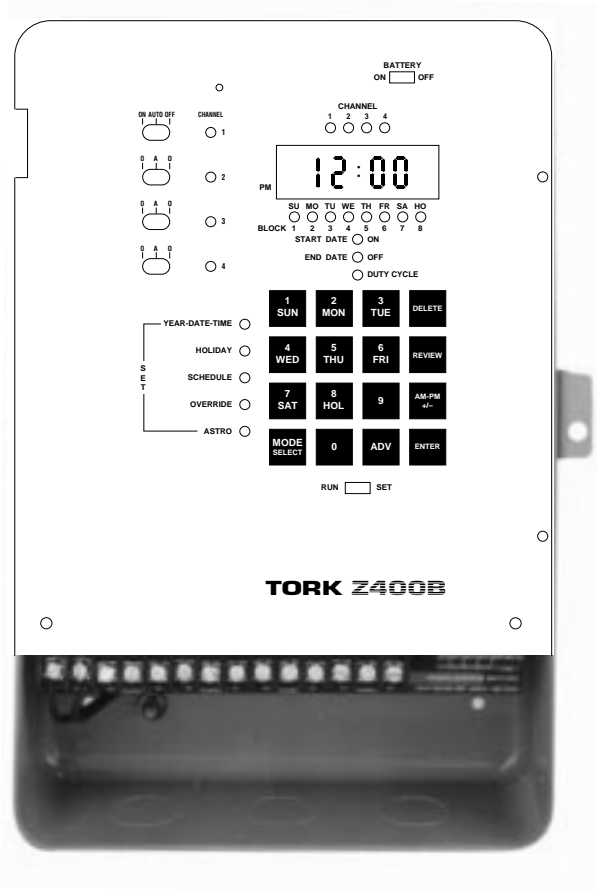


TORK Z400B



OPERATING & INSTALLATION GUIDE

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BATTERY
ON OFF

ON AUTO OFF

CHANNEL

CHANNEL

1 2 3 4

0 A 0

1

PM

12:00

0 A 0

2

SU MO TU WE TH FR SA HO

0 A 0

3

BLOCK 1 2 3 4 5 6 7 8

START DATE ON

END DATE OFF

DUTY CYCLE

YEAR-DATE-TIME

1 SUN 2 MON 3 TUE DELETE

HOLIDAY

4 WED 5 THU 6 FRI REVIEW

SCHEDULE

7 SAT 8 HOL 9 AM-PM +/-

OVERRIDE

MODE SELECT 0 ADV ENTER

ASTRO

S
E
T

RUN SET

TORK Z400B

TORK Z400B INSTALLATION GUIDE

1. Make sure unit is grounded (earth ground).
2. If remote overrides are used, make sure these unpowered wires are not run in the same conduit as the load wires or supply voltage for the unit.
3. Controller must have its own power source, i.e., no outlets or other loads attached to the same supply source as the controller. Supply wire (hot) must be run separately from load wire. Do not jump H terminal to load side. Controller shall not be placed in any other enclosure other than its' own or warranty will be *void*. Consult factory for outdoor applications.
4. The controller is to be installed where temperatures do not exceed 120°F or below 32°F. For trouble free operation it should not be exposed to vibration, dust, corrosive sprays or condensing atmospheric conditions.
5. Control relays are SPDT dry contacts (unpowered) with LED indication when relay is energized (when common and normally open close).
6. To install unit open front cover to the left and lift off to remove.
7. Make sure to mount unit so that it is at a convenient eye level for viewing display and operating key board.
8. Place unit at desired location and mark center of key hole on back of enclosure, using #10 sheet metal screws or other suitable fastening device.
9. Hang enclosure by key hole, locate lower left and right mounting holes and fasten using 2 additional screws.
10.
 - A. Use knockouts on bottom of enclosure for conduit connections.
 - B. Do not run any wires from the back of the board.
11. Connect all your load wires and identify them on the supplied schedule sheet.
12. Connect your dedicated 120 VAC line to the left hand side of your terminal board marked Hot and Neut. *Note. Be sure unit is grounded.* (Convenient ground terminal is located at the bottom back of the case.) Do not jump H to any other terminal.
13. Slide Battery Switch to "ON".

