



Altra-Air *Sailfin*

DESIGN & ENGINEERING GUIDE

METRIC & IMPERIAL

Subject to Changes Without Notification.

ENVIRA-NORTH
SYSTEMS LIMITED

(519) 527-2198
enviranorth.com



ALTRA-AIR SAILFIN FANS

Thank you for incorporating Envira-North System's Altra-Air Sailfin Fans into your project. Envira-North Systems Ltd. recognizes that energy savings is a top priority in today's economic and social environment. Bringing over 50 years of ventilation expertise, we've established ourselves by providing quality products accompanied by the best after-sales service in the industry, while contributing to the effectiveness of heating / cooling and ventilation systems.

Our mission is to continually develop and provide quality, cost efficient ventilation solutions that improve energy consumption and increase comfort levels for the occupants of large structures.

Energy consumption has grown to be a critical factor in business worldwide. Envira-North will continue to develop and provide solutions to improve energy consumption while increasing occupant productivity inside structures around the globe. Ample research is available to show that adequate fresh air exchange is crucial for workers, students, animals and home occupants to perform at their best. A well designed ventilation scheme can:

- Lower temperatures in buildings by cooling roof spaces and removing trapped ceiling heat through ceiling grilles.
- Improve air quality by lowering impurity levels caused by human respiration and toxic chemical emissions.

Altra-Air Sailfin Fans are a green power breakthrough which allows our High Volume Low Speed (HVLS) fans to deliver previously impossible levels of performance. These HVLS fans are simply outstanding when compared to what was previously considered the state-of-the-art fan.

- 5 blades are 25% more aerodynamically efficient (they move more air more smoothly).
- Aerodynamic blade noise (the main source of fan noise) is less than 1/5 of conventional fans.
- Best of all, they consume 20% less power.

We are proud to acknowledge that no other blade can match a Sailfin blade when it comes to generating substantially greater lift while reducing drag.

This Engineering and Design Guide should give you everything you need to successfully include Altra-Air Sailfin fans into your project.

Thank you for giving Envira-North Systems Ltd. the opportunity to be incorporated into your project's design plans. If you have any questions, concerns or comments please do not hesitate to contact the Envira-North office at 1(519)527-2198 or visit our website at www.enviranorth.com.

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Engineers requiring AutoCAD or SolidWorks drawings can download them by accessing the Envira-North 'Dealer Login' page on our website at www.enviranorth.com/dealerlogin. Please note that an authorised username and password is required to access this secure area of our site. Please contact Envira-North at 1(519)527-2198 to receive a username and password.

**Please note that all dimensions in this engineering and design guide are subject to change without notice. Envira-North Systems Ltd reserves the right to make changes accordingly.

WHY CHOOSE ENVIRA-NORTH SYSTEMS LTD?

We are Canada's largest supplier of industrial/commercial big ceiling (HVLS - High Volume Low Speed) fans and claim 75% of the Canadian market for industrial/commercial destratification and ventilation fans. Applications include hangars, warehouses, hockey rinks, shopping malls, distribution centres, office buildings, dairy farms, or any other facility with high ceilings. Envira-North Systems has been featured on CBC, MSNBC, A Channel, and in Discover Magazine, Toronto Star, Christian Science Monitor and Material Handling Management.

Envira-North Systems Ltd. staff bring to you over 50 years of ventilation expertise. We pride ourselves in providing the best after sales service in the industry. We recognize that energy savings is a top priority in today's environment.

Envira-North Systems Ltd. has recognized a worldwide need to reduce energy consumption by contributing to the effectiveness of heating, cooling and ventilation systems. Our products and systems enable your building to perform better; save on heating, cooling, mechanical operating costs and provide a healthier environment for the occupants of the structure.

THE SAILFIN BLADE ADVANTAGE

Salfin blades outperform all conventional airfoils. They accomplish this by:

- Offering an angle of attack up to 23°.
- Eliminating span-wise pumping; the primary cause of efficiency loss in all rotating systems.
- Eliminating tip stalling; the primary cause of blade noise and damaging vibration.
- Variablevariable pitch modulated trailing-edge airfoil removes the inefficiencies created by differentiating rotational HVLS Fan speeds.

