C and on2C)

The monitor value for output 1 or 2 is only displayed. It cannot be set.
The output ON count will be 1,000 times the displayed value.

Operation in Run Mode
Operating Procedures for Timer Function



Present Value and Set Value

These items are displayed when the power is turned ON. The present value is displayed in the main display and the set value is displayed in the sub-display.
The values displayed will be determined by the settings made for the time range and the timer mode in function setting mode.

Present Value and ON Duty Ratio (Output Mode = Z)

The present value is displayed in the main display and the ON duty ratio is displayed in the sub-display. Set the ON duty ratio used in ON/OFF-duty-adjustable flicker mode (Z) as a percentage.

$$\text{ON time} = \text{Cycle time} \times \frac{\text{ON duty ratio (\%)}}{100}$$

The output accuracy will vary with the time range, even if the ON duty ratio setting is the same. Therefore, if fine output time adjustment is required, it is recommended that the time range for the cycle time is set as small as possible.

Examples: 1. When Time Range = - - - - s (9999 s)

$$20(\text{s}) \times \frac{31(\%)}{100} = 6.2(\text{s})$$

Rounded off to the nearest integer (because of the time range setting) → ON time = 6 s

2. When Time Range = - -. - - s (99.99 s)

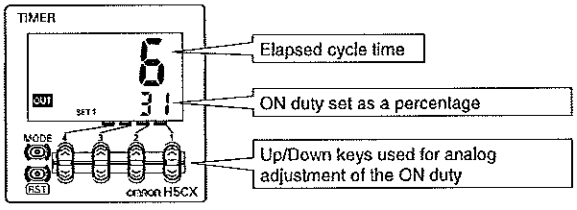
$$20.00(\text{s}) \times \frac{31(\%)}{100} = 6.200(\text{s})$$

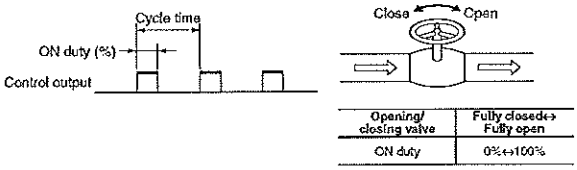
Rounded off to 2 decimal places (because of the time range setting) → ON time = 6.20 s

If a cycle time is set, cyclic control can be performed in ON/OFF-duty-adjustable flicker mode simply by changing the ON duty ratio.

Present Value and Cycle Time (Output Mode = Z)

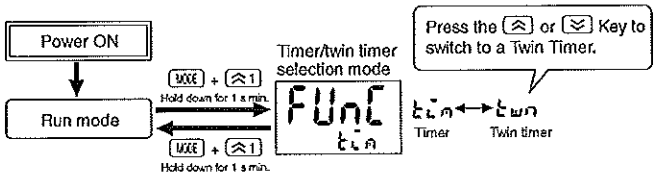
The present value is displayed in the main display and the cycle time is displayed in the sub-display. Set the cycle time.



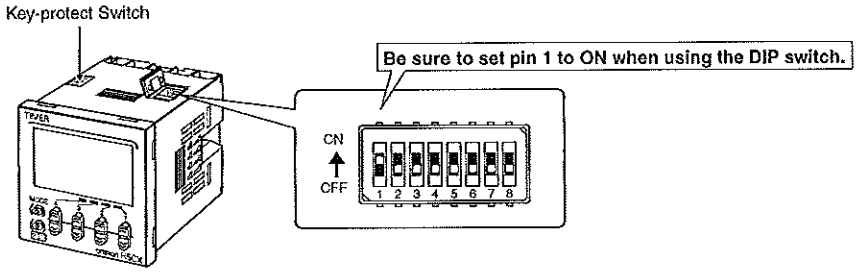


Setting Procedure Guide
Operating Procedures for Twin Timer Function

Step1 Switching to a Twin Timer



Step2 Settings for basic functions can be performed with just the DIP switch.
Note: There is no DIP switch on the H5CX-L8□. Go to **Step3**.