The controller is now ready for scheduling.

Please refer to the users instruction portion of this manual for scheduling instructions.

Please see additional instructions provided to change from standard to automatic daylight savings.

For circuits with high electrical noise, utilize the surge suppressors (supplied) across the switched terminals.

Z400B

OPERATING GUIDE

FEATURES

Four Channels	Independent scheduling for each channel
Duty Cycling:	OFF/ON duration 1 to 99 minutes
365 Day Holiday:	Scheduling 40 holiday dates and 8 block holidays 1 year in advance
Remote Overrides:	User programmable 1 minute to 16 1/2 hours — displayed in minutes
Astronomic ON/OFF:	Latitude 10° to 60° both hemispheres, assignable to any or all channels
256 Set Points:	Can be distributed in any number to any or all channels.

PLEASE READ THE ENTIRE MANUAL BEFORE PROCEEDING TO SET SCHEDULES. IT IS ADVISABLE TO USE SCHEDULE SHEETS AT BACK OF MANUAL BEFORE PROGRAMMING THE Z400B.

KEY FUNCTIONS

BATTERY SWITCH

Slide to "ON" before any scheduling is made.

RUN-SET Slide Switch

Allows the user to choose in the RUN MODE the function that will be reviewed. In the SET MODE the MODE SELECT key will allow the user to step through or choose the functions to be set or changed. i.e. Schedule, Astro, etc. Appropriate light indicator will allow the user to know what function is being accessed.

REVIEW

In the RUN MODE, the REVIEW KEY serves to review the functions available in the unit by stepping through it. In the SET MODE, the REVIEW KEY serves to display the entries that may be either left alone or deleted.

DELETE

The SET MODE allows the user to DELETE any entries while reviewing.

ADVANCE (ADV)

In the SET MODE, the ADV KEY serves as a cursor in order to move through the information displayed in the front panel. It is a "STEP" key that allows you to move through the different data that was entered, such as channels, time of operation, days of the week, etc.

ENTER

Sets the information being entered into the unit's memory.

PROGRAMMING SUMMARY

RUN MODE

Displays the current time (AM/PM format only), day of week, and channel status as per schedule. In this mode, the user can review all the following menus without accidental modification:

YEAR DATE TIME

HOLIDAY

SCHEDULE

OVERRIDE

ASTRO

SET MODE

In the SET MODE, flashing LED's guide user at the appropriate times, to enter, change, review or delete data in the five modes listed above. A flashing channel LED, for example, is asking the user to enter a new channel # or use the one that is flashing. Also, a pair of flashing colons are asking for data entry into display which could be year, date, time, etc. This feature is the keynote to programming the unit.

Another feature is that any new entry or changes (note that data entry/change is possible in the SET MODE) will become active only when the SET/RUN switch is moved from SET to RUN position. However any existing entries would continue to be executed while the SET/RUN switch was in the SET position.

After setting schedules and other data the SET/RUN switch is moved to the RUN position. The unit will then execute the true status of the circuits and no manual ON/OFF is necessary.

The same will happen when the user sets a new time; the circuit status would be current immediately. (Look back feature).

Any time a key is pressed an audible signal is generated (one beep). Every time the entry or information is entered into the unit's memory a double beep signal will be generated. Errors will generate a multiple-beep signal.

In order for any channel to execute its schedule, the (ON-AUTO-OFF) switch must be in the AUTO POSITION.

SETTING THE SCHEDULES

Be sure battery switch is ON.

It is advisable to first layout schedules on the schedule sheets supplied.

IMPORTANT: TO SET DAYLIGHT SAVINGS TIME, PLEASE SEE ADDENDUM ON PAGE 7 AND EXECUTE PRIOR TO SETTING SCHEDULES.

If the unit was started for the first time or if memory is empty, the display shows a flashing SUN 12:00.

If the unit display shows a specific time indicating it retained old time and data, then proceed with DATE TIME SET or press the reset button to rid the unit of all data and start fresh. (See page 1 — clear all memory.) Use a ballpoint pen or end of a paper clip. Press gently.

