

SETC

Smart Evaporative Truck Cooler

**INSTALLATION &
OPERATING INSTRUCTIONS**



PATTERSON

THE AUTHORITY IN AIR MOVEMENT

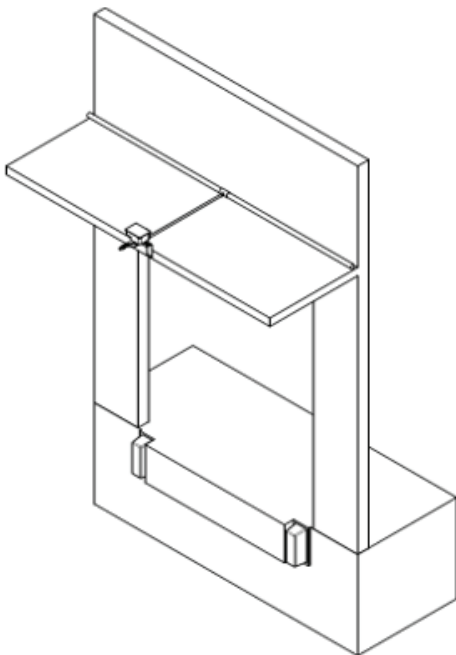
OPERATION PRINCIPLES

- Evaporative cooling of a trailer: cools by spraying water on a trailer roof at regular intervals to allow evaporation to occur and pull heat from a trailer to make a safer working environment for employees.
- System will detect presence of a truck and sense the temperature of its roof. System will spray truck roof just enough to cover the roof then delay while the water evaporates. If too many other nozzles are spraying at the same time, the system will wait for water pressure to return before spraying to ensure complete coverage. All parameters are adjustable with onboard controls.

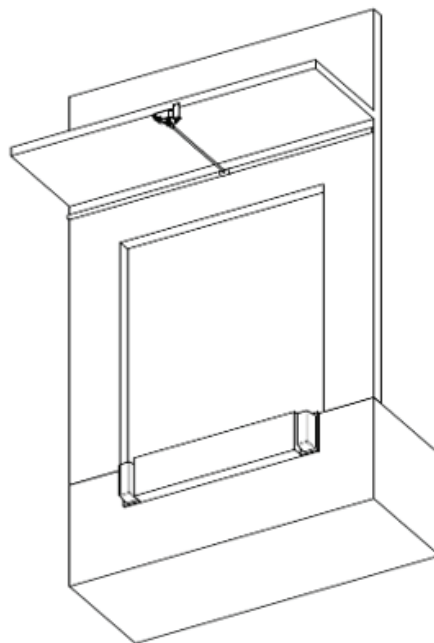
MECHANICAL INSTALLATION

- The Smart Evaporative Truck Cooler comes with an awning mount - reversible to hang below or above the edge of an awning.
- A wall mount is available on request for dock doors without awnings.
- Mount the SETC at the center of the dock door, at least 18" above the trailer when parked at the dock door and high enough to clear any dock seals present.
- SETC needs to be positioned so the sensors are directly above the trailer when parked. If wall mounting, longer brackets are available.

