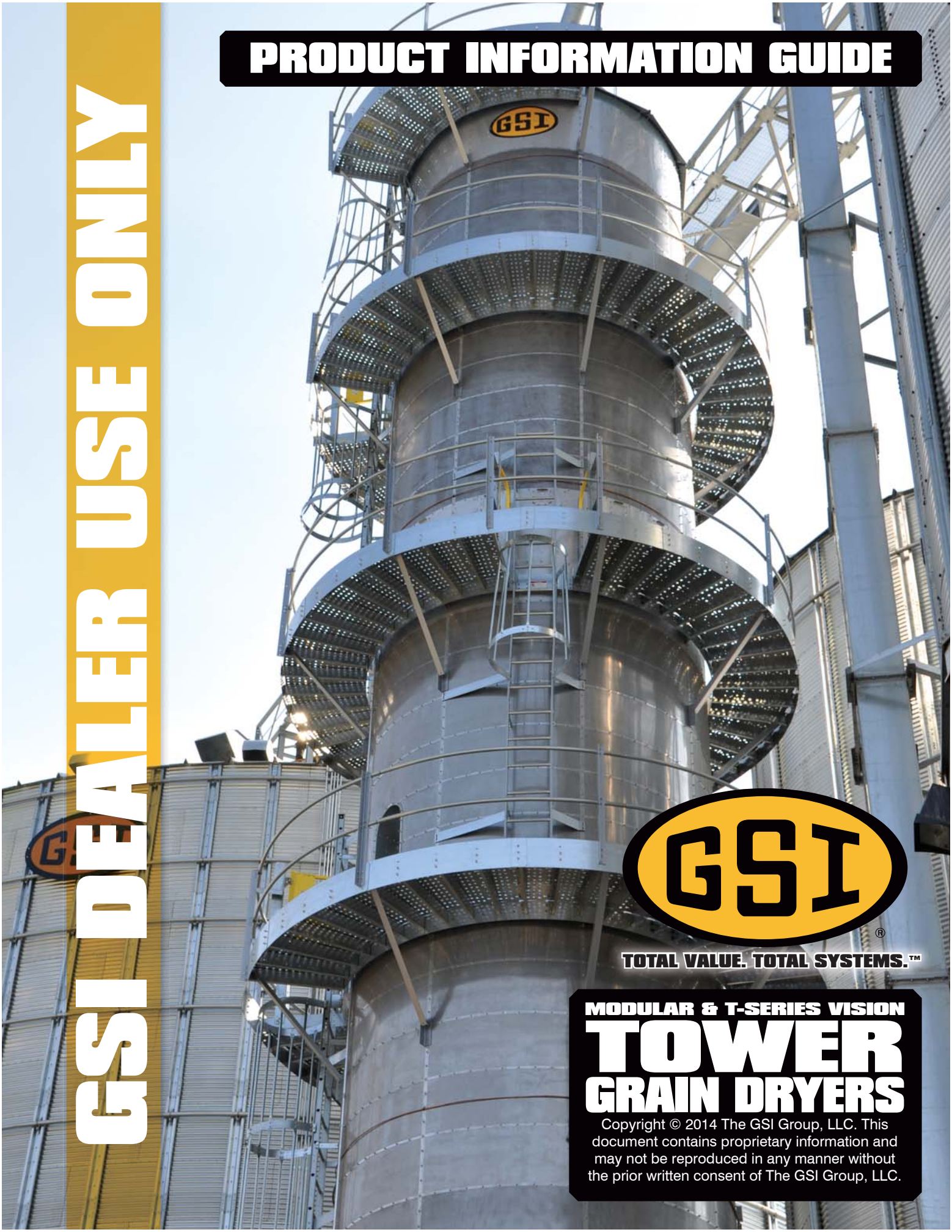

GSI DEALER USE ONLY

PRODUCT INFORMATION GUIDE

GSI®

TOTAL VALUE. TOTAL SYSTEMS.™

MODULAR & T-SERIES VISION

TOWER GRAIN DRYERS

GSI GROUP

Limited Warranty

The GSI Group, LLC. ("GSI") warrants products which it manufactures to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months after sale to the original end-user or if a foreign sale, 14 months from arrival at port of discharge, whichever is earlier. The end-user's sole remedy (and GSI's only obligation) is to repair or replace, at GSI's option and expense, products that in GSI's judgment, contain a material defect in materials or workmanship. Expenses incurred by or on behalf of the end-user without prior written authorization from the GSI Warranty Group shall be the sole responsibility of the end-user.

Warranty Extensions: The Limited Warranty period is extended for the following products:

	Product	Warranty Period
AP Fans and Flooring	Performer Series Direct Drive Fan Motor	3 Years
	All Fiberglass Housings	Lifetime
	All Fiberglass Propellers	Lifetime
Cumberland Feeding/Watering Systems	Feeder System Pan Assemblies	5 Years **
	Feed Tubes (1.75" & 2.00")	10 Years *
	Centerless Augers	10 Years *
	Watering Nipples	10 Years *
Grain Systems	Grain Bin Structural Design	5 Years
Grain Systems Farm Fans Zimmerman	Portable & Tower Dryers	2 Years
	Portable & Tower Dryer Frames and Internal Infrastructure †	5 Years

* Warranty prorated from list price:
  0 to 3 years – no cost to end-user
  3 to 5 years – end-user pays 25%
  5 to 7 years – end-user pays 50%
  7 to 10 years – end user pays 75%

** Warranty prorated from list price:
  0 to 3 years – no cost to end-user
  3 to 5 years – end-user pays 50%

† Motors, burner components and moving parts not included. Portable Dryer screens included. Tower Dryer screens not included.

GSI further warrants that the portable and tower dryer frame and basket, excluding all auger and auger drive components, shall be free from defects in materials for a period of time beginning on the twelfth (12^{th}) month from the date of purchase and continuing until the sixtieth (60^{th}) month from the date of purchase (extended warranty period). During the extended warranty period, GSI will replace the frame or basket components that prove to be defective under normal conditions of use without charge, excluding the labor, transportation, and/or shipping costs incurred in the performance of this extended warranty.

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH ABOVE. SPECIFICALLY, GSI MAKES NO FURTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (i) PRODUCT MANUFACTURED OR SOLD BY GSI OR (ii) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

GSI shall not be liable for any direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. The sole and exclusive remedy is set forth in the Limited Warranty, which shall not exceed the amount paid for the product purchased. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor.

GSI assumes no responsibility for claims resulting from construction defects or unauthorized modifications to products which it manufactured. Modifications to products not specifically delineated in the manual accompanying the equipment at initial sale will void the Limited Warranty.

This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained. This Limited Warranty extends solely to products manufactured by GSI.

Prior to installation, the end-user has the responsibility to comply with federal, state and local codes which apply to the location and installation of products manufactured or sold by GSI.

TOTAL VALUE. TOTAL SYSTEMS.™

STATE-OF-THE-ART

GSI (Grain Systems) offers the most technologically advanced and reliable tower dryers in the industry. GSI also provides the widest selection of tower dryer models, with 3 series and 33 models available.

All GSI tower dryers feature easy to use and state-of-the-art color touch screen controls, heavy-duty galvanized and stainless steel construction, and industrial grade electrical components.

High grain quality is synonymous with the GSI name. GSI's tower dryers have the largest holding capacities of any commercial or large farm column dryers. Controlling retention time in this way ensures that grain is dried efficiently and maintains peak grain quality. GSI's exclusive patented grain inverters and vacuum cooling completes the package as the highest quality and efficient tower dryers on the market today.

WHY BUY A DRYER?

If grain could always be harvested when it was at the optimal moisture level for long term storage, grain dryers would be unnecessary. Because so many factors influence harvest, grain dryers give growers the flexibility to harvest when necessary and to dry grain to the ideal levels for storage. This significantly minimizes risk of loss and adds tremendous value to an operation.

- Start harvest earlier to minimize potentially significant field losses from grain shatter and lodged crops.
- Condition grain early before adverse weather conditions appear and avoid catastrophic crop losses that could occur by waiting for the grain to dry in the field.
- Prevent elevator shrinkage charges applied to grain that is delivered above requested moisture limits. By avoiding these charges, your customers can add more dollars to their bottom line.
- Deliver grain closer to the moisture level desired by the elevator and avoid dockage charges.
- Gain marketing flexibility by storing properly conditioned grain for long periods of time without deterioration.
- Eliminate harvest bottlenecks by conditioning grain at a pace that compliments today's high-capacity combines.

This manual provides an in-depth understanding of what sets GSI dryers apart from the competition and will serve as an invaluable tool to explain the features and benefits that make GSI dryers an outstanding value proposition for customers.

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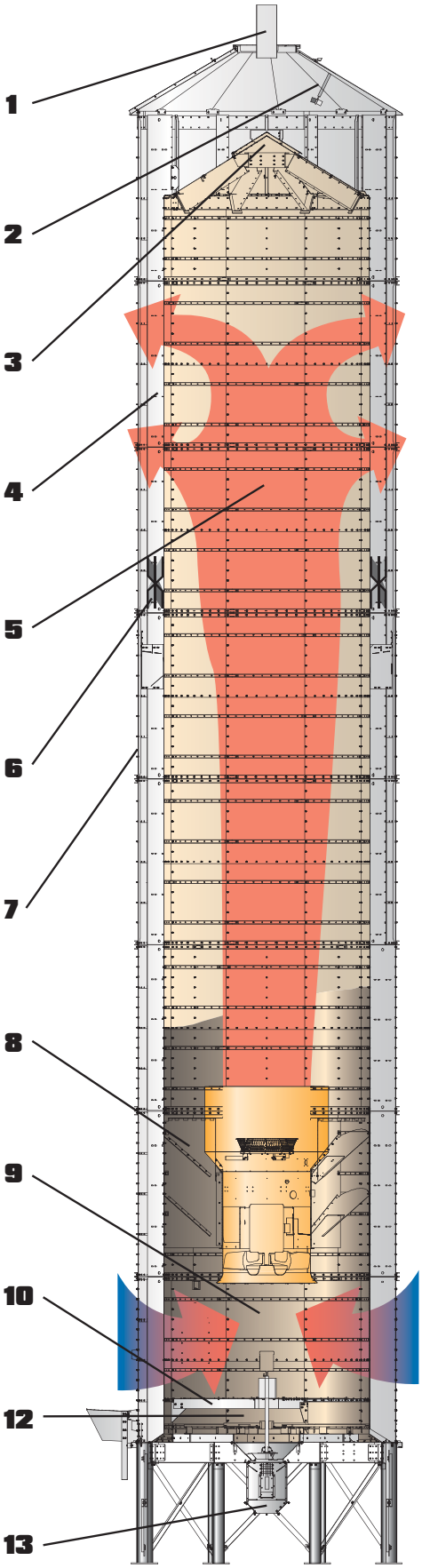
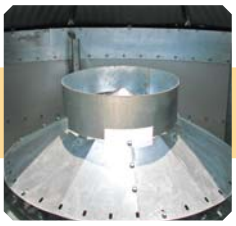
GSI DEALER USE ONLY

MODULAR TOWER



1 Gravity inlet does not require leveling auger, reducing the number of moving parts.

2 Motorized grain level monitor designed for trouble free positive control.



3 Self cleaning cushion box on the plenum roof reduces grain damage and plenum roof wear.

4 The 12-3/4" grain columns surrounding the heat plenum chamber allows the grain to receive all BTU's from the burner, improving efficiency while providing superior noise reduction.

5 Uniform low velocity heated air improves efficiency and quality as well as reducing particulate emissions.

6 Patented, stainless steel grain inverters equalize column moisture content and temperature of the grain column, greatly improving quality and efficiency.

7 Optional stainless steel outside sheets extend the life and appearance of the dryer. All screens utilize .078 & .0625 perforations to reduce emissions.

8 Like all GSI Tower Dryers, the heat chamber floor self cleans in the minimum or maximum cooling positions.

9 Recycling heat from the cooling grain results in significant fuel savings.

10 The sealed discharge section retains particulate matter.

11 GSI's state of the art Vision Control Panel.

12 Accu-trol metering system with stainless steel floor.

13 A specially designed flow control system houses the Moisture Control Sensor. This insures a constant accurate reading from the sensor back to the Moisture Control System.

MODULAR KEY FEATURES

INNER ROOF

INNER ROOF

Heavy galvanized inner roof and support provide 260 bushels of wet holding in the garner. The garner is totally sealed to retain particulate matter.

PLATFORMS

OUTSIDE PLATFORMS

Platforms, ladders, and cages are standard on all models and provide easy access to the outside of the dryer.

ACCESS DOORS & HATCHES

ACCESS DOORS & HATCHES

All areas of the dryer are accessible through doors and floor hatches for easy cleaning and maintenance.

METERING DRIVE

METERING DRIVE

The SCR variable speed DC motor and the single maintenance free Cyclo gearbox located in the cooling chamber provides simple, trouble free operation of the dryers metering system.

SWEEP DISCHARGE

SWEEP DISCHARGE

Field proven (patented) Accu-trol Metering System is self cleaning and provides positive grain flow.

MODULAR ADJUSTABLE COOLING FLOOR

The GSI Modular Dryers have a unique and patent pending feature called the Adjustable Cooling Floor. This floor allows two major improvements to the dryers operation.

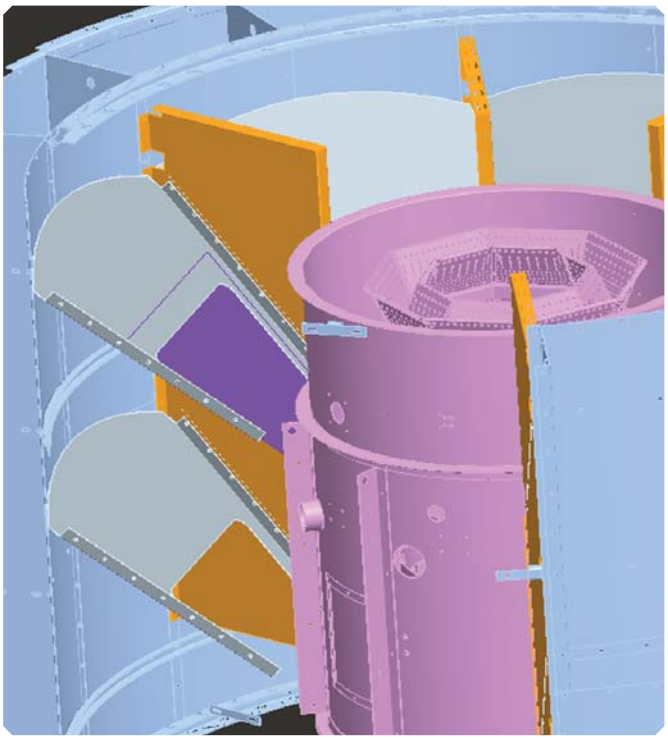
Tower Dryers in the past have had a set portion of the grain column reserved for cooling. This most often has been a 70/30 percentage split with 30% being in cooling. Some dryers have had an 80/20 split. This improves capacity in very wet grain over 25% but means grain over 100 degrees may be discharged when at 20% or under. The 80/20 split really does not provide true Dry & Cool operation within 10 degrees of ambient temperature which is provided for by the 70/30 traditional split.

As dryer capacity requirements on farm have increased the maximum 50,000 bu. cooling bin limit has made it difficult to continue using dryers in the All Heat mode putting up to 140 degree grain directly into the cooling bin. You cannot get adequate airflow, ½ to 1 cfm/bu., in larger bins due to high static pressures which can consume a tremendous amount of horsepower and build heat from that pressurization the goal to cool the grain is defeated. It is possible however to achieve ¼ to ½ cfm/bu. in bins up to 100,000 bu. and adequately cool grain which has already been partially cooled. This is not the traditional All Heat operation and will not remove as much moisture in the bin, but does allow for higher capacities for those operations that have adequate airflow. This could be called Partial Cooling an operation between Dry & Cool and All Heat.

In the past one had to choose the 70/30 split with its traditional Dry & Cool ability or the 80/20 split with its ability to achieve greater capacities in grain over 25% or operate in partial Cooling mode. It is now possible to have both with the Patent Pending GSI Modular Dryer adjustable cooling feature. This feature involves 8 moveable doors that can change the split from approximately 70/30 to 80/20 and back in a few minutes from the service area in the cooling section of the dryer.

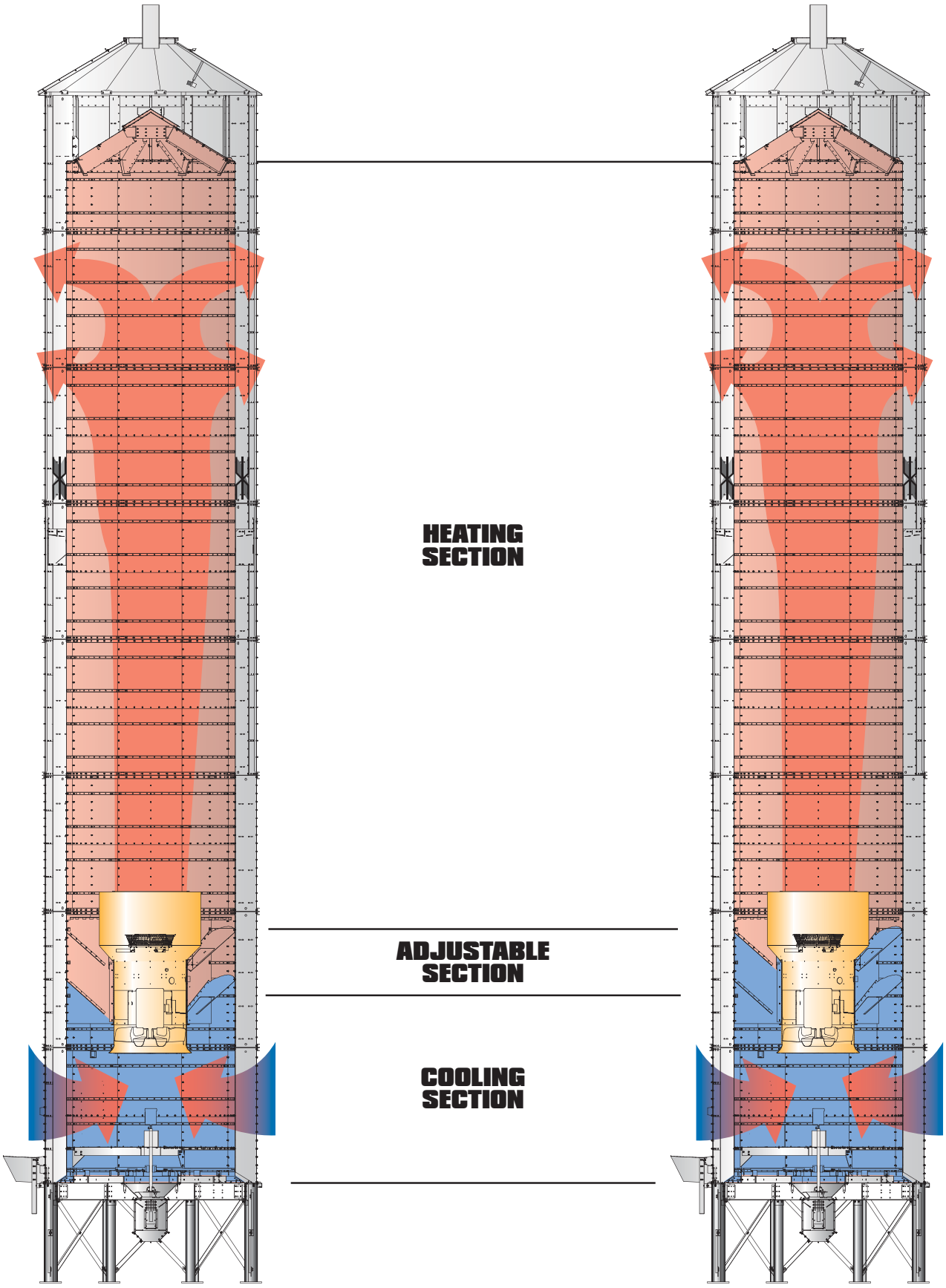
It is the best of two worlds. If the year starts at 30% operate the dryer in the minimum cooling position putting out dried and cooled grain within 10 degrees of the ambient temperature to make sure this very wet grain is safe for storage. As the harvest progresses and nears 20% you can then decide to change the position of the movable doors to the maximum cooling position continuing to put out true dried and cooled grain or leave them in the minimum cooling position to take advantage of the additional capacity in combination with adequate cooling air in the cooling bins. Only the GSI Modular Tower Dryers allow this simple method to control how much cooling is applied to a Tower design dryer.

This new design also does not eliminate the long time Zimmerman self cleaning feature. All Zimmerman and GSI Tower Dryers have special divider floors which have an angled floor and a small continuous opening that allows any chaff or fines that would otherwise accumulate in the heat chamber to drop into the cooling chamber. The new design continues this feature and ability in both positions of the floor.



80/20

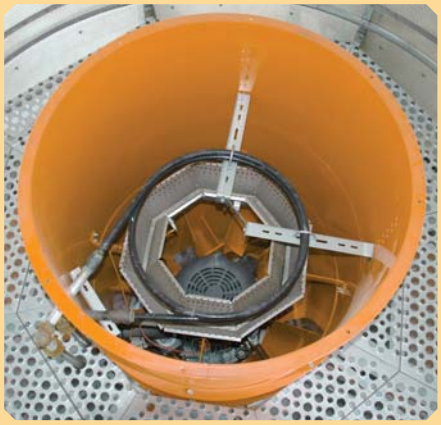
70/30



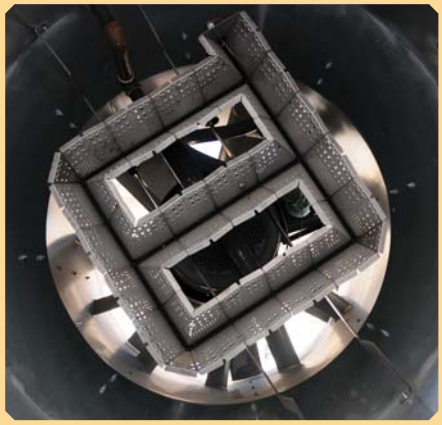
MODULAR BLOWER & BURNER

Modular Tower Dryers are designed with the mid-sized to large farm in mind. Capacities range from 800 to 1,690 BPH at 5 point removal. All heat from the grain cooling process is recycled and the long retention times result in very efficient dryer operation.

AXIAL FAN
Efficient, quiet, adjustable pitch blowers deliver high volumes of air at low horsepower on all models.



OCTAGON BURNER
TM-1012 and smaller models use a fuel efficient in-line octagon burner to provide even continuous heat.



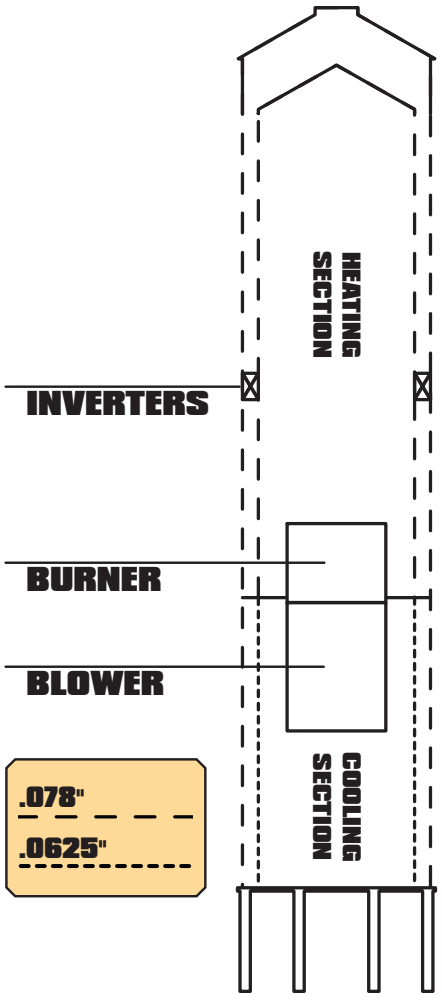
MAXON NP-LE-AL BURNER
For TM-1015 only, a Maxon fuel efficient, low nox in-line burner with engineered profiling provides even, continuous heat. An aluminum extrusion reduces burner maintenance.

MODULAR HEAT CHAMBER

The heat plenum chamber is entirely surrounded by a 12-3/4" grain column. All heated air must pass through the grain column resulting in total use of heated air. The galvanized and optional stainless steel smooth sidewall construction with .078” and .0625” perforations helps retain particulate matter.

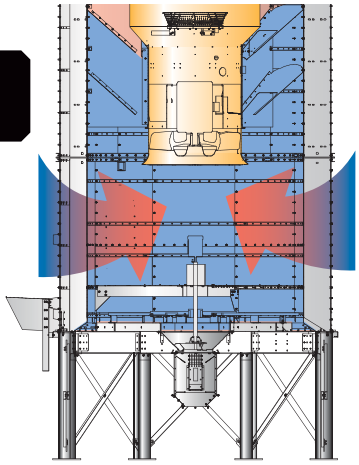
Inside: all 16 gauge panels
- Heating section has .078" perforation sidewalls.
- Cooling section has .0625" perforation to minimize particulate matter.

Outside: all 22 gauge panels
- Heating & Cooling sections have .078" perforation sidewalls.



MODULAR VACUUM COOLING

Vacuum Cooling is one of the most effective ways to reclaim usable heat from hot dry grain. All GSI T-Series Modular Dryers are designed around this principle. With the fan being mounted between the cooling and heat sections cooling air is pulled through the hot grain, mixed with ambient air and pushed through the high efficiency burner into the drying air plenum, thus reducing the btu's required to dry the grain. The grain columns themselves serve as an extremely effective noise reducer with the fan being mounted internally.



MODULAR CONSTRUCTION

The GSI Modular Tower Dryer Series uses modular construction to improve overall fit, dependability and speed of installation. Building on site, often referred to as "Stick Built" has been the standard method of construction for the larger tower dryers that GSI manufactures. However, with the new Modular Tower Dryer comes the option to factory assemble a tower dryer in modules, then ship the dryer to the site for final assembly. This leads to several improvements including...