	Item	OFF	ON
1	DIP switch settings	Disabled	Enabled
2	OFF time range	Refer to the table on the right.	
3			
4	ON time range	Refer to the table on the right.	
5			
6	Output mode	Flicker OFF start	Flicker ON start
7	Timer mode	UP	DOWN
8	Input signal width	20 ms	1 ms

Note: All the pins are factory-set to OFF.

Pin 2	Pin 3	OFF time range
OFF	OFF	0.01 s to 99.99 s
ON	OFF	0.1 s to 999.9 s
OFF	ON	1 s to 9999 s
ON	ON	0 min 01 s to 99 min 59 s

Pin 4	Pin 5	ON time range
OFF	OFF	0.01 s to 99.99 s
ON	OFF	0.1 s to 999.9 s
OFF	ON	1 s to 9999 s
ON	ON	0 min 01 s to 99 min 59 s

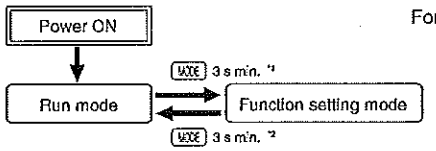
- Be sure to turn ON pin 1 on the DIP switch.
- Changes to DIP switch settings are enabled when the power is turned ON.
  (Perform DIP switch settings while the power is OFF.)

After making DIP switch settings for basic operation, advanced functions can be added using the operation keys on the front panel. Refer to **Step3** on **page 26** for details.

To switch to twin timer operation, use the procedure given below. For details, refer to page 31.

Step3 Settings that cannot be performed with the DIP switch are performed with the operation keys.

• Change to Function Setting Mode.



For details on operations in run mode, refer to page 28.

*1. If the mode is switched to the function setting mode during operation, operation will continue.
*2. Changes made to settings in function setting mode are enabled for the first time when the mode is changed to run mode. Also, when settings are changed, the timer is reset (time initialized and output turned OFF).

The characters displayed in reverse video are the default settings.
When performing settings with operation keys only, set pin1 of the DIP switch to OFF (factory setting).
If pin 1 of the DIP switch is set to ON, the setting items indicated in ☐ will not be displayed.

Function setting mode

OFF time range (oFtr)

• Set the OFF time range using the ▲ ▼ keys.

0.01 s ↔ 0.1 s ↔ 1 s ↔ ..... ↔ 1 h ↔ 0.1 s

➡ For details, refer to **Time Range List.**

ON time range (ontr)

• Set the ON time range using the ▲ ▼ keys.

0.01 s ↔ 0.1 s ↔ 1 s ↔ ..... ↔ 1 h ↔ 0.1 s

➡ For details, refer to **Time Range List.**

Timer mode (tmm) UP

• Set the timer mode using the ▲ ▼ keys.

UP (UP) ↔ down (DOWN)

ON/OFF start mode (otm) toFF

• Set the twin timer output mode using the ▲ ▼ keys.

toFF ↔ ton ↔ toF1 ↔ ton1

(Flicker OFF start 1) (Flicker On Start 1) (Flicker OFF start 2) (Flicker On Start 2)

Note: Only Flicker OFF Start 1 or Flicker ON Start 1 can be selected for the H5CX-L8E□.

Input signal width (iFLt) 20mS

• Set the input signal width using the ▲ ▼ keys.

20mS (20 ms) ↔ 1mS (1 ms)

Note: Not displayed for models with instantaneous contact outputs.

NPN/PNP input (imod) nPn

• Set the NPN/PNP input mode using the ▲ ▼ keys.

nPn (NPN input) ↔ PnP (PNP input)

Note: Displayed only for the H5CX-A□ and H5CX-A11□.