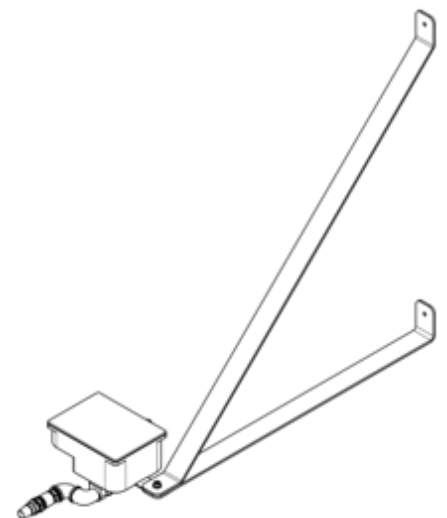
MOUNTING SUGGESTIONS



Above Awning



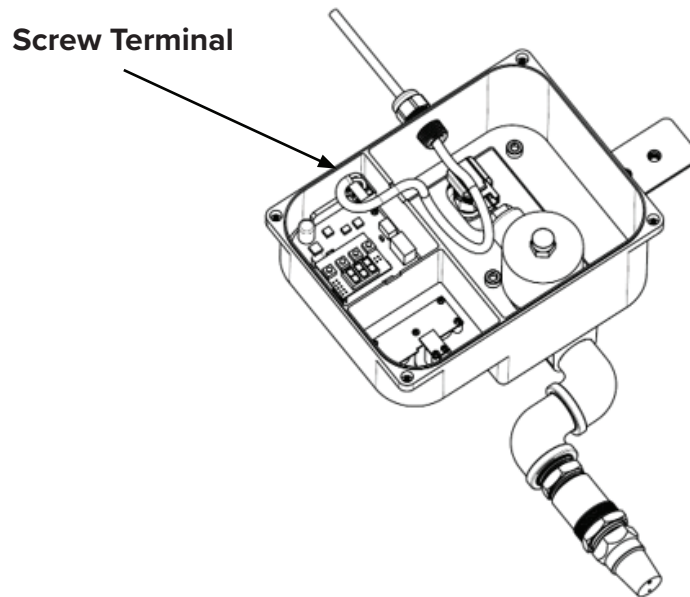
Below Awning



With Optional Wall Mount Bracket

ELECTRICAL INSTALLATION

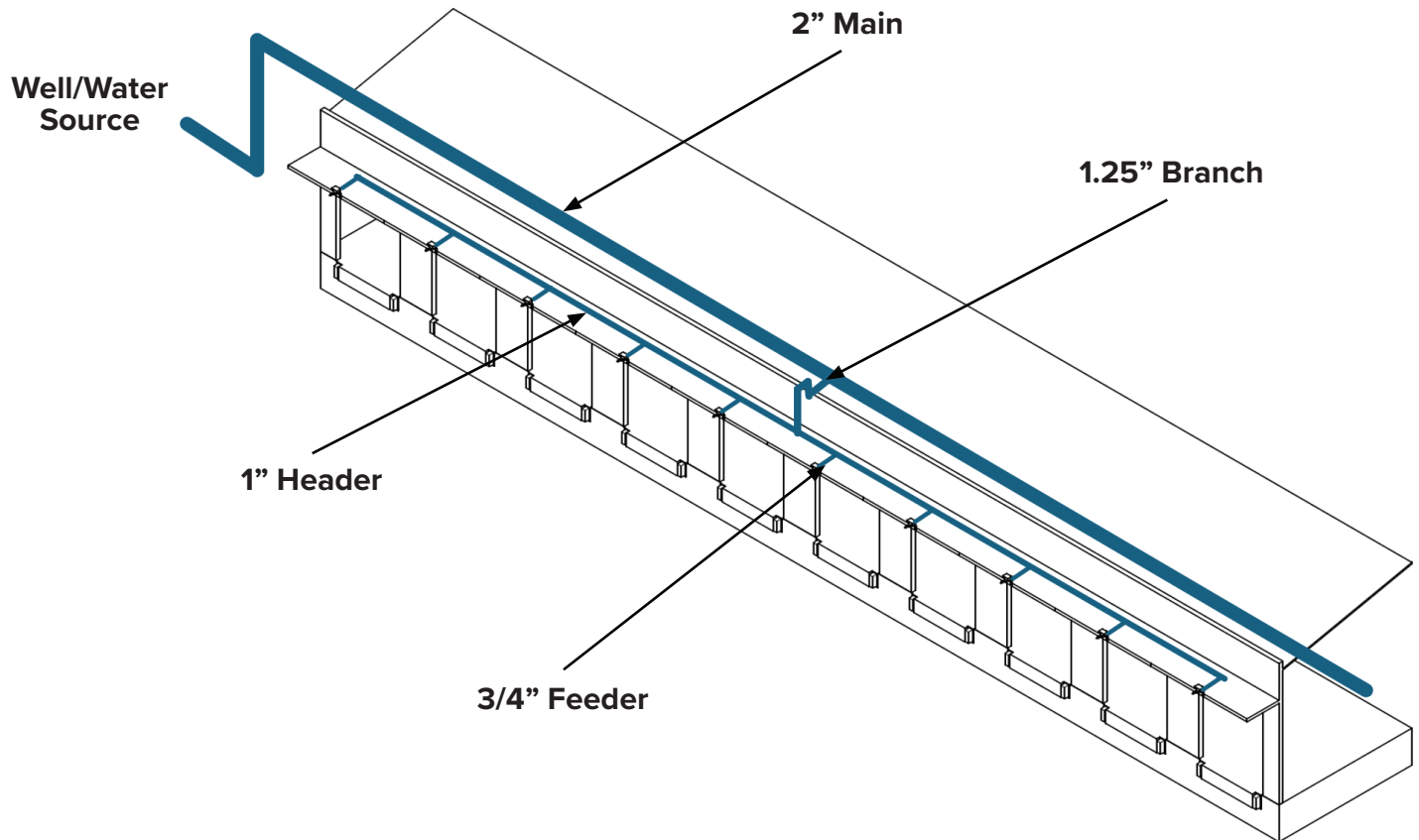
- SETC runs on 24 Volts AC or DC at 24 Watts using readily available LED power supplies or sprinkler transformers. Power supply is not included.
- Install power wiring through cable gland into valve chamber, add drip loop, then pass power cable over wall into the control board chamber.
- Removable screw terminal is in the lower left-hand side of the control board.



PLUMBING INSTALLATION

- Water is supplied to the Smart Evaporative Truck Cooler via a 3/4 in FNPT port.
- Unit has been pressure tested at the factory so there might be some residual water in the system.
- Each nozzle flows 8.5 GPM at 90 PSI when activated.
- Typical 12-15 seconds on, 300 seconds off cycle.
- With a small quantity of SETC installed, existing building water pressure may be sufficient.
- With larger quantities, supplementary pumps will be required. A single 25 GPM pump can supply 20 SETC systems as the integrated pressure sensor will wait until water pressure is available before spraying.
- For large quantity installs, a typical installation would have a 2" water main supplying 1.25" branches that feed 10 doors at a time via 1" line.
- It is common for these systems to be fed by a dedicated well.
- Depending on building layout, plumbing could be routed on the roof, inside along the wall, or outside the wall either above or below the awning. Each installation is different, but several options are depicted below.