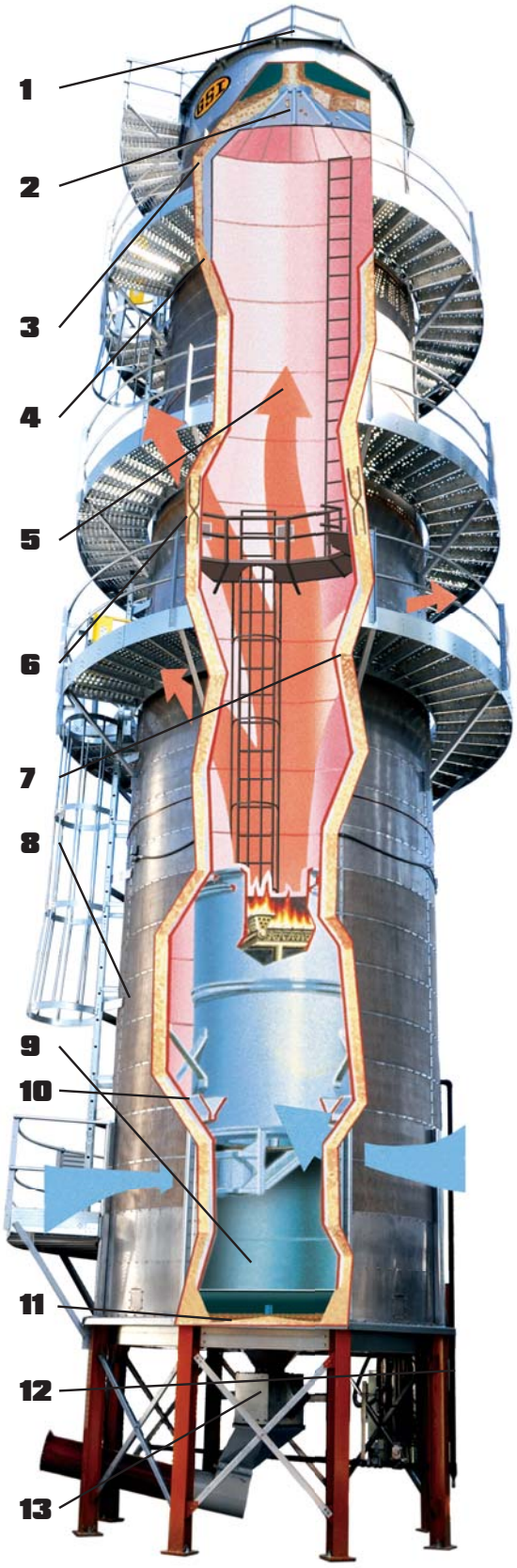
- Assembly at GSI's state of the art manufacturing plant means labor time on site is reduced and labor efficiency can be maximized.
- The use of specially built jigs ensures that each module is exactly right, ready to fasten to the other modules with a minimum of adjustment or work.
- Shipping in modules means fewer part backorders due to limited availability or damage to parts in transit.
- On site assembly can be done quickly with a crane with almost all work occurring close to the ground.
- The modular design allows for a standard adjustable unload auger that extends past the outside edge of the dryer with a clearance of up to 42", with the option to direct discharge at the center of the dryer with 24" of clearance. Standard on 48" clearance with optional 24" leg extensions.
- Safety and operational devices are pre-installed on each module. Wire and conduit are ready to uncoil and wire to the main control boxes reducing time and chance of error.
- Control boxes, though remote install capable, are mounted on the base module ready to accept the wiring from the other modules.
- Controls are pre-powered and all module wiring and components are pre-tested to assure correct operation and improved dependability at startup.
- Modular construction makes relocating the dryer easier.

CONNECTIONS MADE SIMPLE

An adjustable auger allows from a 0° to 30° angle to accommodate a variety of facility configurations. The flexibility of this auger provides for faster setup times and fewer field modifications to achieve the appropriate connections. In addition, a durable, powder coated gravity inlet does not require a leveling auger, reducing the number of moving parts.

Discharge Height is Adjustable to 42" with standard unload auger and 24" at the center discharge with standard legs. An option for 24" taller legs is available.

T-SERIES TOWER



1 Gravity inlet does not require leveling auger, reducing the number of moving parts.

2 Self cleaning cushion box on plenum roof reduces grain damage and plenum roof wear.

3 Motorized grain level monitor designed for trouble free positive control.

4 The 12-3/4" grain columns surrounding the heat plenum chamber allows the grain to receive all BTU's from the burner, improving efficiency while providing superior noise reduction.

5 Uniform low velocity heated air improves efficiency and quality as well as reducing particulate emissions.

6 Patented Grain Inverters are used to equalize column moisture content and temperature of the grain column, greatly improving quality and efficiency.

7 Standard stainless steel outside sheets can greatly extend the life and appearance of the dryer. All screens, galvanized or stainless, utilize .078 & .0625 perforations to reduce emissions.

8 Optional corrugated panels available.

9 Recycling heat from the cooling grain results in significant fuel savings.

10 Divider hopper prevents particulate build up in the heat plenum chamber and simplifies maintenance.

11 Sealed discharge section retains particulate matter.

12 GSI's state of the art Vision Control Panel.

13 A specially designed flow control system houses the Moisture Control Sensor. This insures a constant accurate reading from the sensor back to the Moisture Control System.

T-SERIES KEY FEATURES

INNER ROOF

Heavy galvanized inner roof and support provides over 300 bushels of wet holding in the garner. The garner is totally sealed to retain particulate matter.

INNER ROOF

PLATFORMS

Inside/outside platforms, ladders and cages are standard and provide access to the dryer.

PLATFORMS

ACCESS DOORS & SAFETY GATES

All areas of the dryer are accessible for easy cleaning and maintenance. New Yellow Safety Gates improves fall protection for platforms.

ACCESS DOORS
& SAFETY GATES

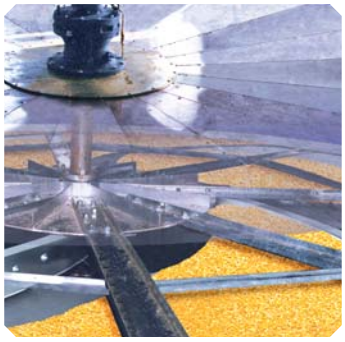
METERING DRIVE

The SCR variable speed DC motor and the single maintenance free Cyclo gearbox located in the cooling chamber provides simple, trouble free operation of the dryers metering system.

METERING DRIVE

SWEEP DISCHARGE

Field proven (patented) Accu-trol Metering System is self cleaning and provides positive grain flow.



SWEEP DISCHARGE

T-SERIES BLOWER & BURNER

T-Series Tower Dryers are designed with the mid-sized to large farm in mind. Capacities range from 1000 BPH to 7000 BPH. All heat from cooling the grain is recycled and the long retention times result in very efficient dryer operation.

MIXED FLOW INDUSTRIAL BLOWER
Highly efficient, quiet industrial blowers will provide years of trouble free operation on T-Series models 1575 and up. T-Series models 1050 and 1260 use an Axial Fan.

MAXON NP-LE-AL BURNER
T-Series models 1575 and up are equipped with fuel efficient, low nox in-line, direct fire Maxon burners. The engineered profiling provides very even heat and the aluminum extrusion reduces burner maintenance. T-Series models 1050 and 1260 use a similar Octagon Burner.

T-SERIES HEAT CHAMBER

The smaller the holes in the screens the less particulate matter exits the heat chamber or enters the cooling chamber. Almost all non commercial dryers use .092" hole size inside and out.

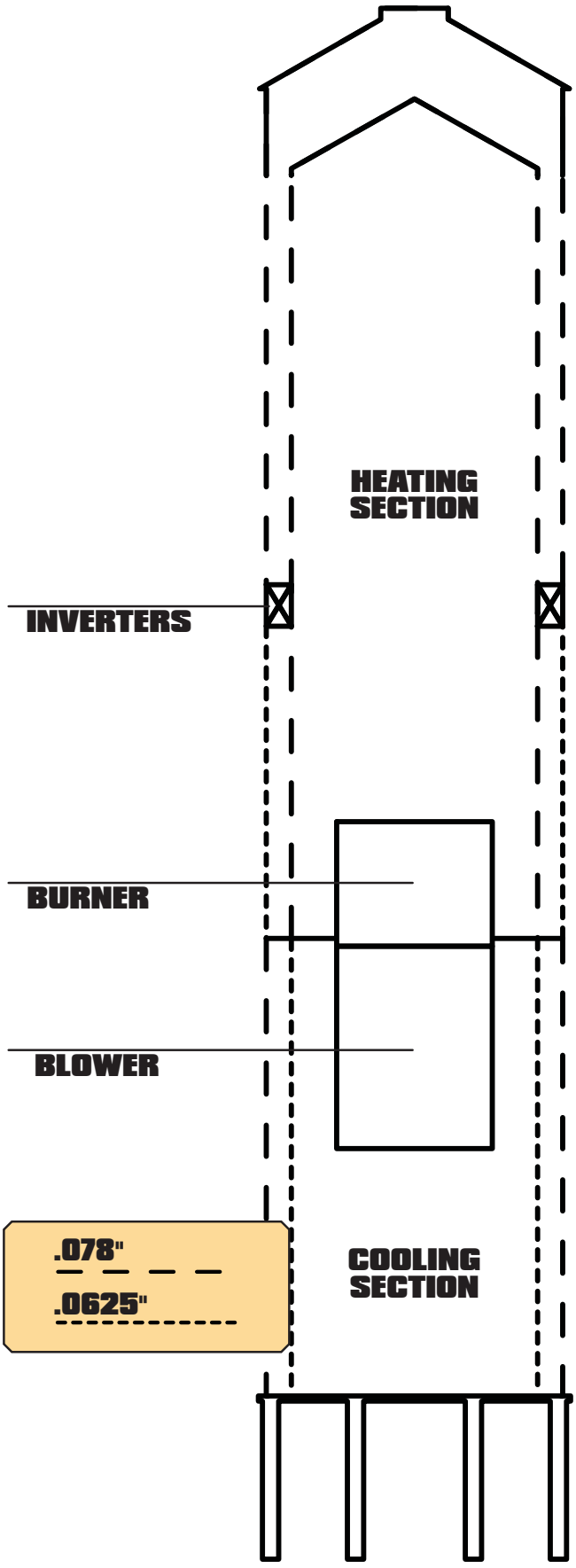
The T-Series uses smaller .078 & .0625 hole sizes while putting more holes per square foot to maintain the same airflow as with the larger holes. This design means there will be less particulates on the ground and inside the cooling chamber reducing maintenance and clean up.

This step up to the same holes sizes as used with GSI's largest Commercial Tower dryers reduces the movement of particulate matter to an absolute minimum and meets all known particulate matter restrictions for higher density or populated areas.

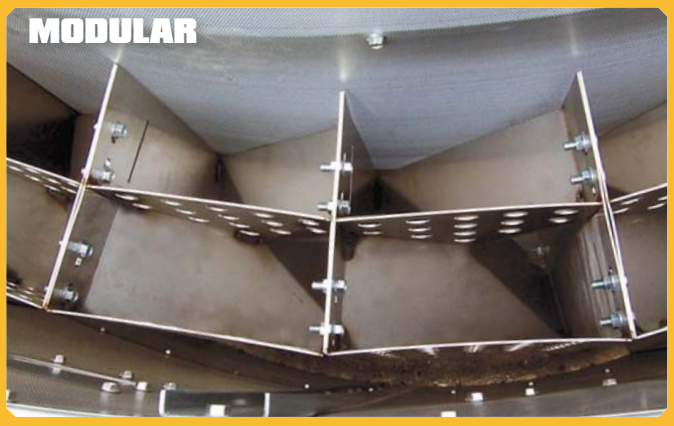
The heat plenum chamber is entirely surrounded by a 12-3/4" grain column. All heated air must pass through the grain column resulting in total use of heated air. T-Series stainless steel, smooth sidewall construction with .078" and .0625" perforation diameter helps retain particulate matter.

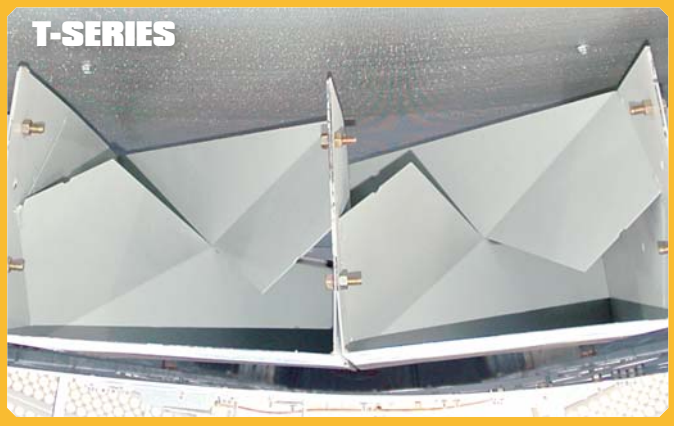
Inside: all 16 gauge panels
- Heating section has .078" perforation sidewalls.
- Cooling section has .0625" perforation to minimize particulate matter entering the cooling section.

Outside: all 22 gauge panels
- Heating section to the Grain Inverter has .078" perforation sidewalls.
- Grain Inverter to the cooling section has .0625" perforation sidewalls to contain the particulate matter.
- Cooling section has .078" perforation sidewalls.



MODULAR & T-SERIES GRAIN INVERTERS





PATENTED GRAIN INVERTERS

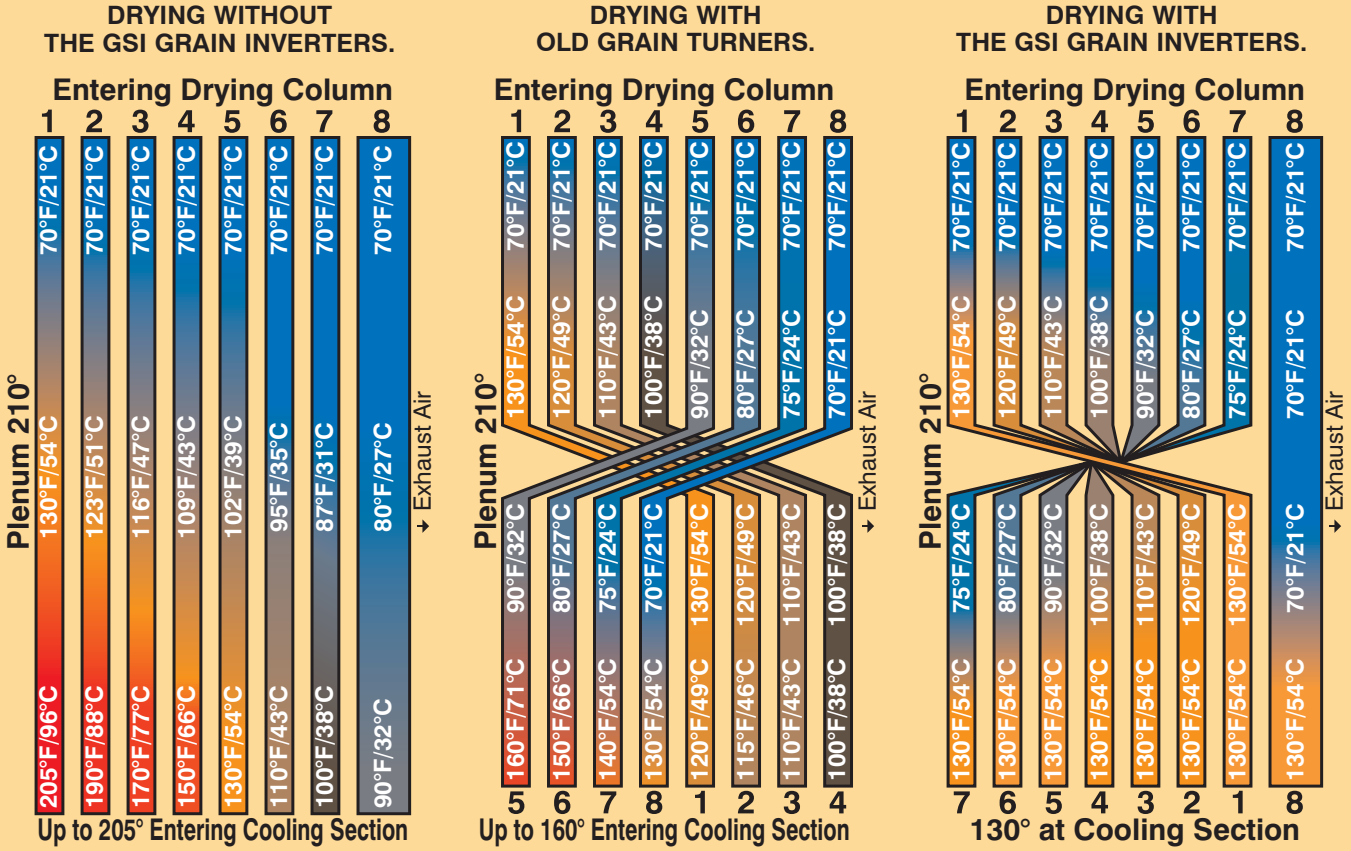
Inverters promote more even drying, higher test weights, and also help reduce operating costs.

While the older grain exchangers move grain from the inside of the grain column to the outside of the column in 6” columns, the patented GSI Grain Inverters put a new twist on this process.

GSI's Grain Inverters move all grain, except the outer two inches, within the column to eliminate over-dried grain and to maximize drying efficiency and grain quality. These patented Grain Inverters redirect the warmest grain from the inside of the column to be next to the wettest grain left at the outside of the column where it is dried by the captured heat which would have otherwise escaped the dryer. (See diagram to right for visual illustration.)

This process maintains optimal grain temperature, thus maximizing grain quality while using less fuel and significantly reducing operating costs.

A convenient clean-out door also provides easy access for quick maintenance.



MODULAR & T-SERIES MOISTURE CONTROL SENSOR

The flow control system which was specifically designed for the Tower Dryers at the discharge of the dryer delivers as good a grain capacitance moisture measurement as possible. The idea is to keep the sensor completely covered by grain at all times. The flow rate past the sensor is adjustable with a set of plates with different sized holes so it can be adjusted to the size of the dryer and the flow volume of the grain.

MODULAR & T-SERIES VISION CONTROLS

ELECTRICAL CONTROL FEATURES

Exclusive Intertek ETL (nationally recognized testing laboratory) approved controls.

Built to UL 508a and CSA C22.2 No. 14 standards, certified to US and Canadian electrical requirements.

IEC Branch Breakers: IEC controls are higher quality, rated for more cycles, and meet domestic and international electric codes. All dryers have branch breakers for each motor.

IEC Motor Overloads: IEC overloads allow a wide range of adjustment to accommodate variances in incoming voltage.

Auxiliary Auger IEC Contactors/ Overloads*: Load and unload auxiliary motor branch circuits are standard. If load and unload HP are specified at time of order, GSI will install properly sized breaker, contactor, and overload for customer's application.

Entrelec Terminals: Color-coded Entrelec terminals are used for all computer control circuits connections, making for easy installation, diagnosis and service.

Safety Disconnect*: For safely disconnecting power from main panel for servicing dryer controls. Also provides an easy connection point for incoming electric supply.

Work Light and Shutdown Indicator: The light on the outside of the dryer doubles as a shutdown indicator.

**Provides significant cost savings over dryers that neglect these features.*

VISION CONTROL FEATURES

The GSI Vision Dryer Control System features a wide-array of settings that creates unparalleled options and control. Boasting a large color screen with easy-to-use touch screen controls, the Vision can be remote-mounted, via a simple seven wire harness, up to 1000 feet away from the dryer.

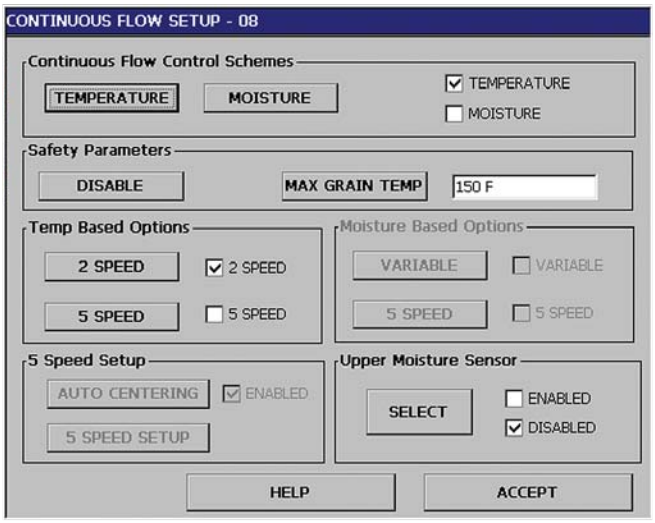
Because safety and dependability are paramount for all GSI products, the Vision system features a low voltage safety circuit and a safety disconnect on every dryer. Each safety is monitored individually and its status displayed on-screen. With no moving parts – timers, time delays, thermostats, etc. – the Vision system is less prone to wear-and-tear that leads to costly repairs and downtime.

Plenum and grain temperatures can be modified on-screen using temperature and moisture based controls.

The Vision also puts help at your fingertips when you need it most. Every shutdown error tells you exactly where the problem is and help you with tips and instructions to fix the error.

GSI Vision allows users to track the dryer's history. All shut downs are logged with time and date information. This data can be saved to a USB flash drive for use on a home computer.

The GSI Vision Dryer Control System provides an outstanding value, with a tremendous scope of features and benefits.



MOISTURE CONTROL

Every GSI Vision dryer is equipped with three different styles of moisture control when operating in continuous flow. Users select the mode that best fits their needs in a particular situation.

1. **Temperature Based 2 Speed with optional 5 Speed Mode:** This temperature based control uses grain temperature to determine the final moisture content. As grain moisture increases or decreases from the desired moisture set point, the metering rolls speed up or slow down an amount pre-determined by the user in order for the dryer to bring the moisture level back to the desired setting. The optional 5 Speed Mode includes automatic speed averaging. When moisture changes significantly, all 5 speeds will change accordingly to bring the operation back into synch with the output moisture. This mode is best for all conditions when operating in dry & cool or all heat.
2. **Moisture Based Infinite Speed:** This is a moisture-based system that extracts data from three different points in the dryer: the moisture of the incoming grain, the temperature of the grain in the middle of the dryer, and the grain moisture upon exiting the dryer. All three measurements are factored to determine final moisture. Simply enter the desired moisture set point for finished grain and the Vision's moisture control will speed up or slow down the metering rolls to maintain moisture at the desired setting. This setting makes very slow and calculated adjustments to the grain and is most effective when the moisture of the incoming grain does not vary much and is within a narrow range, i.e. one or two points when operating in dry & cool or all heat.
3. **Moisture Based 5 Speed:** This moisture control method makes very quick meter roll changes and uses only the rear (exiting grain) sensor for adjustments. This setting works best when operating all heat and the moisture of the incoming grain varies quite a bit and has a wider degree of variance, i.e. three or more points. It is best to not use this mode for dry and cool operation.

VISION CONTROLS ADVANTAGES

GSI COMPUTERIZED CONTROLS THE BEST IN THE INDUSTRY

When you talk about computerized controls you have to think GSI. GSI was the first to come out with a successful computerized control for grain dryers in 1993. All GSI dryers since then have been computerized. The Competitors that first chastised computers as the wrong way to go have eventually followed suit, though with standard generic PLC industrial controls. GSI continues to be at the front of the pack with computerized controls. GSI is the only company that from the start used computerized controls specifically designed and built for use in the extreme conditions grain dryers see and not just purchased off the shelf controls designed for use in the much better conditions of a factory floor. GSI's Vision controls were not only specifically designed from scratch for a grain dryer and the conditions it sees, but were designed entirely in house at GSI by our own Engineers. This may not sound like that big of a deal until you realize that standard PLC industrial controls are not normally used outside on the side of a very dirty, cold, hot and wet grain dryer, but are replaced by new series every 5 to 10 years making replacements very hard to come by. The now 17 year old GSI EMCS control boards are readily available from GSI in the unlikely chance one goes bad. PLC controls have their place with Tower Dryers at large commercial locations already using PLC's being one. However the Vision Control are the best answer for farm locations.

All GSI boards are also easily repaired by Ag Express Electronics a reputable and well known Ag Electronics repair facility north east of Indianapolis. They have specialized for many years at repairing Ag electronics and have specifically worked with GSI to design and develop testing equipment to bring faulty boards back to full dependability and durability. GSI's partnership with AG Express is a great asset to our owners.

COMPUTERIZED CONTROLS & INNOVATION

As stated earlier GSI has led in the innovation of Dryer controls including the development of the first successful computerized control for dryers in 1993. These controls eliminated most of the moving parts that plagued the controls industry causing constant service and replacement. They made the dryer much more durable and dependable while allowing control innovations which, as said then made the control "Really Smart". One such simple innovation that makes life simpler was making the Load auger come on immediately when its switch is turned on and then implementing the load delay every time the load restarts. Previously you had to wait through the load delay when you started it in automatic. Many innovations now taken for granted and copied by others have arrived with each new generation of GSI computerized controls.

Other companies first called computerized controls undependable and even unusable on grain drying equipment, but 5 to 15 years later did an about turn and started following GSI's lead. GSI offered the first controls that allowed remote monitoring of the dryer from another computer in 1994. Brock claimed inaccurately to be the first at this 10 years later. In 1994 with the Series 2000 controls and then again in 1997 with the Network Controls GSI became the first to provide controls that used networking to significantly reduce the wires and connections required. On one larger model networking reduced the number of wires by 60% and terminal points by over 80%. On one stack model what was nearly 70 wires strung up the length of the dryer that had to each be wired in during installation become 6 wires and that means a much easier installation and far less chance of wiring issues during the life of the dryer. Less wires and terminals meant better dependability and longer life. Simple things like not allowing the dryer to start until the switches are set to the right setting, not allowing incorrect settings to be entered at all and warnings that tell you exactly which component caused the shutdown while logging the shutdown to be viewed later made service much easier. All along the way innovative testing screens confirming all switch positions and wiring integrity were employed getting better with each new generation. There really are too many innovations over the years, some eventually copied by others, to mention here but they keep on coming.