Move the SET/RUN switch to the SET position. Be sure battery switch is on.

YEAR DATE TIME SET

Press MODE SELECT until YEAR DATE TIME LED is lit constantly (no flashing). The colon will be flashing and 4 zeros (00:00) will be displayed. Sequence of entries should be: YEAR, MONTH/DATE, TIME. Each one is considered a partial entry — together, they constitute a complete entry.

YEAR 1 9 8 6 — Press ADVANCE
MONTH/DATE 0 9 1 7 — Press ADVANCE (Correct day is lit now)
TIME 0 8 1 5 — Press AM or PM, then press ENTER (you will hear a double beep)

PM is on lower left screen, use AM/PM to change. When no light is on, it indicates AM time.

YEAR DATE TIME SET LED is flashing again.

NOTES

If an error is made while entering one of the partial entries (e.g., you keyed in the year 1925 but ADV is yet to be pressed), just key in the correct year and press ADV.

TIME is the final partial entry in this sequence and the ENTER key should be pressed. If ADV is pressed, year will appear again. At this point, year can be changed or, simply by pressing ADVANCE, MONTH/DATE could be brought on the display and changed. Similarly by repeatedly pressing ADVANCE any partial entry could be brought back and changed. But always press ENTER at the last partial entry. Time of Day is last partial entry.

HOLIDAY SET

1 Block Holidays

Press the MODE SELECT key until the HOLIDAY LED is lit constantly (no flashing). The display will show BLn and the BLOCK 1 LED will be flashing. If you want to program the block, press ENTER.

The display will show 00:00 and the colon will be flashing. The BLOCK 1 LED will be lit along with the START-DATE LED. Use the numbered keys to program the start date for the block (Month & Day). Press ADV.

The display will show the same as before except that the END DATE LED will be lit instead of the START DATE LED. Program the end date for the block (Month & Day). Press ENTER.

The same block number will be displayed along with its flashing LED. Select the next block number to be programmed and proceed as before. (You can program up to 8 blocks.)

NOTES: If you do not want to program any more block holidays, press ADV while the block number is being displayed and the unit will go to the Single-Day Holiday scheduling screen. (See Below)

Block dates can not overlap one another. An error beep will sound. For example, if January 15th - 25th is one block, you cannot begin another block from January 20th to February 5th.

2 Single-Day Holidays

Press the MODE SELECT key until the HOLIDAY LED starts to flash. Press the key once more and the HOLIDAY LED is constantly lit.

The display will show BLn and the BLOCK NUMBER 1 LED will be flashing.

Press the ADV key to pass block programming and go to single day holiday programming. The display will show 00:00 with the colon flashing.

Use the numbered keys to program the date. Press ENTER. Continue in the same manner to program up to 40 other dates.

Press the MODE SELECT key when you have entered the last date.

NOTES: Once you have passed the block holiday section, you will not be able to program more block holidays unless you use the MODE SELECT key to enter the Holiday mode again.

A block holiday with the same start and end date will be treated as a single day holiday. For example, if you are out of single day holidays you can use a block for December 25 - December 25.

All holidays (single and block) are selected when "HO" is selected in the schedule mode.

Holidays may be entered in any order; unit will place them chronologically. Up to 40 Holiday dates and 8 blocks may be set a year in advance.

SCHEDULE SET

Press MODE SELECT key to advance to SCHEDULE SET. LED will be flashing. Press MODE SELECT button again and the SCHEDULE LED will be lit constantly. The channel #1 LED will be flashing indicating a channel to be scheduled must be selected first. The display shows a default time of 00:00, Monday ON event. The sequence of entry is:

Press channel # desired (1,2,3, or 4) from main keyboard — press ADVANCE. Channel LED will be "ON" constantly. Colons start flashing on indicating time to be entered. Enter time of first operation and indicate AM/PM. If PM LED in display is lit, ON or OFF time will be in the PM. Press

TO CHANGE OR DELETE OVERRIDES

1. With RUN/SET switch in SET, press mode select until override LED flashes. Press again and LED is on constantly.
2. Press REVIEW and Channel #1 LED flashes; continue to press review until the desired channel LED flashes.
3. Now press ADV until the colon is flashing. At this time, enter the override time you desire and press enter.
4. To delete an entry, press REVIEW until the desired channel LED is flashing, and press delete.