Display color (Colr) rEd

• Set the display color using the ▲ ▼ keys.

rEd (Red) ↔ Grn (Green) ↔ orG (Orange) ↔ r-G (Red-green) ↔ G-r (Green-red) ↔ r-o (Red-orange) ↔ o-r (Orange-red) ↔ G-o (Green-orange) ↔ o-G (Orange-green)

Note: Displayed only for models with terminal screws (H5CX-A□).

Instantaneous/time-limit (otmd) IC IC

• Set the function (instantaneous or time-limit operation) for the instantaneous output (output 1) using the ▲ ▼ Keys.

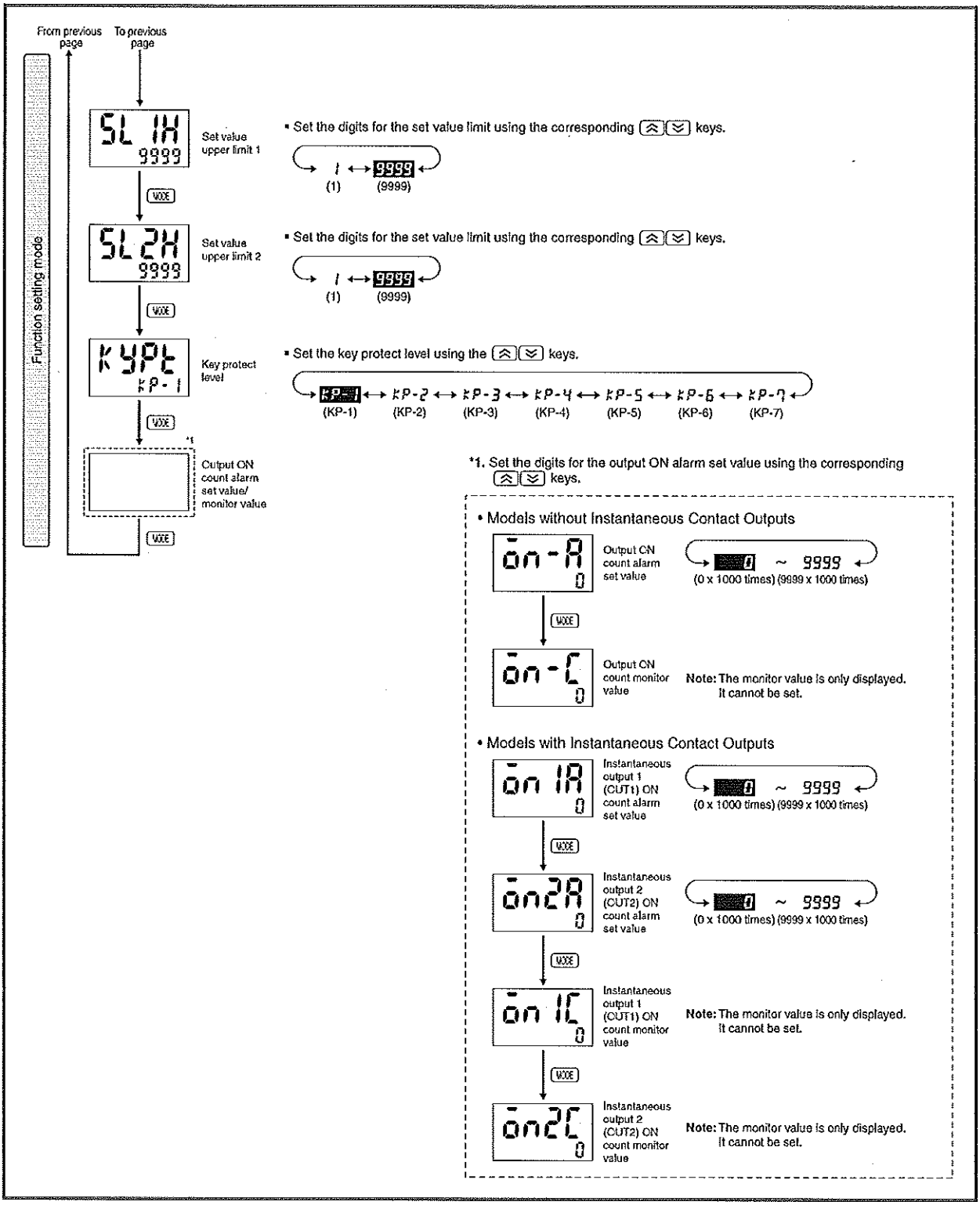
IC IC (Instantaneous) ↔ 2C (Time-limit)

Note: Displayed only for models with instantaneous contact outputs.