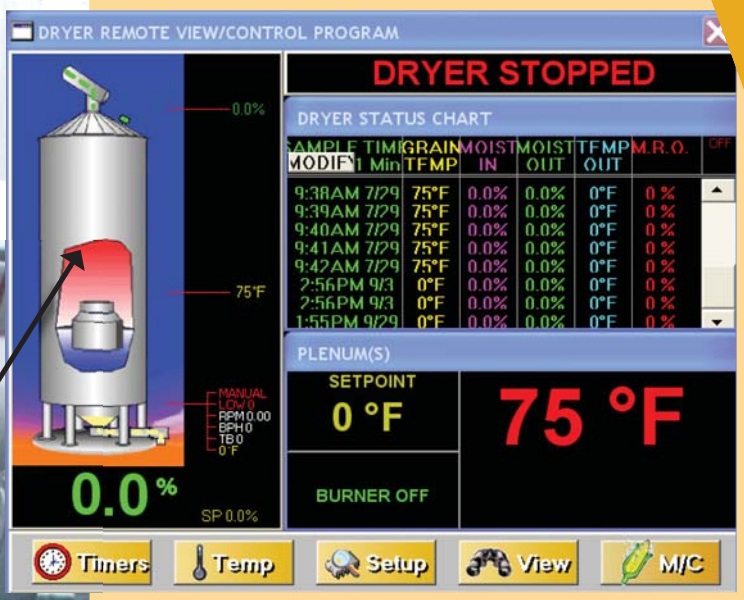
THE LATEST INNOVATIONS

Today full color touch screens with an interface that virtually requires no instructions, further reduces switches and hardware buttons that others continue to use further improves GSI controls durability and dependability. The depiction of each dryer model in color on screen with animations showing whether and how the augers, fans and heaters are operating is not only an exclusive but an incredible improvement in the operators ability to quickly access and determine if the dryer is operating correctly. If you haven't compared this to the interfaces our competitor use you do not realize just how much better it is. This makes it easier than ever to operate a GSI Dryer. Full reports and graphs on screen are easily downloadable to any USB drive. Easy updates to the software from that same USB drive after downloading from an always available web site completes the package to make it easy for the Owner to keep their records complete and their software up to date on their own. No need for a Dealer to make the trip to update the software, replace a physical Eprom chip or worse yet remove a board and swap it out to send back to the company for an upgrade. The newest Web based WatchDog system puts the innovative display with its animated color diagram and charts which make monitoring and operating the dryer very intuitive and easy right on your office computer screen or if you have a smart phone right in your hand anywhere you go. You will not fully appreciate GSI's one of a kind dryer interface until you have seen it remotely and realize that a quick glance tells all particularly when compared to scrolling through a list of text readouts. It provides live monitoring and control of any GSI Vision Dryer across the web not only from any computer or smart phone anywhere in the world. With the exception of the initial startup of the dryer most safe to change remotely functions, settings and readouts commonly monitored, accessed and changed on a dryer are readily available from anywhere you have web access.

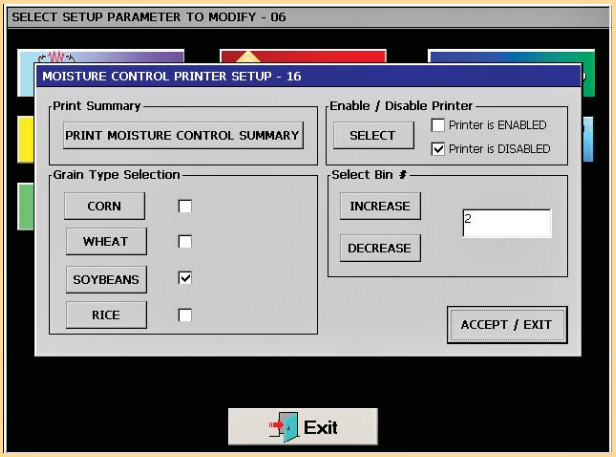
Perhaps the most flexible part of the new controls is the three mode moisture control system. No one system works best in all conditions, grains and operation modes. GSI provides Temperature control in both the legacy conventional 2 speed ON/Off or HIGH/LOW and the innovative 5 speed mode which constantly monitors the average speed and moves the main center speed setting to keep the dryer centered and operating smoothly via auto averaging. You can opt for 5 speed Moisture control with the same auto averaging while using the standard of moisture sensing DMC's Calc-U-Dri moisture sensor at the discharge. For larger models and higher volumes GSI offers the first successfully offered infinitely variable speed moisture control mode that uses incoming moisture, grain temperature at the middle of the dryer and outgoing moisture at the discharge to control grain moisture output. Accurate measurement of moisture at the back of a grain dryer is not an easy thing to do. GSI's original grain sensing auger for the portables and grain flow capture box on tower dryers give the most accurate measurement available while making cleaning and maintenance much easier. These first of a kind designs are now being "emulated" by others. In addition GSI exclusively offers for food grade grains such as rice, grain temperature control at the discharge of the dryer. This is unique and allows the operator to control the highest temperature the grain will attain. So no matter the dryer model, grain type, operating mode or conditions encountered you have a moisture control mode to best operate and put out grain at the correct moisture. Other companies offer at best one temperature and one moisture based moisture control operation mode. GSI gives the customer the flexibility to control their moisture the best way for their locale, conditions and grain type.

Take a look at GSI's control boxes, quality of wiring and cutting edge screen interface and monitoring ability and the difference is obvious. Other companies claim to have modern computer controls, but that often is just run of the mill PLC controls which will never compare to GSI's in house designed grain dryer specific controls. GSI has had a long history of easy to use reliable fully computerized controls with a proven record for innovation that others can only follow and that will continue into the future.

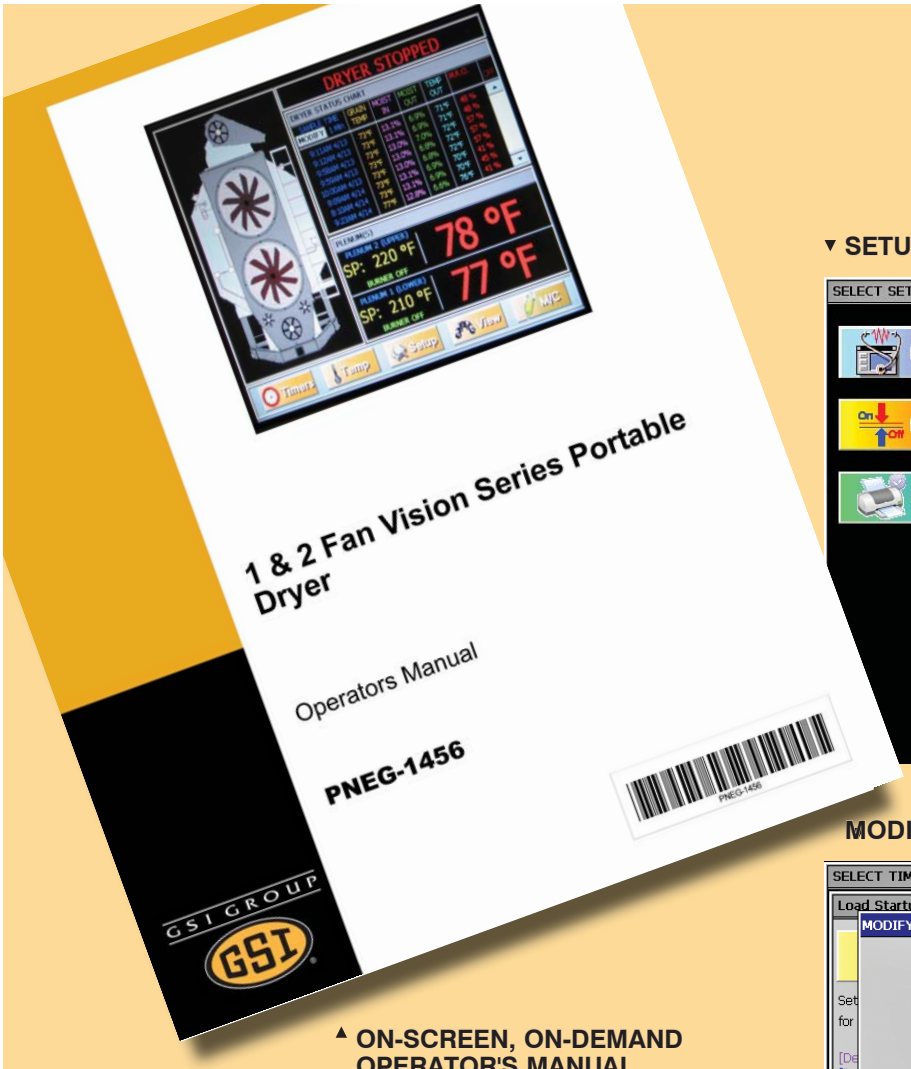
VISION CONTROLS BREAK OUTS



▼ ADVANCED MOISTURE CONTROL SETUP

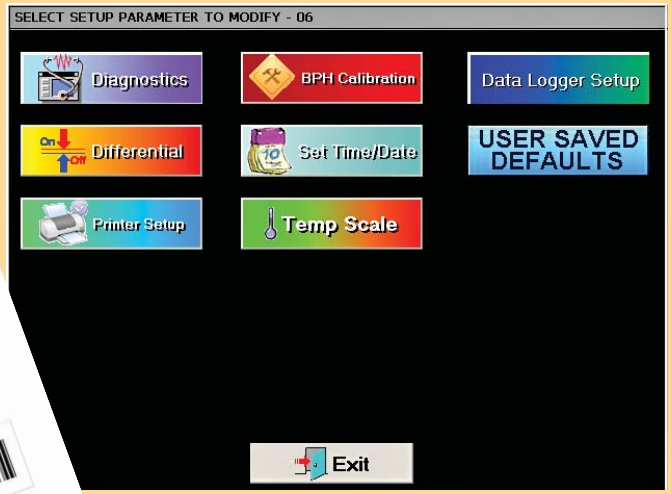


▼ TIMERS CONFIGURATION SCREEN



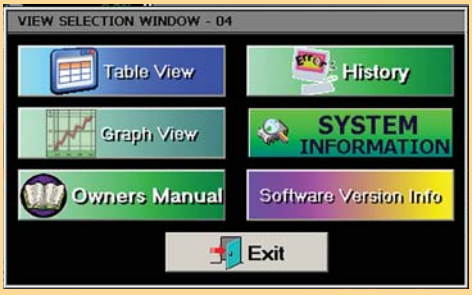
▲ ON-SCREEN, ON-DEMAND OPERATOR'S MANUAL

▼ SETUP CONFIGURATION SCREEN



MODIFYING TIMER SET POINT SCREEN

▼ VIEW SELECTION SCREEN



▼ SHUTDOWN HELP FILE SCREEN

OPTIONAL VISION WATCHDOG SYSTEM

Since 1993 GSI has offered phone call alerts and remote monitoring through the WatchDog system. This required either a special modem or a full fledged computer on site with a phone line to it and a remote computer at another location to be operational. For more than 20' or more distance between the computer and dryer required additional equipment in the form of what are called short haul modems to provide the connections. A special 3rd party remote connection software was also required to provide the communications between the onsite computer and the remote computer. This was a first for the drying industry and was not made available by other companies until recently. It worked well allowing for remote monitoring and significant adjustment of those settings available to the EMCS controls. The Network Control allowed for more control, but still required the above hardware, computers and software as well as significant computer knowledge for installation.

The new Vision WatchDog monitoring system is now fully web-based capable, giving you the ability to monitor your dryers from anywhere with an Internet connection. The direct connect will still likely require short haul modems if the distance is more than 80 to 100', but they will allow for a connection up to ¼ mile and they are included in the direct connect package. However any web based connection eliminates the need for short haul modems altogether. This convenient system requires no special software. With the direct connect just browse for the IP address 10.0.0.1 on your direct connected computer. With an internet connection use the IP address from the Cell Modem or your Internet LAN, preferably with a permanent IP address set up by your ISP. With any of these systems you just use an Internet browser to view the status of your dryer and make changes in its settings. This greatly improved system not only makes it even easier to monitor and operate much of the dryer remotely, but it never takes more than one computer, an internet connection and some CAT5 cable to make it fully operational after the WatchDog interface board is installed in the dryer. GSI has arranged a source to make sure that a fully compatible and compliant Cell Phone Modem be purchased separately for those locations where there is not presently an internet connection present. They will work out the best carrier to use and will arrange for the monthly billing charges to that service provider. At this time one can turn on and off this service on a monthly or quarterly basis.

PNOT-403 describes the new Vision Watchdog, It replaces the older WatchDog (pre 2009) with the following functionality (For detailed information, please consult the Internet Based WatchDog's Manual PNEG-1706):

- A Web Browser is the only software needed by the client PC (No special program that might have trouble executing on different versions of Windows). Internet Explorer and Mozilla Firefox have both been tested with success. .
- Connection between drying equipment and the user's PC can be provided by two different means.
  1. Direct connection using outdoor grade CAT-5 Ethernet Cable between the customers's drying equipment and their PC. This length can be up to 1000 feet. (Part # VIS-WATCH-DC).
  2. Connection between drying equipment and user's PC provided by a high speed Internet Connection. (Part # VIS-WATCH-IC).
- If the WatchDog System is connected to the Internet, then the drying equipment can send emails or text messages to the user's email address or cell phone number.
- Drying parameters such as plenum temperature setpoints, grain temperature setpoints, timer setpoints, metering roll speed setpoints, etc. Anything that can be modified using the drying equipment's touch screen (except for the setup menu) can be modified remotely using this new system.
- The user can at anytime view the current status of drying. Everything which can be viewed at the Vision Dryer's user interface screen can also be viewed remotely using the WatchDog System (Except for the Setup Menu).
- The drying equipment can be shutdown remotely by the user via the new WatchDog. NOTE: The dryer can only be started from the dryer's control panel.
- If the dryer shuts down, a screen will be displayed by the WatchDog System, giving the reason why. There is also an audio indication (barking dogs) to alert the user who is not looking at the WatchDog screen.
- There are two different types of web pages that can be viewed by the WatchDog user. A graphical screen can be selected for view by PC users and some cell phones. Some cell phones will have to access the WatchDog's text based interface to view the current status of their drying equipment. The initial WatchDog screen will allow the choice to view graphics or simple text.

WATCH DOG

▼ SETUP SCREEN

▼ MODIFY TEMP

▼ SHUTDOWN SCREEN

▼ WATCHDOG COMPONENTS

Direct Connected Type
(Part # VIS-WATCH-DC)

Systems includes: WatchDog Enclosure, Ethernet Cable, Modified Serial Cable, Short Haul MODEM, Short Haul MODEM Power Supply, Serial Cable

LAN / WAN connection
(Part # VIS-WATCH-IC)

Systems includes: 3" DIN Rail, WatchDog Board Power Cable, WatchDog Board, Mounting ¼" Nuts, Serial Cable, Mounting Plate

WHY A TOWER DRYER?

Why would one choose a tower dryer for their operation? There are differences that make a tower dryer the best choice for many farms, particularly large farms or commercial installations. Tower dryer do well with a wide variety of grains delivering high quality and efficient drying of any cereal or feed grain grown most anywhere in the world.

With 5 point removal capacities from 800 to 10,000 BPH any size operation capacity demands can be met which will eliminate bottlenecks in any grain drying, handling and storage facility. These high capacities are delivered not only dried but cooled adequately to safely store in your long term storage bins. Portable dryers can run all heat and cool in a bin, but this is limited to 48' and about 60,000 bushel bins because adequate cooling air is all but impossible to provide in larger bins. With GSI tower dryers you combine the capacity you need processed to go directly into the largest bin with just normal aeration designs.

Even with the large capacities that GSI tower dryers offer they have a relatively small footprint. Taking advantage of today's move to high capacity bucket elevators the tower design is tall and circular allowing it to offer very high capacities that fit where other designs will not.

GSI tower dryers are the largest holding capacity column dryers built today. When you compare rated capacities to holding capacities they offer the longest retention time in this design type. Long retention times greatly improve grain quality and efficiency. There is a balance point where longer retention time will not improve dryer performance and GSI tower dryers are squarely at this optimum position. Add to this optimum retention time GSI's patented grain inverters which rotates all but the outside two inches of the column eliminating overheating of any of the grain and capturing in that outside two inches the heat otherwise lost and vacuum cooling which reuses the latent heat from the cooling of the grain you have the highest quality and best efficiency dryer on the market.

The largest perforation GSI tower dryers use is .078" which is significantly smaller than the .092" commonly used in most portable and even some tower dryers. The Modular series tower dryers takes advantage of this smaller perforation to minimize the loss of particulate matter through the dryer screens. The T-Series and Commercial Tower dryers take this one step further using .0625" perforation size in key areas on the inside cooling area and the outside just after the grain inverters to provide the cleanest operation available. With modern low speed axial and latest design mixed flow fans surrounded entirely by the grain column you have the best in very quiet operation. The clean and quiet operation allows GSI tower dryers to be installed where other dryers cannot in urban and other congested areas.

Elegant simple mechanical design means less maintenance than other dryer designs. There is no load auger at all and the patented flat bottom Accu-trol sweep or hopper with metering drum means less moving parts which means more dependable performance, less down time and higher profits.

If the need is for a high capacity, efficient, quiet, clean dryer that produces the highest grain quality and consumes the least ground space per BPH capacity one of the three GSI Tower dryer series will fit that need.

TOWER DRYER SERIES COMPARISON

	TM Modular Series	T-Series			Commercial			
CAPACITY RANGE 5 PT. REMOVAL	800 to 1,690 BPH	1,000 to 7,000 BPH			1,200 to 12,000 BPH			
DIAMETERS AVAILABLE	10' 7"	12'	18'	24'	12'	18'	24'	30'
CONSTRUCTION	Modular delivery	Built on Site			Built on Site			
BLOWER TYPE	Axial Inline Adjustable Pitch	Axial (T-1050, T-1260) and Mixed Flow			Mixed Flow			
BLOWER NUMBER	1	1	3	3	1	3	3	4
BURNER TYPE	Inline Octagon (TM-1008, TM-1010, TM-1012)	Inline Octagon (T-1050, T-1260)			Maxon NP-LE-AL			
	Maxon NP-LE-AL (TM-1015)	Maxon NP-LE-AL						
BURNER TEMPERATURE CONTROL	High/Low Standard	High/Low Standard			Motorized Regulator Modulated Control			
	Motorized Modulating Optional	Motorized Modulating Optional						
LP VAPORIZER TYPE	Internal Standard	Internal Standard	External	External	External			
					Internal Optional on 12'			
SCREEN SURFACE	Corrugated	Smooth or Corrugated			Smooth or Corrugated			
GALV. OR STAINLESS OUTER SCREENS	Stainless Standard	Stainless Standard			Stainless Standard			
SCREEN PERFORATIONS	.078 & .0625	.078 & .0625			.078 & .0625			
GRAIN INVERTERS	Standard	Standard			Standard			
DISCHARGE FLOOR MATERIAL	Stainless Standard	Stainless Standard			Stainless Standard			
DISCHARGE TYPE	Patented Acccu-trol Flat Metering Sweep	Patented Accu-trol Flat Metering Sweep or Patented Hopper & Metering Drum			Patented Accu-trol Flat Metering Sweep or Patented Hopper & Metering Drum			
CONTROL TYPE	Vision Network	Vision Network			Commercial PLC/SLC			
CONTROL INTERFACE	Color Touch Screen	Color Touch Screen			Color Touch Screen			
SOFTWARE UPDATING	Web Download & USB Drive Upload	Web Download & USB Drive Upload			EPROM Program Update			
REMOTE MONITORING	Web Based WatchDog	Web Based WatchDog			Web Based Allen Bradley			
ELECTRICAL COMPONENT TYPE	IEC	IEC			NEMA IV Commercial			
ELECTRICAL CERTIFICATION	MET	MET			MET			
ADJUSTABLE COOLING SECTION	yes	no			no			

☐ - Modular ☐ - T-Series ☐ - Commercial

DRYER CAPACITY CONVERSIONS CHART




Conversions are to be used against the literature 5 and 10 point capacity estimates or the manuals point by point 1 to 20 point estimates.

The following are approximate starting points. Set and run the dryer for one (1) to two (2) hours and then adjust speed according to desired output moisture.



Crop to be Dried (Common Types)	Plenum Temperature Setting Drying Rates Calculated based on Plenum Temperature Setting	Conversion Formula (bu) Corn Production Rate Conversion to New Crop Production Rate	Conversion to Metric Tons Conversion of Crop Production Rate from bushels/hour to Metric Tons/hour
Canola *	160° F	(corn dryer capacity) x 0.63	1 Metric Ton (@ 56 lb / bu) = 39 bu
Corn	210° F	rated capacity given in specs.	1 Metric Ton (@ 56 lb / bu) = 39 bu
Milo / Sorghum *	160° F	(corn dryer capacity) x 0.63	1 Metric Ton (@ 56 lb / bu) = 39 bu
Soybeans *	150° F	(corn dryer capacity) x .65	1 Metric Ton (@ 60 lb / bu) = 36.75 bu
Sunflowers *	140° F	(corn dryer capacity) x 1.33	1 Metric Ton (@ 32 lb / bu) = 68.9 bu
Wheat *	160° F	(corn dryer capacity) x 0.63	1 Metric Ton (@ 60 lb / bu) = 36.75 bu
Rice ∞	130° F	(dryer column holding capacity) x 2.5 per 2 points of removal	1 Metric Ton (@ 45 lb / bu) = 49 bu

* Only corn can be dried on All Heat. Cooling hot grain in a bin is not recommended for any other commodity.
∞ GSI recommends that no more than 2 points of moisture be removed from rice per pass through the dryer.

Example 1: Wheat capacity calculation for TM-1010 dryer with 5 point removal in Dry & Cool Maximum Cool mode:
1,000 bu/hr x 0.63 = 630 bu/hr

Example 2: Wheat capacity metric tons for TM-1010 dryer:
630 bu/hr ÷ 36.75 = 17.14 MT/hr

Example 3: Rice capacity calculation for TM-1010 dryer:
624 Heat column holding capacity x 2.5 = 1,560 bu/hr removing 2 points of moisture.

Example 4: Rice capacity metric tons for TM-1010 dryer:
1,560 bu/hr ÷ 49 = 31.84 MT/hr

DRYER CAPACITY COMPARISON DRY & COOL

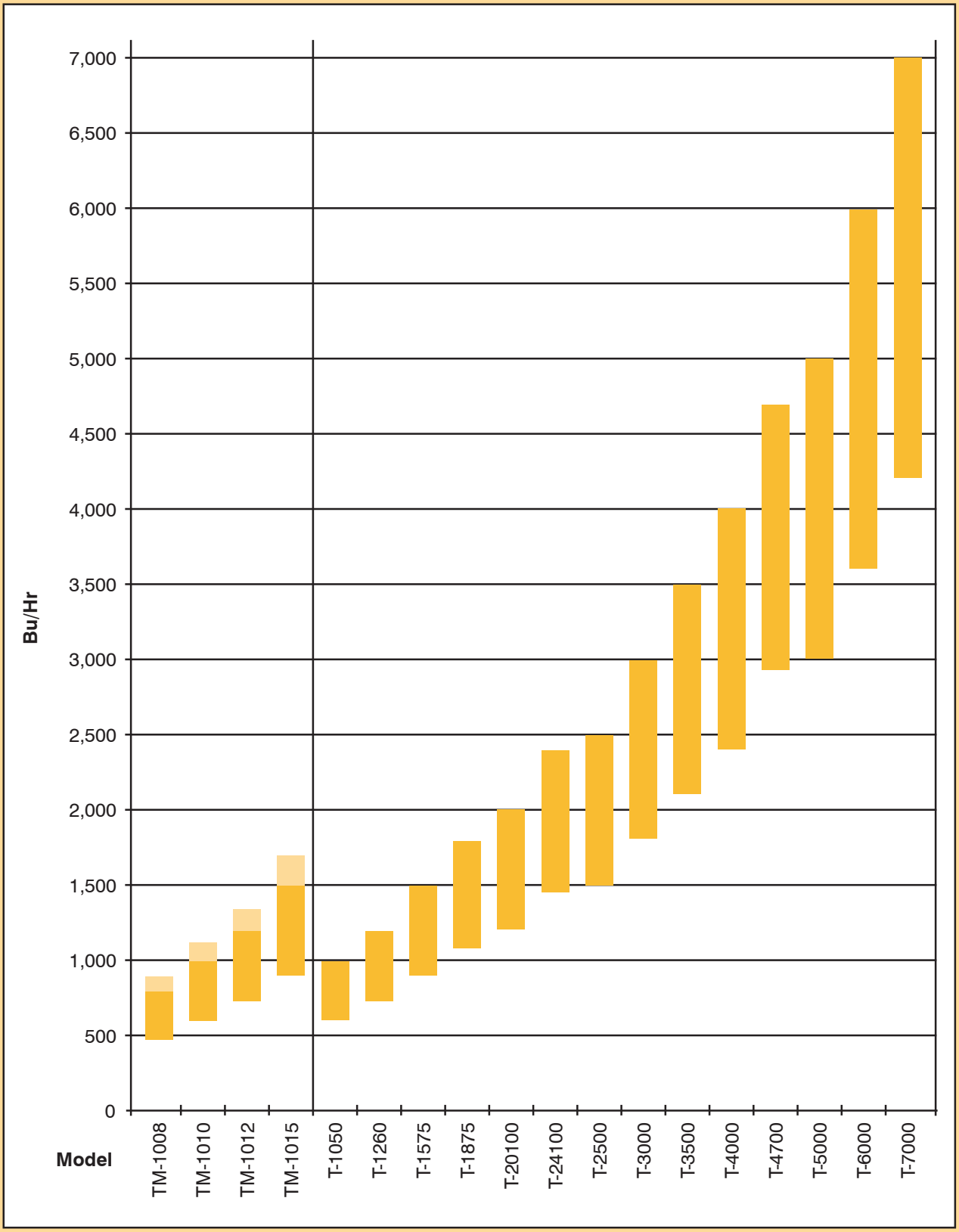


Chart shows the range of 5 point to 10 point removal.