NOTE: When channel is in override ON Time, it can be cancelled any time by pressing the button again. The internal timer will reset. If the override button is pressed again, override time will start from it's original amount of scheduled time.

ASTRONOMIC SET — NORTH OR SOUTH LATITUDES

1. PRESS MODE SELECT UNTIL THE ASTRO LED IS FLASHING. PRESS AGAIN TO HAVE LED LIT CONSTANTLY.
2. Channel 1 LED is flashing and display shows Ln:00/
3. The sequence for any Channel to be ASTRO ON/OFF is:
4. Channel # PRESS CHANNEL NUMBER BUTTON, THEN ADV (colons flashing now)
5. Press AM/PM to change from northern to southern latitude and vice versa if needed.
6. Press numbers to desired latitude value of 10° to 60°. If not known, call local weather bureau.
7. Set to nearest degree including odd numbers, then press ADV.
8. SUNSET TIME — Display now shows the sunset time for the date the unit was set. Note that Astronomic time (sunset or sunrise) are always shown as STANDARD TIME. Days of week will flash, press day buttons to eliminate days and/or HOLIDAYS. Press ADV ONLY.
9. Display now shows :00 with flashing colons and ON LED is lit.

ASTRONOMIC ON TIME OFFSET

Key in the desired on-time offset 00 to 99 minutes, press AM/PM for plus or minus offset. Then press ADV. Example: 7:30 PM Astro ON plus 15 min. will be ON at 7:45 PM.

SUNRISE TIME — Display now shows the sunrise time for the day the unit is set to. PRESS ADV ONLY.

Display shows :00 with flashing colons and OFF LED lit.

ASTRONOMIC OFF TIME OFFSET

1. Press buttons to the desired OFF time OFFSET 00 to 99 minutes, press AM/PM for plus or minus OFFSET. (see above)

2. Press ENTER to set ASTRO settings to memory. Now next channel to be programmed begins to flash.

ASTRONOMIC WITH TIME SCHEDULE

If you should decide to have, for example, ASTRO ON Time and schedule OFF do the following:

1. Follow above ASTRO SETTING for a particular CHANNEL.
2. Then, when you have done so, go back and follow SCHEDULE SET procedure to enter an OFF/ON schedule for that CHANNEL.
3. EXAMPLE
 - a. ASTRO ON
 - b. TIME SWITCH OFF
 - c. TIME SWITCH ON
 - d. ASTRO OFF

Channel may be SET for Astro ON and Time OFF only.

NOTE: When reviewing Astro settings, sunrise and sunset are displayed in standard time not daylight savings. REMEMBER! There is no relation between daylight savings and sunrise and sunset.

REVIEWING THE SETTINGS

REVIEW IN THE SET MODE

Press the MODE SELECT until the sub mode to be reviewed has its LED FLASHING. Press REVIEW key and the first item will be displayed in the REVIEW MODE, although not indicated by any LED. You are able to review, change and delete, where needed.

DATE TIME REVIEW

Press REVIEW WHEN DATE TIME LED IS FLASHING. YEAR is displayed, key in the new year and press ADV or simply press the review button to check the month/date.

You can repeat this as many times as necessary and then, if any changes were made, press ENTER when time is displayed. If no changes were made exit by pressing MODE SELECT.

IN THE REVIEW MODE OBSERVE THE FOLLOWING:

1. Press ADV after CHANGING a partial entry.
2. Press REVIEW to get to the next partial entry on display, and press ENTER at the last partial entry to put into the memory.
3. This remains the same for changes in any of the sub modes.

While REVIEW/MODIFYING in SCHEDULE SET, if you want to start reviewing a new channel, press the desired channel button, the CHANNEL LED will be flashing.

This happens when you press REVIEW while the SCHEDULE LED is flashing or when the next entry appears on the screen.

