BARD MEGA-TEC™ WALL-MOUNT™ Air Conditioners- 10EER (60hz) with Logic Board

Bard 10 Ton High Sensible Capacity Multi-Stage Cooling Systems

The MEGA-TEC™ is designed for applications requiring a large amount of sensible cooling capacity and limited wall space. Dual refrigeration circuits and a total of three stages with the lowest stage less than 35% of total capacity provide cooling for an area with a varying heat load. MEGA-TEC provides an AHRI certified 10+ EER solution that meets D.O.E. requirements and the efficiency ratings of state and national codes. An industrial grade indoor and outdoor fans provide years of trouble-free service. An optional economizer provides full-flow outdoor air intake and room exhaust based on outside temperature or enthalpy.

MEGA-TEC Unit

Bard LC Controller

Engineered Features

Multi Capacity: System fluctuates between three cooling capacities. The MEGA-TEC Series High Sensible system operates in part load or full load cooling, based upon need and peak efficiency.

Logic Board: System control panels are equipped with PLC Logic Boards that allow multiple unit operation (up to 4 units) with a single controller. Unit connection to the LV controller is accomplished with 2 wire shielded cable with drain (ground).

Advanced Unit Diagnostics: Whether connected to the TEC-EYE™ diagnostic tool, or just viewed from the shelter control, the system PLC Logic Board is able to display stored alarms and easy to read diagnostic information.

Orphan Mode: System is designed to run independently if communication to the LV controller is lost, meaning that cooling can be provided even if the controller or wiring fails.

Airflow Switch: All systems feature an airflow switch to monitor blower operation. Settings are field adjustable with alarm signal.

Dirty Filter Switch: All systems include an airflow switch to monitor pressure drop across the unit filter. This will indicate when a filter change is needed. Settings are field adjustable with alarm signal. An indicator light is located on the outside of the MEGA-TEC that illuminates when the filter needs replaced.

High Pressure Transducer: A high pressure transducer is used for advanced diagnostic features including an alarm signal when condenser coil cleaning is needed.

Low Pressure Transducer: A pressure transducer is used for advanced diagnostic features and indication of refrigerant loss. Combined with other sensors, the MEGA-TEC will constantly display superheat readings.

High Efficiency Indoor Blower: Using the latest technology Backword Incline fan designs, the MEGA-TEC achieves peak CFM airflow rates with the lowest energy usage possible.

High Efficiency Outdoor Fan Motor: The MEGA-TEC uses a high efficiency ECM fan system to provide air through the condenser coil. By varying the fan speed, the system is able to provide the airflow needed at high and low outdoor temperature conditions.

Security Features: By selecting the BardGuard™ option, electronic security features allow the system to sense coil and copper theft, and features multiple alarm options. An in-shelter disarm button allows authorized personnel to service the system.

Enhanced Grilles: The MEGA-TEC reverse airflow design uses enhanced indoor supply and return grilles for maximized airflow and inreased cooling dispersion in the structure.

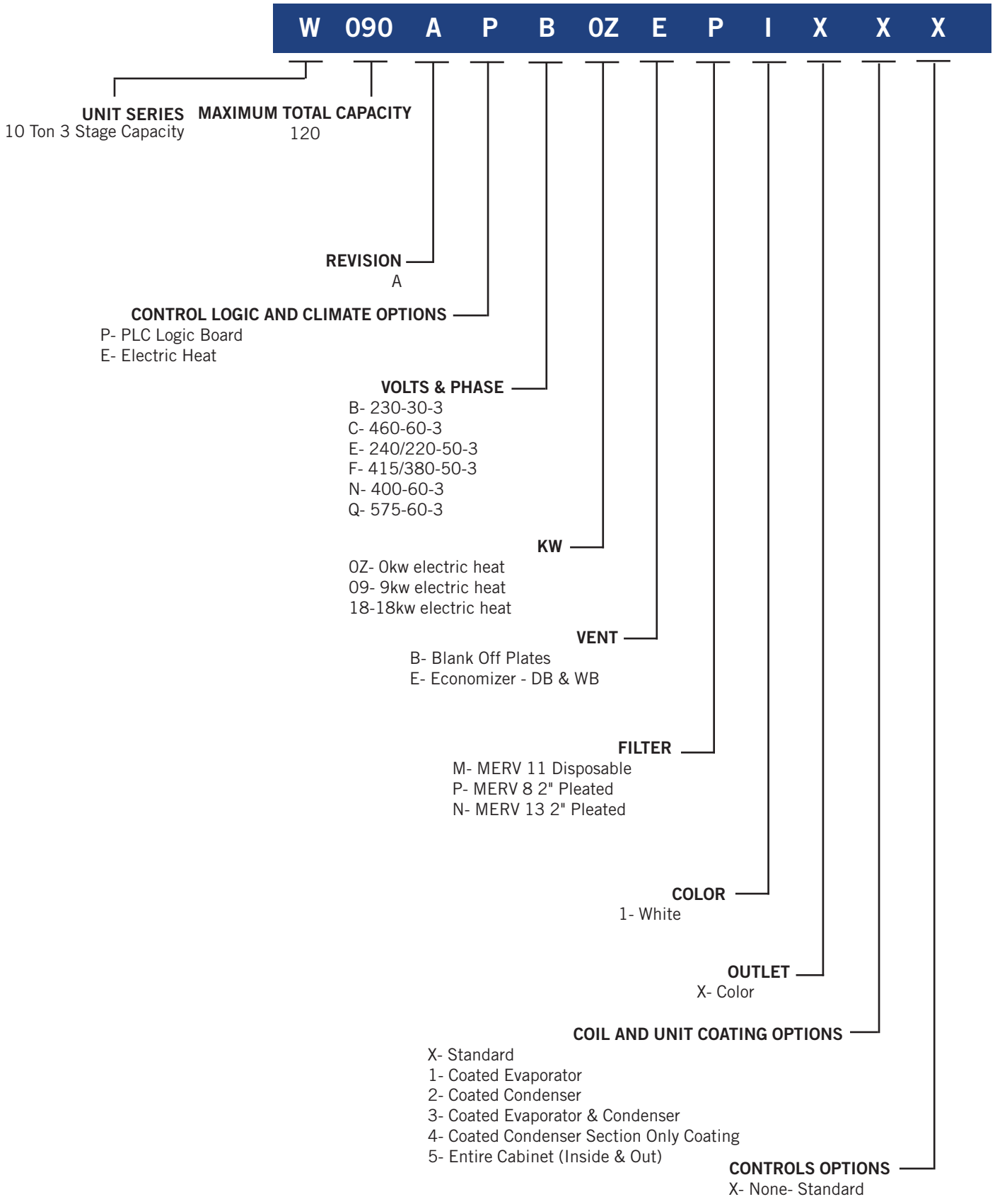
AHRI CERTIFIED™ www.ahridirectory.org
Single Package Vertical AC
AHRI Standard 390

Intertek

Bard is an ISO 9001:2008 Certified Manufacturer

R-410A

Unit Nomenclature



MEGA-TEC™ WO90 Unit Specifications

	W090APB	W090APC	W090APE	W090AF	W090APN	W090APQ
Electrical Rating	230/208-60-3	460-60-3	220/200-50-3	415/380-50-3	400-60-3	575-60-3
Operating Voltage Range	197V-253V	414V-506V	198V-254V	342V-356V	360V-440V	517V-632V
Compressor A – Electrical Circuit A						
Voltage	230/208V	460V	220/200V	415/380V	400V	575V
Rated Load Amps	TBD	TBD	TBD	TBD	TBD	TBD
Branch Circuit Selection Current	TBD	TBD	TBD	TBD	TBD	TBD
Lock Rotor Amps	TBD	TBD	TBD	TBD	TBD	TBD
Compressor Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Compressor Stages	2	2	2	2	2	2
Expansion Device	EEV	EEV	EEV	EEV	EEV	EEV
High Pressure Transducer	Standard	Standard	Standard	Standard	Standard	Standard
Low Pressure Transducer	Standard	Standard	Standard	Standard	Standard	Standard
Compressor B – Electrical Circuit B						
Voltage	230/208V	460V	220/200V	415/380V	400V	575V
Rated Load Amps	TBD	TBD	TBD	TBD	TBD	TBD
Branch Circuit Selection Current	TBD	TBD	TBD	TBD	TBD	TBD
Lock Rotor Amps	TBD	TBD	TBD	TBD	TBD	TBD
Compressor Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Compressor Stages	1	1	1	1	1	1
Expansion Device	EEV	EEV	EEV	EEV	EEV	EEV
High Pressure Transducer	Standard	Standard	Standard	Standard	Standard	Standard
Low Pressure Transducer	Standard	Standard	Standard	Standard	Standard	Standard

*Performance data given at AHRI rating conditions.

