Dryer

EDG Computer Programming
and Operating Instructions

Microprocessor Control

PROG01

abc 0	def 1	ghi 2	START
jkl 3	mno 4	pqrs 5	SINGLE CYCLE
tuv 6	wxyz 7	8	ENTER
UP	9	DOWN	STOP
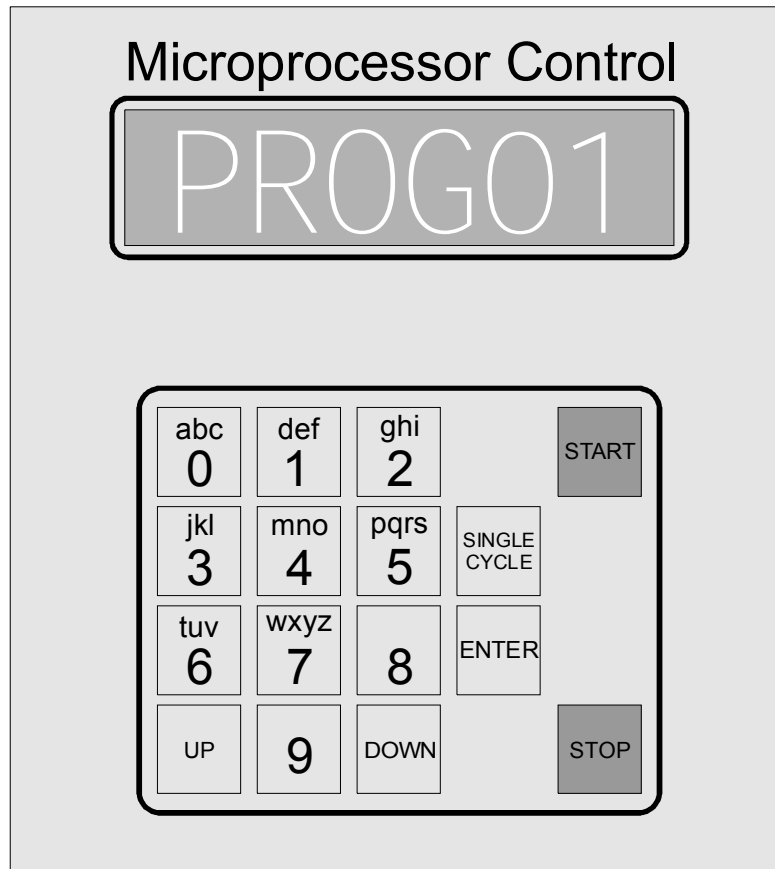
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Introduction

Description

The EDG is equipped with the following features :

>Six-digit alphanumeric display with high brightness (messages longer than 6 digits scroll across the screen)
>Keyboard with 16 keys
>Buzzer for acoustic signaling
>8 opto-isolated digital inputs (on/off)
>6 digital relay outputs
>1 probe for temperature measure
>Data storage in case of power failure

Main functional features

Through the various menus, which can be accessed by typing in the correct password, the user can choose from the following options :

Operator interface language
Operation with temperature in °C or °F
Reverse enable/disable
Coin enable/disable.

In addition, it is possible to name programs so they can give information on the type of fabric the program is configured for (Sheets, Towels, etc).

For details on configuration options please turn to Programming.

I/O signals to and from the dryer

The EDG is equipped with a set of digital inputs and outputs whose function is listed below.

Inputs

1.   Door open
A program will not start if the door is open during start up.
If the door is accidentally opened while a program is running, the program will stop and the display will indicate a diagnostic message. The program restarts once the door is closed and start is pressed.
2. Filter door open
A program will not start if the lint door/drawer is open during start up.
If the lint door/drawer is accidentally opened while a program is running, the program will stop and the display will indicate a diagnostic message.
The program restarts once the door is closed and start is pressed.
3. Depression Alarm
The program will not start when the pressure alarm is active. The EDG uses the cabinet sail switch to determine if the exhaust blower is operational. The sail switch must be open for a program to start, and then be pulled closed by airflow for the program to continue. For this reason, stops and starts too close together in time may not work because of fan inertia. If a program starts and sail switch remains open, an alarm is generated and the buzzer sounds (see chapter "Alarms".
4.   Motor overload
If the motors overload(s) trip during program execution, the program will stop, generating an alarm with relevant diagnostic on the display and the buzzer will sound.
5.   Coin box 1
In the coin box version, this signal indicates that a type 1 coin has been deposited (whose value is configured in the specific field). Not Used.
6.   Coin box 2
In the coin box version, this signal indicates that a type 2 coin has been deposited (whose value is configured in the specific field). Not Used.