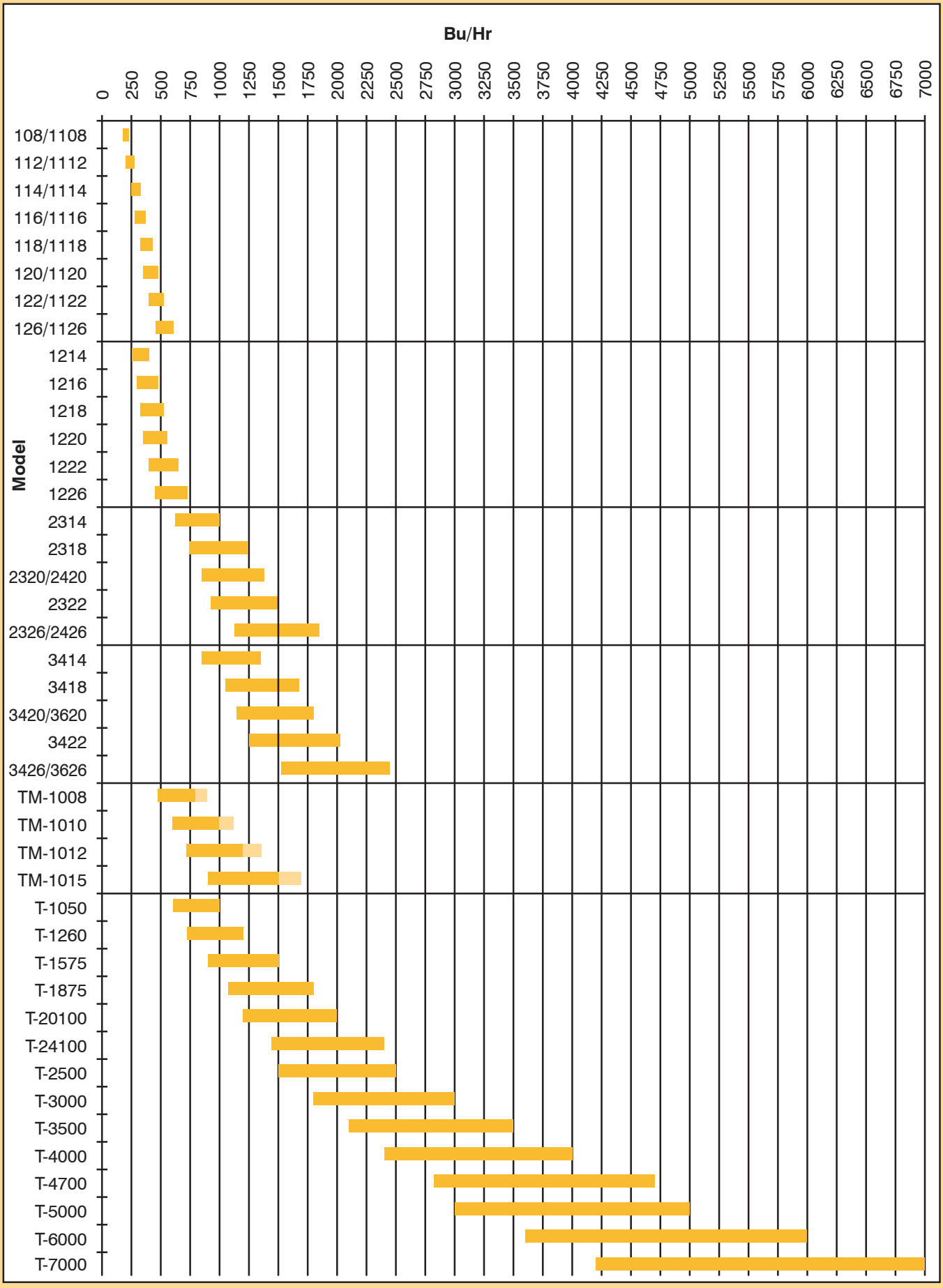


Chart shows the range of 5 point to 10 point removal.

DRYING RATES & COSTS

AUXILIARY EQUIPMENT

A. Capacity
Always verify the capacity of the loading and unloading equipment. Compare the auxiliary equipment capacities to the maximum values for the dryer. The auxiliary equipment must be able to handle the input and output requirements of the dryer.

B. Electrical
Always verify the type of phase, voltage, amperage, and horsepower of the auxiliary equipment. If the dryer is to control the operation of the auxiliary equipment, values for the electrical requirements of this equipment must be taken into account when ordering the components of the dryer control system.

Horsepower required for 6", 8" & 10" Wet Load Augers

Three phase motors:

6"	3 HP/10' of length
8"	4 HP/10' of length
10"	5 HP/10' of length

One phase motors:

6"	2 HP/10' of length
8"	3 HP/10' of length
10"	4 HP/10' of length

MAXIMUM COOL MODE:
Sample calculations: 25% shelled corn dried to 15% moisture content. Use the average drying energy of 1,370 to 1,541 BTU/pound of water removed which is 1,455.

BTU REQUIRED PER BUSHEL:
To find the BTU required per bushel, multiply the amount of water to be removed for a given point differential by the drying energy used in the dryer for each pound of water removed.

$$\text{10 point removal} \quad \frac{7.42 \text{lb } H_2O}{\text{bushel}} \times \frac{1{,}455 \text{ BTU}}{\text{lb}H_2O} = \frac{10{,}796 \text{ BTU}}{\text{bushel}}$$

FUEL UNITS REQUIRED PER BUSHEL:
To find the fuel units required per bushel, divide the amount of BTU required per bushel at a given point removal by the heating value per unit of the fuel to be used.

$$\text{10 point removal} \quad \frac{10{,}796 \text{ BTU}}{\text{bushel}} \div \frac{91{,}500}{\text{gallon LP}} = \frac{0.118 \text{ gallon LP}}{\text{bushel}}$$

The reciprocal of these values is the number of bushels that can be dried per gallon of LP.

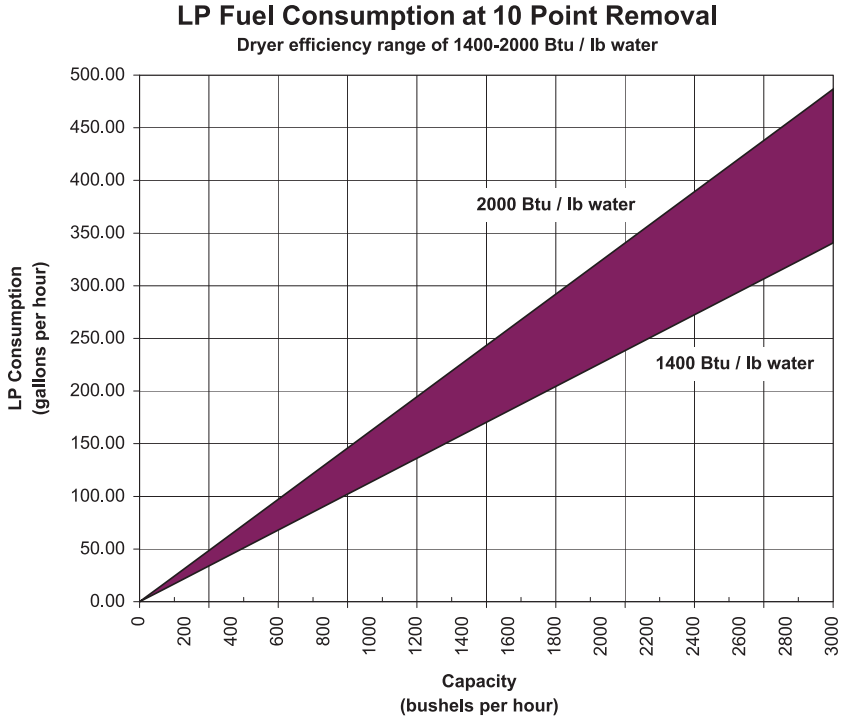
FUEL CONSUMPTION (UNITS PER HOUR):
Multiply the number of fuel units required by the bushel capacity of the dryer in question at the moisture removal desired. A M-1010 dryer has a capacity of 600 BPH for 10 point removal. How many gallons of LP are used?

$$\frac{600 \text{ bushels}}{\text{hour}} \times \frac{0.118 \text{ gallon LP}}{\text{bushel}} = \frac{70.8 \text{ gallon}}{\text{LP/hour}}$$

DRYING COSTS (COST PER BUSHEL):
Multiply the cost of fuel per unit by the fuel unit per bushel rate. LP costs estimated at $1.50 per gallon.

$$\frac{\$1.50}{\text{gallon LP}} \times \frac{0.118 \text{ gallon LP}}{\text{bushel}} = \frac{\$0.177}{\text{bushel}}$$

Example is for a TM-1010 with Inverters running in Dry & Cool Maximum Cool mode



DRYING ENERGY CONSTANTS FOR CORN

The following information should be used for estimates only.

7.42 lbs of water (H2O) are removed per bushel at 10 point removal. 3.48 lbs of water (H2O) are removed per bushel at 5 point removal. 1044 BTU are required to evaporate one pound of free water at 100% efficiency. Approximately 1400 to 2000 BTU are required to remove one (1) pound of water from 25% moisture corn when drying it down to 15% moisture content.

Requirements will vary with the type of dryer, method of operation, grain density, grain quality and outside conditions. The shaded area in the graph represents the range of values for fuel consumption that can occur for each capacity and between the drying energies of 1400 and 2000 BTU/lb of water removed.

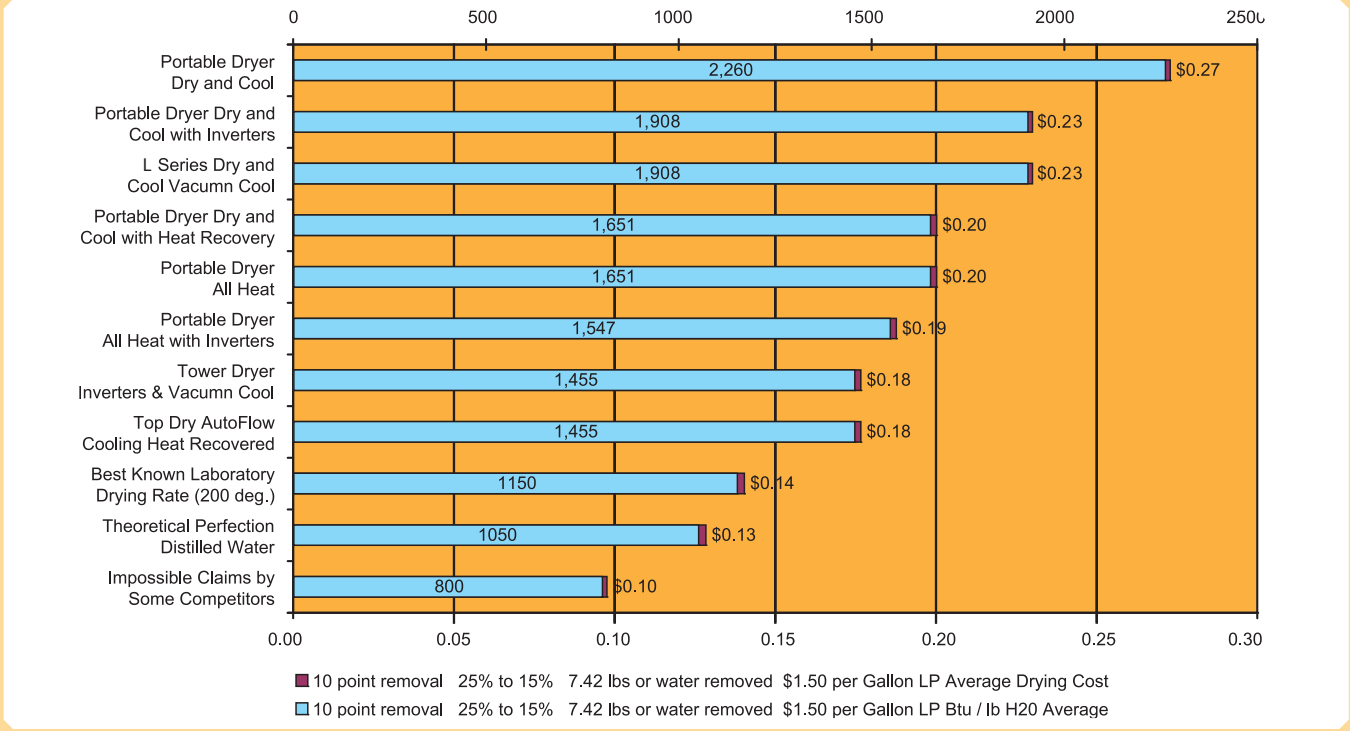
FUEL FORMULA CONSTANTS		
Fuel Type	**Base Unit**	**BTU Content**
Liquid Propane	gallon	91,500
Natural Gas	cubic foot	1,040
	therm	100,000
#2 Fuel Oil	gallon	136,000
Electricity	kilowatt	3,413

DRYING RATES & COSTS

10 point removal 25% to 15% 7.42 lbs or water removed $1.50 per Gallon LP

DRYING METHOD	BUSHELS / GALLON LP	BTU / LB H20	BTU / LB H20 AVERAGE	AVERAGE DRYING COST
Portable Dryer Dry & Cool	5 - 6	2,466 - 2,055	2,260	0.2727
L & B Series Dry & Cool Vacuum Cool	6 - 7	2,055 - 1,761	1,908	0.2308
Portable Dryer Dry & Cool with Inverters	7 - 8	1,761 - 1541	1,651	0.2000
Portable Dryer - Dry & Cool with Heat Recovery	7 - 8	1,761 - 1541	1,651	0.2000
Portable Dryer - All Heat	7 - 8	1,761 - 1541	1,651	0.2000
Portable Dryer - All Heat with Inverters	7.5 - 8.5	1,644 - 1,450	1,547	0.1875
Tower Dryer - Inverters & Vacuum Cool	8 - 9	1,541 - 1,370	1,455	0.1764
Top Dry AutoFlow - Cooling Heat Recovered	8 - 9	1,541 - 1,370	1,455	0.1764
Best Known Laboratory Drying Rate (200 deg.)	10.7	1,150	1150	0.1402
Theoretical Perfection Distilled Water	11.7	1,050	1050	0.1282
Impossible Claims by Some Competitors	15.4	800	800	0.0974

AVERAGE DRYING COST COMPARISON



X-STREAM DRYER TESTING

PURDUE/PERC EFFICIENCY TESTING ON X-STREAM PORTABLE DRYERS.
The problem is that a conventional portable dryer puts more heat at the opposite end from the burner creating a tendency to dry more at that end and allow some heat to escape which reduces both quality and efficiency. This is not as much of an issue on the shorter models with those under 20' showing less effects. It is an issue at 20' and gets worse as a dryer gets longer.

The GSI X-Stream has eliminated this issue in our 20' through 26' portable dryer models by alternating the end that gets the extra heat. The end result is all the grain gets the same amount of heat so no heat loss or over drying occurs. In 2009 working with the Propane Education & Research Council (PERC) GSI paid for Purdue University to independently determine the btu/lb efficiency of our model 2326 X-Stream. The Dryer's only option was X-Stream and ran Dry & Cool drying commercial corn on a central Illinois farm. The grain and gas was weighed for accuracy. Three separate test runs were made. With 2009 being a relatively hard drying fall the 2326 X-Stream performed "extremely" well. It is in line to suggest that the X-Stream models will perform 10% more efficiently than previous non X-Stream models. They will also improve grain quality by not over drying the back columns.

The statistics and results were as follows.	
Moisture In and Out:	20.7% to 14.5%
Points Moisture Removed:	6.2
Test Weight:	54.8 lbs
Bushels per hour:	1,487.43 bph (95% of rated cap)
BTU/Lb of water:	1,990.72
Past Average for non X-Stream GSI models:	2,260.50
Difference:	11.5%

TOWER DRYER TESTING

PURDUE/PERC EFFICIENCY TESTING ON TOWER DRYERS.
The original testing of typical farm dryers was done in the 1970's. Several Universities tested and most of the dryers at that time used 3,500 btu's per lb of water that they removed. As gas was inexpensive and there were few repercussions for poor grain quality most dryers were high airflow which led to low efficiency and poor quality. But, it kept the size of the dryers small which kept the purchase price lower. Later all Heat improved things but the hot grain must be cooled and today's large bins will not allow the hot grain to be cooled quickly enough. Increased farm size today has brought back the need for efficient dry and cool dryers on many farms.

In 2010 working with the Propane Education & Research Council (PERC) GSI paid for Purdue University to independently determine the btu/lb efficiency on our T&F series model 24100. The Dryer was a standard model with Inverters operating Dry & Cool drying commercial corn on a north central Ohio farm. The grain was weighed across a scale and gas was measured via a certified meter. Two separate test runs were made.

The end result with the GSI Tower Dryer with its large drying column holding capacity, low effective airflow, patented Grain Inverters and vacuum cooling was some of the best BTU/lb of water efficiency numbers realistically possible. Today's Tower dryer uses less than half the fuel than the typical Dry & Cool Dryer from the 1970's and even less fuel than any All Heat Dryer with grain quality that compares as well.

The statistics and results were as follows.	
Moisture In and Out:	20.9% to 14.3%
Points Moisture Removed:	6.6
Test Weight Wet/Dry:	56.3/57.4 lbs
Bushels per hour:	1,856.87 bph (98% of rated cap)
BTU/Lb of water:	1,501.96
Adj. to 15%	1,425.0
Typical 1970's Dryer	3,500.00
Difference:	Over 50%

COMPARISON GSI VERSES BROCK/MEYER TOWERS (UP TO 2,000 BPH RATING)

MODELS	GSI TM-1008	Meyer 1000S	GSI T-1050	Meyer 1200S	GSI TM-1010	GSI T-1260	Meyer 1400S	GSI TM-1012	Meyer 1600S	Meyer 1800S	GSI T-1575	GSI TM-1015	GSI T-1875
BLOWER TYPE & SIZE	Axial 43"	DWDI	Axial 43"	DWDI	Axial 43"	Axial 43"	DWDI	Axial 43"	DWDI	DWDI	Mixed Flow	Axial 48"	Mixed Fow
BLOWER RPM	1775		1750		1775	1750		1775			1035	1775	856
BLOWER HP	40 HP	60 HP	50 HP	60 HP	50 HP	60 HP	60 HP	60 HP	80 HP	80 HP	75 HP	75 HP	75 HP
METERING HP	1	5	1	5	1	1	5	1	5	5	1	1	1
UNLOAD MOTOR HP	3				3			3				3	
DRYING CFM - STANDARD	38,000	64,600	42,300	67,200	45,000	48,400	72,500	52,000	82,800	88,800	77,100	66,000	81,800
DRYING CFM/BU - STANDARD	84.4	137.2		117.9	72.1		109.4	65.2	113.6	112.5	84.4	67.9	70.6
COOL CFM - STANDARD	19,500		14,500		22,500	17,500		26,000			38,550	33,000	40,900
COOL CFM/BU - STANDARD	135				156			139			126	176	116
BURNER CAPACITY (MBTU)	8.20	14.65	11.10	15.24	9.70	11.10	16.44	11.20	18.77	20.12	16.65	14.30	17.67
AVERAGE HEAT USE (MBTU)[1]	5.10	7.30	5.71	7.59	6.10	6.53	8.19	7.00	9.35	10.02	9.58	8.90	10.16
TOWER DIAMETER	10'-7"	11'-8"	12'-0"	11'-8"	10'-7"	12'-0"	11'-8"	10'-7"	11'-8"	11'-8"	12'-0"	10'-7"	12'-0"
HEIGHT	42'-1"	42'-10"	45'-8"	47'-10"	48'-11"	52'-4"	54'-1"	55'-9"	57'-10"	61'-7"	59'-0"	62'-7"	69'-0"
COLUMN WIDTH	12-3/4"	10-12"	12-3/4"	10-12"	12-3/4"	12-3/4"	10-12"	12-3/4"	10-12"	10-12"	12-3/4"	12-3/4"	12-3/4"
WET HOLDING (BU)	260	220	302	220	260	302	220	260	220	220	335	260	335
HEAT HOLDING SET MAX. COOL (BU)	450	471	610	570	624	756	663	798	729	789	914	972	1,158
BUSHELS HELD IN 10" COLUMN		108		108			135		135	162			
NO AIRFLOW STEEPING AREA		99		99			99		132	132			
COOL HOLDING SET MAX. COOL (BU)	246	165	219	198	246	268	264	289	264	297	305	289	354
UNLOAD AREA HOLDING	93	49		49	93		49	50	49	49	101	50	101
% IN COOL HOLDING	35.3%	22.4%	26.4%	22.8%	28.3%	26.2%	25.7%	26.6%	23.5%	24.4%	25.0%	22.9%	23.4%
HEAT HOLDING - SET MIN. COOL	552				726			900				1,074	
COOL HOLDING - SET MIN. COOL	144				144			187				187	
% IN COOL HOLDING	20.7%				16.6%			17.2%				14.8%	
DRYING COLUMN HOLDING	696	735	829	867	870	1,024	1,026	1,087	1,125	1,218	1,219	1,261	1,512
TOTAL HOLDING CAPACITY (BU)	1,049	1,004	1,232	1,136	1,223	1,427	1,295	1,397	1,394	1,487	1,602	1,571	1,895
OUTSIDE CATWALKS	1	1	0	1	3	0	1	3	1	2	1	3	2
WEIGHT LBS.	17,900	17,990		19,350	19,200		20,030	21,700	22,070	23,090	31,200	23,000	35,900
DISCHARGE CLEARANCE	Up to 42"	?	40"	?	Up to 42"	40"	?	Up to 42"	?	?	40"	Up to 42"	40"
GRAIN INVERTERS	Standard	n.a.	Standard	n.a.	Standard	Standard	n.a.	Standard	n.a.	n.a.	Standard	Standard	Standard
BPH (25-15%) SET MAX. COOL	480	600	600	720	600	720	840	720	960	1,080	900	900	1,080
BPH (25-15%) SET MIN. COOL	542				670			810				1,010	
RETENTION TIME MINUTES @ 10 PT. MAX. COOL	99	83		82	99		83	103	80	77	92	95	95
BPH (20-15%) SET MAX. COOL	800	1,000	1,000	1,200	1,000	1,200	1,400	1,200	1,600	1,800	1,500	1,500	1,800
BPH (20-15%) SET MIN. COOL	900				1125			1350				1690	

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[1] GSI Typical burner use at 50 deg. F Suction Cool
[1] Brock Typical burner use at 60 deg. F. Suction Cool Brock Literature BR-2060/0108
Brock/Meyer Specifications from Brock Manual MFH1937B page 39 models 1000S through 2400S, 2650S best estimates.
Retention Time Minutes @ 10 pt. removal is Column holding bushels divided by the 10 pt. removal wet bu. capacity converted to dry bushels time 60.
GSI Modulars discharge auger height adjustable 12" to 42" (24" discharge clearance at center with standard legs)

GSI Modular base Module measures 96", all other Modules 81".
Information best known 3-2-10

COMPARISON GSI VERSES BROCK/MEYER TOWERS (2,000 - 7,000 BPH RATING)

MODELS	Meyer 2000S	Meyer 2400S	GSI T-20100	Meyer 2650S	GSI T-24100	GSI T-2500	GSI T-3000	GSI T-3500	GSI T-4000	GSI T-4700	GSI T-5000	GSI T-6000	GSI T-7000
BLOWER TYPE	DWDI	DWDI	Mixed Flow	DWDI	Mixed Flow	Mixed Flow	Mixed Flow	Mixed Flow	Mixed Flow	Mixed Flow	Mixed Flow	Mixed Flow	Mixed Flow
BLOWER RPM			981		818	1,106	1,240	1,111	1,185	1,000	966	793	817
BLOWER HP	100 HP	100 HP	100 HP	100 HP	100 HP	3-40 HP	3-50 HP	3-60 HP	3-75 HP	3-75 HP	3-100 HP	3-100 HP	3-125 HP
METERING HP	5	5	1	5	1	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	2	2	2
UNLOAD MOTOR HP													
DRYING CFM - STANDARD	94,400	101,800	98,600	102,700	108,300	121,950	145,200	175,800	192,750	213,600	282,000	304,800	337,500
DRYING CFM/BU - STANDARD	106.3	100.4	78.5	89.5	72.2								
COOL CFM - STANDARD			49,300	50,000	54,150	60,975	72,600	87,900	96,375	106,800	141,000	152,400	168,750
COOL CFM/BU - STANDARD			109	117	108								
BURNER CAPACITY (MBTU)	21.40	23.09	21.30		23.39	26.34	31.36	37.97	41.63	46.14	60.19	65.84	72.90
AVERAGE HEAT USE (MBTU)[1]	10.66	11.50	12.25		13.45	15.15	18.03	21.83	23.94	26.53	35.02	37.86	41.92
TOWER DIAMETER	11'-8"	11'-8"	12'-0"	11'-8"	12'-0"	18'-0"	18'-0"	18'-0"	18'-0"	18'-0"	24'-0"	24'-0"	24'-0"
HEIGHT	66'-7"	75'-4"	75'-8"	81'-7"	85'-8"	66'-0"	76'-0"	86'-0"	96'-0"	109'-4"	97'-10"	107'-10"	117'-10"
COLUMN WIDTH	10-12"	10-12"	12-3/4"	10-12"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"
WET HOLDING (BU)	220	220	335	220	335	731	731	731	731	731	1,279	1,279	1,279
HEAT HOLDING SET MAX. COOL (BU)	888	1,014	1,256	1,147	1,499	1,511	1,813	2,210	2,512	2,964	3,479	4,042	4,452
BUSHELS HELD IN 10" COLUMN	162	189		216 ?									
NO AIRFLOW STEEPING AREA	132	165		165									
COOL HOLDING SET MAX. COOL (BU)	330	396	451	401	500	529	680	737	888	1,038	1,126	1,177	1,381
UNLOAD AREA HOLDING	49	49	101	49	100								
% IN COOL HOLDING	24.4%	25.1%	26.4%	23.4%	25.0%								
HEAT HOLDING - SET MIN. COOL													
COOL HOLDING - SET MIN. COOL													
% IN COOL HOLDING													
DRYING COLUMN HOLDING	1,350	1,575	1,707	1,713	1,999								
TOTAL HOLDING CAPACITY (BU)	1,619	1,844	2,090	1,982	2,401	2,915	3,368	3,822	4,275	4,877	6,171	6,785	7,399
OUTSIDE CATWALKS	2	3	2	3	3	2	2	2	3	3	2	3	3
WEIGHT LBS.	24,450	26,830	37,700	?	41,600								
DISCHARGE CLEARANCE	?	?	40"	?	40"								
GRAIN INVERTERS	n.a.	n.a.	Standard	n.a.	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
BPH (25-15%) SET MAX. COOL	1,200	1,440	1,200	1,590	1,440	1,500	1,800	2,100	2,400	2,820	3,000	3,600	4,200
BPH (25-15%) SET MIN. COOL													
RETENTION TIME MINUTES @ 10 PT. MAX. COOL	76	74	97	73	94								
BPH (20-15%) SET MAX. COOL	2,000	2,400	2,000	2,650	2,400	2,500	3,000	3,500	4,000	4,700	5,000	6,000	7,000
BPH (20-15%) SET MIN. COOL													