Now press the CHANNEL# you wish to review and press REVIEW. The first chronological entry in that CHANNEL schedule will be displayed. Colon in display is now flashing. If you wish to start reviewing from a certain time onwards,

key in the time onwards of which you want to review and press REVIEW or only press REVIEW, then the same event stays on the display and channel LED starts flashing.

To make any changes in REVIEW MODIFY, once the channel indicator is flashing, press ADV until the partial entry which you want to modify is flashing, i.e. Time, ON/OFF events, etc. Then modify your entry. Then advance to the end of a partial entry and press ENTER.

Example: 1987 ADVANCE
 0606 ADVANCE
 10:00 AM ENTER

NOTE THAT IN BOTH CASES ABOVE, THE ENTRY WHICH WAS ON THE DISPLAY BEFORE IS NOT AFFECTED AT ALL.

Reviewing from a different CHANNEL is done the same way as above for both override and ASTRO feature.

REVIEW IN THE RUN POSITION

When the current time is being displayed, press REVIEW and the YEAR-DATE-TIME SET LED begins to flash. This is the PROTECTED REVIEW, although no special LED indicates this.

ONLY REVIEW OF DATA IS PERMITTED AND NO CHANGES.

The review process is exactly the same as in the SET except you cannot press the advance key because no changes are permitted.

At any time to return to standard run, press the ENTER KEY.

SPECIFICATIONS

POWER INPUT120/240VAC -15% to +10%VAC
 50//60 Hz

Power Consumption ...12VA Max.

Output Circuits.....SPDT Unpowered Contacts

Contact Rating.....10 Amps Resistive @ 120/240VAC
 10 Amps Resistive @ 30 VDC
 1/4 H.P. @ 120VAC
 1/3 HP @ 240 VAC
 360 Watts Tungsten @ 120VAC

Operating Temp0° to +50°C (-35° to +50°C optional)
 32°F to 120°F (-30° to +120°F)
 (optional)

Battery BackupLithium, 6 months cumulative

EnclosureNEMA 1 Surface Mount

Weight6.5 lbs. (2.95 kg.)

ColorBeige

Dimensions.....7 3/4" W x 12" H x 3 1/4" D

ADDENDUM

PLEASE FOLLOW THESE PROCEDURES TO SET DAYLIGHT SAVINGS

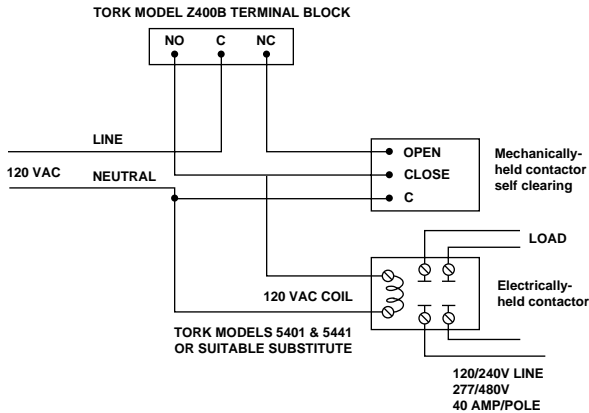
1. Place run/set switch in the set position.
2. Press MODE SELECT key until HOLIDAY LED is lit constantly. **OLn** shows on display. Block #1 is flashing.
3. Press ADV key and 00:00 will show on display.
4. Key in the start date of DAYLIGHT SAVINGS.
5. Press AM/PM key until *ON* LED is lit . . . then press ENTER.
6. Colon in display is now flashing.
7. Key in the END of DAYLIGHT SAVINGS . . . MONTH/DAY.
8. Press AM/PM key. *ON* LED is now lit.
9. Press AM/PM KEY AGAIN. *OFF* LED is lit.
10. Press ENTER and the unit is now set for DAYLIGHT SAVING.
11. *PLEASE NOTE:* If no dates are entered into the unit for DAYLIGHT SAVINGS the unit will automatically revert to STANDARD TIME.
12. If only one date is entered into the unit, i.e. the beginning date or end date unit will again revert back to STANDARD TIME.

REMEMBER TO ENTER BOTH BEGINNING AND END DATES TO INSTITUTE AUTOMATIC DAYLIGHT SAVINGS.