Outputs

1.   Gas control unit reset
Not Used in the USA.
2.   Cycle under way
Indicates that a drying cycle is currently under way. This signal remains even when the program is interrupted (through the keyboard or by opening the door).
3.   Blower Autoclean
Each time a program starts, compressed air cleans the blower, preventing lint buildup.
4.   Motor forward
Commands forward direction of the cylinder motor (reversing models only).

Introduction

5.   Motor backward
Commands reverse direction of the cylinder motor (reversing models only).
6.   Blower
Turns on the exhaust blower.
In non-reversing models, this controls both the blower and the cylinder motors.
7.   Heating
On when the cylinder temperature is below the programmed set point.
8.   RFU
Not used in the USA.

Keyboard

The keyboard is equipped with the following keys
0-9 : these keys have a different function depending on the situation.
1.   If you are choosing a program to run, each key corresponds to a program - pressing a key will display the name of the associated program if named (Sheets, Towels, etc.).
2.   If you are entering numerical values, each key inputs the associated number.
1.   If you are entering a program name (therefore an alphanumeric sequence), pressing each key will result in the inputting of the associated values (numbers or letters) in turn. For example, if you want to enter "A", press button "0" twice, if you want to enter "Z", push button "7" five times.
After pressing button "7" five times, if you press it once more another "7" will be generated. If you press it for the eighth time, a "W" is generated and so on, in rotation for all the other keys as well.
        "START" : starts the selected program (both in case of single cycle or pre-set programs) or restarts the program previously interrupted (through STOP or by opening the door).
        "STOP" : this key also carries out different functions if pressed under different operating conditions :
1.   During program execution, pressing this button once suspends the program (with the possibility of restarting it from where it left off), while pressing it twice stops the program for good ;

2.   During programming, this button allows to exit the currently programmed item and returns to the program selection mode. All data entered up to that point will be stored;
3.   Silences the buzzer.
        SINGLE CYCLE : if pressed while the dryer is waiting for a program to be selected, allows to set a simplified program in which the operator can choose both temperature and program length. Please see Section 5.2 - Single Cycle.
        "UP" and "DOWN" : these keys are used during the various configuration phases for the following purposes :
1.   To select the type of currency during the machine's configuration phase (in case of coin box operation) ;
2.   To select the program to modify during the program modification phase ;
3.   To set YES/No values where configuration require such a choice : for example, when you're setting up coin box operation, press UP for YES and press DOWN for NO ;
4.   When inputting a program name or number, pressing DOWN alone will allow you to erase the characters or the numbers displayed at the far right.
        "UP" and "1" : press these two keys simultaneously while the dryer is waiting for program selection to access the password mode. In other words, the board waits for a numeric password, and once this is changed it will be possible to access the various machine and program configuration phases.
        ENTER : below is a list of what can happen when this button is pressed with the control unit operating under different modes:
1.   After selecting a program (without the coin box), pressing this key will start the same program. If this does not occur, it may be that one of the conditions supplied by the inputs is missing. In case of coin box operation, pressing this button starts the machine only after reaching the minimum starting credit required for the selected program;
2.   After suspending program execution (by

Operation

opening the door or by pressing STOP once), pressing this button will restart the program exactly from where it left off ;

3.   Dduring programming phases, pressing this button allows to switch from one parameter to the next.

In particular, when the name of a parameter is displayed, pressing this key displays - and allows to modify - the actual value of the parameter in question. Once you've seen (or changed) the value, pressing ENTER again allows to move on to the next parameter.

If this does not happen after pressing ENTER, it means that the new value is outside the allowed range. In this case, you can correct the value or cancel the change by pressing STOP and halting the programming.

Program selection and execution

To select a program, press one of the 10 numerical keys found on the keyboard.

1.   When you press one of these keys, the name of the associated program will be displayed (it will move across the screen since the max length is 12 characters).

2.   At this point, pressing START allows to start the program. The program name disappears and the current temperature in the drum along with the time remaining until the end of the program (residual time) will be displayed moving across the screen.

Single cycle

When you press the SINGLE CYCLE key, you will be asked to input the length of the drying program and the desired temperature.

1.   Press SINGLE CYCLE : the message "CYCLE TIME" appears (requesting program duration).

2.   Press ENTER : the number "00000" is displayed (default program duration expressed in minutes).

3.   Press DOWN to cancel the zeroes, starting from the left, and then type in the desired number of minutes.

4.   Use the numerical keys to enter the duration of the drying cycle.

5.   Press ENTER : if the number is within the allowed range the message "HEAT" appears (requesting the drying temperature).