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[1] GSI Typical burner use at 50 deg. F Suction Cool
[1] Brock Typical burner use at 60 deg. F. Suction Cool per literature Brock Literature BR-2060/0108
Brock/Meyer Specifications from Brock Manual MFH1937B page 39 models 1000S through 2400S, 2650S best estimates.
Retention Time Minutes @ 10 pt. removal Converted wet bushel capacity to dry bushels then divided by Column holding bushels.
GSI Modulars discharge auger height adjustable 12" to 42" (24" discharge clearance at center with standard legs)

All Meyer Airflows best estimates from Fan Manufacturers specs.
GSI Modular base Module measures 96", all other Modules 81".
Information best known 3-2-10

COMPARISON GSI 10'7" & 12' VERSES MC 10' TOWER DRYERS (UP TO 1,700 BPH RATING)

MODELS	GSI TM-1008	MC 10740	GSI TM-1010	GSI TM-1012	MC 10950	MC 101160	GSI TM-1015	GSI T-1575	MC 101375	GSI T-1875
BLOWER TYPE	43" Axial	Inline Cent.	43" Axial	43" Axial	Inline Cent.	Inline Cent.	48" Axial	Mixed Flow	Inline Cent.	Mixed Flow
BLOWER HP	40 HP	40	50 HP	60 HP	40	60	75 HP	75 HP	75	75 HP
NUMBER OF POINTS GRAIN PULLED FROM COLUMNS	4	4	4	4	4	4	4	4	4	4
METERING HP/UNLOAD HP	.75 / 5	5	.75 / 5	.75 / 5	5	5	.75 /5	1.0	5	1.0
MC DRYING CFM - FROM SPECIFICATIONS		35,100			47,200	59,500			64,700	
GSI DRYING CFM	38,000		45,000	52,000			66,000	77,100		81,800
COOL CFM - STANDARD	19,500	?	22,500	26,000	?	?	33,000	38,550	?	40,900
COOL CFM/BU - STANDARD	79.3	?	91.5	90.0	?	?	114.2	126.4	?	115.5
BURNER CAPACITY (MBTU)	8.20	5.88	9.70	11.20	7.95	9.68	14.30	16.65	10.89	17.67
AVERAGE HEAT USE (MBTU)[1]	5.10	4.41	6.10	6.10	5.96	7.26	8.90	9.58	8.04	10.16
BTU PER BU/HR 5 PT. REMOVAL (CALCULATED)	6,375	4,742	6,100	5,083	4,806	4,840	5,933	6,387	4,729	5,644
TOWER DIAMETER	10'7"	10'	10'7"	10'7"	10'	10'	10'7"	12'	10'	12'
HEIGHT (TOTAL)	42'1"	42'5"	48'11"	55'9"	50'5"	58'6"	62'7	59'0"	66'7"	69'0"
COLUMN WIDTH	12-3/4"	12"	12-3/4"	12-3/4"	12"	12"	12-3/4"	12-5/8"	12"	12-5/8"
WET HOLDING (BU)	260	140	260	260	140	140	260	302	140	302
HEAT HOLDING - STANDARD (BU)	450	442	624	798	596	740	972	914	853	1,158
5 PT. RETENTION TIME IN MINUTES	35.9	30.3	39.8	42.4	30.6	31.5	41.3	38.9	32.0	41.0
COOL HOLDING SET MAX. COOL (BU)	246	176	246.0	289.0	199	232	289.0	305	296.0	354
% COOL CHAMBER - IN MAX. COOL	35%	27%	28%	27%	24%	23%	23%	25%	25%	23%
HEAT HOLDING - SET MIN. COOL	552		726	900			1,074			
COOL HOLDING - SET IN MIN. COOL	144		144	187			187			
% COOL HOLD. - SET IN MIN. COOL	21%		17%	17%			15%			
UNLOAD AREA HOLDING	42	?	42	42	?	?	42	101	?	101
DRYING COLUMN HOLDING	696	648	870	1,087	826	1,003	1,261	1,219	1,181	1,512
TOTAL HOLDING CAPACITY (BU)	1,049	758	1,172	1,389	935	1,112	1,563	1,622	1,289	1,915
OUTSIDE CATWALKS (STANDARD)	1	1	3	3	2	3	3	1	3	2
WEIGHT LBS.	17,900	?	19,200	21,700	?	?	23,000	31,200	?	35,900
DISCHARGE CLEARANCE [2]	Up to 42"	Up to 36"	Up to 42"	Up to 42"	Up to 36"	Up to 36"	Up to 42"	40"	Up to 36"	40"
GRAIN INVERTERS	Standard	None	Standard	Standard	None	None	Standard	Standard	None	Standard
BPH (25-15%) SET MAX. COOL	482	450	605	720	720	870	900	900	1,000	1,080
BPH (25-15%) SET MIN. COOL	542		670	810			1,010			
BPH (20-15%) SET MAX. COOL	800	930	1,000	1,200	1,240	1,500	1,500	1,500	1,700	1,800
BPH (20-15%) SET MIN. COOL	900		1,125	1,350			1,690			

□ - Modular ▨ - T-Series

[1]GSI Average Heat Use at 50 degrees Ambient and 35 degrees heat recovery. MC's computation method is unknown.
[2]GSI Modular's have an adjustable height discharge Auger with up to 42" clearance (24" clearance at center standard - opt leg ext. 48")
MC 10' Tower Specs: http://www.mathewscompany.com/10%20ft%20tower%20specs%20web.pdf
MC 10' Tower Airflow was not specified as to Total or Heat Chamber volume.
MC Dryers Unload Holding is not specified and is probably incorrectly added to the Cool Holding
Retention Time Calculated by (Heat Holding Bushels / (5pt. Rated * .941)) * 60
All Information best known as of 2-25-13

COMPARISON GSI 12' & 18' VERSES MC 11'8" & 17'6" TOWER DRYERS (1,800 TO 4,000 BPH RATING)

MODELS	GSI T-1875	MC 2000	GSI T-20100	MC 2400	GSI T-24100	GSI T-2500	GSI T-3000	MC 3000	GSI T-3500	MC 3500	GSI T-4000	MC 4000
FAN TYPE	Mixed Flow	Inline Cent.	Mixed Flow	Inline Cent.	Mixed Flow	Mixed Flow	Mixed Flow	Inline Cent.	Mixed Flow	Inline Cent.	Mixed Flow	Inline Cent.
FAN HORSEPOWER	75 HP	100 HP	100 HP	100 HP	100 HP	3 - 40 HP	3 - 50 HP	3 - 50 HP	3 - 60 HP	3 - 60 HP	3 - 75 HP	3 - 75 HP
NUMBER OF POINTS GRAIN PULLED FROM COLUMNS	4	4	4	4	4	4	4	4	4	4	4	4
METERING HP/UNLOAD HP	1.0	5.0	1.0	5.0	1.0	1.5	1.5	2.0	1.5	2.0	1.5	2.0
DRYING CFM/BU - STANDARD	70.6	74.3	78.5	75.0	72.2	80.7	80.1	74.2	79.5	71.4	76.7	75.3
MC DRYING CFM - LISTED AT 4"		90,000		109,000				153,000		165,000		193,000
GSI DRYING CFM - STANDARD	81,800		98,600		108,300	121,950	145,200		175,800		192,750	
COOL CHAMBER - STANDARD	40,900	45,000	49,300	54,500	54,150	60,975	72,600	73,440	87,900	79,200	96,375	92,640
COOL AIRFLOW/BU - STANDARD	115.5	92.8	109.3	96.3	108.3	115.3	106.8	84.3	119.3	90.9	108.5	93.0
BURNER CAPACITY (MBTU)	17.67	21.78	21.30	26.38	23.39	26.34	31.36	33.66	37.97	36.30	41.63	42.46
AVERAGE HEAT USE (MBTU)[1]	10.16	11.88	12.25	14.39	13.45	15.15	18.03	20.20	21.83	21.78	23.94	25.48
BTU PER BU/HR 5 PT. REMOVAL	5,644	5,940	6,125	5,996	5,604	6,058	6,011	6,733	6,238	6,223	5,985	6,370
TOWER DIAMETER	12'	11'8"	12'	11'8"	12'	18'	18'	17'6"	18'	17'6"	18'	17'6"
HEIGHT	69'0"	75'9"	75'8"	87'9"	85'8"	68'7"	78'7"	82'11"	88'7"	88'11"	98'7"	97'11"
COLUMN WIDTH	12-5/8"	12"	12-5/8"	12"	12-5/8"	12-5/8"	12-5/8"	12"	12-5/8"	12"	12-5/8"	12"
WET HOLDING (BU)	302	249	302	249	302	731	731	765	731	765	731	765
HEAT HOLDING (BU)	1,158	1,211	1,256	1,453	1,499	1,511	1,813	2,062	2,210	2,312	2,512	2,562
5 PT. RETENTION TIME IN MINUTES	41.0	38.6	40.0	38.6	39.8	38.5	38.5	43.8	40.3	42.1	40.0	40.8
COOL HOLDING (BU)	354	485	451	566	500	529	680	871	737	871	888	996
% COOL CHAMBER	23%	29%	26%	28%	25%	26%	27%	30%	25%	27%	26%	28%
UNLOAD AREA HOLDING	101	?	101	?	101	144	144	?	144	?	144	?
DRYING COLUMN HOLDING	1,512	1,696	1,707	2,019	1,999	2,040	2,493	2,933	2,947	3,183	3,400	3,558
TOTAL HOLDING CAPACITY (BU)	1,915	1,945	2,110	2,268	2,401	2,915	3,430	3,698	3,822	3,948	4,275	4,323
OUTSIDE CATWALKS	2	2	2	3	3	2	2	2	2	2	3	2
WEIGHT LBS.	35,900	31,200	37,700	33,000	41,600	?	?	?	?	?	?	?
DISCHARGE CLEARANCE	40"	?	40"	?	40"	40"	40"	?	40"	?	40"	?
GRAIN INVERTERS	Standard	Turner	Standard	Turner	Standard	Standard	Standard	Turner	Standard	Turner	Standard	Turner
BPH (25-15%)	1,080	1,200	1,200	1,400	1,440	1,500	1,800	1,800	2,100	2,100	2,400	2,400
BPH (20-15%)	1,800	2,000	2,000	2,400	2,400	2,500	3,000	3,000	3,500	3,500	4,000	4,000

☐ - Modular ☐ - T-Series

[1]GSI Average Heat Use at 50 degrees Ambient and 35 degrees heat recovery. MC's computation method is unknown.
MC Dryers Unload Holding is not specified and is probably incorrectly added to the Cool Holding.
MC 12' & 18' Commercial Tower Specs: http://www.mathewscompany.com/images/com_tower_specs.pdf
Retention Time Calculated by (Heat Holding Bushels / (5pt. Rated * .941)) * 60
All Information best known as of 2-25-13

COMPETITIVE CLAIMS DISCUSSION

COMPETITIVE CLAIMS DISCUSSION

The following discussions on a selected set of our Competitors is meant to cover those claims about their equipment that are in question as well as claims they have made against our designs and dryers at trade shows or with Customers in the field. Almost all of the information discussed is from our Competitors literature or from their web sites and is as accurate as possible limited by how much they provide for specifications and information. Much of the information comes from the physics of drying, University testing and practical knowledge. For instance many companies estimate their capacities based on perfect conditions, grain with the lowest btu/lb of water required and projections for theory or optional equipment. They then take these very optimistic projections and calculate efficiency numbers which will likely never be met. The following discussions are to help you our Dealer put the claims both for and against in perspective so you can better represent our equipment to your Customers.

COMPETITIVE CLAIMS DISCUSSION BROCK TOWER

BASIC PREMISES

1. Meyer has the smallest holding capacities compared to rated capacities in the industry.
2. Meyer provides in their literature and manuals the least specification information such as Air Flow, Column Holding Capacity & Weight in the industry. This appears to be intentional so the Customer cannot make comparisons. Recently we did acquire up to date accurate specifications for comparisons.
3. Meyer has more flash then substance. If it sounds good it is promoted, whether it actually helps the capacity or quality. The Variable column width, Moisture Equalizer and Centrifugal Fans are all examples of things that sound better than they actually perform.

PHYSICAL OVERVIEW

LOAD SYSTEM: As with all Tower Dryers there is no auger or load device, but just a wet holding area. Years of experience with the Zimmerman Tower Dryers have shown that you need a sizable amount of grain in this area to assure two things. One that significant airflow does not come through this area to force bees wings into the environment and two that a constant and even flow of wet grain enters the drying columns. Tower dryers have very tall and very fast moving columns and cutting this area short can lead to ineffective operation. Across the board GSI has significantly more holding then Meyer and that includes the wet holding area.

BASKET HOLDING & AIRFLOW: The Meyer Tower Dryers like all Brock manufactured dryers has the smallest holding capacities compared to rated capacities in the industry. That holding is reduced by the steeping area which has no airflow. The physics of drying is it takes heat, time and airflow to make capacity. In general more holding makes achieving more capacity, better efficiency and good quality easier. GSI Tower dryers all have airflows in the 70 to 85 cfm/bu. range. Observation and testing has shown that providing less than this airflow rate does not improve efficiency as the air moves through the grain slow enough to catch as much water as it can at 80 cfm/bu. Airflow below 70 cfm/bu. also promotes dirt buildup on the upper outside screens. Just look on the side of any Meyer dryer equipped with moisture equalizers and observe the dirt buildup from the reduced airflow in that area. Going 90 cfm/bu. or higher starts pushing heat through the grain without catching as much water as it could and efficiency suffers. 70 to 85 cfm/bu. is the best airflow range for a Tower Dryer. Myer consistently go over 100 cfm/bu. and that means inefficient operation. It comes down to you can get more capacity with more air, but efficiency and quality suffers.

Any university will confirm that the slower you dry grain the better the quality will be. Take any dryers column holding capacity and divide by the bu./hr. rating converted to dry bushels and you will get the retention time for the number of points removed. Meyer has the lowest retention times in the industry. The most telling point may be the specifications of CTB's larger Brock Commercial Tower dryers which they market to the larger Terminal customers. Their holding and airflow specifications exactly match those that GSI adhere to on all models no matter the customer size. So having as large or larger holding capacity is critical to capacity, efficiency and quality and that is why all GSI Tower Dryers maintain the largest holding of the column dryer type in the industry. Use the accompanying specification comparison chart to compare drying column holding and retention times between Meyer and GSI models.

SCREEN PERFORATION AND FORM: The Meyer Towers screens are short circular sections with horizontal lips by which they are bolted together. Before going to stainless outside screens Meyer had a reputation for premature rusting likely from debris sitting on these lips constantly feeding oxidation whenever wet. Myer Tower Dryers use .094 perforations on the outside screens and .078 perforations on their inside screens. .078 is available as an option on their outside screens. .062 screens are optional for small grains. All GSI Towers including the new Modular use .078 perforations as their largest perforation standard to contain particulate material. The Modular and T-Series use .0625 on the inside of the cooling section to improve containment and in addition to that the T-Series and Commercial Series add .0625 on the outside below the Inverters and above the cooling section to provide maximum retention of all particulate material.

Variable Column width: Myer varies the thickness on the upper 20% of their heat column. At the top it is about 10 inches thick and then widens to 12 inches. That means that a relatively small portion of the drying column will have even higher airflow. The claim is that this column variation seriously improves capacity by allowing more air to move through the wet grain thus making up for the column holding being the smallest in the industry compared to rated capacities. Thickness of column and airflow is not linear in that reducing the column thickness by half will not increase the airflow by double. Reducing the thickness of the column by 17% on 20% of the drying column changes total airflow no more than 3 to 4%. It doesn't equate with any significant increase in the drying capacity of a Meyer Tower Dryer. Certainly not enough to make up the difference in holding, let alone capacity claimed.

STEEPING SECTIONS: Meyer Towers Dryers have a non perforated area between the heat and cooling sections. They call this a steeping section and claim that the grain equalizes temperature between kernels causing a noticeable improvement in quality and reduced breakage. Zimmerman and GSI separately trialed several variations of steeping sections in the past. The grain simply has too steep for a much longer time then is possible inside the dryer to gain any noticeable equalization of grain temperature. Up to 10' sections approaching 20% of the dryer column holding have been added to Zimmerman and GSI towers and there were some minor gains, but not enough to make this a standard feature. In the event that steeping is desirable it must be a much larger portion of the dryer than what Meyer provides and can be added as an option to some GSI and Zimmerman Towers. Note that you cannot exceed the present tallest height so maximum capacity in each diameter will be reduced. For instance according to Meyers manual a 2400S only has 165 bu. in the steeping area out of the 1,575 bu. total column holding or 10%. The 2400S is rated 1,440 wet bu./hr @ 10 pt. removal which is 1,253 dry bu./hr. At that capacity the grain stays in the column area of the dryer both heating and cooling for (1,575/1,253) x 60 or 75 minutes and the time spent in the steeping section is 7.5 minutes. In the GSI testing the grain spent 17 minutes in the steeping area at the same 10 pt. moisture removal. Myer is claiming much more advantage from steeping in the dryer then can be delivered with a steeping section, particularly one so small. In our specification comparison sheets we left the grain in the Meyer steeping sections as part of the drying column as they do. No drying occurs in that area. The steeping area just means there is even more airflow/bu. in the rest of the dryer potentially reducing efficiency.

MOISTURE EQUALIZER: Myer has this patented device at the top of their column and apparently on some Tower models at at a second location. The device does slow down the outer portion of the column and speeds up the inner portion of the dryer in the area it is located. The suggestion often made is that it makes all the grain equalized in moisture. This type of device has been used in the past by at least one other company and though it does affect the column for the 1 to 2 foot of column it does not affect the column enough to equalize the moisture across the column. The biggest negative is it puts a linear edge in the column near the inside close to the plenum heat where debris can accumulate and possibly block the column very near the high temperature plenum which can lead to a fire in the column. On the other hand the GSI Inverters are positioned near the half way point of the drying column. They allow the column to be half way dried then invert or twist the column around so the grain on the inside just hitting temperatures that would do damage is moved to the outside of the column and wet grain is put against the plenum. That is all but the outside 2 inches which is left wet and in place at the outside of the column to catch the heat that would otherwise be lost to the outside. All of the grain is equalized at the same temperature and dryness before it enters the cooling chamber. Instead of removing part of the over drying and damage done as Meyer does with their Moisture Equalizers all of the grain is dried to the same moisture.

SELF CLEANING PLENUM FLOOR: Meyer Tower Dryers have plenum floors sloped to the outside of the dryer which fasten solid to the inside screens. At this junction there are spaced ports that allow particulate material that accumulates on the floor to re-enter the drying column. GSI also has sloped floors but they are in a V on the T-Series and Commercial and slope to the inside or the outside on the Modular depending on which position the Cooling Doors are set. In all cases the GSI Dryer drops any particulate matter onto the lower cooling floor. GSI will never allow particulate material to be put back into the drying column as it is a fire hazard. Particulate material in the heat plenum area is the most likely material to catch on fire and allowing it to move back into the column significantly increases the possibility of a fire as well as allowing it to move to handling equipment and storage bins quicker then otherwise possible.

DOUBLE WHEEL CENTRIFUGAL FANS: Meyer uses double wheel centrifugal fans for their Tower Dryers. It has been reported they no longer purchase these from one of the two well known suppliers, but build them their selves so they may not be as efficient as before and they do make more noise which isn't as big of an issue on a Tower Dryer as with Portables. GSI uses Mixed Flow Fans for all Towers 1,500 bph and larger designed specifically for the static pressures seen in a Tower Dryer making them a better match providing more airflow per horse power consumed.

UNOBSTRUCTED GRAIN COLUMNS: Meyer Tower Dryers design brings all the air not passed through the cooling section into the dryer through a center bottom opening. They claim that not putting air and access openings in the columns of the dryer provides significant advantage. Zimmerman has

been putting air and access openings in the column for over 50 years with no reports of an issue or any compromise to the performance of the dryer. This is one of those claims that sounds ominous, but in fact has no measurable benefit. In addition Meyers design increases the height of the dryer so as not to have the inlet right against the ground. Even then the inlet of all the additional air is being pulled from the most dust and debris laden area around the dryer which means more debris inside the drying plenum which is not desirable. This design more likely has to do with allowing multiple drying mode operation then anything to do with improving the dryer by eliminating vent or access openings in the grain column. Myer is claiming an advantage from a simple difference that is not well founded.

MULTIPLE MODE OPERATION: Meyer by its design can be set to run Dry & Cool Pressure or Vacuum Cool or All Heat. This requires the location of the burner exit be higher up into the plenum. This makes maintenance on the burner at a higher height and leaves the exiting of the heat high into the plenum and heated air must work its way back downward into the area between the air duct and the column. There are very few instances where pressure cooling would be desired particularly with up to a 15 to 30% efficiency loss when compared to vacuum cool. All heat works well in capacity ranges up to 1,000 bu./hr. but above that it is very difficult to get enough cooling air in the storage bins to properly cool the hot grain. Dry & Cool operation with vacuum cooling is the best choice for high capacity efficient drying into storage tanks over 48' diameter and 30' eave height. GSI Tower Dryers are designed to maximize operation drying Dry & Cool with vacuum cool. Virtually all those buying a Tower Dryer will end up operating the dryer Dry & Cool with vacuum cooling and the other modes just complicate the dryer unnecessarily. The Modular Tower design does allow for reducing the cooling section of the column which at the capacities involved with the Modular series allows for effective semi all heat operation. The reduced exiting grain temperature compared to full all heat makes cooling much easier in the cooling bin.

DISCHARGE: Meyer Tower Dryers have a drag conveyor design that both pulls grain out of the columns and moves the grain out of the dryer. Myers claim is that this is a much gentler way to move grain out of the columns and to the edge of the dryer. Let's compare the two designs assuming 11'8" Meyer and GSI 12' diameter Tower dryers.

Drag Conveyors have a reputation for gentle handling of grain. In fact most of the equipment that takes grain away from today's Tower Dryers will be drag conveyors. The issue is whether the use of a circular drag conveyor is gentler than the GSI Drum or Accu-trol unloading systems. The GSI Drum system moves grain less than 2' moving it with a 3' diameter spiral shaped drum. The GSI Accu-trol design drags the grain no more than 4' with spiral shaped paddles similar in material and design to drag conveyor paddles. One of GSI's patents is the lining of these paddles with anti-wear low friction UMHW material that allows for 100% contact with the floor for a clean sweep, reduced torque requirements as well as a much gentler handling of the grain than would be possible with non lined metal sweeps. In both GSI designs there are no pinch points and very little movement involved with no reason to think any more damage would be done then by a drag conveyor. At the center of the dryer the grain is as mentioned is likely deposited into a drag conveyor where the grain will have to be moved about 6' to get to the same exit point as the Meyer Design.

The Meyer Design moves the grain in a circle just inside the grain column. That circle is approximately 8'8" to 9'8" in diameter inside and out with the average being about 9'. Take the universal value of Pi and you get the length of travel in this circle which is 9 x 3.14 or 28.3'. If the grain comes out of the column at or just before the discharge it will travel about 1'. If it leaves just after the discharge it will travel 28' with the average being 14' of travel. At the very worst in a GSI Tower dryer grain will move 10' including the distance from the center of the dryer to the outer edge, with no evidence that any more damage will occur then with a drag conveyor. The question is does the Meyer design handle the grain more gently or with 4' more average travel less gently. The reasonable answer is there is likely no measurable difference in grain quality certainly no advantage to Meyer.

There are however a few issues besides grain quality. The uneven flow of the grain from a drag conveyor makes it difficult to make sure that a constant even flow of grain crosses the moisture sensor making accurate moisture control difficult. Both of the GSI designs involve a rigid mechanism bolted solidly together directly attached to a single gear box which provides a constant and steady flow of grain across the moisture sensor. The Meyer design has a large number of loosely connected parts including chain links driven by a sprocket that is press fitted into the inside chain of the drag chain. There is going to be a lot higher chance of wear and tear and thus maintenance on the Meyer design when compared to either GSI design.

CONTROL OVERVIEW

TEMPERATURE SENSOR TECHNOLOGY: Take a look at the sensing equipment in a SuperB dryer. You will see a lot of coiled copper line in the plenum and column to sense temperature which indicates two things. The sensing device is not electronic and it is much more subject to physical damage. One reason for using gas filled copper tubing heat sensing devices is they are not spot sensing and will not show severe temperature variations. They also never take the tube all the way back to the back of the basket where the highest temperature will likely be found. GSI exclusively uses electronic temperature sensing devices as they one are far more durable

COMPETITIVE CLAIMS DISCUSSION BROCK TOWER

being located inside stainless steel bolts or inside tubing eliminating physical damage while providing a much more accurate temperature read out.

COMPUTERIZED CONTROLS & INNOVATION:

GSI offered the first controls that allowed remote monitoring of the dryer from another computer in 1994. SuperB claimed to be the first at this 10 years later. Today full color touch screens with an interface that virtually requires no instructions, reduces switches and hardware buttons that others like SuperB continue to use which further improves durability and dependability. This makes it easier than ever to operate a GSI Dryer.