WO90 Unit Specifications (continued)

	W090APB	W090APC	W090APE	W090AF	W090APN	W090APQ
Outdoor Cond. Fan						
Outdoor Fan Motor Horsepower	3.95 (2950W)	3.95 (2950W)	3.95 (2950W)	3.95 (2950W)	3.95 (2950W)	3.95 (2950W)
Outdoor Motor Amps	TBD	TBD	TBD	TBD	TBD	TBD
Outdoor Fan Motor RPM	1450	1450	1450	1450	1450	1450
Outdoor Fan Diameter	28" (630mm)	28" (630mm)	28" (630mm)	28" (630mm)	28" (630mm)	28" (630mm)
Outdoor Fan Rotation	CW	CW	CW	CW	CW	CW
Outdoor Fan Weight	89lb (40.2kg)	89lb (40.2kg)	89lb (40.2kg)	89lb (40.2kg)	89lb (40.2kg)	89lb (40.2kg)
Max Outdoor CFM	8200	8200	8200	8200	8200	8200
Degree of protection	IP55	IP55	IP55	IP55	IP55	IP55
Moisture/Environmental Class	F4-1	F4-1	F4-1	F4-1	F4-1	F4-1
Insulation Class	F	F	F	F	F	F
Protection Class	1	1	1	1	1	1
EMC Immunity	EN61000-6-2	EN61000-6-2	EN61000-6-2	EN61000-6-2	EN61000-6-2	EN61000-6-2
Indoor Evap. Fan						
Indoor Fan Motor Horsepower	4 (3000W)	4 (3000W)	4 (3000W)	4 (3000W)	4 (3000W)	4 (3000W)
Indoor Motor Amps	TBD	TBD	TBD	TBD	TBD	TBD
Indoor Fan Motor RPM	1500	1500	1500	1500	1500	1500
Indoor Fan Size	22" (560mm)	22" (560mm)	22" (560mm)	22" (560mm)	22" (560mm)	22" (560mm)
Indoor Fan Weight	66lb (30kg)	66lb (30kg)	66lb (30kg)	66lb (30kg)	66lb (30kg)	66lb (30kg)
Indoor Blower Motor Type	Backward Curve	Backward Curve	Backward Curve	Backward Curve	Backward Curve	Backward Curve
Indoor Blower Motor Input	0-10V	0-10V	0-10V	0-10V	0-10V	0-10V
Degree of protection	IP55	IP55	IP55	IP55	IP55	IP55
Moisture/Environmental Class	F4-1	F4-1	F4-1	F4-1	F4-1	F4-1
Insulation Class	F	F	F	F	F	F
Protection Class	1	1	1	1	1	1
EMC Immunity	EN61000-6-2	EN61000-6-2	EN61000-6-2	EN61000-6-2	EN61000-6-2	EN61000-6-2
Indoor Blower Motor CFM @ Rated Static Pressure	4000	4000	4000	4000	4000	4000
Max Indoor CFM	6600	6600	6600	6600	6600	6600
Indoor Filter Size	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2

MEGA-TEC™ W090 Unit Specifications (continued)

	W090APB	W090APC	W090APE	W090AF	W090APN	W090APQ
Indoor Filter Size	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2	(4) 20x25x2
R410A Charge – Circuit A, lbs.	TBD	TBD	TBD	TBD	TBD	TBD
R410A Charge – Circuit B, lbs.	TBD	TBD	TBD	TBD	TBD	TBD
Unit Weight	TBD	TBD	TBD	TBD	TBD	TBD
Economizer Weight	TBD	TBD	TBD	TBD	TBD	TBD
Unit Weight - Shipped	TBD	TBD	TBD	TBD	TBD	TBD

MEGA-TEC™ W090 Unit Capacity and Efficiency Ratings

Unit Performance	W090AP*
3rd Stage Cooling Operation Capacity BTUH	125,000 BTUH
3rd Stage Cooling Operation EER	TBD
3rd Stage Cooling Rated CFM (Wet Coil)	4000CFM @1300RPM
2nd Stage Cooling Operation Capacity BTUH	115,000 BTUH
2nd Stage Cooling Operation EER	TBD
2nd Stage Cooling Rated CFM (Wet Coil)	4000CFM @1300RPM
1st Stage Cooling Operation Capacity BTUH	43,500 BTUH
1st Stage Cooling Operation EER	TBD
1st Stage Cooling Rated CFM (Wet Coil)	4000CFM @1300RPM
IPLV (Integrated Part Load Value)	TBD

Note: Capacity, Efficiency, and IPLV data is certified through AHRI in accordance with ANSI/ARI Standard 390-2003 for single package vertical units. Information is based on operation with fresh air covor plate.

Unit Indoor Airflow Performance - CFM (0.0" thru 0.5" H_2O)

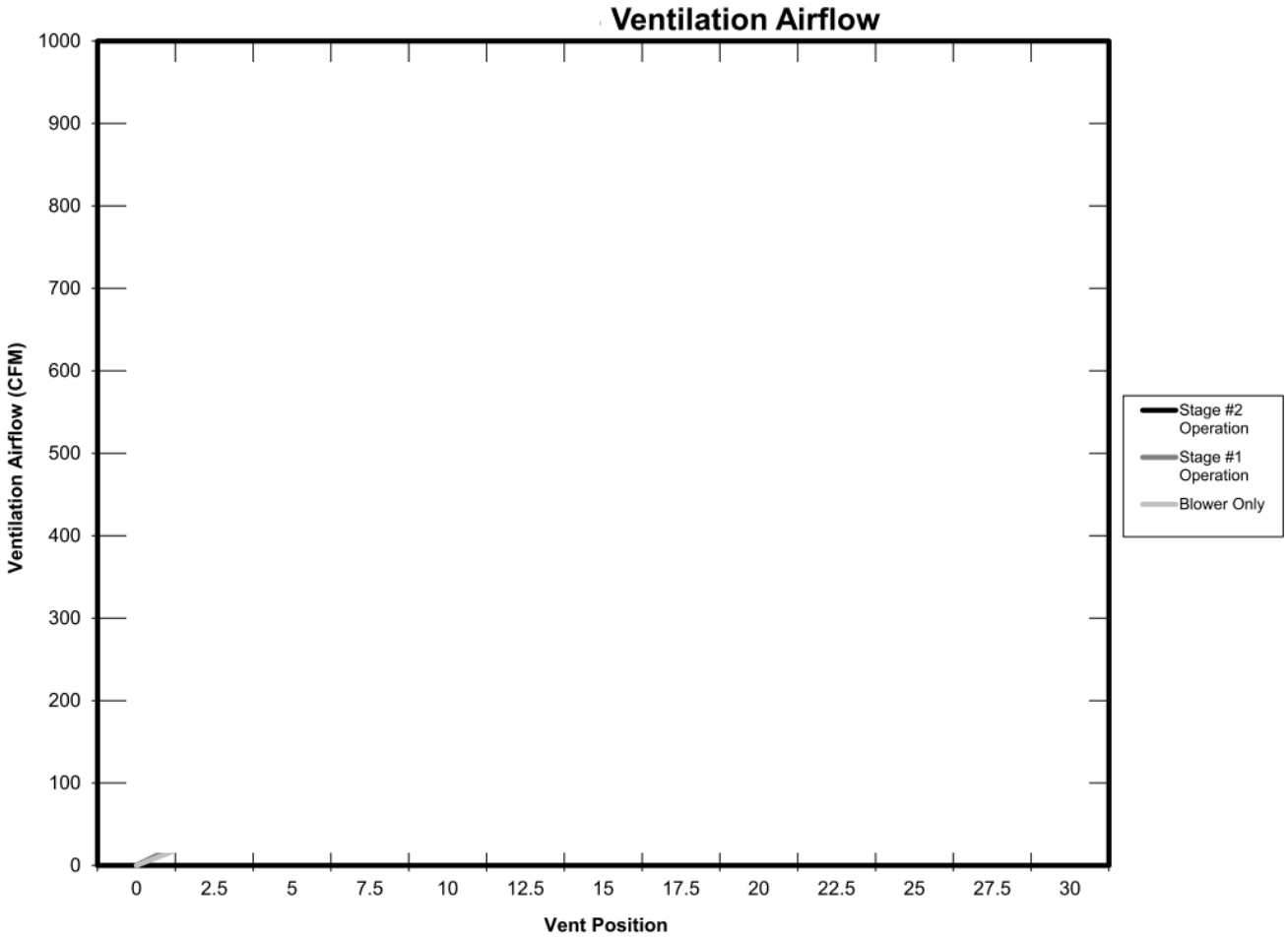
Unit	Blower Only	3rd Stage Cooling	2nd Stage Cooling	1st Stage Cooling	5-10kw Electric heat	15-20kw Electric heat
W090AP*	4000	4000	4000	4000	TBD	TBD