6.   Press ENTER : the number "00000" appears (default temperature expressed in °F or °C, depending on machine configuration).

7.   Use the numerical and DOWN keys, as in points 3 and 4, to set the desired temperature.

8.   Press ENTER to confirm the input values. The message "PRESS START" is displayed.

9.   Press START to start the drying cycle. Both the current basket temperature and the time remaining until the end of the cycle are displayed.

Programming

Programming

Programming includes machine configuration (1 or 2 motors, coin box or no coin box), operating ranges (the desired settings - language, times), and lastly the definition of the behavior of each single drying cycle.

All programming phases start by entering the correct password, after which the operator proceeds to enter the desired parameters.

All programming phases can be stopped at any time by pressing STOP. All parameters entered up to that point will be stored, except for the current one.

All temperature range values listed in the following tables are expressed in °C. In case the board is configured for operation in °F, all values will be automatically converted.

Machine configuration

The password required to access this phase is 748. Proceed as follows : press keys UP and 1 at the same time. When the message "PASSWO" is displayed, press ENTER.

The message "00000" appears, press three times the DOWN key to erase three zeroes starting from the right, then type in "748" and press ENTER. Actual programming starts now.

In the following table, programming is summarized with the message that appears on the display, the values allowed when programming after pressing ENTER and the meaning of each parameter.

DISPLAY	ALLOWED VALUES	DESCRIPTION
DISPLA	0..2	Display mode, showing which data will be displayed during the drying cycle. Available values are : 0 Residual time/Temperature 1 Residual time 2 Temperature
GET SN	Yes/No	Coin box operation
INV SN	Yes/No	Reversing Enable. Yes if the machine is equipped with reversing, otherwise No.

Programming

Setting the operating ranges

The password required to access this phase is "916". Proceed as follows : press both keys UP and
1 at the same time. The message "PASSWO" is now displayed, then press ENTER.
The display now shows "00000". Press the DOWN key three times to erase three zeroes starting
from the right and then type in the password "916". Press ENTER. Actual programming starts now.

DISPLAY	ALLOWED VALUES	DESCRIPTION
CELSIUS SN	Yes/No	Yes - Programs and displays in Celsius. No - Programs and displays in Fahrenheit.
ANTICREASE SN	Yes/No	Anti-creases. Enables or disables the anti-wrinkle feature at the end of the program.
CYCLE TIME	0..99 (min)	Cycle time. This parameter specifies duration of the drying cycle.
T ROTATION	10..200 (sec)	Rotation time (only if reversing is enabled). This parameter indicates the maximum duration in seconds of rotation entered in the programs.
T PAUS	10..250 (sec)	Rotation pause time (only if reversing is enabled) This parameter indicates the minimum time that the basket must stop for between one motion reversal and the next.
° HEAT	30..99 (°C)	Heating temperature. Establishes the maximum temperature value that can be programmed.
TIME COOL	0..15 (min)	Cooldown time. This parameter sets the maximum duration of the cool down time for each individual program.
°COOLING	20..50 (°C)	Cool down temperature. The maximum temperature that can be set for each program in order to consider cool down finished.

Programming

Customizing the individual programs

The password required to access this phase is "955". Proceed as follows : press keys UP and 1 at the same time. At this point the message "PASSWO" appears on the display, then press ENTER. The display now shows "00000". Press three times the DOWN key to erase three zeroes starting from the right, then type in the password "955". Press ENTER. Actual programming starts now.

DISPLAY	VALUES ALLOWED	DESCRIPTION
Program selections through the UP and DOWN keys. The various configured programs are displayed. Select the desired one by pressing ENTER.		
LANGUAGE	0..7	Language: 0 English 1 Italian 2 French 3 German 4 Spanish
NAME	12 alphanumeric characters	Enter a new program name This name is displayed when a program is selected by pressing a numeric key, or when the machine turns on again after a power failure occurred during program execution. Press the DOWN key to erase the existing text.
CYCLE TIME	0 .. max. value set in high level programming	Cycle time. This field determines the duration of the drying program. The value is expressed in minutes.
T ROTATION	10.. max. value set in high level programming	Rotation time (only if reversing is enabled) Time in seconds the basket moves (both directions).
T PAUS	min. value set in high level programming... 250	Rotation pause time (only if reversing is enabled) Time in seconds the basket stops between forward and reverse.
° HEATING	30°C ... max. value set in high level programming	Heating temperature Temperature to be maintained inside the basket during the drying phase. In °C or °F, depending on the value entered in field CEL SN in the operating ranges.
COOL TIME	0 .. max. value set in high level programming	Cool down time. Duration (in minutes) of the cooling down phase at the end of drying.
° COOLING	20 °C .. max. value set in high level programming	Cool down temperature Temperature at which the cooling down phase ends after the drying phase. The value can be in °C or °F, depending on the value entered in field CEL SN in high level programming
BUZZER	0 .. 15 (sec)	Buzzer time. Duration (in seconds) of the acoustic signal that indicates program completion (end of the cooling down phase)