Time Range List

Display	Set Value
0.0 0	0.01 s to 99.99 s (default setting)
0.0	0.1 s to 999.9 s
0	1 s to 9999 s
0:0	0 min 01 s to 99 min 59 s
0.0	0.1 min to 999.9 min
0	1 min to 9999 min
0:0	0 h 01 min to 99 h 59 min
0.0	0.1 h to 999.9 h
0	1 h to 9999 h
0.0 0	0.001 s to 9.999 s

To next page From next page


From previous page
To previous page
Function setting mode
SL 1H
9999
Set value upper limit 1
MODE
SL 2H
9999
Set value upper limit 2
MODE
KYPt
KP-1
Key protect level
MODE
*1
Output ON count alarm set value/ monitor value
MODE
▪ Set the digits for the set value limit using the corresponding ▲ ▼ keys.
1 ↔ 9999
(1) (9999)
▪ Set the digits for the set value limit using the corresponding ▲ ▼ keys.
1 ↔ 9999
(1) (9999)
▪ Set the key protect level using the ▲ ▼ keys.
KP-1 ↔ KP-2 ↔ KP-3 ↔ KP-4 ↔ KP-5 ↔ KP-6 ↔ KP-7
(KP-1) (KP-2) (KP-3) (KP-4) (KP-5) (KP-6) (KP-7)
*1. Set the digits for the output ON alarm set value using the corresponding ▲ ▼ keys.
• Models without Instantaneous Contact Outputs
On-A
0
Output ON count alarm set value
0 ~ 9999
(0 x 1000 times) (9999 x 1000 times)
MODE
On-C
0
Output ON count monitor value
Note: The monitor value is only displayed. It cannot be set.
• Models with Instantaneous Contact Outputs
On 1A
0
Instantaneous output 1 (CUT1) ON count alarm set value
0 ~ 9999
(0 x 1000 times) (9999 x 1000 times)
MODE
On2A
0
Instantaneous output 2 (CUT2) ON count alarm set value
0 ~ 9999
(0 x 1000 times) (9999 x 1000 times)
MODE
On 1C
0
Instantaneous output 1 (CUT1) ON count monitor value
Note: The monitor value is only displayed. It cannot be set.
MODE
On2C
0
Instantaneous output 2 (CUT2) ON count monitor value
Note: The monitor value is only displayed. It cannot be set.

Explanation of Functions

Operating Procedures for Twin Timer Function

Items marked with stars (★) can be set using the DIP switch.

OFF Time Range (oFFr)★

Set the time range for the OFF time in the range 0.000 s to 9,999 h. Only settings of type --.-- s (99.99 s), ---.- s (999.9 s), ---- s (9,999 s), and -- min -- s (99 min 59 s) can be made with the DIP switch. Use the operation keys if another type of setting is required.

ON Time Range (onTr)★

Set the time range for the ON time in the range 0.001 s to 9,999 h. Only settings of type --.-- s (99.99 s), ---.- s (999.9 s), ---- s (9,999 s), and -- min -- s (99 min 59 s) can be made with the DIP switch. Use the operation keys if another type of setting is required.

Timer Mode (tMnn)★

Set either the elapsed time (UP) or remaining time (DOWN) mode. In UP mode, the elapsed time is displayed, and in DOWN mode, the remaining time is displayed.

