

Instruction manual (949741) for detailed explanation of EC405.

Remove the battery insulator will cause the memory carryover system to be inoperative.

If no enter key, the EC405 will be programmed with the last data displayed prior to leaving that mode.

Key is used during programming or reviewing to increase displayed value in left two digits of LED display.

Key is used during programming or reviewing to decrease displayed value in left two digits of LED display.

Key is used during programming or reviewing to increase displayed value in right two digits of LED display.

Key is used during programming or reviewing to decrease displayed value in right two digits of LED display.

To Initiate Programming

Step	Key	Description
1.	TIME	Press and hold one second while pressing and releasing concealed switch by inserting a thin object through opening. 12 Hr is displayed. This indicates that memory is cleared.
2.	TIME	The EC405 clock is programmable to operate in either 12 hour AM/PM (°F) or 24 hour (°C) formats. Select format as desired.
	TIME	12:00 (AM) Sunday is displayed. EC405 is ready for programming. One dot designates AM. Two dots designates PM. Temperature will be displayed in °F.

Specifications: MODEL EC405

CAPACITY PER POLE: 10A RESISTIVE AT 24 Vac, 40VA PILOT DUTY AT 24Vac

INPUT: 24V 50/60Hz TOVA MAXIMUM

24 Volt Wiring

- Wire 24V (+10-15%), 50/60Hz to terminals 1 and 4.
- The factory has installed a jumper between terminals 2 and 3 for your convenience.

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IN CANADA: PARAGON ELECTRIC, P.O. Box 3620, Guelph, Ontario N1H 7H1, Division of AMF CANADA LIMITED

AMF Paragon

PART NUMBER 28019 Rev. 10-84 Made in U.S.A. Printed in U.S.A.

To Review Daylight Savings Time

Step	Key	Description
1.	TIME	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	4.5.01 or first holiday month and date is displayed. Holiday LED will light.
3.	HOLIDAY	Month and date are displayed when daylight savings time goes into effect. Holiday LED will be OFF.
4.	HOLIDAY	Month and date are displayed when daylight savings time is terminated. Holiday LED will be OFF.
5.	RUN	Returns EC405 to normal operation.

To Program Occupancy Schedules

Step	Key	Description
1.	BEGIN	Select occupancy begin function. 1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2 for programming occupancy schedule. 12:00 (PM) Sunday is displayed.
3.	HOLIDAY	Advance to day of week or holiday to be programmed for selected zone. Selected day of week LED will light.
4.	HOLIDAY	Advance to desired hour of occupancy begin time for selected day and zone.

To Program Timed Override Duration

Step	Key	Description
1.	HEATING OPERATION	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2. 0400 is displayed. This indicates a default value of 4 hours of timed override. Override duration is adjustable from 1 hour to 11 hours and 59 minutes.
3.	HOLIDAY	Advance to desired hours of override duration. Hours are displayed in left two digits.
4.	HOLIDAY	Advance to desired minutes of override duration. Minutes are displayed in right two digits.
5.	RUN	Returns EC405 to normal operation. Timed override duration is programmed for selected zone. Return to step 1 to program other zone.

To Activate Timed Override

Step	Key	Description
1.	OVERIDE	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2. Timed override for selected zone starts timing at the moment override is activated if the zone is in the unoccupied mode. Otherwise override starts timing at the end of the programmed occupancy period. Occupied LED will flash during override for selected zone. Return to step 1 to override other zone.

To Program or Review Heating/Cooling Target Temperature (Optional)

Notes:

- The heating target temperature for each zone is recorded by the EC405 three hours after the programmed occupancy begin time. The cooling target temperature for each zone is recorded at the programmed occupancy end time or at the optimized stop time when the optimized stop feature is enabled.
- The heating/cooling target temperature can be a programmed input for each zone, if desired. Refer to general instructions 949741, Introduction Section for application information.
- A dot in the LED display indicates that the target temperature is a programmed input and not a recorded value taken by the EC405.