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Details

List of phases carried out during program execution

When the user has selected the desired program, START must be pressed to begin the program. In order for this to occur, the heat intake fan must not be running (the EDG must detect the sail switch transitioning from open to closed).
Once the program starts, a set of operations is carried out periodically, regardless of the program phase currently under way. These operations are as follows :

When START is pressed, the first phase to be carried out is the program starting phase.
This consists in cleaning the blower by piloting a jet of compressed air for 3 seconds (optional feature, not present on all machines).
In addition, gas control unit reset is carried out, and the "Dryer Busy" signal turns on. This signal will remain active until the program is completed or interrupted, even during pauses due to opening of the door or single stop.

When this phase ends, the flow of compressed air is cut off and the gas control unit reset signal is turned off. At this point the fan turns on and the actual drying phase begins. Up until now the display shows the name of the selected program.

Heat adjustment is carried out during this phase so that the temperature inside the basket may be kept at the set value, with a 3 °C hysteresis.
The display showing information about the program under way, in other words actual temperature and residual time, is updated every 6 seconds.
In addition, basket movement is started. This, if the machine is equipped with reversing, determines an alternate basket movement according to the times set in the program. In case the machine is not equipped with reversing, the basket is connected to the fan motor which gives it its motion.

The machine moves on to the next phase, cooling down, when the residual time expires.

During the cooling down phase the display shows the message "COOL DOWN".
This phase differs from the drying phase mainly because heat adjustment now ends. Cool down is completed once the relevant temperature set in low level programming is reached, or when the relevant time expires (also set in low level programming), depending on which of the two conditions occurs first.

At the end of the cool down phase the dryer stops, and the "Dryer Busy" signal turns off.
Depending on the setting of parameter "ANTICREASE SN" in high level programming, the end of cooling down determines :
    If ANTICREASE SN was set to YES, the machine moves on to the pause phase which precedes the anti-crease cycle.
    If ANTICREASE SN was set at NO, the program ends.
In both cases the display indicates "END" and the buzzer goes off for a time set in the program.

The anti-crease phase is preceded by a 2-minute pause interval, during which the machine remains inactive.

At the end of this pause the anti-crease cycle begins.
This cycle can last for a maximum of 99 minutes, and it stops every time the door is opened. During this phase the basket moves periodically (with alternate motion if reversal is enabled). In addition, the buzzer goes off every time motion starts.

Once the anti-crease cycle is finished the program is done.

Restart after a program interruption

Every time a program is interrupted (door opened or STOP push-button pressed), the subsequent restart (by pressing ENTER) no longer begins from the starting phase but rather from the drying one.

Details

Restart after a power failure

In case a power failure occurs while a program is running, the following information will be stored in memory : number of the program under way, the residual time, the phase under way and any other data required to restore the operating conditions in force right before the power failure. When the power supply is restored, the display indicates the program interrupted, and the user can press ENTER to start it or STOP to stop it for good.

Specific behavior of the single cycle

The execution of a single cycle is rather simple compared to that of a complete program. In case of single cycle, a group of settings is carried out using standard values (not set by the user), namely:

The basket rotation time is set for 20 seconds
Pause time during basket rotation is also 20 seconds
The cooling down phase lasts 5 minutes or until a temperature of 35°C is reached
At the end of the program the buzzer goes off for 2 seconds
The anti-crease cycle is not carried out at the end of the program

Password list

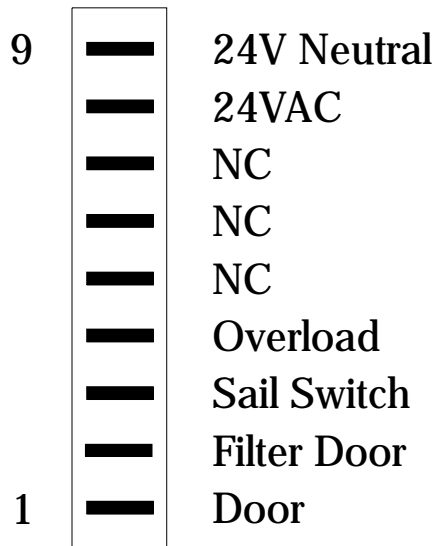Following is a list of available passwords and their purpose:

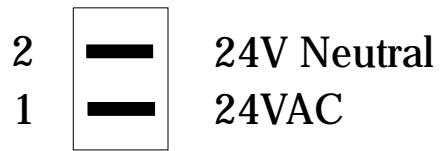| CODE	FUNCTION
748	Access to Machine Configuration
916	Access to Operating Ranges
955	Access to Cycle Programming
750	Reset control to defaults
383	Access to test procedure
743	Display working hour counter
347	Reset working hour counter
666	Set to on signal for reset gas control unit
667	Set to off signal for reset gas control unit

Factory Programs

Program	Drying Time 0-99Min	Rotation 10-200Sec	Pause 10-250Sec	Drying Temp 30-99C (86-210F)	Cooling Time 0-15Min	Cooling Temp 20-35C	Buzzer
0	50	120	5	90C (194F)	10	30C (86F)	5
1	40	120	5	75 (167)	10	30C (86F)	5
2	30	120	5	60 (140)	10	30C (86F)	5
3	30	120	5	45 (113)	10	30C (86F)	5
4	40	120	5	60 (140)	10	30C (86F)	5
5	25	120	5	50 (122)	10	30C (86F)	5
6	25	120	5	45 (113)	10	30C (86F)	5
7	25	120	5	40 (104)	10	30C (86F)	5
8	20	120	5	40 (104)	10	30C (86F)	5
9	1	120	5	36 (97)	10	30C (86F)	5

Connections

EC3
Inputs

9 — 24V Neutral
— 24VAC
— NC
— NC
— NC
— Overload
— Sail Switch
— Filter Door
1 — Door

EC4
Power

2 — 24V Neutral
1 — 24VAC

EC2
Temp Probe

— NC
— NC
— NC
— NC
— Red Wire
— White Wire
1 — Blue Wire

EC1
Outputs

12 — NC
— Heat Call
— Blower
— REV
— Dir Common
— FWD
— Common
— NC
— Blower Clean
— Dryer Busy
— NC
1 — NC
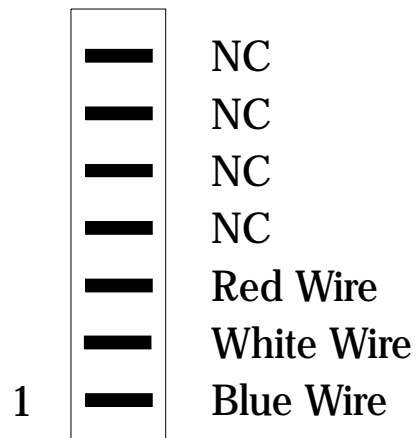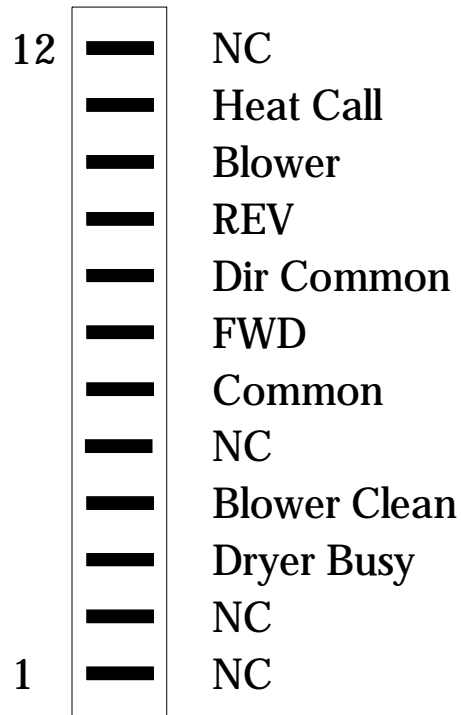
Alarms

TEMP PROBE
Faulty temperature probe, replace.
Part number 370-068.

ALM GAS PRES
Faulty wiring to EC3, terminal 8

ALM OVERLOAD
Motor Overload(s) tripped. Usually
caused by overloading the dryer.

FILTER OPEN
Close the lint filter door/drawer.
Check the lint door/drawer switch

ALM DEPRESSION
Check Blower motor
Check cabinet sail switch
Check that blower rotation is in the
correct direction (3 phase models)
Check for exhaust restriction
Check for make up air restriction

DOOR OPEN
Close the loading door
Check the loading door switch

Notes