Both the SuperB Spectrum and Quantum controllers still use many mechanical buttons. These buttons are a wear points and much more prone to problems then a touch screen. Though the Quantum screen is color and larger than the Spectrum screen it is in no way comparable to the GSI Vision's 10" touch screen.

GSI's Vision provides full reports and graphs on screen are easily downloadable to any USB drive. There is no mention of this ability in any SuperB literature. Easy updates to the software from that same USB drive after downloading from an always available web site completes the package to make it easy for the Owner to keep their records complete and their software up to date on their own. Again as far as can be determined SuperB still does not have this ability. With GSI's Vision there is no need for a Dealer to make the trip to update the software with special equipment, replace a physical Eprom chip or worse yet remove a board and swap it out to send back to the company for an upgrade.

Take a look at GSI's control boxes and screen interface and the difference is obvious. SuperB claims "A Proven Record of Reliability". GSI has led the way in electronic and computerized controls. GSI computerized controls have been on the farm and commercial elevator for much longer with A Proven Record not only for Reliability but for Innovation that SuperB can only follow.

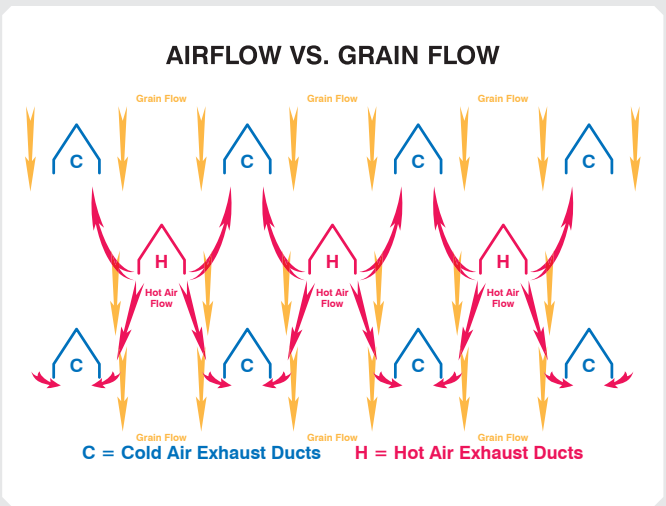
COMPETITIVE CLAIMS DISCUSSION GRAIN HANDLAIR

BASIC PREMISES

1. Grain Handlair holds more grain, but not as much as they represent as not all of it is under airflow.
2. Grain Handlair provides specifications that are incomplete and inaccurate. Their holding numbers do not show a significant part that is wet holding without airflow. Despite different fan configurations they give identical airflows and those airflows are generated as Total Holding times 40 cfm/bu to get the cfm numbers.
3. Grain Handlair claims extremely heavy construction and weight, but when the holding and airflow is brought down to more legitimate numbers their weight is not higher then GSI's products and they have had collapse failures, something GSI has never experienced.

PHYSICAL OVERVIEW

STRUCTURAL DESIGN: Grain Handlair is one of the many copies of the old Canadian Vertec design. These include NECO, Northern Grain Equipment of West Fargo ND among others. It is a mixed flow design which involves a narrow central vertical plenum the length of the basket with inverted V shaped vents to allow air to enter and leave the grain holding area along with mixing the grain as it flows past these vents. They claim to be very heavy in design, but at least in one location they had a dryer collapse on itself. The cause is in dispute, but none of the GSI designs have ever experienced a collapse. They exclusively use centrifugal fans in two placements. One is to use two fans one larger than the other at one end which they call "Conventional". This requires



the air to move the length of the basket through the narrow plenum area leading to more problems with uneven heat than any other design. The other approach is to place the fans underneath the dryer which they call “Fan Under”. This may help with plenum mix issues on long baskets, but will still have issues with taller models.

SCREEN PERFORATION: Grain Handler does not have screen perforations. As stated above they have a limited number of entrance and exit points. These are completely open with no screens of any kind. That has to be that way as these entrance and exit points represent a much smaller opening area when compared to the amount of opening any of the perforated screens that GSI uses will provide. This also means that there is little or nothing to stop bees wing or particulate matter from leaving the dryer. This means they do not meet the EPA requirements for debris or particulate matter containment as the GSI T & F or Commercial Tower dryers do meet.

LOAD SYSTEM: Their load system is of two types. A conventional load auger that works like most other dryers which minimizes the height. They also offer a simple garner type supply that uses an upside down V shaped containment area that allows gravity to deliver grain to all points in the dryer. This design adds significant height to the dryer and moves the concentration of fines from the load end to the center of the dryer.

BASKET HOLDING: Grain Handlair does hold considerably more grain in the drying area when compared specification wise by using their claimed airflows to GSI’s measured airflows. 20 to 50% more holding after the wet holding is calculated and removed from Grain Handlair’s specs, something which they never do in print. You can see this in the Specification comparisons we provide.

AIRFLOW CHARACTERISTICS: Grain Handlair claims exactly 40 cfm/bu. on every model. Their airflow listings in their literature and on their website is always the listed holding capacity of the dryer model times 40. That holding by the way includes the wet holding area which does not have any airflow through it. Simple calculations of their literature will point this out by observing the difference in holding from adding an additional tier or two then multiplying that number times the total number of tiers and then comparing it to the total holding. Take a look at the GSI vrs Grain Handlair Specification Comparisons to verify this on every model. Dividing the claimed CFM’s by the real drying column holding results in higher airflow than 40 cfm/bu, more like 45 to 60 depending on the model.

Grain Handlair shows their designed airflow in the Airflow Diagram (bottom of previous page). The claimed higher holding capacity helping drying capacity or efficiency is compromised by the design and physics. The very top and bottom of the tiers illustrated at the top and bottom of the diagram cannot provide any airflow as there is no path for it to take out of the dryer. Also the path of the air travel within the tiers comes into question. In a GSI cross flow dryer every bushel and every kernel of grain always has the same amount of air coming across it due to the always equal distance the air travels from the larger equal pressure plenum to exit the outer screens of the dryer. In a Grain Handlair the grain located between the red and blue vents is in the shortest or least resistance path and will receive a much higher rate of airflow then the grain not located in that direct path. The airflow rate will be higher where the red air path arrows appear on the diagram so not all of the grain has the same amount of air going across it and in fact some of the grain probably has no airflow across it at all. When the wet bin grain which has no airflow is removed and the actual path of the air is measured for velocity it will be much closer or even higher than the air velocity across the grain in a cross flow column dryer. The physics of the design does not support the claim to higher efficiencies due to slower air movement across the grain. The long retention time and the mixing of the grain potentially could provide good quality, but their admission they see “moisture rebound” discussed further below brings that into question.

There is another issue with how the air moves through the Grain Handlair tiers. Probably the number one reason they have so much more holding is to get enough opening for the air to pass through. Compare the percentage of opening that perforated screens provide with the percentage of opening the vents comprise on the side of a Grain Handlair basket. Percentage of air opening is critical and when measured it is much lower on the mixed flow designs. The reason you always see centrifugal fans on a mixed flow design is likely due to high static pressures created from the small plenum sizes, see photo on page one above, and the limited physical opening through the grain. The likely reason for the larger holding is to provide enough area for the air to pass through the grain and leave the dryer basket.

The claim that the air passes over the grain so slowly that it has more time to more efficiently pick up and carry off moisture is misleading based on the restricted air entry points and limited path of the air from vent to vent. The very interesting admission that Grain Handlair makes on their website in the Drying Basics section pretty well confirms that the above issues are a problem. That is the subject of what they and others call “moisture rebound”. Grain Handlair describes this on their web site in the Drying Basics section as follows

> *“The drying process dictates that water be removed from the surface of the seed. Since most moisture testers test surface moisture, it seems logical that the moisture content of the grain will test lower right after drying then it will a day later when the moisture inside the kernel has had a chance to become even throughout the kernel. This does in fact take place - a phenomenon known as "moisture rebound". For this reason it is advisable to dry the grain to a moisture content about 1 percent less than the suggested storage*

moisture content. ***It is the responsibility of the owner of the machine to see that the operator in charge of the dryer is knowledgeable in the operation of the machine."***

GSI dryers very rarely see the "moisture rebound" "phenomenon" whether on Bin, TopDry, Portable, Stack or Tower models. Those rare occurrences are almost all with Portables with no Inverters installed running dry & cool which is seldom used today. Running a GSI dryer at 70 to 80 cfm all heat and or with an inverter installed you will not see this issue. That is because of the consistent airflow across all the grain in the drying column, slow cooling running all heat and the inverting of the column with Inverters eliminating the tendency to over dry the outer kernel and not leaving the core wet.

CENTRIFUGAL FANS: Grain Handlair exclusively uses centrifugal fans. The use of centrifugal fans is likely due to the high pressures the always narrow profile plenums they use creates. Static pressure may be very low within the grain between vents, but the static pressure at the inlet to the plenum itself will be very high. They claim very high air volumes per HP on these fans and that does not match up with the physical design of the dryer. Grain Handlair does not give anything other than the airflows which are always exactly 40 cfm times the total holding of the dryer no matter whether it is Conventional or Fan Under design with very different HP usage and these are very unlikely to be accurate numbers.

CAPACITY: The physics of drying is it takes heat, time and airflow to make capacity and that doesn't change much in any of the designs presently on the market. We know that Grain Handlair's airflow numbers are not measured as they could not always be 40 cfm/total bushels held with the variation in holding percentage depending on height and the horsepower differences between the Conventional and Fan Under designs. The need for centrifugal fans is probably driven by the small plenum size causing pressure along with the limited opening the vent design provides. Any centrifugal fan chart will show that in order for their fans to deliver the airflows claimed they must not only have very low static pressure, but also would have to have much higher efficiencies than any other fan on the market. We run the same temperatures and once you use Grain Inverters and reduced cfm/bu as GSI has provided time is not going to be much of an issue. So airflow is the overriding factor as to whether either of our rated capacities are accurate. When GSI and Grain Handlair models using Grain Handlair's questionable airflows are compared Grain Handlair regularly claims 20% higher capacities. These claims appear to be very optimistic and are not as conservative as GSI's rated capacities.

GRAIN COLUMN MANAGEMENT: Grain Handlair's mixed flow design may lead to not raising the kernel temperatures to a level that severe damage would occur. Their admittance to regularly experiencing "moisture rebound" puts that into question. All of the documentation about the superiority of the mixed flow design, including the paper written by Professor F.W. Bakker-Arkema and M.D. Montross of Michigan State university that Grain Handlair posts on their web site under Discussion/Technical and in their literature was written in the early 1990's when only the Zimmerman cross flow dryer had any grain column management to reduce or eliminate grain damage. That is not true today. Reduced cfms/bu across the board and more dramatically GSI's patented grain inverters make sure that all of the grain can not only receive the same amount of air throughout the dryer but before the kernel temperatures can get to a level that damage can occur it is moved to the outside of the column where any good heat left is used to dry the outside two inches of grain. Of course this issue is much reduced when the all heat drying mode is used and column management is not much of an issue, but now even when GSI's cross flow designs are used in the dry and cool mode the quality and the efficiency can be managed and maximized. The mixed flow design, if ever, no longer has an advantage on quality and efficiency as those 15 to 20 year old papers claim.

DISCHARGE: There is no information about Grain Handlair's discharge metering or moving of grain out of the dryer in their literature or on their web site.

CONTROL OVERVIEW

Grain Handlair has almost nothing about their controls in their literature or on their web site. That is probably because it appears to be a typical 1980's design with mechanical electrical controls with the use of a simple version PLC for grain flow control.

COMPETITIVE CLAIMS DISCUSSION MC TOWER

BASIC PREMISES

1. At the same capacity ratings MC's 10' Tower line holds 30 - 34% less in the drying and 20 -32% less in the cooling chambers than the GSI Modular Tower models. The 12' & 18' models are much more similar in specifications and ratings to GSI's. GSI's larger holding means more accurate capacity ratings and the lower static pressures allow axial fans to be used without airflow delivery issues.
2. MC's line in much less complete than GSI's. They have similar models to our Modular based on rated capacities, but a very limited offering in the 12' and 18' models. Their max. capacity offered is 4000 bu./hr. They also do not offer hopper bottom models as GSI does in the 12' and larger diameters.
3. MC's 10' line, because their design is based on the Kan-Sun dryer line they purchased from Butler is the lightest built Tower Dryer on the market. The 12' line is also significantly lighter in structure and weight than GSI's models.
4. MC has not made the effort that GSI has on OSHA compliance on ladders, platforms and stairs. This has not been a big issue on the farm in the past, but that is changing.
5. MC has among the lowest retention times in the industry. Low retention times mean higher than optimum airflow or plenum temperatures and always lead to poorer grain quality.
6. MC's claims their KEY to efficiency is based upon vacuum cooling. Vacuum cooling can improve drying efficiency, but is only significant when combined with good column management as with GSI's Grain Inverters.
7. MC's Pinnacle Lite is a monitor and discharge controller, not a full control and monitor system like Vision^{N2}.

The following covers both MC's Modular 10' and larger series to reduce duplication. They share controls, grain turner, ladder and platform designs. The 12' and larger models are heavier than their Modular series, but not as heavy as GSI. Their holding capacities and airflows are very similar to GSI's models so the structural, air flow and holding comments below are mainly directed to MC's 10' models.

PHYSICAL OVERVIEW

RECENT 10' MODEL CHANGES: In December 2012 MC made changes in their 10' Tower line. The biggest switch was the move to Inline Centrifugal fans. With much smaller holding capacities at the same rated capacity and 80 cfm/bu. claimed airflow the Inline Centrifugals are required to work at the much higher statics. The major Inline Centrifugal makers do not list in their catalogs fans that would be capable of reaching their stated airflow. They dropped the 3 models 560 to 800 bu./hr. They changed from an 80/20 to 75/25 heat/cool split primarily by shifting 49 bu. of wet holding area to cooling area. They now offer as an option the Dryer Master Capacitance moisture control system.

STRUCTURAL DESIGN: MC, because their 10' design is based on the Kan-Sun dryer line that they acquired from Butler, is the lightest built Tower Dryer on the market. MC has the lightest shipping weights of any dryers in the industry on their 10' models. Light gauges, pop rivets and lack of a heavy multipoint structural internal structure all add to this lighter weight. MC's have been consistently 20% lighter when compared on total grain holding capacity to GSI Tower dryers. The new models will be slightly heavier due to the Inline Centrifugal, but that will not change the overall comparison. The light weight in itself isn't necessarily a major problem in that the design has been around a long time and it holds grain adequately secure. The main problem is that the base Kan-Sun design is farm duty, built for when 50,000 bushels per year was a lot of grain to run through a grain dryer. MC's 12' & 18' design is not as light as the 10' models, but still significantly lighter than GSI's. Today with the much higher volumes being dried the structural design becomes an issue. GSI Tower Dryers all based on the proven commercial Zimmerman design are all heavier not only in weight, but in those key areas that commercial volumes of grain might wear and cause failure during the usable life of the dryer. GSI's self cleaning cushion box where the grain enters the dryer is a prime example. The heavier structure throughout the dryer makes a real difference. For today's large producers commercial design is a necessary thing.

SAFETY: A few years ago GSI started upgrading our ladders and platforms to improve OSHA compliance. OSHA has guidelines for the safe design for ladders, platforms and access points. GSI has improved our ladders, increased platform size and introduced yellow powder coated surfaces where it will enhance safety and make us more OSHA compliant. MC has not made these efforts with their ladders and platforms. OSHA has not been a big issue on farm in the past. This is rapidly changing and will be a big issue in the future.

LOAD SYSTEM: As with all Tower Dryers there is no auger or load device, but just a wet holding area. Probably due to their farm duty design background the MC's 10' Tower Dryers have a simple peak cap without the heavy duty self cleaning cushion box to reduce grain damage and plenum roof wear that all GSI towers provide. Years of experience with the Zimmerman Tower Dryers have shown that you need a sizable amount of grain in this area to assure two things. One that significant airflow does not come through this area to force bee's wings into the environment and two that a constant and even flow of wet grain enters the drying columns and no drying air escapes. Tower dryers have very tall and very fast moving columns and cutting this area short can lead to ineffective operation. GSI has significantly more wet holding then MC's 10'12' & 18' models.

BASKET HOLDING: At the same capacity ratings MC's 10' Tower line holds 30 - 34% less in the drying and 20 -32% less in the cooling chambers than the GSI Modular Tower models. The 12' & 18' models are much more similar in specifications and ratings to GSI's. Ask yourself, and your Customer, how one line can perform so much better than the other. The physics of drying is it takes heat, time and airflow to make capacity, but after exceeding 80 cfm/bu. capacity gains quickly

diminish and quality is reduced. MC's specification numbers at the very least suggest that they are much more optimistic on their 10' series rated capacities possibly basing them on grain easier to dry then what is normally experienced. If MC can hit their capacity claims there retention time in the dryer are among the lowest in the industry. Low retention times mean higher than optimum airflow or plenum temperatures and always lead to poorer grain quality. In December 2012 MC increased the percentage of grain in their cooling area. Less cooling area is not always a bad thing. If cooling capability better than normal aeration rates, but less than the required all heat cooling airflow is available in the storage bins the grain can be partially cooled in the dryer and finish cooled in the bin allowing for some capacity, efficiency and quality gains. The problem is when a dryer with too little cooling dries grain into a bin that does not have adequate cooling capability grain will either cool too slowly causing condition issues or will never cool resulting in more serious issues and possible total loss of the grain. GSI Towers all provide the right percentage in the cooling section and provide exiting grain temperatures within the temperature ranges expected from a true dry and cool dryer. The GSI Modular Tower Dryer has the patented ability to switch the amount of grain in cooling back and forth from a reduced amount for partial cooling to the higher number of bushels normally found in any GSI Tower Dryer. This allows for higher dry and cool capacities in grain moistures over 25% than normal and the flexibility to choose true dry & cool or semi all heat operation at 22% and under. This is an advantage over MC and every other Tower Dryer now manufactured. The ability to take advantage of the capacity, efficiency and quality gains from partial cooling when the Owner has adequate cooling in his bins and provide full cooling when he doesn't can be turned on and off in the modular series towers.

SCREEN PERFORATION: MC 10' series towers screens are .094 perforations on all outside and heat area inside screens with .075 perforations on their inside cooling screens. Their 12' series provide .075 perforations on the outside with .0625 from the Turners to the cooling section. The inside provides .075 in the heat area and .0625 in the cool section. .063 screens are optional for small grains on both series. .094 perforations are the standard screen for most portable farm dryers. On small volumes it is not too much of an issue, but as grain volumes increase it becomes one. Today farms are becoming more commercial in nature and the grain volumes have dramatically increased. All GSI Towers including the new Modular use .078 perforations as their largest perforation standard to contain particulate material. The Modular and T-Series use .0625 on the inside of the cooling section to improve containment and in addition the T-Series and Commercial Series add .0625 on the outside below the Inverters above the cooling section to provide maximum retention of all particulate material.

GRAIN COLUMN MANAGEMENT: MC states that the "Key" to their exceptional efficiency is vacuum cooling. Vacuum cooling is a part of why a Tower Dryer can be very efficient, but if you do not have good column management you just over dry the inside of the column in the plenum chamber and reverse the drying front in the cooling chamber leaving the outside of the column wet with a much lower net gain. MC provides what appears to be a copy of the old Zimmerman "turners" on their 10' and larger series. This older turner design simply moves the inside 6" of column as a mass to the outside and the outside 6" to the inside without truly turning or mixing the grain. They do improve both efficiency and quality, but not as much as the GSI Grain Inverters. They also move hot grain to the outside of the column allowing usable heat to escape to the environment. Look at the GSI Tower literature for a good description and visual explanation on the differences between the old Turners and the new patented GSI Inverters. All GSI Tower Dryers have GSI Inverters standard. They allow the column to be half way dried then invert or twist the column around so the grain on the inside just hitting temperatures that could do damage is moved to the outside of the column and wet grain is put against the plenum. That is all but the outside 2" which is left wet and in place at the outside of the column to catch the heat that would otherwise be lost. All of the grain is equalized at the same temperature and dryness before it enters the cooling chamber. Instead of removing part of the over drying and damage done and allowing usable heat to escape as MC does with their old exchangers all of the grain is dried to the same moisture. Tower Dryer efficiency is a combination of optimal airflow, good column management and burner efficiency. GSI puts the whole package together, where MC falls short.

INLINE CENTRIFUGAL FANS: MC now uses inline centrifugal fans for all of their Tower Dryers. These fans perform better than Axial's at very high static pressures. With MC's 6" smaller diameter and much lower column holding static pressure will be much higher than GSI's to attain their claimed 80 cfm/bu. airflow rates. GSI uses high performance axial fans designed for higher than normal statics on the Modular series. Our larger column holding lower the static pressures to well within the fans capabilities making them a good choice with their higher airflow per HP delivery rates. These fans fit the diameter and airflow requirements well and have been carefully tuned to our dryers to provide the rated capacities. GSI uses Mixed Flow Fans for all Towers 1,500 bph and larger which are designed specifically for the static pressures seen in a Tower Dryer making them a better match, providing more airflow per horse power than Inline Centrifugals. Mixed Flow Centrifugals combine the best attributes of an Axial and Centrifugal fan designs to maximize performance in the static range found in Tower Dryers.

NEW BURNER: Along with the new Inline Centrifugal fans MC announced a new burner on their 10' series. They refer to it as a "Proprietary process burner, with cast aluminum manifold and stainless steel mixing plates". This is very similar to the Maxon burners they used in the past and may continue to use on their larger tower series. It is not clear if this new burner is now or will at some point be used across all their series.

DISCHARGE: MC Tower Dryers have a flat unload much

like the original Kan-Sun design. As of December 2012 all MC Tower dryers pull from 4 points same as the GSI Towers. After many years only pulling from 2 points they have upgraded to 4 points though the arms are much straighter causing higher torque loads. The significant difference lies in GSI's patents on our unloading sweep design with its long sweep arms which keep grain from bypassing the system. The patented GSI Accu-trol design is the only one that can utilize UMHW liners on the sweep arms which allows for no rollers or clearance device on the end of the sweeps, much cleaner sweeping of the floor, a great reduction in wear, tear and the torque requirements on the gear box drive. Even with that GSI uses a heavier gear boxes and drives than the ones used by MC. The designs may be similar, but there are multiple patented differences that make the GSI Accu-trol a much better design.

CONTROL OVERVIEW

BASIC DESIGN: In 2012 MC made their Pinnacle Lite their standard controller. It is an off the shelf PLC generic controller that has been custom altered to control their dryers. It appears to be an off the shelf Red Line brand PLC controller. This is not computerized as in a desktop PC, but a Process Logic Controller which makes web connection and software upgrading difficult. The screen is larger than the other PLC's used by other competitors, is in color and touch based. That puts them ahead of Sukup and the others, but not ahead of GSI's Vision. **According to MC's manual the Pinnacle Lite uses a combination of mechanical switches to control the fans, burners etc and color touch screen for control the discharge and monitor certain functions such as the plenum temps etc.** It is a monitor and unload control and not a full integrated system control like the Vision controls. Burner temperature control is accomplished via a separate control module located at each fan and heater location. Since it is a monitor over viewing manual controls they are able to provide manual control in the event the Pinnacle system fails. The control box can be installed remote up to 150' but will take more wiring than the GSI Vision control system. An option called MCTrax is available for simple text based remote monitoring.

MC uses temperature and simple discharge capacitance control from the PLC as its standard moisture control. Optionally they add the Dryer Master system into the Pinnacle Lite which monitors electrical capacitance or moisture sensor at the top at the wet grain entry point and back of the dryer at the discharge.

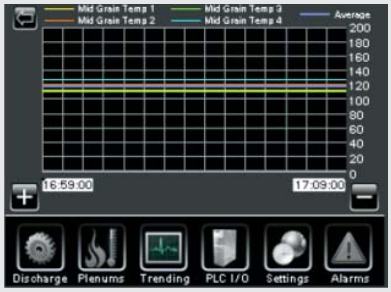
PINNACLE CONTROL: There is an option for a larger touch screen control that uses no auxiliary switches other than those on the touch screen itself. It is still a PLC based system, just more capable than the standard Pinnacle Lite. It controls all functions, but for some reason this control is seldom sold or used.

COMPUTERIZED CONTROLS: GSI offered the first computerized controls in 1993 and a system that allowed remote monitoring of the dryer from another computer in 1994. Since 2006 full color touch screens with an interface that virtually requires no instructions, reduces switches and hardware buttons.

MC Pinnacle PLC Control Box

Plenum Temperatures

Moisture Monitoring



Data Trending

Alarm

COMPETITIVE CLAIMS DISCUSSION MC TOWER

This makes it easier than ever to operate a GSI Dryer.

Here is a list of some of the differences between the Pinnacle Lite and GSI Vision controls.