THE BENEFITS OF SAILFIN

- Quiet speed and efficient operation, no annoying high speed circulating and exhaust fans.
- Virtually maintenance free (recommended inspection every 20,000 hours).
- Inexpensive to operate. Costs approximately 6 cents per hour for one fan at 1 HP.
- Greatly reduces "recovery" time when overhead doors are open with a constant air flow throughout.
- Provides a constant, even temperature from floor to ceiling and wall to wall.
- Will minimize the need for expensive duct work in new construction for both heating and air conditioning systems.
- A comfortable workplace environment increases productivity and decreases absenteeism.

INSTALLATION

Altra-Air Sailfin Fans come as a complete system including power unit, mounting hardware, wiring kit (optional) and low voltage controller (optional). Having everything included in this complete package streamlines installation and eliminates the costly search for components and hardware.

WARRANTY

Altra-Air Sailfin fans are of industrial grade construction and should provide many years of virtually maintenance free use. Standard 3 Year Limited Warranty duration is as follows:

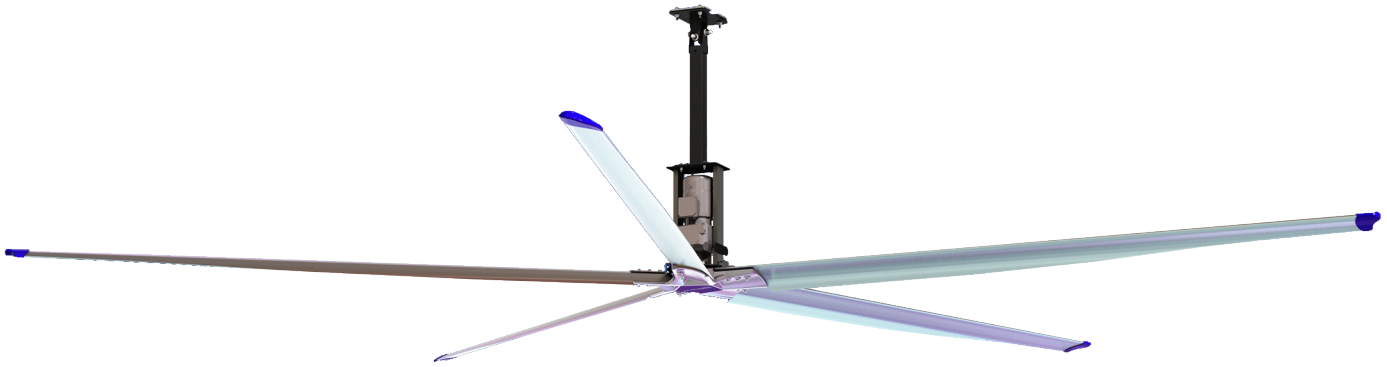
Air Foil Shaped Blade	Lifetime Warranty
Aluminum Alloy Hub	Lifetime Warranty
Motor	3 Year Limited Warranty
Gear Reducer	3 Year Limited Warranty
VFD Control Panel	3 Year Limited Warranty
Labour	1 Year Limited Warranty (pre-approved)
Custom fan wraps/paint	1 Year Limited Warranty

Please see page 28 of this document for complete warranty information including specifics and warranty exclusions. Use the above warranty information as a general guideline only.

ALTRA-AIR SAILFIN FANS

Altra-Air HVLS fans blanket a very large area with constantly moving air to create an expansive comfort zone. As a result, the big ceiling fan can create an evaporative cooling effect of three to four degrees Celsius throughout the facility.

During the heating season, the Altra-Air HVLS fan technology can de-stratify uneven temperatures that can be in excess of fifteen degrees Celsius from ceiling to floor. This results in significant energy savings since the heating system cycles less frequently.