Step	Key	Description
1.	SETBACK or SETUP	Select setback for programming or reviewing heating target temperature or setup for programming or reviewing cooling target temperature. 1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2. Present setback/setup temperature is displayed in either °F (12 hour) or °C (24 hour).
3.	HOLIDAY	Heating or cooling target temperature is displayed in either °F (12 hour) or °C (24 hour) for selected zone. PROCEED TO STEP — 4 to program a heating or cooling target temperature for selected zone. — 6 if reviewing is complete.
4.	HOLIDAY	Dot in LED display will light. Dot must be lit to adjust the heating or cooling target temperature.

Step	Key	Description
1.	HOLIDAY	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or 2 to program holidays. Holiday LED will light. 4.5.01 is displayed for zone 1. 4.5.01 is displayed for zone 2.
3.	HOLIDAY	Advance to month for single day holiday or first day of holiday duration.
4.	HOLIDAY	Advance to date for single day holiday or first day of holiday duration.
5.	HOLIDAY	4.E.01 is displayed for zone 1. 4.E.01 is displayed for zone 2.
6.	HOLIDAY	Advance to month for single day holiday or last day of holiday duration.
7.	HOLIDAY	Advance to date for single day holiday or last day of holiday duration.
		PROCEED TO STEP — 8 until all holidays are programmed for selected zone. — 9 if programming is complete for selected zone.
8.	HOLIDAY	4.5.02 (4.5.02) 4.5.16 (4.5.16) displayed. Return to step 3.
9.	RUN	Returns EC405 to normal operation. Return to step 1 to program the other zone.

To Program Timed Override Duration

Step	Key	Description
1.	HOLIDAY	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2. 0400 or preheat/precool offset time is displayed for selected zone.
3.	HOLIDAY	Advance to desired preheat/precool offset, -99 to +99 minutes.
4.	HOLIDAY	Select every day or Monday only for offset assignment. All weekday LEDs will light or Monday only LED will flash.
5.	RUN	Returns EC405 to normal operation. Return to step 1 to continue programming preheat/precool offset time.

To Review Preheat/Precool Offset, Optimized Start Time and Variance

Step	Key	Description
1.	OFFSET	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2. 00 or preheat/precool offset time is displayed for selected zone.
3.	HOLIDAY	Optimized start time is displayed from previous optimized start period for selected zone.
4.	HOLIDAY	Minutes of actual variance from the occupancy begin time to reaching target temperature is displayed, -127 to +127 minutes. A positive variance occurs when the target temperature is reached after the start of occupancy. A negative variance occurs when the target temperature is reached before the start of occupancy. This value can be used to determine if more or less preheat/precool is required.
5.	RUN	Returns EC405 to normal operation. Return to step 1 to review other zone.
5.	HOLIDAY	Advance to desired minute of occupancy begin time for selected day and zone. PROCEED TO STEP — 3 to program occupancy begin time for another day. — 6 to program occupancy end time.
6.	END	Select occupancy end function. 1 or 2 is displayed.
7.	ZONE 1 or ZONE 2	Select zone 1 or zone 2 for programming. 12:00 (PM) Sunday is displayed.
8.	HOLIDAY	Advance to day of week or holiday to be programmed for selected zone. Selected day of week LED will light.
9.	HOLIDAY	Advance to desired hour of occupancy end time for selected day and zone.
10.	HOLIDAY	Advance to desired minute of occupancy end time for selected day and zone. PROCEED TO STEP — 8 to program occupancy end time for another day. — 1 to program other zone. — 11 if programming is complete.
11.	RUN	Returns EC405 to normal operation. Occupancy schedules are programmed for zone 1 and zone 2.

— OR —

24 Hour Format

24Hr is displayed. Temperature will be displayed in °C.

00:00 Sunday is displayed. EC405 is ready for programming.

Note: If EC405 is left in a programming mode for more than 60 seconds without pressing a key, the control will automatically return to normal operation with time-of-day display with flashing dots.