ON/OFF Start Mode (tonM)★

Set the output mode.
Set either flicker OFF start or flicker ON start. (For details on output mode operation, refer to **"Timing Charts" on page 29.**)

Input Signal Width (iFLt)★

Set the minimum signal input width (20 ms or 1 ms) for signal, reset, and gate inputs.
The same setting is used for all external inputs (signal, reset, and gate inputs).
If contacts are used for the input signal, set the input signal width to 20 ms.
Processing to eliminate chattering is performed for this setting.

NPN/PNP Input Mode (inMod)

Select either NPN input (no-voltage input) or PNP input (voltage input) as the input format. Set an NPN input when using a 2-wire sensor.
The same setting is used for all external inputs.
For details on input connections, refer to **"Input Connections" on page 9.**

Display Color (Colr)
(Terminal black model: H5CX-A□ only)

Set the color used for the present value.

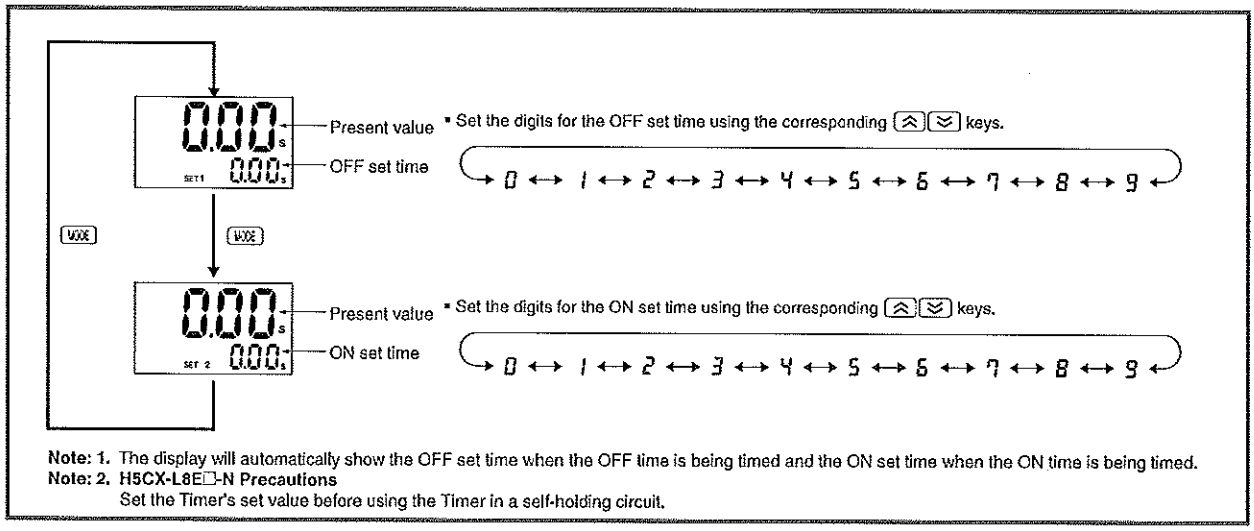
	Output OFF	Output ON
rEd	Red (fixed)	
Grn	Green (fixed)	
orG	Orange (fixed)	
r-G	Red	Green
G-r	Green	Red
r-o	Red	Orange
o-r	Orange	Red
G-o	Green	Orange
o-G	Orange	Green

Key Protect Level (KyPt)

Set the key protect level.
Refer to **"Key Protect Level" on page 32.**

Operation in Run Mode

Operating Procedures for Twin Timer Function



Note: 1. The display will automatically show the OFF set time when the OFF time is being timed and the ON set time when the ON time is being timed.
Note: 2. H5CX-L8E□-N Precautions
Set the Timer's set value before using the Timer in a self-holding circuit.

Present Value and OFF Set Time

The present value is displayed in the main display and the OFF set time is displayed in the sub-display. Set the OFF time.

Present Value and ON Set Time

The present value is displayed in the main display and the ON set time is displayed in the sub-display. Set the ON time.

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