Z400B

APPLICATION NOTES

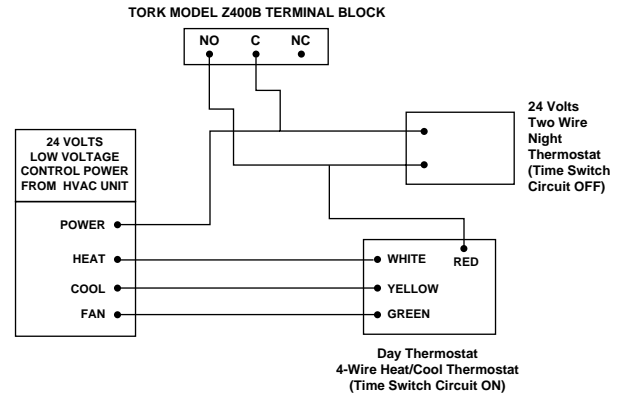
TYPICAL INTERFACE WITH TORK CONTACTORS



Model 5401 - DPST

To control 120 volt circuits where increased voltage and/or amperage switching is necessary, close or remote from controller. Can switch up to 40 amps per pole from 120VAC to 480VAC — one or two circuits simultaneously. Indoor-outdoor enclosure.

TYPICAL INTERFACE WITH DAY/NIGHT THERMOSTAT



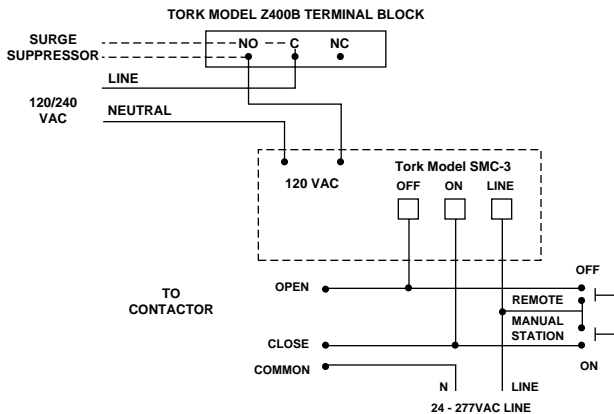
A typical wiring diagram of how to use the Z400B for night set-back for heating or night set-up for cooling.

Winter Set-back: Set 2-wire night thermostat at 55°F. When control is "OFF" temperature will not go below 55°.

When control is "ON" (day hours) day thermostat set at 70° to 72° will override night thermostat.

Summer Set-up: Night thermostat is usually set at 90° to 95°. When control turns "ON", day thermostat will override night setting and cool to (76° to 78°) day setting.

TYPICAL INTERFACE WITH MOMENTARY CONTACT ADAPTER

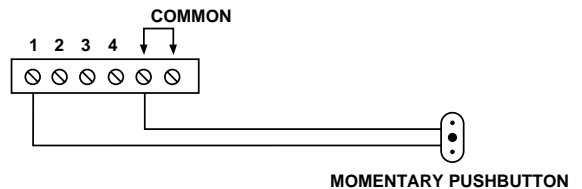


Model SMC-3D

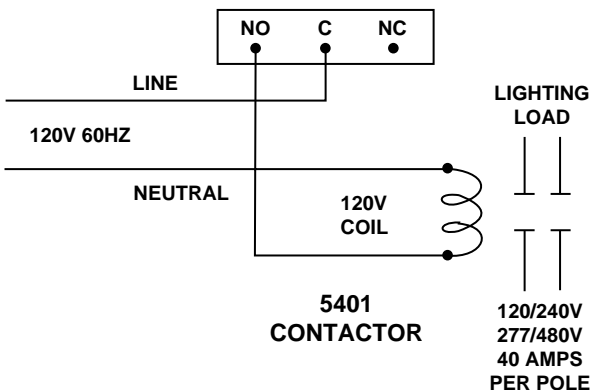
Momentary contact adapter 120V input maintained contact converts to SPDT pulsed (2 seconds) circuits. Pulsed switching circuit will control 24VAC up to 277VAC.