Note: MEGA-TEC systems use variable speed technolog to maintain airflow across static pressure range at dry and wet coil conditions

MEGA-TEC™ Economizer

The optional MEGA-TEC economizer uses outdoor air to cool an area when outdoor conditions are acceptable. The built-in economizer system is internally mounted on each side of the unit and allows outdoor air to be introduced through the air inlet openings. The amount of outdoor air varies in response to the system controls and settings defined by the end user. It includes a built-in exhaust air damper operated independently of the intake side dampers. The economizer is designed to provide "free cooling" when outside air conditions are cool and dry enough to satisfy cooling requirements without running the compressor. This in turn provides lower operating costs, while extending the life of the equipment.

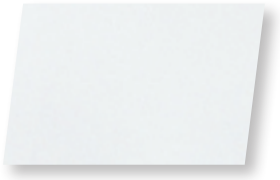
Standard Features:
- Fully modulating
- Belimo Direct Drive Hi-Torque Actuators
- 3 blade design allows air intake from sides and exhausting room air through the unit front.
- Positive shut-off with non-stick gasket material.
- Electronic DB and/or Enthalpy control to measure outdoor conditions.
- PLC control of economizer logic.
- Independent control of intake dampers and exhaust for positive pressurization adjustment.



Unit Options

Cabinet Finish Options

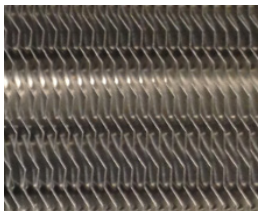
All unit models are available in Beige, White, Buckeye Gray, Desert Brown and Dark Bronze.



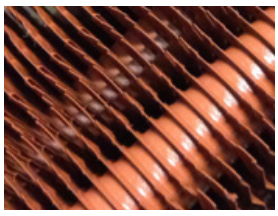
1 = WHITE

Evaporator and Condenser Coil Coating Options

All models utilize a copper/aluminum evaporator and condenser coil. An additional corrosion resistant AeroMarine coating may be ordered for the evaporator coil, condenser coil or both evaporator and condenser coils.



Aluminum Fin
(standard evaporator)



AeroMarine Fin
(optional coil coating)

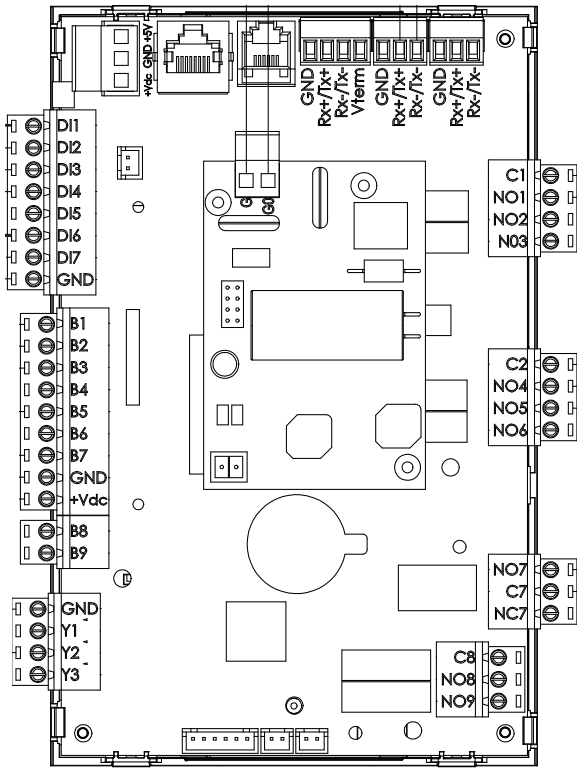
Control Options

Control Module Code	Field-Installed Part #	Fits Models Listed	Description
X	N/A	All Models	Standard control module package. It contains the following: • Logic Control Board • Electronic Expansion Valve • High Pressure Transducer • Low Pressure Transducer • High Pressure Safety Switch • Dirty Filter Pressure Switch • Indoor Blower Operation Switch • Return Air Temperature Sensor • Supply Air Temperature Sensor • Outdoor Temperature and Humidity Sensor • Compressor Control Module • Economizer Intake Air Quality Sensor • Compressor Crankcase Heater • Phase Monitor (3 phase models only)

Programmable Logic Board

Each unit uses a programmable logic board located in the unit control panel to communicate with the LV controller. By using a 2-wire connection, alarm functionality and unit operational commands are communicated. If communication is lost, the unit is able to run by using the logic in the unit controller in orphan mode.

Wall-Mount Unit Control Board



Power Supply Specifications:

24Vac/Vdc +10%/-15% 50/60 Hz
Max power input: 28 VA
Insulation between power supply and instrument:

- Mod. 24Vac: reinforced ensured by the use of external safety (class 2) transformer (mandatory)

External fuse: 3.15 AT (mandatory)
Minimum section of wires of all other connectors: 0.5mm^2

Product Specifications:

Program memory (FLASH): 128MB
Data memory: 16MB/8MB
Internal clock precision: 100 ppm
Battery type: Lithium button battery (removable), BR2032, 3 Vdc
Battery lifetime characteristics of removable battery; Min. 8 years in normal operating conditions.

User Interface:

Type: all the pGD terminals with telephone connector J10, th-Tune single unit controller with connector J11/J12/J13

Operating Conditions:

Storage: -40T70 °C, 90% rH non-condensing
Operating: -40T60 °C, 90% rH non-condensing

Other Specifications:

Environmental pollution degree: 3
Index of protection: IP00
Class according to protection against electric shock: to be incorporated into Class 1 and/or Class 11 appliances
PTI of the insulating materials PCB: PTI 250'
insulation material: PTI 175
Period of stress across the insulating parts: long
Type of action: 1C; 1Y for SSR versions
Type of disconnection or micro interruption: micro interruption
category of resistance to heat and fire: Category D (UL94 - VO)
Immunity against voltage surges: Category III
Rated impulse voltage: 4000V;
Temperature for Ball Pressure Test: 125 °C

Communication Lines Available:

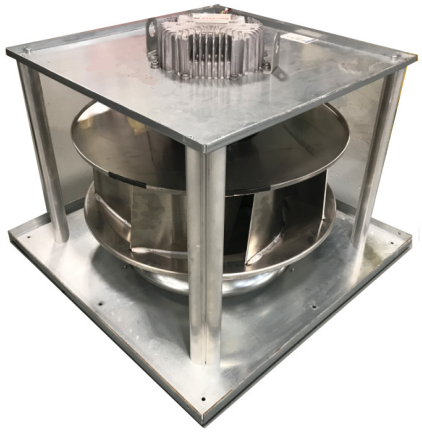
- 1 shielded RJ45 Ethernet line. To the Ethernet port only one circuit type SELV CIRCUIT can be connections

Maximum Ethernet port connection cable length: 100M CAT-5 STP

MEGA-TEC Series Standard Components

Indoor Airflow System

The MEGA-TEC uses an industrial grade high efficiency centrifugal fan design. Aluminum and steel construction is used for strength and durability. Modbus communications provide the fan operational instructions along with real-time feedback.