To Program Time-of-Day, Day of Week, Month, Date and Year

Step	Key	Description
1.	TIME	Colon will stop flashing. Hour and minute are displayed.
2.	HOLIDAY	Advance to current hour. One dot designates AM; two dots designate PM for 12 hour format only.
3.	HOLIDAY	Advance to current minutes.
4.	HOLIDAY	Advance to current day of week.
5.	TIME	Press a second time to set month and date.

6.	HOLIDAY	Advance to current month. Month is displayed in left two digits.
7.	HOLIDAY	Advance to current date. Date is displayed in right two digits.
8.	TIME	Press a third time to set year.
9.	HOLIDAY	Advance to current year. Year is displayed in right two digits.
10.	RUN	Returns EC405 to normal operation. Dot(s) will begin flashing and control will keep time. Time, day, month, date and year are programmed.

To Review Month, Date and Year

Step	Key	Description
1.	TIME	Colon will stop flashing. Hour and minute are displayed.
2.	TIME	Month and date are displayed.
3.	TIME	Year is displayed.
4.	RUN	Returns EC405 to normal operation.
3.	HOLIDAY	Increase or decrease displayed temperature to correspond to actual indoor temperature for selected zone, up to ± 7°F (± 4°C).
4.	RUN	Returns EC405 to normal operation. Return to step 1 to calibrate other sensor.

To Review Indoor Temperature Profile

Step	Key	Description
1.	INDOOR	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2. Present indoor temperature in °F (12 hour) or °C (24 hour) is displayed for selected zone.
3.	HOLIDAY	12: AM (00:) through 11: PM (23:) is displayed.
4.	HOLIDAY	Indoor temperature in °F (12 hour) or °C (24 hour) is displayed. Repeat steps 3 and 4 until review is complete for selected zone.
5.	RUN	Returns EC405 to normal operation. Return to step 1 to review other zone.

To Program Optimized Stop

- To program optimized stop feature, place optimized stop switch in ON position. Switch is located behind face plate.
- If optimized stop is not desired, place optimized stop switch in OFF position.
- Maximum optimized stop time is two hours before end of occupancy.
- No other programming is needed.

To Activate External Timed Override

- A normally open SPST momentary switch (not provided) is required for each zone. Wire a switch between terminals 5 and 6 to override zone 1 and wire another switch between terminals 8 and 10 to override zone 2.
- Close switch for momentary override. Timed override starts timing at the moment override is activated if the zone is in the unoccupied mode of the programmed occupancy period and extends the end of the programmed occupancy period and extends the end of the programmed occupancy period.

To Program Manual Setback

Step	Key	Description
1.	MANUAL	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2. Unoccupied LED will flash for selected zone. The zone will remain up in manual setback mode until cleared by pressing the RUN key. Return to step 1 to setback other zone.

To Clear Timed Override, External Override or Manual Setback

Step	Key	Description
1.	RUN	Returns both zones of the EC405 to normal operation.

To Calibrate Indoor Sensor

Step	Key	Description
1.	INDOOR	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2. Present indoor temperature in °F (12 hour) or °C (24 hour) is displayed for selected zone.

To Program Daylight Savings Time

Notes:

- The EC405 will automatically adjust for daylight savings time at 2:00 AM (02:00) on the dates entered.
- On November 1st the EC405 will automatically adjust the Spring and Fall daylight savings dates for the next year.

Step	Key	Description
1.	HOLIDAY	1 or 2 is displayed.
2.	ZONE 1	4.5.01 or first holiday month and date is displayed. Holiday LED will light.
3.	HOLIDAY	5P r (Spring) is displayed. Holiday LED will be OFF.
4.	HOLIDAY	Advance to month daylight savings time goes into effect.
5.	HOLIDAY	Advance to date daylight savings time goes into effect.
6.	HOLIDAY	Month and date are entered. FALL is displayed. Holiday LED will be OFF.
7.	HOLIDAY	Advance to month daylight savings time is terminated.
8.	HOLIDAY	Advance to date daylight savings time is terminated.
9.	RUN	Returns EC405 to normal operation. Daylight savings time is programmed.