1. The MC Pinnacle Lite is an off the shelf standard industrial PLC control used in conjunction with mechanical controls to control the discharge and monitor certain functions on the dryer. It does not have a full computer like the Vision and has almost none of the advantages that brings such as networking, easy updating of software and full dryer monitoring from a remote location.
2. MC's Pinnacle Lite was not specifically designed in house as was the GSI Vision control. In house design means GSI controls how long the boards are available and whether the boards can be rebuilt or repaired. GSI's 1993 EMCS boards are still readily available and repairable unlike any of the PLC controllers sold in 1993.
3. MC's Pinnacle Lite is a PLC possibly designed to be in a harsh Industrial environment, but not outside on the side of a grain dryer exposed to the temperature, vibration, moisture and other normal drying conditions. That is likely why it appears the box is never mounted on the dryer, but on a post. Vision has no such limitation.
4. MC's Pinnacle Lite is a discharge control and monitor. A standard PLC just does not have the flexibility the Vision system provides to control all aspects of the dryers operation. When you start a fan on the Pinnacle system it mechanically starts and the monitor acknowledges it. On the GSI Vision system you push the start switch and the system in turn starts the fan with all functions integrally controlled and managed.
5. MC's Pinnacle Lite cannot utilize proprietary graphics or completely customize the interface, but is limited to the standard interface provided by the PLC system. The GSI Vision is fully customizable and specifically laid out and designed for grain dryer control and monitoring.
6. Since the MC Pinnacle Lite is just a discharge and monitor if it fails the dryer may be operated manually with on/off and manual temperature and speed control. GSI's Vision has always been able to run without the touch screen or computer as long as no inputs only available from the screen are needed. The Vision has ports to use a standard computer keyboard, display and mouse if the touch screen fails and with a simple null modem cable any laptop computer can replace the computer, display and touch components. This provides a much better full function fallback position that the MC Pinnacle Lite lacks.
7. The MC Pinnacle Lite is a fairly recent PLC design and it can have the software updated. However this type of update is completed by "pinging" into the controls using a laptop computer with a CAT5 cable. It requires fairly good computer knowledge and ability working through a series of steps opening the files, copying and pasting them onto the controls and then rebooting. It is very much like a manual update of a windows computer program and many average users will find it daunting. Even if it has this feature it is not like the GSI Vision with a simple one folder download to a USB drive with the software updated to the dryer via interactive software instructions with automatic backup of the previous software so you can roll back to the previous software if there is a problem.
8. The MC Pinnacle Lite allows one temperature and one moisture based moisture control method. The Vision offers the legacy On/Off and High Low Temperature based methods that are well know and used for 40 years as well as an advanced 5 speed self centering Temperature option. In addition a 5 speed self centering much like the DMC Calc-U-Dri using only the discharge moisture sensor and an infinitely variable, reading incoming and output moisture as well as mid basket grain temperature moisture based options can be selected. Complete control with maximum unload rate limits, maximum grain temperatures allowed etc. are built into this extremely flexible moisture control system.

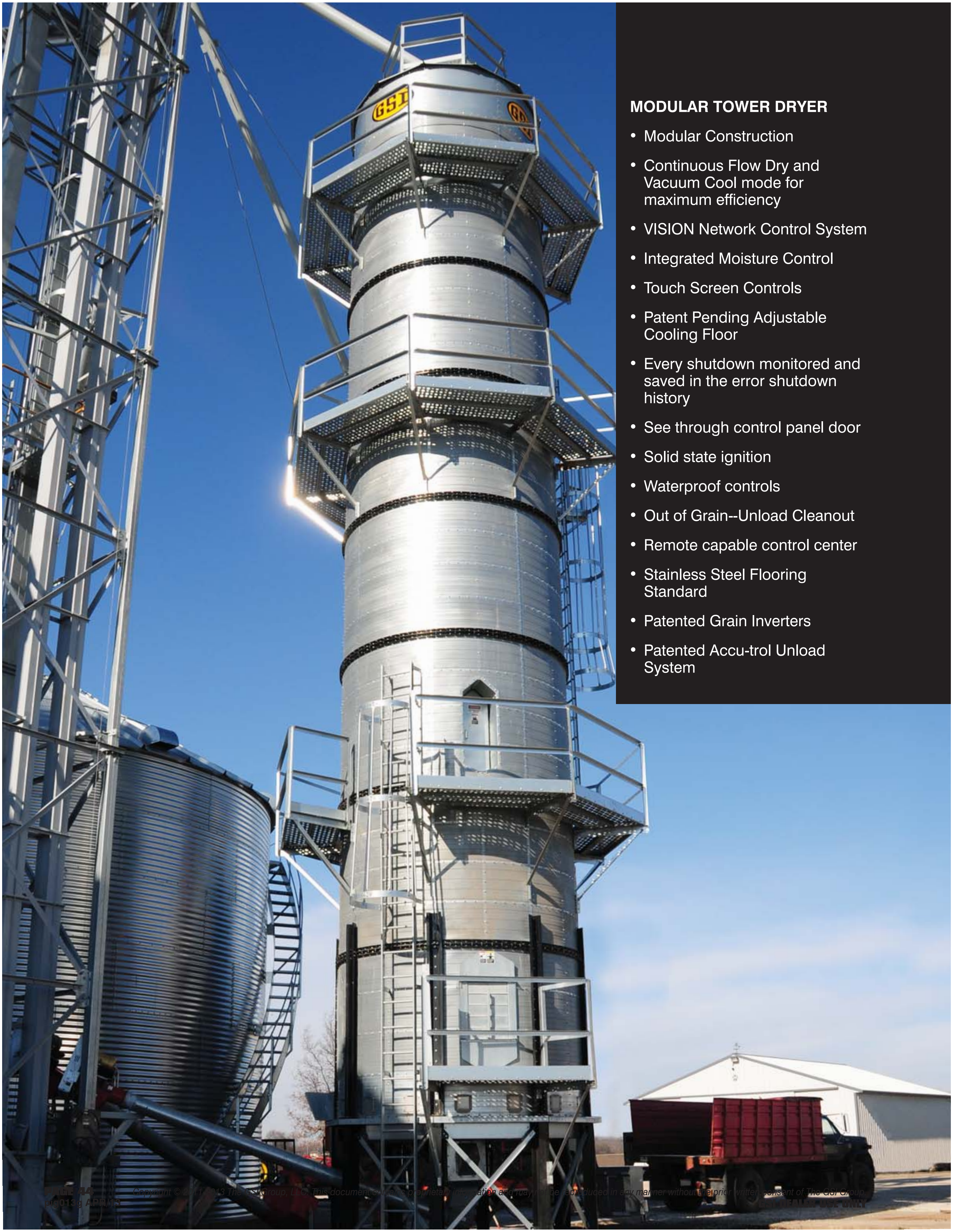
So all the advantages of dependability and durability that come with GSI's in house standard computerized controls is missing on the MC controls. One very important advantage GSI has over all of our Competitors is Ag Express Electronics in Sulphur Springs Indiana. All of the GSI computerized boards through Vision can be repaired and put back in to working order at a minimum expense.

Take a look at GSI's control boxes and screen interface and the difference is obvious. GSI has led the way in electronic and computerized controls. GSI computerized controls have been on the farm and commercial elevator with the original EMCS control in 1993 and now the cutting edge Vision controls with a proven record not only for reliability but for innovation that MC can only try to follow.

MC'S 10' TOWER MODELS OLD VERSES NEW

Old Model	HP	CFM	CFM/ Dry bu.	Wet Hold	Dry Col.	Cool Hold	Total Hold	Heat %	5pt Cap.	10pt Cap.	New Model	HP	CFM	CFM/ Dry bu.	Wet Hold	Dry Col.	Cool Hold	Total Hold	Heat %	5pt Cap.	10pt Cap.
10520	20	24,000	73	189	327	122	639	73%	560	320											
10630	30	30,000	72	189	416	122	728	77%	700	400											
10730	30	34,000	68	189	497	137	823	78%	800	460											
10840	40	42,000	72	189	580	137	906	81%	960	555	**10740**	40	35,100	79	140	442	176	758	72%	930	450
101050	50	51,000	71	189	718	175	1,082	80%	1,175	680	**10950**	50	47,200	79	140	596	199	935	75%	1,240	720
											101160	60	59500	80	140	740	232	1,112	76%	1,500	870
101275	75	62,000	71	189	868	201	1,258	81%	1,415	820	**101375**	75	64700	76	140	853	296	1,289	74%	1,700	1,000

NOTES



MODULAR TOWER DRYER

- Modular Construction
- Continuous Flow Dry and Vacuum Cool mode for maximum efficiency
- VISION Network Control System
- Integrated Moisture Control
- Touch Screen Controls
- Patent Pending Adjustable Cooling Floor
- Every shutdown monitored and saved in the error shutdown history
- See through control panel door
- Solid state ignition
- Waterproof controls
- Out of Grain--Unload Cleanout
- Remote capable control center
- Stainless Steel Flooring Standard
- Patented Grain Inverters
- Patented Accu-trol Unload System

MODULAR TOWER GRAIN DRYERS

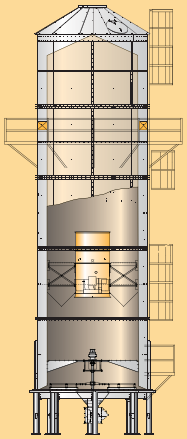
MODELS	TM-1008	TM-1010	TM-1012	TM-1015
Blower Size	43" Axial	43" Axial	43" Axial	48" Axial
Blower Rpm	1775	1775	1775	1775
Blower Hp	40	50	60	75
Metering Hp / Unload HP	1/3	1/3	1/3	1/3
Drying Cfm	38,000	45,000	52,000	66,000
Cooling Cfm	19,500	22,500	26,000	33,000
Burner Capacity (mBtu)	8,200,000	9,700,000	11,200,000	14,300,000
Average Heat Use (mBtu)[1]	5,100,000	6,100,000	7,000,000	8,900,000
Grain Column	12-3/4"	12-3/4"	12-3/4"	12-3/4"
Tower Diameter[2]	10'-7"	10'-7"	10'-7"	10'-7"
Overall Height[3]	42'-1"	48'-11"	55'-9"	62'-7"
Wet Holding (bu)	260	260	260	260
Heat Holding (bu) - Min. Cool	552	726	900	1,074
Cool Holding (bu) - Min. Cool	144	144	187	187
Heat Holding (bu) - Max. Cool	450	624	798	972
Cool Holding (bu) - Max. Cool	246	246	289	289
Unload Area Holding	93	93	50	50
Dryer Holding (bu)	1,049	1,223	1,397	1,571
Dryer Wt (lbs)	17,900	19,200	21,700	23,000
Outside Catwalks	1	3	3	3
BPH (Set in Min. Cool)[4 5] (20% - 15%)	900	1,125	1,350	1,690
BPH (Set in Min. Cool)[4 5] (25% - 15%)	542	670	810	1,010
BPH (Set in Max. Cool)[4] (20% - 15%)	800	1,000	1,200	1,500
BPH (Set in Max. Cool)[4] (25% - 15%)	480	600	720	900

[1] At 50 degrees ambient temperature.
[2] Dimensions exclude outside catwalks. Diameter is 15'-7" with catwalks.
[3] Optional vertical fill pipe height not included.
[4] Capacities listed are wet bushels/tonnes, shelled corn at listed moisture content and are estimates based on drying principles, field results and computer simulation.
Variance may occur due to grain's physiological factors (kernel size, chemical composition, variety, maturity), excessive fines, adverse weather conditions, etc.
[5] Capacities with cooling floor set in the lower minimum cool position and assumes utilization of cooling in bin (dryeration)

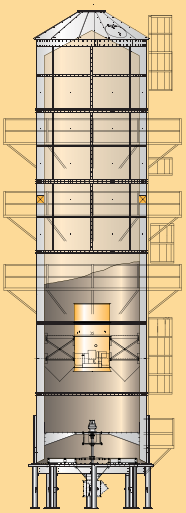
All models are available 3 phase 230 or 460 volts with either natural gas or LP gas for the fuel supply. The LP gas systems include an internal vaporizer and high pressure regulator.

Discharge Height - Adjustable up to 42" with standard unload auger and 24" at center discharge with standard legs.

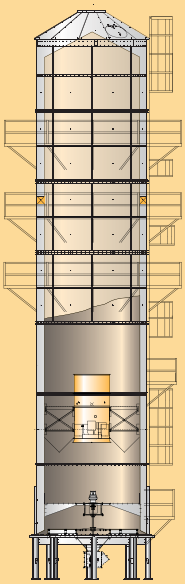
TM-1008
10'-7" dia. x 42'-18" height
15'-7" dia. w/Catwalks



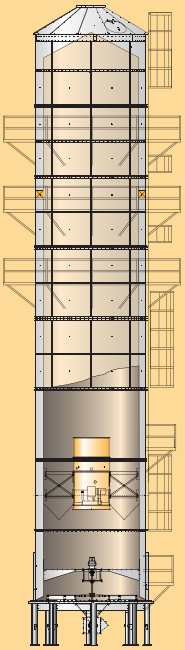
TM-1010
10'-7" dia. x 48'-11" height
15'-7" dia. w/Catwalks



TM-1012
10'-7" dia. x 55'-9" height
15'-7" dia. w/Catwalks

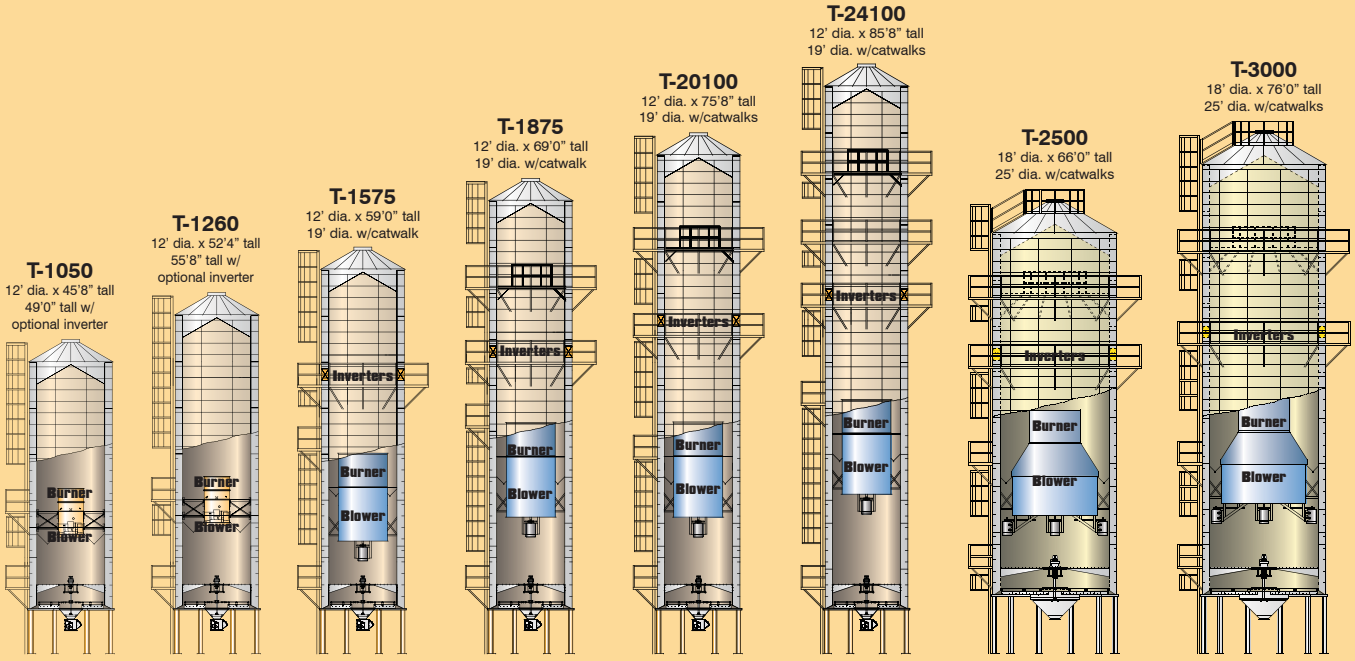


TM-1015
10'-7" dia. x 62'-7" height
15'-7" dia. w/Catwalks



T-SERIES TOWER DRYER

- Continuous Flow Dry and Vacuum Cool mode for maximum efficiency
- VISION Network Control System
- Integrated Moisture Control
- Touch Screen Controls
- Every shutdown monitored and saved in the error shutdown history
- See through control panel door
- Solid state ignition
- Waterproof controls
- Out of Grain--Unload Cleanout
- Remote capable control center
- Stainless Steel Screens Standard
- Stainless Steel Flooring Standard
- Patented Accu-trol Unload System
- Grain Inverters standard
- Each dryer requires 1 truckload of freight



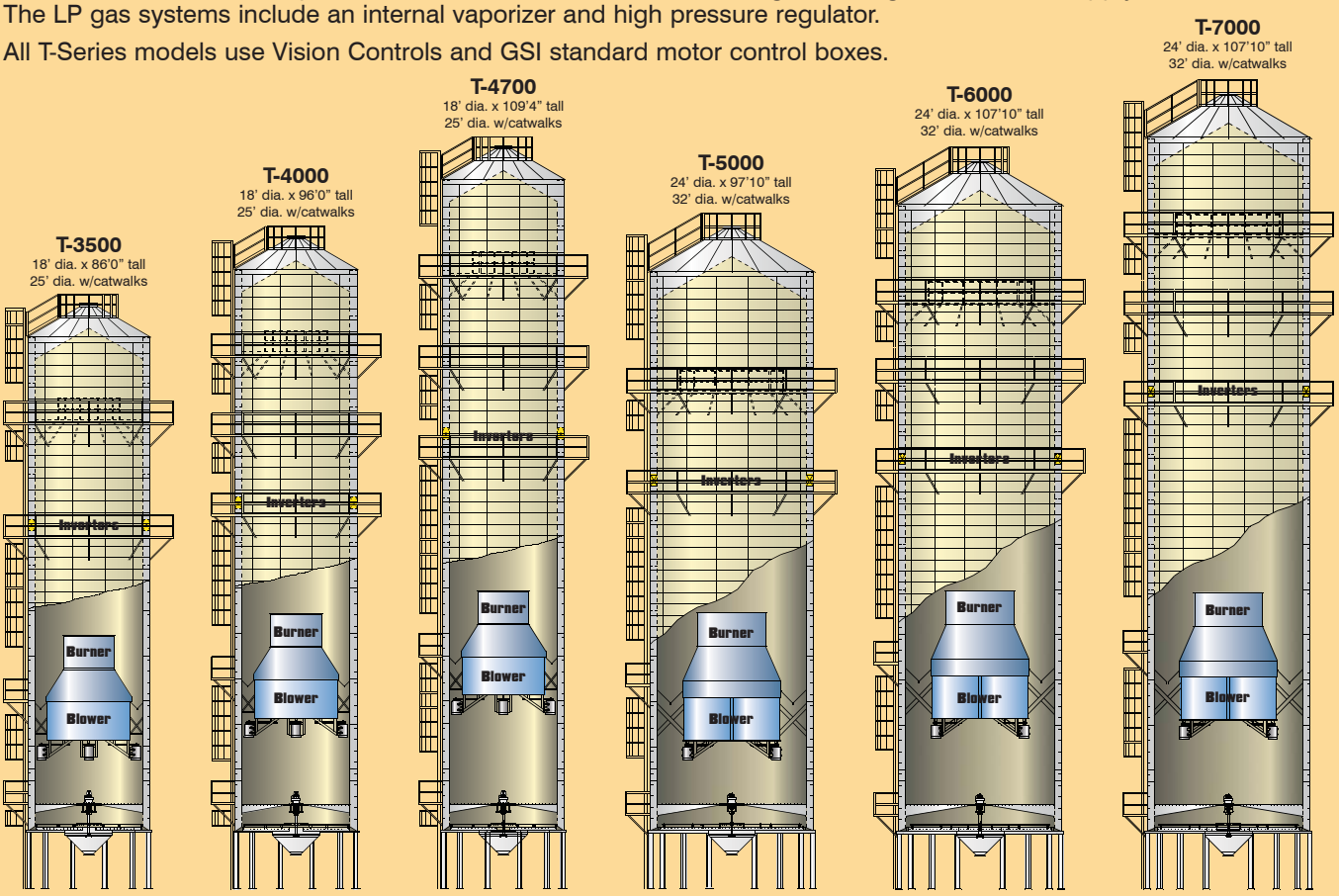
T-SERIES TOWER GRAIN DRYERS

MODELS	T-1050	T-1260	T-1575	T-1875	T-20100	T-24100	T-2500	T-3000	T-3500	T-4000	T-4700	T-5000	T-6000	T-7000
Blower Size	43" Axial	43" Axial	490	542	542	600	3-402	3-402	3-445	3-445	3-490	3-542	3-600	3-600
Blower RPM	1750	1750	1035	856	981	818	1,106	1,240	1,111	1,185	1,000	966	793	817
Blower HP	50	60	75	75	100	100	3-40	3-50	3-60	3-75	3-75	3-100	3-100	3-125
Metering HP	1	1	1	1	1	1	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	2	2	2
Drying CFM	42,300	48,400	77,100	81,800	98,600	108,300	121,950	145,200	175,800	192,750	213,600	282,000	304,800	337,500
Cooling CFM	14,500	17,500	38,550	40,900	49,300	54,150	60,975	72,600	87,900	96,375	106,800	141,000	152,400	168,750
Burner Cap (mBtu)	11,100	11,100	16,654	17,669	21,298	23,393	26,341	31,363	37,973	41,634	46,138	60,192	65,837	72,900
Ave. Heat Use (mBtu)[1]	5,711	6,543	9,576	10,159	12,246	13,451	15,146	18,034	21,834	23,940	26,529	35,024	37,856	41,918
Grain Column	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"	12-3/4"
Tower Diameter[2]	12'	12'	12'	12'	12'	12'	18'	18'	18'	18'	18'	24'	24'	24'
Overall Height[3]	45'8"	52'4"	59'	69'	75'	85'8"	66'	76'	86'	96'	109'4"	97'10"	107'10"	117'10"
Wet Holding (bu)	302	302	335	335	335	335	731	731	731	731	731	1,279	1,279	1,279
Heat Holding (bu)	610	756	914	1,158	1,256	1,499	1,511	1,813	2,210	2,512	2,964	3,479	4,042	4,452
Cool Holding (bu)	219	268	305	354	451	500	529	680	737	888	1,038	1,126	1,177	1,381
Dryer Holding (bu)	1,232	1,427	1,602	1,895	2,090	2,401	2,915	3,368	3,822	4,275	4,877	6,171	6,785	7,399
Outside Catwalks	0	0	1	2	2	3	2	2	2	3	3	2	3	3
BPH (20% - 15%)[4]	1,000	1,200	1,500	1,800	2,000	2,400	2,500	3,000	3,500	4,000	4,700	5,000	6,000	7,000
BPH (25% - 15%)[4]	600	720	900	1,080	1,200	1,440	1,500	1,800	2,100	2,400	2,820	3,000	3,600	4,200

[1] At 50 degrees ambiant temperature.
[2] Dimensions exclude outside catwalks. Diameter is 19'-0" with catwalks.
[3] Optional vertical fill pipe height not included.
[4] Capacities listed are wet bushels/tonnes, shelled corn at listed moisture content and are estimates based on drying principles, field results and computer simulation. Variance may occur due to grain's physiological factors (kernel size, chemical composition, variety, maturity), excessive fines, adverse weather conditions, etc.
* Includes amperage for one 10 HP unload motor.

All models are available 3 phase 230 or 460 volts with either natural gas or LP gas for the fuel supply. The LP gas systems include an internal vaporizer and high pressure regulator.

All T-Series models use Vision Controls and GSI standard motor control boxes.



• Optional vertical fill pipe height not included

2400
12' dia. x 85'-5" h.
19' dia. w/Catwalks

2000
12' dia. x 75'-5" h.
19' dia. w/Catwalks

1800
12' dia. x 68'-9" h.
19' dia. w/Catwalks

1500
12' dia. x 58'-9" h.
19' dia. w/Catwalks

1200
12' dia. x 52'-1" h.
19' dia. w/Catwalks

4718
18' dia. x 110'-3" h.
25' dia. w/Catwalks

4000
18' dia. x 96'-11" h.
25' dia. w/Catwalks

3500
18' dia. x 86'-11" h.
25' dia. w/Catwalks

3000
18' dia. 76'-11" h.
25' dia. w/Catwalks

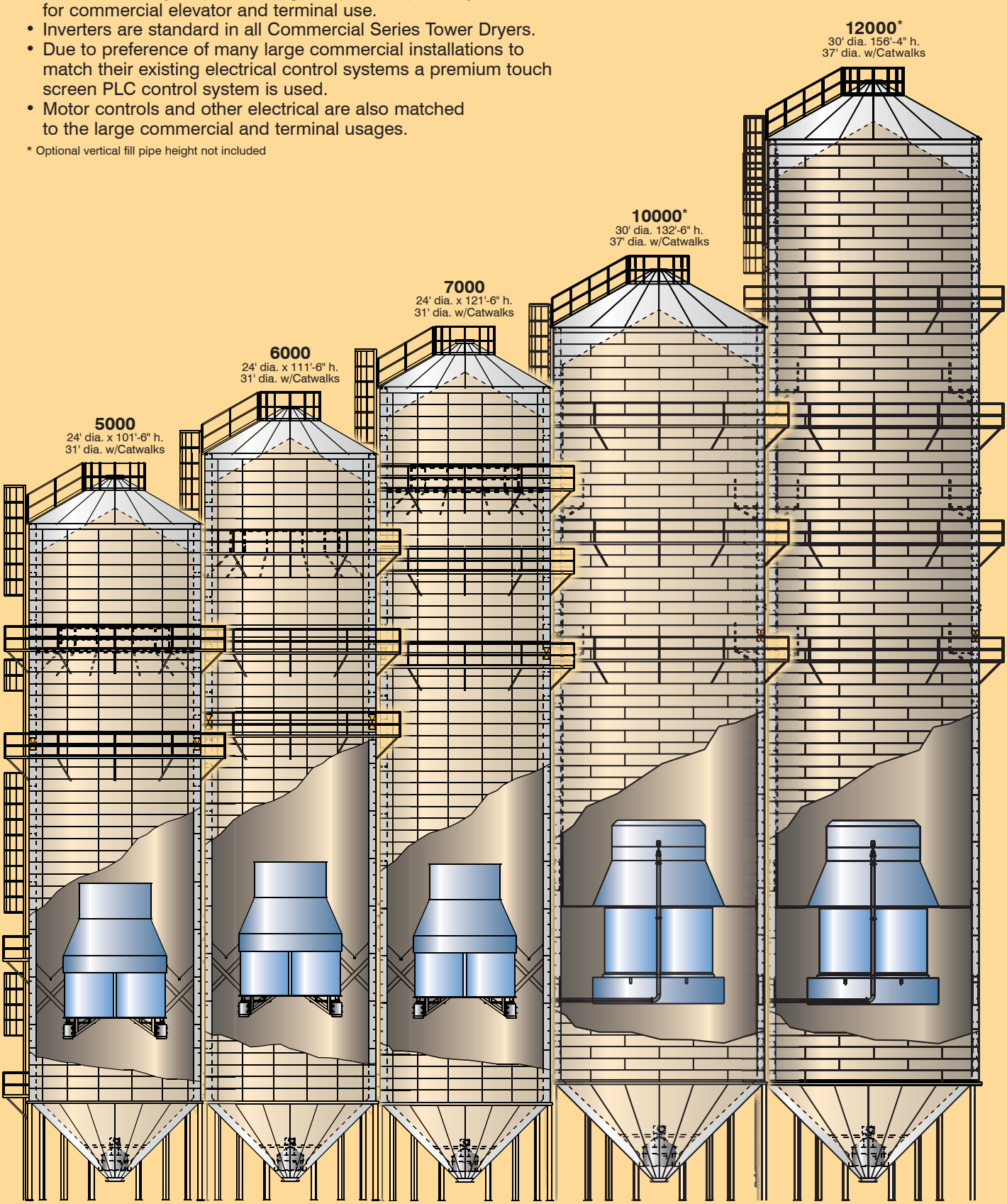
2500
18' dia. x 66'-11" h.
25' dia. w/Catwalks

COMMERCIAL TOWER GRAIN DRYERS FARM APPLICATION

Commercial Towers are listed for comparison and capacities only

- Commercial Dryers provide larger capacities primarily for commercial elevator and terminal use.
- Inverters are standard in all Commercial Series Tower Dryers.
- Due to preference of many large commercial installations to match their existing electrical control systems a premium touch screen PLC control system is used.
- Motor controls and other electrical are also matched to the large commercial and terminal usages.