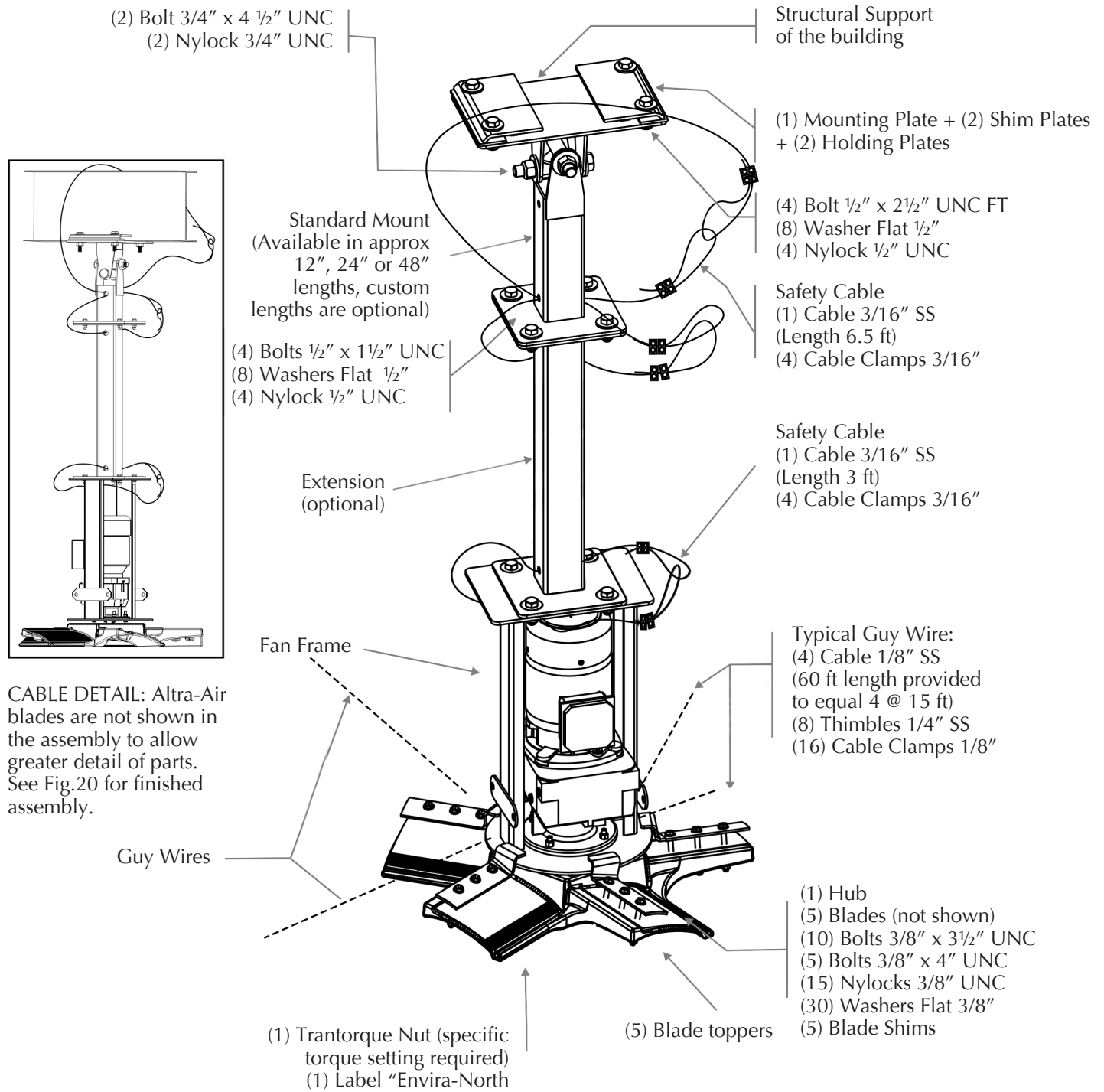


SAFETY SYSTEMS

In regards to safety issues concerning Altra-Air fans we would like to point out the measure we took to ensure the safety of our fans.

- Safety Cable - This cable ties together the vertical drop and the motor/gear reducer frame to the physical structure of your building.
- Safety Clips - These clips prevent the hub from falling in case of failure of the Fenner drive (nut) that holds the hub to the shaft of the gear reducer.
- Guy Wires - The wires have two functions; first, to avoid unnecessary sway of the fan in case of unbalanced blade(s) and second, to avoid large movements due to wind or draft.
- Mount - The mounting hardware has been designed and engineered to support the weight of the fan and provide a secure connection to the structure.