Specifications

- Industrial grade assembly
- Aluminum impeller
- Ball bearing motor design
- Integrated PID controller
- Over temperature protection for motor and electronics
- Soft start
- ECM technology

Electronic Expansion Valve (EEV)

The valves are certified in accordance with the main national and international standards. Precise control is guaranteed by electronic controllers, designed especially to optimize management of air conditioning and refrigeration systems, with special focus on energy saving. In addition, highly precise control is also assured by the special shape of the movable elements, guaranteeing flow with an equal percentage characteristic; the stroke length, achieved by using stainless steel ball bearings; and the use of high precision mechanical components.

Specifications

- Power supply voltage 12V
- Drive frequency 50 Hz
- Phase resistance (25°C/77°F) 40 Ohm ± 10%
- Index of protection IP67
- Step angle 7.5 °
- Linear advance/step 0.02 mm (0.001 inches)
- Complete closing steps 500
- Control steps 480

Copeland UltraTech Compressor

The Copeland Scroll UltraTech compressor offers a better means of powering air conditioning systems. Building on established scroll technology, the Copeland Scroll UltraTech compressor provides superior humidity control, greater efficiency and quieter operation, providing unsurpassed reliability and performance along with increased comfort and reduced energy bills.

Modulating compressors provide precise temperature control, lower humidity and greater energy efficiency in comparison to fixed capacity compressors. The Copeland Scroll UltraTech compressor modulates between two capacity settings, 67% and 100%. Two internal bypass ports enable the compressor to run at 67% part-load capacity during times when only part-load cooling is needed. When demand increases, the modulation ring is activated, sealing the bypass ports and instantly shifting capacity to 100%. Running for longer periods at part-load capacity (67%) lowers the humidity inside the building and allows the HVAC system to operate more quietly. With the redesigned Copeland Scroll UltraTech compressor, the VA load is reduced to an expected range of 2-5 VA.

Outdoor Fan Assembly

The EC outdoor industrial fan assembly maintains its high efficiency across a wide operating range. The result is a significant reduction in energy use when the motor is run at reduced speeds.

Specifications

- Industrial grade fan assembly
- Soft start
- Reverse polarity and locked motor protection
- Painted black
- Aluminum blade sprayed with PP plastic
- Steel grill coated with black plastic

Dirty Filter Switch

All unit models utilize an adjustable dirty filter pressure switch to indicate when the filter needs to be changed. The dirty filter switch measures the pressure difference on both sides of the filter through tubing routed to the blower and vent areas of the unit. When pressure increases to a pre-set measurement in the switch, an alarm signal is sent to the unit programmable logic board, then to the LV controller. The controller energizes a set of normally open contacts. A LED light is also installed on the exterior cabinet surface to indicate a filter change is required.

MEGA-TEC Series Standard Components

Filter Replacement Light

A light is provided on the exterior of the unit that illuminates when the unit filter needs to be replaced. The light is located on the front left side of the cabinet. When the alarm signal for a dirty filter is reset through the LV1000 controller, the light will no longer be illuminated.

Indoor Blower Operation Pressure Switch

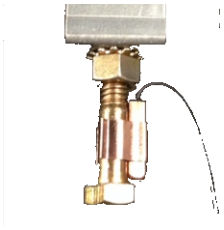
All unit models will utilize an indoor blower operation switch to indicate when blower airflow is not adequate for unit operation due to a failed evaporator blower motor or other mechanical airflow issue. The switch measures the pressure difference on both sides of the blower partition through tubing routed to the blower inlet and outlet areas of the unit. When pressure decreases below a pre-set measurement in the switch, an alarm signal is sent to the unit programmable logic board, then to the LV controller. The controller energizes a set of normally open contacts.

Compressor Control Module

A low voltage monitoring device is used to monitor power and indicate a low incoming voltage situation caused by inadequate shore power or generator operation. The monitoring device protects the unit against compressor contactor “chatter” and reverse compressor rotation during these situations.

Return Air Temperature Sensor

All unit models have a return air temperature sensor installed for operation in “orphan” mode. The return air temperature sensor is also used for indoor temperature averaging with the use of the LV controller. The return air sensor is located in the upper part of the return opening in such a way that it is exposed to the entering airstream. Information is received by the unit logic control board using a 10K resistance signal. An alarm will be sent to the LV controller if the return air temperature sensor is disconnected.



Supply Air Temperature Sensor

All unit models use a supply air temperature sensor. By monitoring the air temperature leaving the supply opening, the unit logic control board is able to monitor the air entering the shelter. Information is received by the unit logic control board using a 10K resistance signal. An alarm will be sent to the LV controller if the supply air temperature sensor is disconnected.

MEGA-TEC Series Standard Components

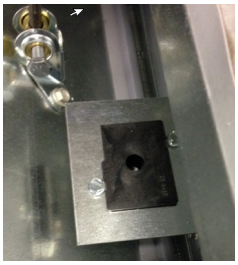
Outdoor Air Temperature and Humidity Sensor

All unit models use a outdoor air temperature and humidity sensor. Using the sensor, the unit logic control board is able to monitor the outdoor air temperature, humidity and dew point. When conditions are acceptable for bringing in cooler outdoor air, the unit logic control board will allow economizer operation. The unit software can be set to operate economizer in Dry Bulb, Humidity %RH or dew point. An alarm will be sent to the LV controller if the supply air temperature sensor is disconnected.

Compressor Crankcase Heater

All unit models have a crankcase heater installed as standard. The crankcase heater is a belly band style heater encircling the base section of the compressor housing. When the unit is not in operation, the crankcase heater is a precautionary measure to prevent compressor oil migration, deter oil and refrigeration from mixing and avoid refrigerant condensation. **Care must be used when servicing the unit to avoid being burned by the belly band attached to the compressor base.** Always disconnect power when servicing this area of the unit.

Economizer Air Intake Quality Dust Sensor



All unit models include a dust sensor to monitor the outdoor air quality entering the economizer damper area. When conditions are unacceptable due to particulates in the air including farm field debris, highway dust and dirt, or other particulates, the economizer is disabled.

The sensor monitors dust density by using an optical system The optical portion of the sensor uses a light-emitting diode and light detector. The sensor is shipped pre-set, but may be adjusted for less or more sensitivity.

High Pressure Transducer

All unit models have a high side pressure transducer. The transducer will be used for system monitoring of high side system pressures. This information will be used to indicate when outdoor coil cleaning is necessary based on outdoor conditions and system pressures. When high pressure increases beyond a pre-set measurement when compared to outdoor temperature stored in the unit programmable logic board, an alarm signal is sent from the unit programmable logic board to the LV controller. The controller energizes a set of normally open contacts to indicate abnormal high system pressure. The high pressure transducer also controls the outdoor condenser fan and motor to increase outdoor airflow during high outdoor ambient conditions.