* Optional vertical fill pipe height not included



GSI DEALER USE ONLY

INSTALLATION NOTES

Commercial and T-Series Tower dryers are normally erected on site by carefully selected contract crews. Modular Tower Dryers are only installed by the selling Dealer. The Customer or Dealer is always responsible for the concrete installation.

COMMERCIAL TOWER DRYERS

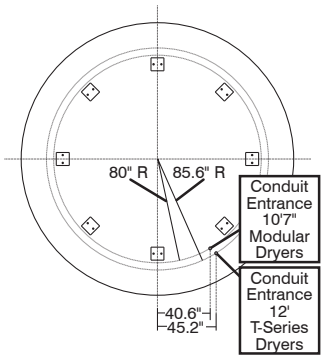
Dryers are only quoted from the plant at NET pricing. A Dealer can be involved by bringing the lead to GSI and actively participating in the sale which may result in a lead fee if the dryer is sold. In some cases a Dealer may purchase and then resell the Tower and may or may not do the complete installation. The Dealer will likely be responsible for service if installed in a Farm situation. The Dealer may provide service on Commercial installations but most large Commercial Customers provide their own service. All of the above should be determined before the sale by discussions between the Dealer and GSI Tower Dryer personnel at the time of the quote before the sale is closed.

T-SERIES TOWER DRYERS

Dryers are included in the GSI Dryer Price Catalog (through the T-24100) and use the same discount program against list price as a Portable Dryer. Models larger than the T-24100 are quoted by the plant like commercial towers. The Dealer can hire a contract crew to do the installation or do the complete installation themselves. The selling Dealer will be responsible for startup and all service warranty and otherwise.

MODULAR TOWER DRYERS

Dryers are included in the GSI Dryer Price Catalog and use the same discount program against the price as a Portable Dryer. All installation will be done by the selling Dealer. The selling Dealer will be responsible for startup and all service warranty and otherwise.



WITH ALL TOWER DRYERS

- A tractor, forklift, heavy duty truck, or crane should be present to help unload the delivery truck on the day of delivery. Commercial Towers may be the responsibility of the Customer. All T-Series and Modular will be the responsibility of the selling Dealer.
- All parts should be identified to verify that all are present. Installation crews should familiarize themselves with the parts to ease the assembly process.

ELECTRICAL INSTALLATION

Modular Main Circuit Breaker Size

DRYER	BLOWER		MOTOR	FULL LOAD	FULL LOAD @ 1.25	CIRCUIT BREAKER	MAIN CIRCUIT BREAKER
MODEL #	HP	VOLTS	FLA (MAR.)	AMPS (480 V)[1]	LARGEST MOTOR[2]	W/20% S.F.	SIZE (AMPS)
1008	40	460	47	75.0	86.8	104.1	200
1010	50	460	59	87.0	101.8	122.1	200
1012	60	460	70	98.0	115.5	138.6	200
1015	75	460	86	114.0	135.5	162.6	200
1008	40	230	94	138.0	161.5	193.8	250
1010	50	230	118	162.0	191.5	229.8	300
1012	60	230	140	184.0	219.0	262.8	300
1015	75	230	172	216.0	259.0	310.8	400

[1] Dryer full load amps assumes a 10 hp fill and unload conveyor on 460v dryers and a 7-1/2 hp fill and unload conveyor on 230v dryers.
[2] 7-1/2 hp motor @ 230V = 22 amps 10 hp motor @ 460V = 14 amps.

T-Series Main Circuit Breaker Size

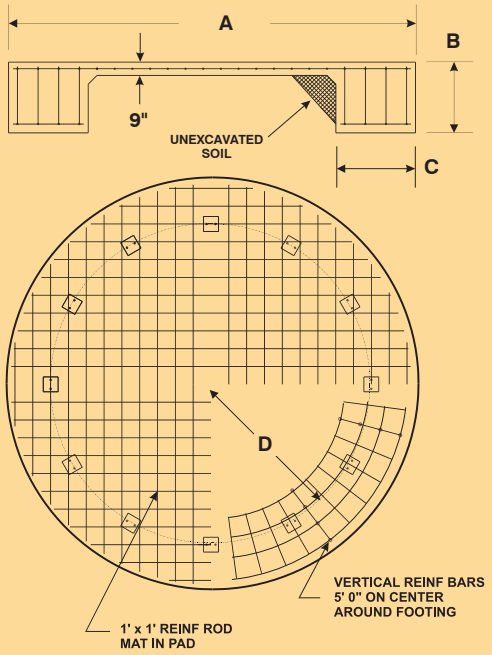
DRYER	BLOWER		MOTOR	FULL LOAD	FULL LOAD @ 1.25	CIRCUIT BREAKER	MAIN CIRCUIT BREAKER
MODEL #	HP	VOLTS	FLA (MAR.)	AMPS (480 V)[1]	LARGEST MOTOR[2]	W/20% S.F.	SIZE (AMPS)
1575	75	460	86	114.0	135.5	162.6	200
1875	75	460	86	114.0	135.5	162.6	200
20100	100	460	115	143.0	171.8	206.1	200
24100	100	460	115	143.0	171.8	206.1	200
2500	3-40	460	47	183.5	183.5	234.3	300
3000	3-50	460	59	219.5	234.3	281.1	300
3500	3-60	460	70	252.5	270.0	324.0	400
4000	3-75	460	86	300.5	322.0	386.4	400
4700	3-75	460	86	300.5	322.0	386.4	400
5000	3-100	460	115	387.5	416.3	499.5	500
6000	3-100	460	115	387.5	416.3	499.5	500
7000	3-125	460	144	474.5	510.5	612.6	600
1575	75	230	172	216.0	259.0	310.8	400
1875	75	230	172	216.0	259.0	310.8	400
20100	100	230	230	274.0	331.5	397.8	400
24100	100	230	230	274.0	331.5	397.8	400
2500	3-40	230	94	354.5	378.0	453.6	500
3000	3-50	230	118	426.5	456.0	547.2	600
3500	3-60	230	140	492.5	527.5	633.0	600
4000	3-75	230	172	588.5	631.5	757.8	800
4700	3-75	230	172	588.5	631.5	757.8	800
5000	3-100	230	230	762.5	820.0	984.0	1000
6000	3-100	230	230	762.5	820.0	984.0	1000
7000	3-125	230	288	936.5	1008.5	1210.2	

MODULAR DRYER LABOR HOURS

Model	Number of Catwalks	Catwalk Assembly Time	Module Stacking Time	Ladder, Platform and Cage Finishing Time	Electrical Finishing Time	Plumbing Finishing Time	Total Man Hours	Crane Time
1008	1	4	22	10	16	6	54	5.5
1010	3	12	28	12	16	6	70	7
1012	3	12	34	14	16	6	82	8.5
1015	3	12	40	16	16	6	90	10

All Times in Total Man hours

FOUNDATION INSTALLATION



Diameter	10' 7"	12' 0"	12' 0"	12' 0"	18' 0"	18' 0"	18' 0"	24' 0"	30' 0"
Models	TM-1008	T-1050	1200	T-24100	2500	4000	4718	5000	10000
	TM-1010	T-1260	1500	2400	3000			6000	12000
	TM-1012	T-1575	1800		3500			7000	
	TM-1015	T-1575	2000						
		T-1875							
		T-20100							
A	15' 0"	17' 0"	17' 0"	17' 6"	23' 0"	24' 0"	25' 0"	30' 0"	37' 0"
B	3' 6"	4' 0"	4' 0"	4' 0"	4' 0"	4' 0"	4' 0"	4' 0"	4' 0"
C	4' 0"	4' 0"	2	4' 9"	4' 6"	4' 6"	5' 6"	6' 0"	6' 6"
D	5' 4.1/2"	6' 1"	6' 1"	6' 1"	9' 1.3/32"	9' 1.3/32"	9' 1.3/32"	12' 0.7/8"	15' 0.3/4"
Dryer Legs	8	8	8	8	12	12	12	16	20
Yards Concrete	24	26	26	31	44	47	56	77	108
#4 Rebar	670'	800'	800'	840'	1400'	1800'	1960'	2500'	4200'

#4 Reinforcement Rods on 1' 0" on centers both directions in slab and bottom of footing
Vertical Reinforcement Bars 5' 0" on centers around footing
Anchor Dryer using 1" x 12" (minimum) Epoxy Anchors
Foundation Design Based on Net Soil Bearing Pressure of 3000 PSF
Site Shall be Free of any Debris or Vegetation and Well Drained
All Reinforcing Steel to be A-615 Grade 40 Deformed Bars

Concrete Specifications:
Compressive Strength @ 28 days - 4000 PSI
Minimum Cement Content - 6 sacks per yard
Maximum Slump - 4" +/- 1"

- Modular
- T-Series
- Commercial

MODULAR RECOMMENDED STACKING ORDER

Modular Tower Dryer Recommended Stacking order

All Modular Tower Dryers will stack in similar fashion.
It is best if all platforms and other items that install on each module are installed at ground level before erection.

STACKING PROCEDURE

1. Careful leveling of all legs is critical.
2. First lift the FLAT UNLOAD Section and place on the concrete pad and fasten the legs down
3. Lift the BURNER/BLOWER Section and fasten on top of the FLAT UNLOAD Section
4. Next depending on model combine HEAT SECTIONS or ROOFTOP PLENUM and HEAT SECTION(S) as combined below and lift and fasten until the dryer Modules are together and complete.

Modules or Sections numbered by position from ground up

TM-1008	
Base / Flat Unload (1)	6,800
FIRST LIFT	**6,800 LBS**
Burner/Blower (2)	4,100
SECOND LIFT	**4,100 LBS**
Rooftop Plenum (5)	2,300
Heat Section w/Inverters (4) *	3,700
Heat Section (3)	1,400
THIRD LIFT	**7,400 LBS**

TM-1010	
Base / Flat Unload (1)	6,800 lbs
FIRST LIFT	**6,800 LBS**
Heat Section (3)	1,400
Burner/Blower (2) *	5,550
SECOND LIFT	**6,650 LBS**
Rooftop Plenum (6)	2,300
Heat Section (5) *	2,550
Heat Section w/Inverters (4) *	3,700
THIRD LIFT	**8,550 LBS**

TM-1012	
Base / Flat Unload (1)	6,800 lbs
FIRST LIFT	**6,800 LBS**
Heat Section (3)	1,400
Burner/Blower (2) *	5,250
SECOND LIFT	**6,650 LBS**
Rooftop Plenum (7)	2,300
Heat Section (6) *	2,550
Heat Section w/Inverters (5)	2,550
Heat Section (4) *	2,550
THIRD LIFT	**9,950 LBS**

TM-1015	
Base / Flat Unload (1)	6,800 lbs
FIRST LIFT	**6,800 LBS**
Heat Section (3)	1,400
Burner/Blower (2) *	5,250
SECOND LIFT	**6,650 LBS**
Rooftop Plenum (8)	2,300
Heat Section (7) *	2,550
Heat Section (6)	1,400
Heat Section w/Inverters (5) *	3,700
Heat Section (4)	1,400
THIRD LIFT	**11,350 LBS**

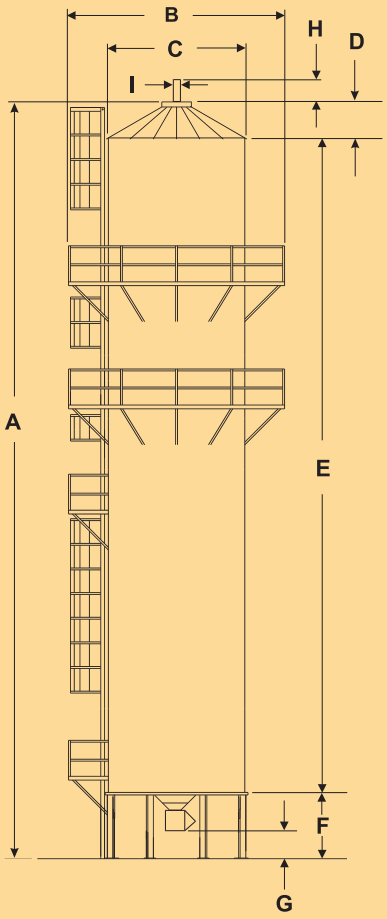
* Indicates Section with standard Catwalk

MODULAR & T-SERIES TOWER DRYER DIMENSION

• Inlet Tube Optional

	A	B	C	D	E	F	G	H	I	OUTSIDE CATWALKS
MODULAR TOWER DRYERS										
TM-1008	42'1"	17'4"	10"7"	2'10"	34'3"	5'0"	24"	20"	10"	1
TM-1010	48'11"	17'4"	10"7"	2'10"	41'1"	5'0"	24"	20"	10"	3
TM-1012	55'9"	17'4"	10"7"	2'10"	47'11"	5'0"	24"	20"	10"	3
TM-1015	62'7"	17'4"	10"7"	2'10"	54'8"	5'0"	24"	20"	10"	3
T-SERIES TOWER DRYERS										
T-1050	45'8"	19'0"	12'0"	3'2"	35'10"	6'8"	3'4"	20"	10"	0
T-1260	52'4"	19'0"	12'0"	3'2"	42'6"	6'8"	3'4"	20"	10"	0
T-1575	59'0"	19'0"	12'0"	3'2"	49'2"	6'8"	3'4"	20"	10"	1
T-1875	69'0"	19'0"	12'0"	3'2"	59'2"	6'8"	3'4"	20"	10"	2
T-20100	75'8"	19'0"	12'0"	3'2"	65'10"	6'8"	3'4"	20"	10"	2
T-24100	85'8"	19'0"	12'0"	3'2"	75'10"	6'8"	3'4"	20"	10"	3

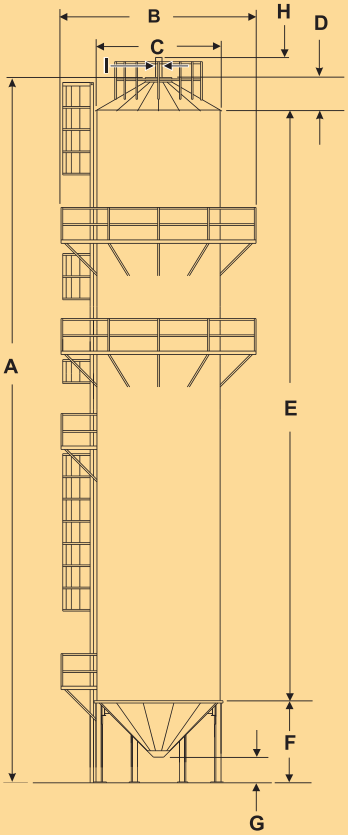
Note: Available optional leg extensions increases clearance and overall height dimensions by 2'.



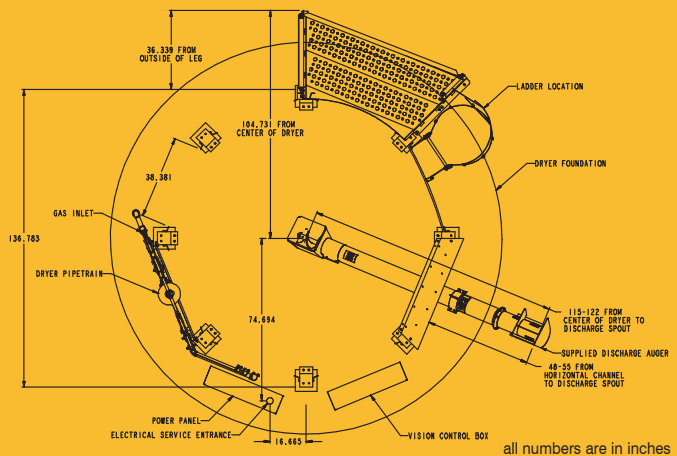
COMMERCIAL TOWER DRYER DIMENSION

	A	B	C	D	E	F	G	H	I	OUTSIDE CATWALKS
12' COMMERCIAL TOWER DRYERS										
1200	52'1"	19'0"	12'0"	3'2"	40'11"	8'0"	2'8"	20"	10"	1
1500	58'9"	19'0"	12'0"	3'2"	47'7"	8'0"	2'8"	20"	10"	1
1800	68'9"	19'0"	12'0"	3'2"	57'7"	8'0"	2'8"	20"	10"	2
2000	75'5"	19'0"	12'0"	3'2"	64'3"	8'0"	2'8"	20"	10"	2
2400	85'5"	19'0"	12'0"	3'2"	74'3"	8'0"	2'8"	20"	10"	3
18' COMMERCIAL TOWER DRYERS										
2500	66'11"	25'0"	18'0"	4'11"	50'10.1/2"	11'1.1/2"	2'8"	20"	14"	2
3000	76'11"	25'0"	18'0"	4'11"	60'10.1/2"	11'1.1/2"	2'8"	20"	14"	2
3500	86'11"	25'0"	18'0"	4'11"	70'10.1/2"	11'1.1/2"	2'8"	20"	14"	2
4000	96'11"	25'0"	18'0"	4'11"	80'10.1/2"	11'1.1/2"	2'8"	20"	14"	3
4718	110'3"	25'0"	18'0"	4'11"	94'3"	11'1.1/2"	2'8"	20"	14"	3
24' COMMERCIAL TOWER DRYERS										
5000	101'6"	31'0"	24'0"	6'8"	80'11"	13'11"	2'8"	20"	14"	2
6000	111'6"	31'0"	24'0"	6'8"	90'11"	13'11"	2'8"	20"	14"	3
7000	121'6"	31'0"	24'0"	6'8"	100'11"	13'11"	2'8"	20"	14"	3
30' COMMERCIAL TOWER DRYERS										
10000	132'6"	37'0"	30'0"	8'3"	107'5"	16'10"	2'8"	user supplied		3
12000	156'4"	37'0"	30'0"	8'3"	131'3"	16'10"	2'8"	user supplied		4

Commercial Towers are not covered in the Farm Tower Product Information Guide. But, the Concrete and Dimension information is offered as a guide for comparison. Contact GSI for all Commercial Tower Dryer questions and information.



MODULAR UPLOAD LAYOUT

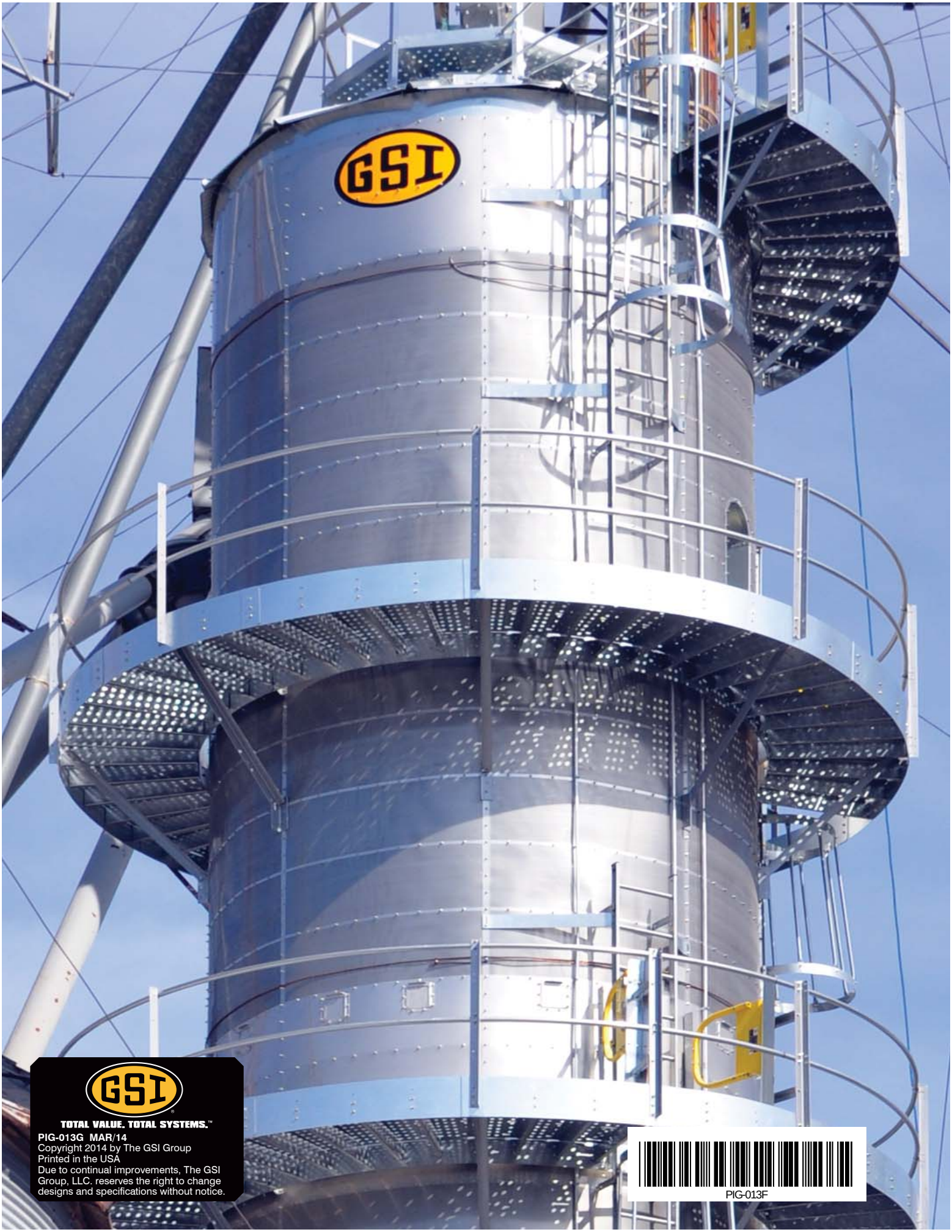


all numbers are in inches

MAX. DISCHARGE CAPACITIES

Accu-trol Model	Diameter	Sweep	Nom. RPM	BPH Max	Hopper Model	Diameter	G.B. Ratio	Nom. RPM	BPH Max
TM-1008	10' 7"	4" x 4 Arms		2,450	**N.A.**				
TM-1010	10' 7"	4" x 4 Arms		2,450	**N.A.**				
TM-1012	10' 7"	4" x 4 Arms		2,450	**N.A.**				
TM-1015	10' 7"	4" x 4 Arms		2,450	**N.A.**				
T or F-1050	12' 0"	4" x 4 Arms		2,450	**T or F-1050**	12' 0"	1:270	2,333	1,700
T or F-1260	12' 0"	4" x 4 Arms		2,450	**T or F-1260**	12' 0"	1:270	2,333	1,700
T or F-1575	12' 0"	4" x 4 Arms		2,450	**T or F-1575**	12' 0"	1:90	2,333	1,700
T or F-1875	12' 0"	5" x 4 Arms		3,063	**T or F-1875**	12' 0"	1:90	2,333	5,000
T or F-20100	12' 0"	5" x 4 Arms		3,063	**T or F-20100**	12' 0"	1:90	2,333	5,000
T or F-24100	12' 0"	5" x 4 Arms		3,063	**T or F-24100**	12' 0"	1:90	2,333	5,000
Z-1210	12' 0"	4" x 4 Arms		2,450	**G-1200**	12' 0"	1:270	2,333	1,700
Z-1512	12' 0"	4" x 4 Arms		2,450	**G-1500**	12' 0"	1:270	2,333	1,700
Z-1816	12' 0"	5" x 4 Arms		3,063	**G-1800**	12' 0"	1:90	2,333	5,000
Z-2018	12' 0"	5" x 4 Arms		3,063	**G-2000**	12' 0"	1:90	2,333	5,000
Z-2420	12' 0"	5" x 4 Arms		3,063	**G-2400**	12' 0"	1:90	2,333	5,000
Z-2521	18' 0"	4" x 4 Arms		5,600	**G-2400**	18' 0"	1:90	2,333	6,500
Z-3026	18' 0"	5" x 4 Arms		7,000	**G-3000**	18' 0"	1:90	2,333	6,500
Z-3531	18' 0"	5" x 4 Arms		7,000	**G-3500**	18' 0"	1:90	2,333	6,500
Z-4036	18' 0"	5" x 4 Arms		7,000	**G-4000**	18' 0"	1:90	2,333	6,500
Z-4742	18' 0"	5" x 4 Arms		7,000	**G-4700**	18' 0"	1:90	2,333	6,500
Z-5046	24' 0"	5" x 4 Arms		8,755	**G-5000**	24' 0"	1:90	2,333	7,500
Z-6055	24' 0"	6" x 4 Arms		10,530	**G-6000**	24' 0"	1:90	2,333	7,500
Z-7060	24' 0"	6" x 4 Arms		10,530	**G-7000**	24' 0"	1:90	2,333	7,500
Z-10090	30 0"	6" x 4 Arms		12,700	**N.A.**				
Z-12010	30' 0"	6" x 4 Arms		12,700	**N.A.**				

Note: All Tower discharges are driven with a VFD drive. Standard maximum capacities are what have been determined to cover most operational situations, but all can be increased by resetting the maximum RPM on the VFD drive if required.



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