2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2. 00 or preheat/precool offset time is displayed for selected zone.
3.	HOLIDAY	Advance to desired preheat/precool offset, -99 to +99 minutes.
4.	HOLIDAY	Select every day or Monday only for offset assignment. All weekday LEDs will light or Monday only LED will flash.
5.	RUN	Returns EC405 to normal operation. Return to step 1 to continue programming preheat/precool offset time.

To Review Occupancy Schedules

Step	Key	Description
1.	BEGIN or END	Select occupancy begin or end function. 1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	shown.
3.	HOLIDAY	Advance to next day of week or holiday to be reviewed. Continue to press HOLIDAY key until week is reviewed. Return to step 1 until review is complete.
4.	RUN	Returns EC405 to normal operation.

Notes:

- EC405 can be programmed with up to 16 holiday durations and/or single day holidays for each zone.
- 4.5. (zone 1) and 4.5. (zone 2) are abbreviations for holiday start dates. 4.E. (zone 1) and 4.E. (zone 2) are abbreviations for holiday end dates.
- Single day holidays are programmed with the last day being the same as the first.
- To clear a holiday, advance month and date to 00 4.5.01 (4.5.01) 4.5.16 (4.5.16) and 4.E.01 (4.E.01) 4.E.16 (4.E.16) will be displayed.

Step	Key	Description
5.	HOLIDAY	Increase or decrease to desired heating or cooling target temperature.

Note 1: The heating target temperature entered must be greater than the entered heating setback temperature and less than the cooling target temperature.

Note 2: The cooling target temperature entered must be less than the entered cooling setup temperature and greater than the heating target temperature.

To Program Holidays

Notes:

- The beginning of start-up for heating or cooling can be advanced or retarded for each zone without affecting the ventilation start time by ± 99 minutes.
- If the variance to reaching target temperature is positive (+1 to +127 minutes) then a positive offset value should be entered.
- If the variance to reaching target temperature is negative (-1 to -127 minutes) then a negative offset value should be entered.
- A positive offset increases the time spent in preheat/precool. A negative offset decreases the time spent in preheat/precool.

To Program Preheat/Precool Offset

Step	Key	Description
1.	OFFSET	1 or 2 is displayed.

PROGRAMMING INSTRUCTIONS

MODEL EC405

AMF Paragon

6.	HOLIDAY	Advance to current month. Month is displayed in left two digits.
7.	HOLIDAY	Advance to current date. Date is displayed in right two digits.
8.	TIME	Press a third time to set year.
9.	HOLIDAY	Advance to current year. Year is displayed in right two digits.
10.	RUN	Returns EC405 to normal operation. Dot(s) will begin flashing and control will keep time. Time, day, month, date and year are programmed.

To Review Month, Date and Year

Step	Key	Description
1.	TIME	Colon will stop flashing. Hour and minute are displayed.
2.	TIME	Month and date are displayed.
3.	TIME	Year is displayed.
4.	RUN	Returns EC405 to normal operation.
3.	HOLIDAY	Increase or decrease displayed temperature to correspond to actual indoor temperature for selected zone, up to ± 7°F (± 4°C).
4.	RUN	Returns EC405 to normal operation. Return to step 1 to calibrate other sensor.

To Review Indoor Temperature Profile

Step	Key	Description
1.	INDOOR	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2. Present indoor temperature in °F (12 hour) or °C (24 hour) is displayed for selected zone.
3.	HOLIDAY	12: AM (00:) through 11: PM (23:) is displayed.
4.	HOLIDAY	Indoor temperature in °F (12 hour) or °C (24 hour) is displayed. Repeat steps 3 and 4 until review is complete for selected zone.
5.	RUN	Returns EC405 to normal operation. Return to step 1 to review other zone.