PLUMBING ROUTING SUGGESTIONS



- Every building is different so each application will be specific to its location. Common places to route the main water line are on the roof, across the top of the awnings, below the awnings, inside the building above the doors or in the ceiling structure.
- When routing the main water line away from the awnings, it is common to run a header every 10 doors to minimize penetrations or numerous plumbing runs.

STARTUP

- Once the mechanical, electrical, and plumbing installations are complete, apply power. Once unit has started, it will automatically start checking sensors, as described in the Operation Principle section, and may immediately spray water. The unit comes pre-programmed with parameters that will work in most applications.
- On the bottom side of the Smart Evaporative Truck Cooler, there are four status LEDs, one for each sensor and one for the valve. When the unit is waiting on the sensor readings to meet the thresholds to spray, the corresponding LED will flash. When conditions are met, the LED will hold solid. Once all three sensor readings meet their thresholds, the Green Valve LED will hold solid, and the unit will spray. Specifics on the LEDs are in Table 1 below.

Table 1

LED	Color	Function	Solid	Flashing	Quick Flashing
1	Green	Spray valve	Currently spraying	Waiting on sensors or timers (all other lights solid)	Valve failure or input voltage below 16 volts
2	Blue	Temperature	Trailer is hot enough to be sprayed	Temp below threshold for spraying	Sensor failure
3	Yellow	Distance	Truck is detected	Truck is not detected	Sensor failure
4	Red	Pressure	Pressure is available for spraying	Pressure is not available for spraying	Sensor failure

INTERNAL DISPLAY AND PARAMETER EDITING

- To edit parameters, there is a small display and four buttons on the inside of the Smart Evaporative Truck Cooler. When the unit is first powered on, it will display the version number of the firmware for five seconds, then go blank. To wake up the display, press any of the four buttons. The display will sleep again after two minutes of inactivity.
- After first waking up, the display will show the current reading from the Distance Sensor (example 5.6 meaning the Distance Sensor is measuring an object 5.6 ft below the sensor). By pressing the “M” button, the unit will cycle through which sensor reading is displayed, Distance (ex 5.6), Temperature (ex 90) and Pressure (ex P45).
- To adjust the parameters and set points, hold the “M” button to enter into the Parameter Mode. Use the “+” and “-” key to change which parameter to edit, F-0 through F-7. Press the “P” button to edit the Parameter. The screen will then display what that parameter is currently set to. That parameter can then be adjusted with the “+” and “-” buttons and then saved by pressing the “P” again. Details on the specific parameters and ranges are listed in Table 2 below.

Table 2

Number	Parameter	Sensor Range	Parameter Range	Factory Default
F-0	Distance	0.3 ft -10 ft (.1m - 3m)	0.3 ft -8.3 ft (.1m - 2.5m)	8.3
F-1	Temperature	32-248 F	59-194 F (15-70C)	90
F-2	Pressure	0-100 psi	7-58 psi (0.5-4.0 bar)	45
F-3	Spraying Time	-	2-600 s	12
F-4	Waiting Time	-	2-600 s	300
F-5	Distance Units	-	0: ft 1: m	0
F-6	Temperature Units	-	0: F 1: C	0
F-7	Pressure Units	-	0: psi 1: bar	0

PARAMETER TUNING GUIDANCE

- **Distance:** Default setting chosen for stable sensing range. If flatbed trailers are used at dock and water spray is not desired, reduce threshold based on SETC installation height above enclosed trailer height.
- **Temperature:** Default setting chosen to come on at 90F to avoid spraying while raining. Lower to spray at a lower temperature and increased water usage. Diminishing returns below 85F. Raise to reduce water usage.
- **Pressure:** Spray distance will fluctuate with pressure. Raising the threshold may require more pump flow. Lowering can help with insufficient pump flow.
- **Spraying Time:** Default chosen for 53' trailer coverage. Increase if trailer is not fully covered in a single spray. Decrease if excessive water is on the ground. Adjust after waiting time is tuned.
- **Waiting Time:** Default chosen for hot, humid environments (ie Southeastern USA). Decrease if water is fully evaporating between sprays. Increase if water builds up over time.

DISCLAIMER

- While the goal of the Smart Evaporative Truck Cooler is to limit the amount of water sprayed to just what evaporates, some water can reach the pavement.
- This water could ultimately flow into a municipal separate storm sewer system (M4S).
- The Environmental Protection Agency (EPA) under the Clean Water Act regulates what is allowed to enter an M4S via the National Pollutant Discharge Elimination System (NPDES) Program.
- Industrial facilities, which includes shipping and receiving areas, must be permitted under the NPDES Program.
- Depending on local NPDES permitting authorities, the Smart Evaporative Truck Cooler may be covered by existing permits.
- It is the customer's responsibility to verify installations meet all local laws and building codes.