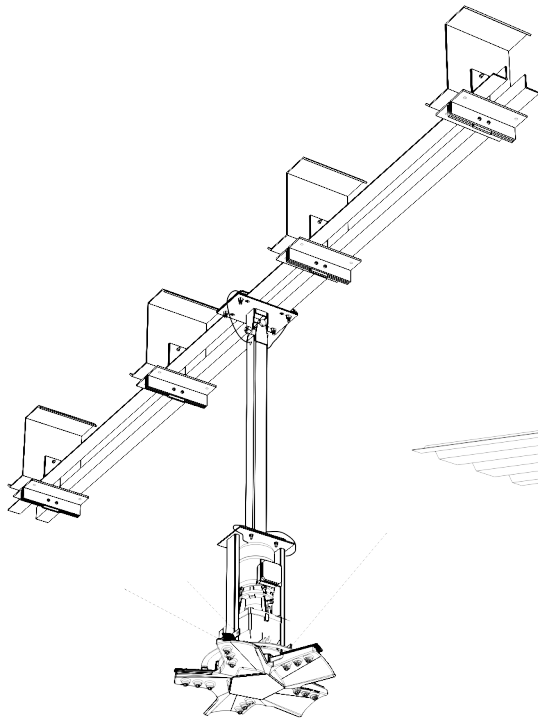
FAN COMPONENTS DIAGRAM



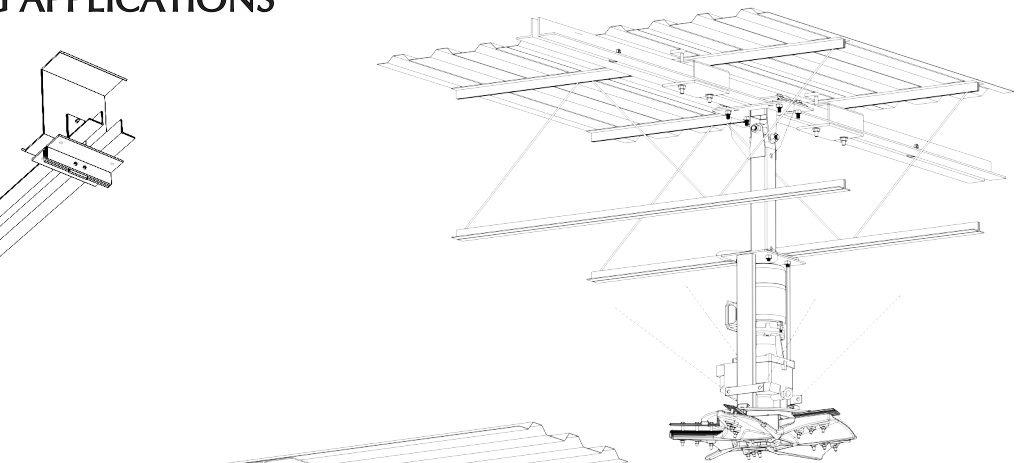
CABLE DETAIL: Ultra-Air blades are not shown in the assembly to allow greater detail of parts. See Fig.20 for finished assembly.