Low Pressure Transducer

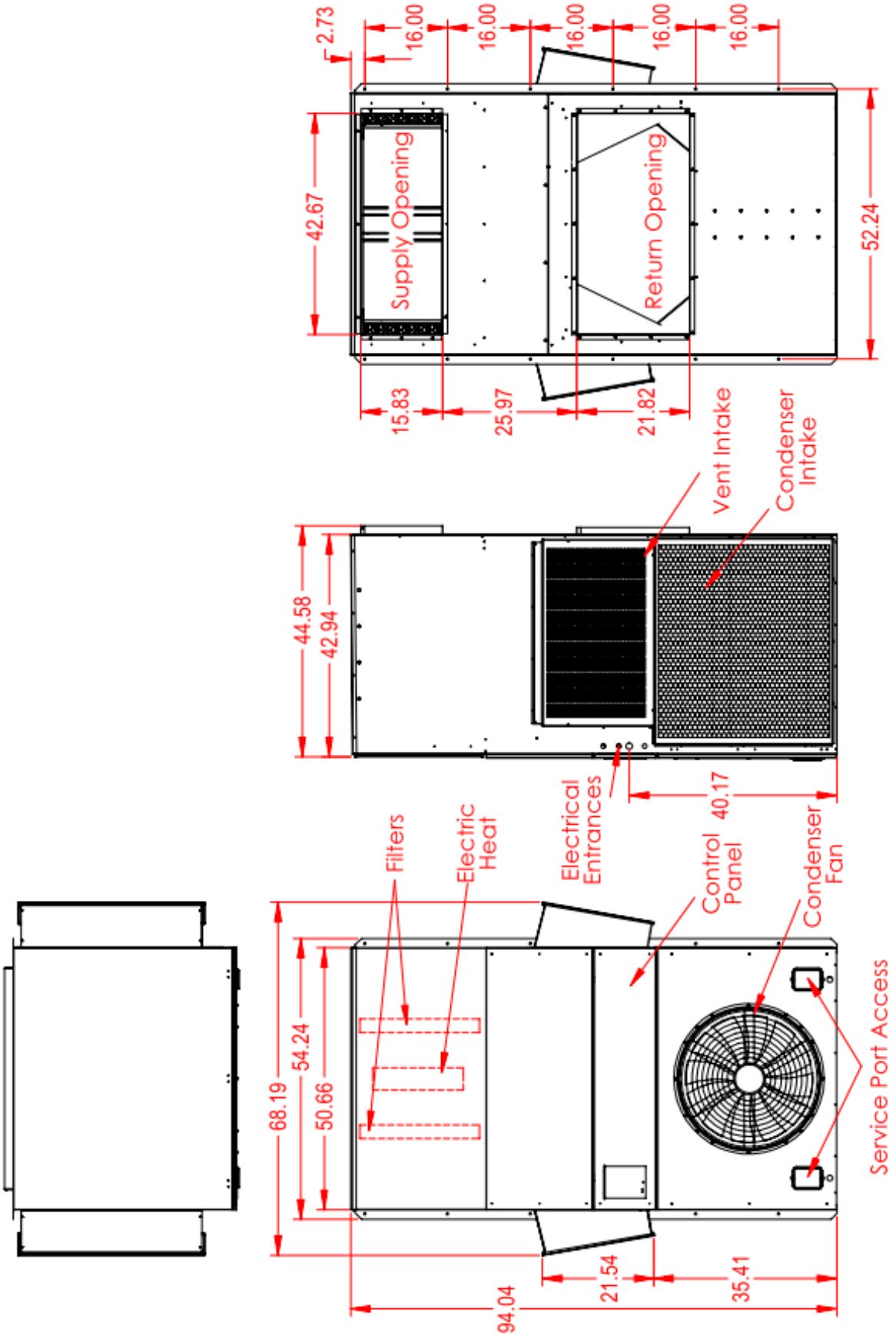
All unit models have a low side pressure transducer installed on the suction line between the evaporator coil and compressor. The transducer is used for system monitoring of low side system pressures. This information is used to indicate a loss of system refrigerant. When low pressure drops below a pre-set measurement stored in the unit programmable logic board, an alarm signal is sent from the unit programmable logic board to the LV controller. The controller energizes a set of normally open contacts to indicate abnormal low system pressure. When a loss of charge is measured, the LV controller energizes a set of normally open contacts to indicate refrigerant loss and that the unit needs to be serviced. The low pressure transducer is also used for operation of the eletronic expansion valve (EEV). Superheat is displayed at the unit using the TEC-EYE diagnostic tool.

High Pressure Safety Switch

All unit models have a high side pressure switch as a safety device. This device is connected to a safety rated set of contacts, and operates if high system pressures reach an unacceptable level. When activated, the unit will shut down compressor operation immediately. After a predetermined time, the unit will attempt to restart. If the switch is activated during the restart, compressor operation will lockout, and an alarm signal will be sent to the LV controller. **This is a safety device that disables unit operation at a high refrigerant pressure. It is also used to protect unit components including the electronic expansion valve and compressor.** Never disable the high pressure safety switch. Activation of the switch normally indicates the unit needs to be serviced.

MEGA-TEC Series Unit Dimensions – Shelter Top and Side View

WO90 Models



WO90 Mechanical Cooling Performance - Stage 3

Cooling Capacity - 60 hz.												
Return Air (DB/WB)	**Cooling Capacity**	**75**	**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**	**125**
75/62	Total Cooling Sensible Cooling	136700 106300	128600 101800	121300 97800	114800 94300	108800 91100	103600 88400	98800 86000	94700 84000	91000 82400	87900 81200	85300 80400
80/67	Total Cooling Sensible Cooling	146000 103100	140200 99800	134800 96900	129800 94300	125000 92000	120700 90000	116600 88300	113000 86900	109600 85800	106600 85100	104000 84700
85/72	Total Cooling Sensible Cooling	173900 105500	163900 101200	154800 97300	146500 93600	138800 90200	132000 87000	125700 84100	120200 81400	115100 79000	110700 76800	106900 74900

Cooling Capacity - 50 hz.												
Return Air (DB/WB)	**Cooling Capacity**	**75**	**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**	**125**
75/62	Total Cooling Sensible Cooling	124400 96800	117100 92700	110400 8900	104500 85900	99100 83000	94300 80500	90000 78300	86200 76500	82900 75000	80000 73900	77700 73200
80/67	Total Cooling Sensible Cooling	132900 93900	127600 90900	122700 88200	118200 85900	113800 83800	109900 81900	106200 80400	102900 79100	99800 78100	97100 77500	94700 77100
85/72	Total Cooling Sensible Cooling	158300 96100	149200 92100	140900 88600	133400 85200	126400 82100	120200 79200	114400 76600	109400 74100	104800 71900	100800 69900	97300 68200

WO90 Mechanical Cooling Performance - Stage 2

Cooling Capacity - 60 hz.												
Return Air (DB/WB)	**Cooling Capacity**	**75**	**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**	**125**
75/62	Total Cooling Sensible Cooling	120300 97200	115000 94800	109800 92500	104900 90200	100100 87900	95600 85600	91200 83500	86900 81300	82800 79300	78800 77100	74800 73900
80/67	Total Cooling Sensible Cooling	128500 94300	125300 93000	122000 91600	118600 90200	115000 88700	111400 87200	107600 85700	103700 84100	99700 82500	95500 80800	91200 79200
85/72	Total Cooling Sensible Cooling	153000 96500	146500 94400	140100 92000	133900 89600	127700 87000	121800 84300	116000 81600	110300 78800	104700 76000	99200 73000	93800 70000

Cooling Capacity - 50 hz.												
Return Air (DB/WB)	**Cooling Capacity**	**75**	**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**	**125**
75/62	Total Cooling Sensible Cooling	109500 88500	104700 86300	100000 84200	95500 82100	91100 80000	87000 77900	83000 76000	79100 74000	75400 72200	71800 70200	68100 67300
80/67	Total Cooling Sensible Cooling	117000 85900	114100 84700	111100 83400	108000 82100	104700 80800	101400 79400	98000 78000	94400 76600	90800 75100	87000 73600	83000 72100
85/72	Total Cooling Sensible Cooling	139300 87900	133400 86000	127500 83800	121900 81600	116300 79200	110900 76800	105600 74300	100400 71800	95300 69200	90300 66500	85400 63700

WO90 Mechanical Cooling Performance - Stage 1

Cooling Capacity - 60 hz.												
Return Air (DB/WB)	**Cooling Capacity**	**75**	**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**	**125**
75/62	Total Cooling Sensible Cooling	52200 43300	47900 40300	44100 37800	40900 35600	37900 33800	35400 32300	33200 31300	31400 30500	29900 29300	28700 28100	27800 27600
80/67	Total Cooling Sensible Cooling	55700 4200	52200 39500	49000 37400	46200 35600	43500 34100	41200 32900	39200 32100	37400 31500	36000 31300	34800 31500	33900 31900
85/72	Total Cooling Sensible Cooling	66400 43000	61000 40100	56300 37600	52200 35400	48300 33500	45100 31800	42300 30600	39800 29600	37800 28800	36200 28500	34900 28200