To Program Optimized Stop

- To program optimized stop feature, place optimized stop switch in ON position. Switch is located behind face plate.
- If optimized stop is not desired, place optimized stop switch in OFF position.
- Maximum optimized stop time is two hours before end of occupancy.
- No other programming is needed.

To Review Holidays

Notes:

- Single day holidays are shown as durations with the last day being the same as the first.

Step	Key	Description
1.	HOLIDAY	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2 to review holidays. Holiday LED will light. Month and date are displayed first day of holiday duration for selected zone.
3.	HOLIDAY	Month and date are displayed for last day of holiday duration for selected zone. Continue to press HOLIDAY key to review other holidays.
4.	RUN	Returns EC405 to normal operation. Return to step 1 to review the other zone.

NOTE: A hierarchy exists when programming temperature setpoints. All temperature setpoint entries are controlled by the EC405 and follow this hierarchy. The EC405 will not allow this hierarchy to be changed.

HEAT SETBACK (less than) HEAT TARGET (less than) COOL TARGET (less than) COOL SETUP

To Program Setback Temperature

Step	Key	Description
1.	SETBACK	1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2 for programming setback temperature. Present setback temperature is displayed in either °F (12 hour) or °C (24 hour).
3.	HOLIDAY	Increase or decrease setback temperature. Setback temperature entered must be less than heating target temperature.
4.	RUN	Returns EC405 to normal operation. Setback temperature is programmed for selected zone. Return to step 1 to program other zone.

To Program Setup Temperature

Step	Key	Description
1.	SETUP	Select setup function. 1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	Select zone 1 or zone 2 for programming setup temperature. Present setup temperature is displayed in either °F (12 hour) or °C (24 hour).
3.	HOLIDAY	Increase or decrease setup temperature for selected zone. Setup temperature entered must be greater than cooling target temperature.
4.	RUN	Returns EC405 to normal operation. Setup temperature is programmed for selected zone. Return to step 1 to program other zone.

To Review Occupancy Schedules

Step	Key	Description
1.	BEGIN or END	Select occupancy begin or end function. 1 or 2 is displayed.
2.	ZONE 1 or ZONE 2	shown.
3.	HOLIDAY	Advance to next day of week or holiday to be reviewed. Continue to press HOLIDAY key until week is reviewed. Return to step 1 until review is complete.
4.	RUN	Returns EC405 to normal operation.

To Program Holidays

Notes:

- EC405 can be programmed with up to 16 holiday durations and/or single day holidays for each zone.
- 4.5. (zone 1) and 4.5. (zone 2) are abbreviations for holiday start dates. 4.E. (zone 1) and 4.E. (zone 2) are abbreviations for holiday end dates.
- Single day holidays are programmed with the last day being the same as the first.
- To clear a holiday, advance month and date to 00 4.5.01 (4.5.01) 4.5.16 (4.5.16) and 4.E.01 (4.E.01) 4.E.16 (4.E.16) will be displayed.

Step	Key	Description
5.	HOLIDAY	Increase or decrease to desired heating or cooling target temperature.

Note 1: The heating target temperature entered must be greater than the entered heating setback temperature and less than the cooling target temperature.

Note 2: The cooling target temperature entered must be less than the entered cooling setup temperature and greater than the heating target temperature.

To Program Preheat/Precool Offset

Notes:

- The beginning of start-up for heating or cooling can be advanced or retarded for each zone without affecting the ventilation start time by ± 99 minutes.
- If the variance to reaching target temperature is positive (+1 to +127 minutes) then a positive offset value should be entered.
- If the variance to reaching target temperature is negative (-1 to -127 minutes) then a negative offset value should be entered.
- A positive offset increases the time spent in preheat/precool. A negative offset decreases the time spent in preheat/precool.

Step	Key	Description
1.	OFFSET	1 or 2 is displayed.

Occupancy Schedule

OCCUPANCY	SUN	MON	TUE	WED	THU	FRI	SAT	HOL
ZONE 1	BEGIN							
	END							
ZONE 2	BEGIN							
	END							