Note: All bolts are "Grade 5 UNO"
FT = Fully Threaded
(#) = Quantity Supplied

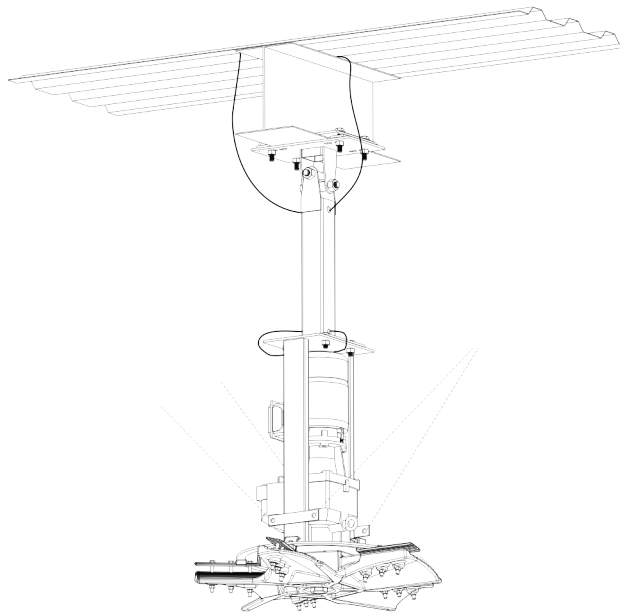
DIFFERENT MOUNTING APPLICATIONS



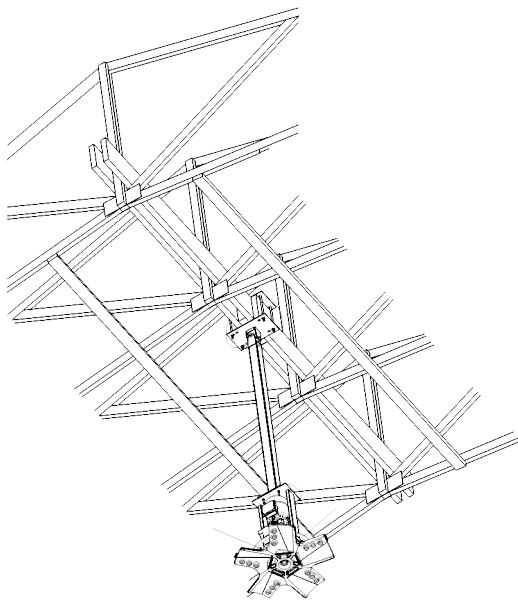
PURLIN Z MOUNT



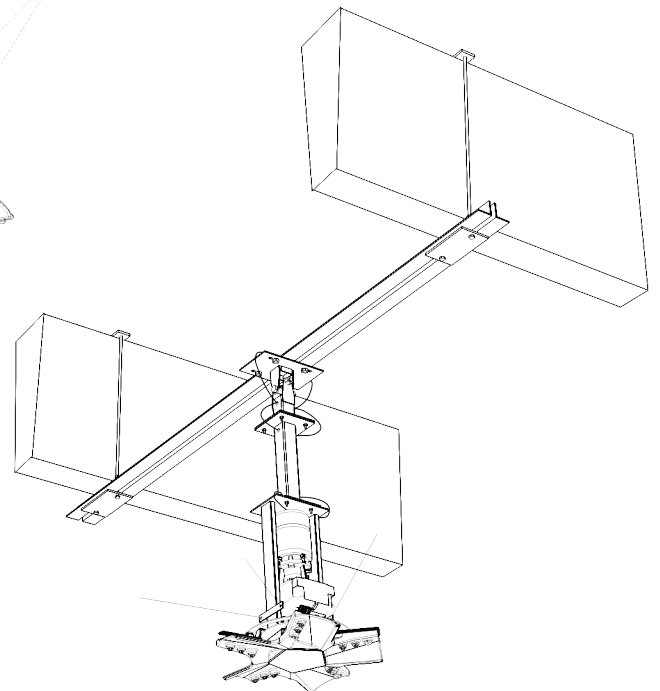
OWSJ MOUNT



I BEAM MOUNT



WOOD BEAM MOUNT



CONCRETE BEAM MOUNT

For a complete review of the mounting system and how it applies to your application, please reference the Altra-Air Sailfin Installation Guide.

To obtain a copy, please contact us by phone at 1-519-527-2198 or by email at bigair@enviranorth.com.

FAN BLADE CLEARANCE

OPEN CEILING, USE DIMENSION A, MINIMUM 60 [1524]

FINISHED TRUSS CEILING, USE DIMENSION B, MINIMUM 48 [1220].

CLEARANCES:

- Min 60" [1524] center of fan to roof deck or to finished ceiling for ideal operating performance without comprising overall fan performance
- Min 30" [762] from fan blade's leading edge to obstruction above or below fan.
- Min 18" [457] from side of fan to any obstruction
- Min floor to fan leading edge height 120" [3048]
- To determine correct length for drop:
 - establish method to mount the fan
 - determine necessary clearances
 - add clearance to distance required to mount location
 - select from standard UMH mounts' lengths available

NOTE: All dimensions are minimum requirements

Dimensions are in inches, metric dimensions [mm].