Cooling Capacity - 50 hz.												
Return Air (DB/WB)	**Cooling Capacity**	**75**	**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**	**125**
75/62	Total Cooling Sensible Cooling	47600 39500	43600 36700	40200 34400	37300 32400	34500 30800	32300 29400	30300 28500	28600 27800	27300 26700	26200 25600	25300 25200
80/67	Total Cooling Sensible Cooling	50700 38300	47600 36000	44600 34100	42100 32400	39600 31100	37500 30000	35700 29300	34100 28700	32800 28500	31700 28700	30900 29100
85/72	Total Cooling Sensible Cooling	60500 39200	55600 36500	51300 34300	47600 32300	44000 30500	41100 29000	38500 27900	36300 27000	34400 26300	33000 26000	31800 25700

WO90 Free Cooling Economizer Performance

Unit Model	Indoor Airflow	Outdoor Temperature	Indoor Temperature	Free Cooling Sensible Capacity	Free Cooling EER
HR36	TBD	70°F	80°F	TBD	TBD
HR36	TBD	60°F	80°F	TBD	TBD
HR36	TBD	55°F	80°F	TBD	TBD
HR36	TBD	70°F	85°F	TBD	TBD
HR36	TBD	60°F	85°F	TBD	TBD
HR36	TBD	55°F	85°F	TBD	TBD

WO90 Electrical Specifications

MODEL	Rated Volts & Phase	No. Field Power Circuits	Single Circuit				Multiple Circuit											
			③ Minimum Circuit Ampacity	① Maximum External Fuse or Ckt. Brkr.	② Field Power Wire Size	② Ground Wire	③ Minimum Circuit Ampacity			① Maximum External Fuse or Ckt. Breaker			② Field Power Wire Size			② Ground Wire Size		
							Ckt. A	Ckt. B	Ckt. C	Ckt. A	Ckt. B	Ckt. C	Ckt. A	Ckt. B	Ckt. C	Ckt. A	Ckt. B	Ckt. C
W090AP	-B0Z -B09 -B18	230/208-3																
W090AP	-C0Z -C09 -C18	460-3																
W090AP	-E0Z -E09 -E18	220/200-3																
W090AP	-F0Z -F09 -F18	415/380-3																
W090AP	-N0Z -N09 -N18	400-3																
W090AP	-Q0Z -Q09 -Q18	575-3																

① Maximum size of the time delay fuse or HACR type circuit breaker for protection of field wiring conductors.
② Based on 75C copper wire. All wiring must conform to the National Electrical Code and all local codes.
③ These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing.
Caution: When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.

IMPORTANT: While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.

WO90 Series Dehumidification Operation

The MEGA-TEC™ HR Series unit is able to operate in a dehumidification mode when the humidity level reaches 80% RH. By running the unit at a lower blower speed, latent capacity is increased and water is removed from the shelter indoor air.

FUSION-TEC™ Unit Controllers

Controller	Voltage	Shipping Weight	# of Units	Wall-Mount Units	Remote Communication
LC6000	230VAC	23 lbs	1 to 14 units	MEGA-TEC™	Modbus

LC6000 Multi-Unit Controller

The LC Series unit controllers are designed to communicate with one to four MEGA-TEC™ wall mount units. Using a programmable logic board, the LV controller is able to operate all units in a lead/lag configuration for equal unit run time. Normally open or normally closed dry contact points are available for unit and shelter alarming capability. A 230VAC power supply is used to ensure controller is operational during a loss of shore power.

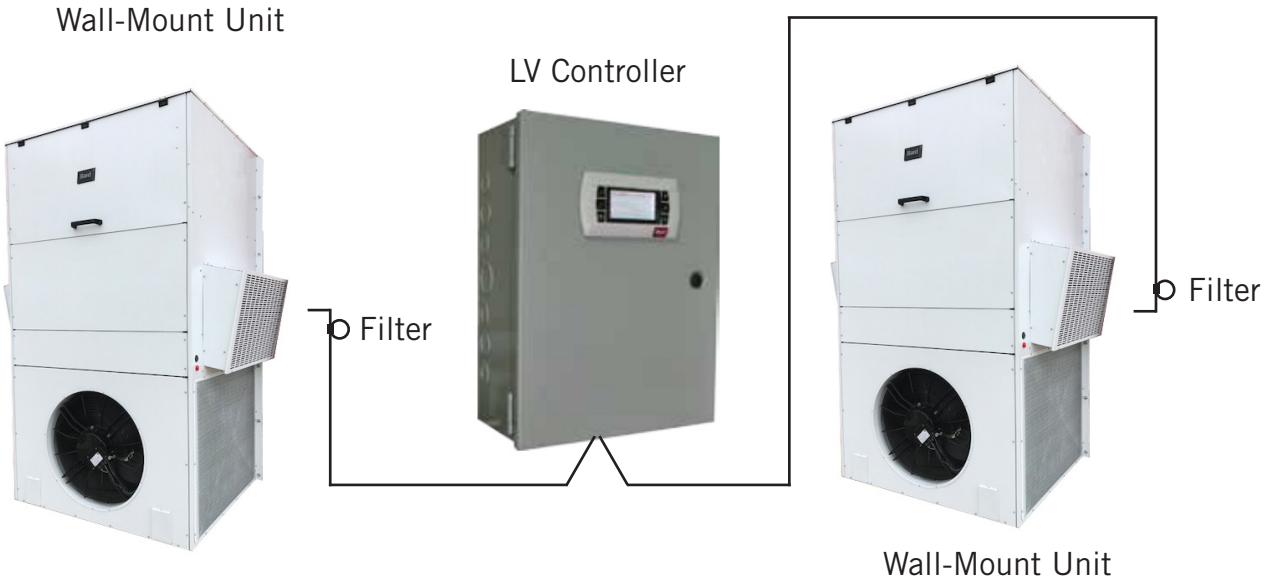
MEGA-TEC™ Accessories Supplied with LV Controller

Part Number	Description	Quantity Supplied
8301-055	EMI Ferrite Filters	2
8403-079	Remote Indoor Temperature and Humidity Sensor	1
8301-059	TEC-EYE™ Service Tool with 5 ft. Communication Cable	1

EMI Ferrite Filters Part #8301-055

EMI (electromagnetic interference) ferrite filters are used to keep the communication wiring connecting the FUSION-TEC™ units and the LV controller from acting as an antenna. As an antenna, the wire could receive electromagnetic interference from other electronic devices in the area.

EMI ferrite filters are attached by forming a wire loop through the filter before connecting each unit. A typical two or four unit installation requires two filters (supplied with LV controller).



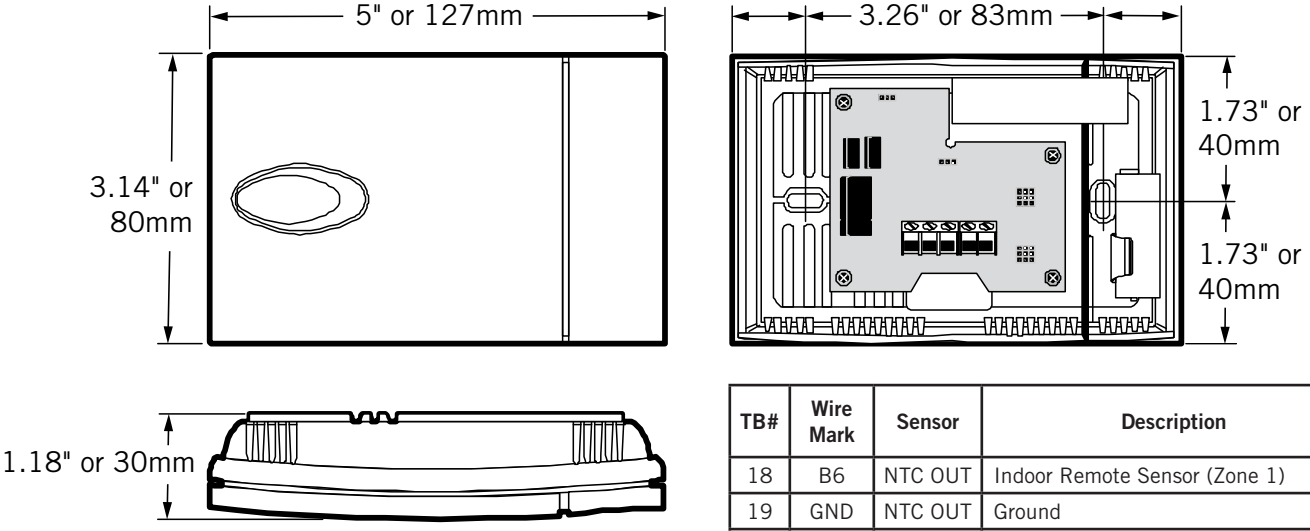
MEGA-TEC™ Accessories Supplied with LV Controller