REMOTE TIMED OVERRIDES

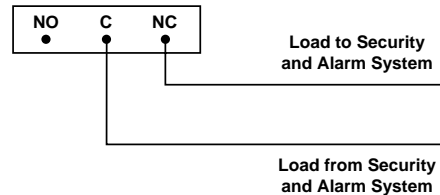
TORK MODEL Z400B TERMINAL BLOCK



TORK DIGITAL TERMINAL BLOCK



TORK DIGITAL TERMINAL BLOCK



LOAD # _____

ASTRONOMIC

LATITUDE	S	M	T	W	T	F	S	H	SUNSET OFFSET	SUNRISE OFFSET

SUNSET TO SUNRISE SCHEDULE

NO.	TIME	S	M	T	W	T	F	S	H	ON	OFF	DUTY CYCLE	
												OFF MIN	ON MIN

REMOTE OVERRIDE TIME _____ MINUTES

LOAD # _____

ASTRONOMIC

LATITUDE	S	M	T	W	T	F	S	H	SUNSET OFFSET	SUNRISE OFFSET

SUNSET TO SUNRISE SCHEDULE

NO.	TIME	S	M	T	W	T	F	S	H	ON	OFF	DUTY CYCLE	
												OFF MIN	ON MIN

REMOTE OVERRIDE TIME _____ MINUTES

LOAD # _____

ASTRONOMIC

LATITUDE	S	M	T	W	T	F	S	H	SUNSET OFFSET	SUNRISE OFFSET

SUNSET TO SUNRISE SCHEDULE

NO.	TIME	S	M	T	W	T	F	S	H	ON	OFF	DUTY CYCLE	
												OFF MIN	ON MIN

REMOTE OVERRIDE TIME _____ MINUTES

LOAD # _____

ASTRONOMIC

LATITUDE	S	M	T	W	T	F	S	H	SUNSET OFFSET	SUNRISE OFFSET

SUNSET TO SUNRISE SCHEDULE

NO.	TIME	S	M	T	W	T	F	S	H	ON	OFF	DUTY CYCLE	
												OFF MIN	ON MIN

REMOTE OVERRIDE TIME _____ MINUTES

LOAD # _____

DESCRIPTION _____

NO.	TIME	S	M	T	W	T	F	S	H	ON	OFF	DUTY CYCLE	
												OFF MIN	ON MIN

REMOTE OVERRIDE TIME _____ MINUTES

LOAD # _____

DESCRIPTION _____

NO.	TIME	S	M	T	W	T	F	S	H	ON	OFF	DUTY CYCLE	
												OFF MIN	ON MIN

REMOTE OVERRIDE TIME _____ MINUTES

LOAD # _____

DESCRIPTION _____

NO.	TIME	S	M	T	W	T	F	S	H	ON	OFF	DUTY CYCLE	
												OFF MIN	ON MIN

REMOTE OVERRIDE TIME _____ MINUTES

LOAD # _____

DESCRIPTION _____

NO.	TIME	S	M	T	W	T	F	S	H	ON	OFF	DUTY CYCLE	
												OFF MIN	ON MIN

REMOTE OVERRIDE TIME _____ MINUTES

TORK Z400B LIMITED WARRANTY

LIMITED WARRANTY — TORK, INC. warrants all Controls manufactured by TORK to be free of defects in material and workmanship under normal use for a period of one (1) year from date of manufacture. TORK reserves the right to change designs or materials without prior notice as it may deem necessary. Liability under this written warranty and under implied warranties is limited to the repair or replacement, without charge, at TORK's option, of any defective Control or part thereof for the original user, and only if the defective Control or part is returned to TORK, at 1 Grove Street, Mount Vernon, New York 10550, or to an authorized servicing station at the address indicated on TORK'S catalog sheets, freight prepaid within such one (1) year period.

TORK's liability shall in no event exceed the purchase price of the Control paid by the original user. This warranty is void if the Control has been improperly installed or altered or damaged through misuse, or by accident, neglect, misapplication, fire, flood or Acts of God. TORK assumes no responsibility for any damages to people, property, apparatus or otherwise resulting from improper installation or maintenance of its Control.

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