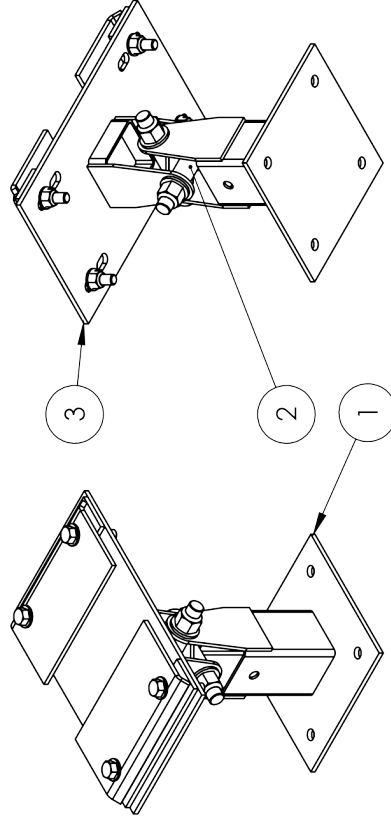
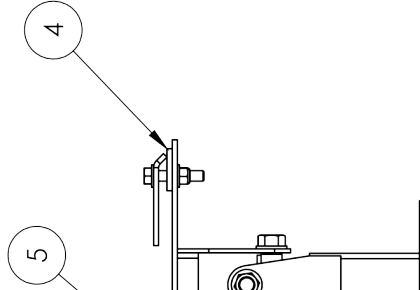
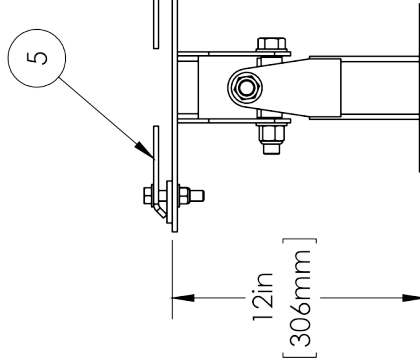
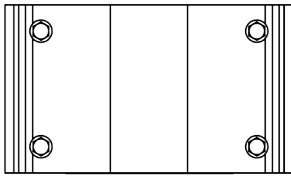
FAN FRAME DETAIL

<p>Q:\01_Envira-North\SolidWorks (DWG)\EN Applications\</p> <p>MATERIAL</p> <p>FINISH</p> <p>VENDORS NUMBER:</p> <p>DO NOT SCALE DRAWING</p> <p>PROPRIETARY AND CONFIDENTIAL</p> <p>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ENVIRO-NORTH SYSTEMS LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ENVIRO-NORTH SYSTEMS LTD. IS STRICTLY PROHIBITED. THIS CONSTRUCTION DRAWING, ENVIRO-NORTH SYSTEMS LTD SHOULD BE CONTACTED IMMEDIATELY FOR RESPONSE.</p>	<p>COMMENTS:</p> <p>MINIMUM DIMENSIONS FOR CLEARANCE</p> <p><small>Note: Contractor is responsible for verifying all site conditions to include field dimensions where applicable. If the contractor elects to use alternative dimensions, they are responsible for the consequences. All drawings are to be used as general architectural intent only unless otherwise stamped. See Engineering drawings for building departments and other applicable codes. All drawings are intended to be used as a guide only and that all parties are advised to confirm the work.</small></p>	<p>DRAWN: MITCHELL BEERMAN Drawing Date: 9/27/2011</p> <p>G.A.</p> <p>Last Revised Date: 03/08/2018</p> <p>ENG APPR.</p> <p>ENG APPR. Date:</p> <p>UNLESS OTHERWISE SPECIFIED: TOLERANCES ARE IN INCHES FRACTIONAL: 1/16 ANGULAR: MACH ± 0.1° BEND ± 0.5° TWO PLACE DECIMAL ± 0.060 THREE PLACE DECIMAL ± 0.030</p>	<p>9/27/2011</p> <p>Checked By: CDV</p> <p>Checked Date: 09/27/2011</p> <p>MFG APPR.</p> <p>Last Saved Date: Tuesday, September 27, 2011 3:19:11 PM</p> <p>REVISIONS:</p> <p>ADJUSTED MIN REQUIREMENTS</p>	<p>Envira-North Systems Ltd.</p> <p>TITLE:</p> <p>MINIMUM CLEARANCES</p> <p>SIZE DWG. NO. REV</p> <p>A CONSTRAINTS</p> <p>SCALE: N.T.S. WEIGHT:</p>
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1 FT MOUNT

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	EN823X8425	DROP H TYPE 1 FT	1
2	EN823X8418	UMH COUPLER PC	1
3	EN823X8417	UMH UPPER PIVOT PLATE	1
4	EN823X8401	MANUFACTURED I-BEAM SPACER	2
5	EN823X8402	MANUFACTURED I-BEAM CLAMP	2

DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE.