Remote Indoor Temperature and Humidity Sensor Part #8403-079

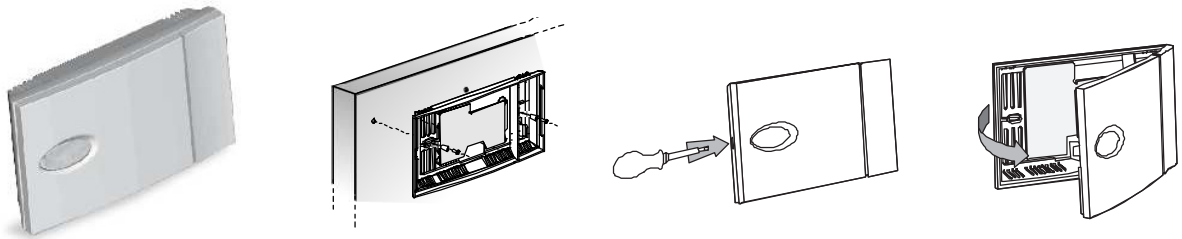
The remote indoor temperature and humidity sensor is used to measure conditions inside the building. Connected with 18 gauge 5 wire shielded cable, the indoor sensor is able to communicate with the LV controller and decide when conditions warrant unit operation. Only one (1) temperature and humidity sensor is used for each LV controller. Up to two (2) optional temperature only sensors may be used (sold separately) for temperature averaging.

Technical Specifications:

Storage Temperature: -20°C to 70°C
Temperature Sensor Range: -20°C to 70°C
Humidity Output Signal Range: 0%RH to 100%RH
Temperature Sensor Type: NTC 10K OHM at 25°C 1%
Humidity Sensor Type: Capacitive
Terminal Block Type: Screw terminals for cables, max. dia. 1.5mm min. Ø .5mm
Maximum Wire Length: 1640 Ft. (500m)
Temperature Time Constant: In still air, 300s
Humidity Time Constant: In still air, 60s. In moving air, 20s.
Category of Resistance to Heat and Fire: Category D (for case and cover)
Category of Immunity Against Voltage Surges: Category 2
Sensor Index of Protection: IP30



TB#	Wire Mark	Sensor	Description
18	B6	NTC OUT	Indoor Remote Sensor (Zone 1)
19	GND	NTC OUT	Ground
12	B2	OUT H	Remote Indoor Humidity Sensor: 0-1 VDC (Zone 1)
13	GND	M (GO)	Ground
22	+VDC	+ (G)	Power for B2



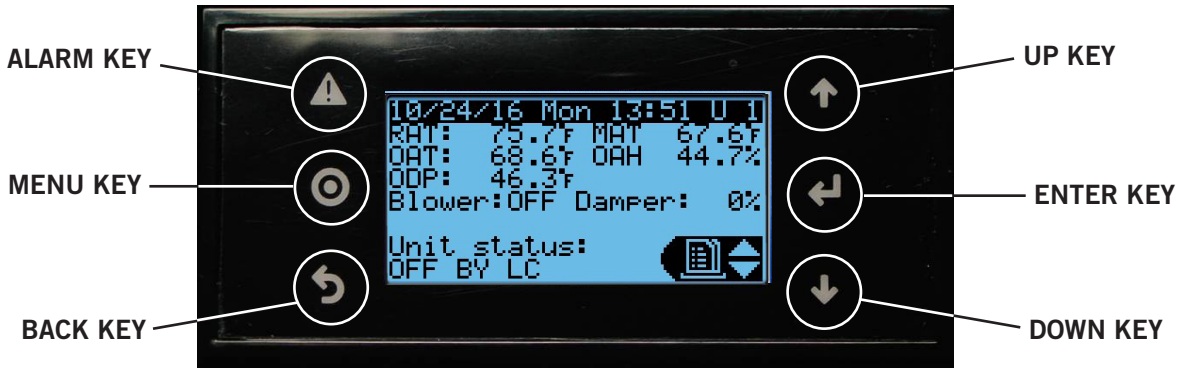
TEC-EYE™ Service Tool Part #8301-059

The TEC-EYE™ service tool is used to communicate with the MEGA-TEC™ unit logic board. By connecting directly to the logic board inside the unit control panel, it is possible to perform diagnostics on the unit, adjust certain settings and verify unit and economizer operation through a run test procedure. **The TEC-EYE™ service tool is required for unit setup and operation, and is supplied with the LC controller.**

Technical Specifications:

Storage Temperature: -20°C to 70°C
Operating Conditions: -20°C to 60°C
Display Type: FSTN graphic
Display Backlighting: LED
Graphic Resolution: 132 x 64 pixels
Size of Display Area: 72mm x 36mm
Connector: RJ12 (phone connector)
Maximum Wire Length: 50m, 164 ft.
Category of Resistance to Heat and Fire: Category D and B
Category of Immunity Against Voltage Surges: Category 2
Index of Protection: IP65, UL Type 1

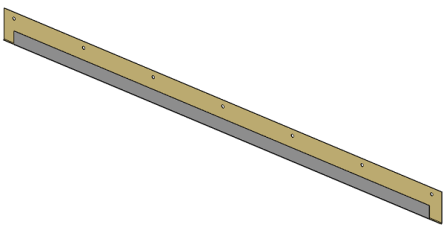
TEC-EYE™ Display



MEGA-TEC™ Accessories Supplied with the Unit

Top Rain Flashing

Top rain flashing is supplied with each FUSION-TEC unit and must be used to avoid water intrusion between the wall and unit top. Follow all instructions for attaching and sealing the top rain angle provided in the MEGA-TEC installation instructions. The top rain flashing is shipped attached to the back of the unit.

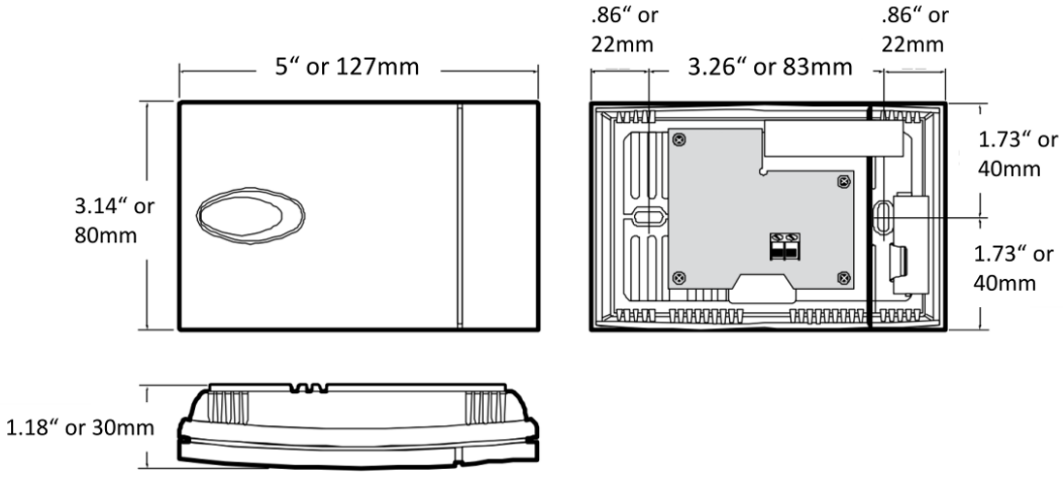


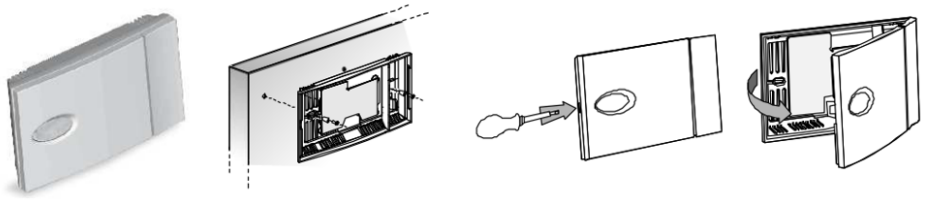
MEGA-TEC™ Optional Accessories (Sold Separately)

Part Number	Description	Quantity Supplied
8301-058	Additional Remote Indoor Temperature Sensor (18 gauge 2 wire shielded cable sold separately)	1
8403-079	Additional Temperature and Humidity Sensor (18 gauge 5 wire shielded cable sold separately)	1
8301-055	Additional EMI Ferrite Filters (Required for four units)	2
8301-053	Large Backlit Display Service Tool	1
2151-021	EEV Manual Adjustment Tool	1
113-140	Bottom Wall Mounting Bracket	1
2151-022	Tri-Groove Socket (Bard Gaurd™ models only)	1

Remote Indoor Temperature Sensor Part #8301-058

Up to two (2) additional remote temperature sensors or two (2) additional remote temperature and humidity sensors may be connected to the LV controller to measure conditions inside the building. Connected with 18 gauge 2 wire shielded cable, the indoor temperature sensor is able to communicate with the LV controller and decide when conditions warrant unit operation.





Large Display Service Tool Part #8301-053

The large display service tool is used to communicate with the FUSION-TEC™ unit logic board. Operation is identical to the TEC-EYE™, with a larger display and mechanical entry keys. By connecting directly to the logic board inside the unit control panel, it is possible to perform diagnostics on the unit, adjust certain settings and verify unit and economizer operation through a run test procedure.

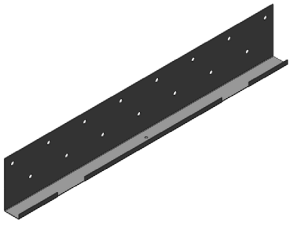
Technical Specifications:

Storage Temperature: -4°F to 158°F (-20°C to 70°C)
Operating Conditions: -4°F to 140°F (-20°C to 60°C)
Display Type: FSTN graphic
Display Backlighting: LED
Graphic Resolution: 132 x 64 pixels
Size of Display Area: 2.8" x 1.4" (72mm x 36mm)
Connector: RJ12 (phone connector)
Maximum Wire Length: 50m, 164 ft.
Category of Resistance to Heat and Fire: Category D and B
Category of Immunity Against Voltage Surges: Category 2
Index of Protection: IP65, UL Type 1

EEV Manual Adjustment Service Tool Part #2151-021

The EEV manual adjustment tool allows for adjustment of the EEV (Electronic Expansion Valve) without the use of the unit logic board. The service technician can use this tool by removing the electronic head of the valve and attaching the adjustment tool. The tool houses magnets that interact with the valve to open or close the EEV for charging or evacuating the system without system power.

Bottom Mounting Bracket Part #113-140



A bottom mounting bracket may be used to help support the unit during and after installation. The front lip of the bracket hooks underneath the unit base. This part is not supplied with the FUSION-TEC unit, but is available as an optioned accessory.

MEGA-TEC™ Supply and Return Grilles (Sold Separately)

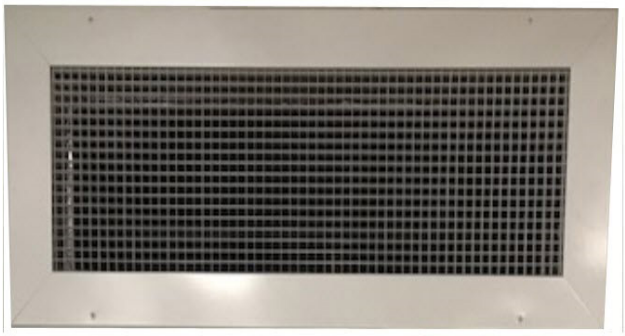
Part Number	Description	Shipping Weight	Quantity Supplied
SGR-10W	Supply Grille, 2" Wide Frame	6 pounds	1
RGR-10W	Return Grille, 2" Wide Frame	12 pounds	1

Supply Grille, Wide Frame Part #SGR-10W

The MEGA-TEC™ unit requires a specially designed supply grille that allows for high velocity airflow through the unit supply opening. The grille finish is powder coated white. Wide frame grilles are used where wall hole sizes require a 2" wide grille flange to cover the wall opening. Used with W090 models.

Return Grille, Wide Frame Part #RGR-10W

The MEGA-TEC™ unit requires a specially designed return grille that allows for high velocity airflow through the unit return opening. Deflectors allow for air distribution at floor level, and are adjustable. The grille finish is powder coated white. Wide frame grilles are used where wall hole sizes require a 2" wide grille flange to cover the wall opening. Used with W090 models.



WO90 Series Field-Supplied Istallation Items, Wiring

Component	Reason for Use
Wiring – All Units	
18 Gauge 2 Wire Shielded Cable with drain	This is **required** to communicate between each MEGA-TEC™ unit and the LV controller. When calculating wire length that is needed, be sure to include routing distance to each unit, conduit requirements and a loop for an EMI ferrite filter inside each unit control panel.
18 Gauge 5 Wire Shielded Cable with drain	This is **required** to communicate between the indoor remote temperature and humidity sensor and the LV controller. When calculating wire length that is needed, be sure to include routing distance between the sensor location and controller, conduit requirements and routing inside the LV panel to the terminal block. 18 gauge 6 wire shielded cable may be used if an extra conductor (wire) is desired.
Main Unit Power Wiring, 230VAC	This is **required** to supply power to the unit for compressor, ventilation and electric heat operation. When calculating wire length that is needed, be sure to include routing distance between the power source and the VAC circuit breaker inside the unit, and the conduit requirements. Be sure to follow all wire sizing and routing requirements supplied in this document and the installation manual.
LV Controller Power Wiring, -48VDC	This is **required** to supply power to the LV controller. When calculating wire length that is needed, be sure to include routing distance between the power source and the VDC connection point inside the LV controller, and the conduit requirements. Be sure to follow all wire sizing and routing requirements supplied in the LV specification sheet and the LV installation manual.
18 Gauge 2 Wire Shielded Cable	This is **optional** to communicate between an additional indoor temperature sensor and the LV controller. When calculating wire length that is needed, be sure to include routing distance between the sensor location and controller, conduit requirements and routing inside the LV panel to the terminal block.

WO90 Series Field-Supplied Installation Items, Unit

Component	Reason for Use
Unit Installation	
Wall Fasteners for Unit	Ten (10) cement fasteners, wall lag bolts or other fasteners are **required** to mount the FUSION-TEC™ product to the wall structure. Ø.375 holes are provided in the wall mounting flange on each side of the MEGA-TEC™ unit. Fasteners must be field specified based on the wall structure.
Wall Fasteners for Rain Flashing	Seven (7) cement or wood screws are **required** to mount the MEGA-TEC™ rain flashing to the wall structure. Ø.250 holes are provided in the top of the rain flashing. Fasteners must be field specified based on the wall structure.
Exterior Silicone Caulk	This is **required** to form a watertight seal between the MEGA-TEC™ unit and the wall. Choose an outdoor rated premium silicone caulk and follow all installation instructions provided with the MEGA-TEC™ unit.
230VAC Main Unit Power Conduit	This is **required** to supply power to the unit for compressor, ventilation and electric heat operation. Hole plugs are provided on each side of the unit for 230V main power.
Communication Wire Conduit	This is **required** to supply communication to the unit logic control board. One hole plug is provided on each side of the unit for the communication wire.

18 Gauge 2 Wire Shielded Cable with Drain

Where specified, this wire is 18/2 18 Gauge Copper Conductor Stranded Shielded and a PVC jacket. Red and black are the preferred wire colors.

18 Gauge 5 Wire Shielded Cable with Drain

Where specified, this wire is 18/5 18 Gauge Copper Conductor Stranded Shielded and a PVC jacket. 18/6 (6 wire) may be used in place of 18/5 (5 wire) if an extra conductor is desired.