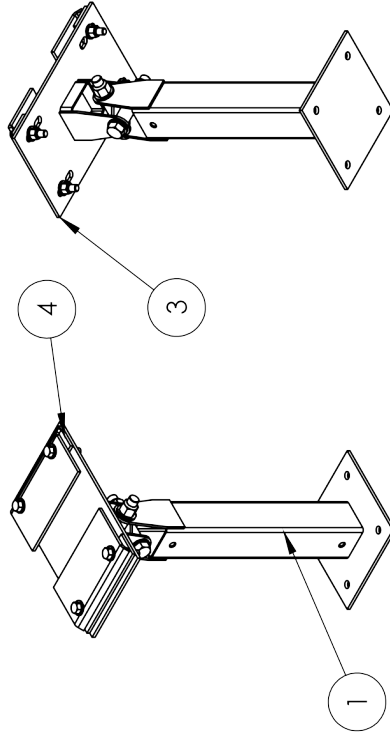
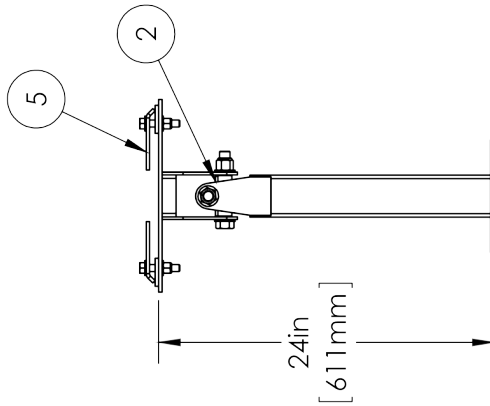
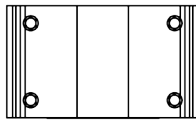


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				SIZE	DWG. NO.	REV	
				A	EN400X2001		
				SCALE: 1:2	WEIGHT: 24.88		

2 FT MOUNT

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1	EN823X8426	DROP H TYPE 2 FT	1
2	EN823X8418	UMH COUPLER PC	1
3	EN823X8417	UMH UPPER PIVOT PLATE	1
4	EN823X8401	MANUFACTURED I-BEAM SPACER	2
5	EN823X8402	MANUFACTURED I-BEAM CLAMP	2



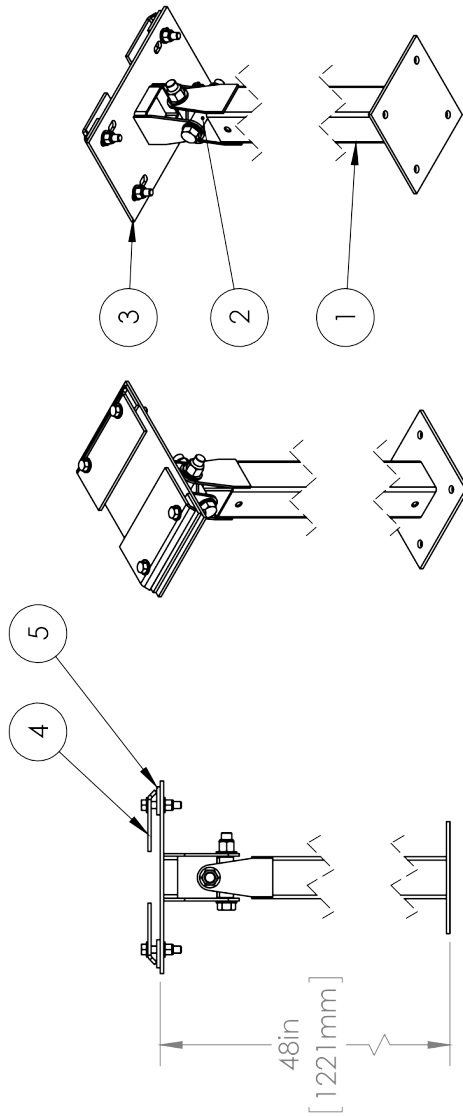
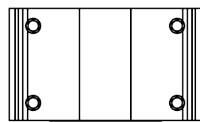
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		ANGULAR: MACH ±					
		BEND: ±					
		TWO PLACE DECIMAL: ±					
		THREE PLACE DECIMAL: ±					

4 FT MOUNT

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	EN823X8428	DROP H TYPE 4 FT	1
2	EN823X8418	UMH COUPLER PC	1
3	EN823X8417	UMH UPPER PIVOT PLATE	1
4	EN823X8402	MANUFACTURED I-BEAM CLAMP	2
5	EN823X8401	MANUFACTURED I-BEAM SPACER	2

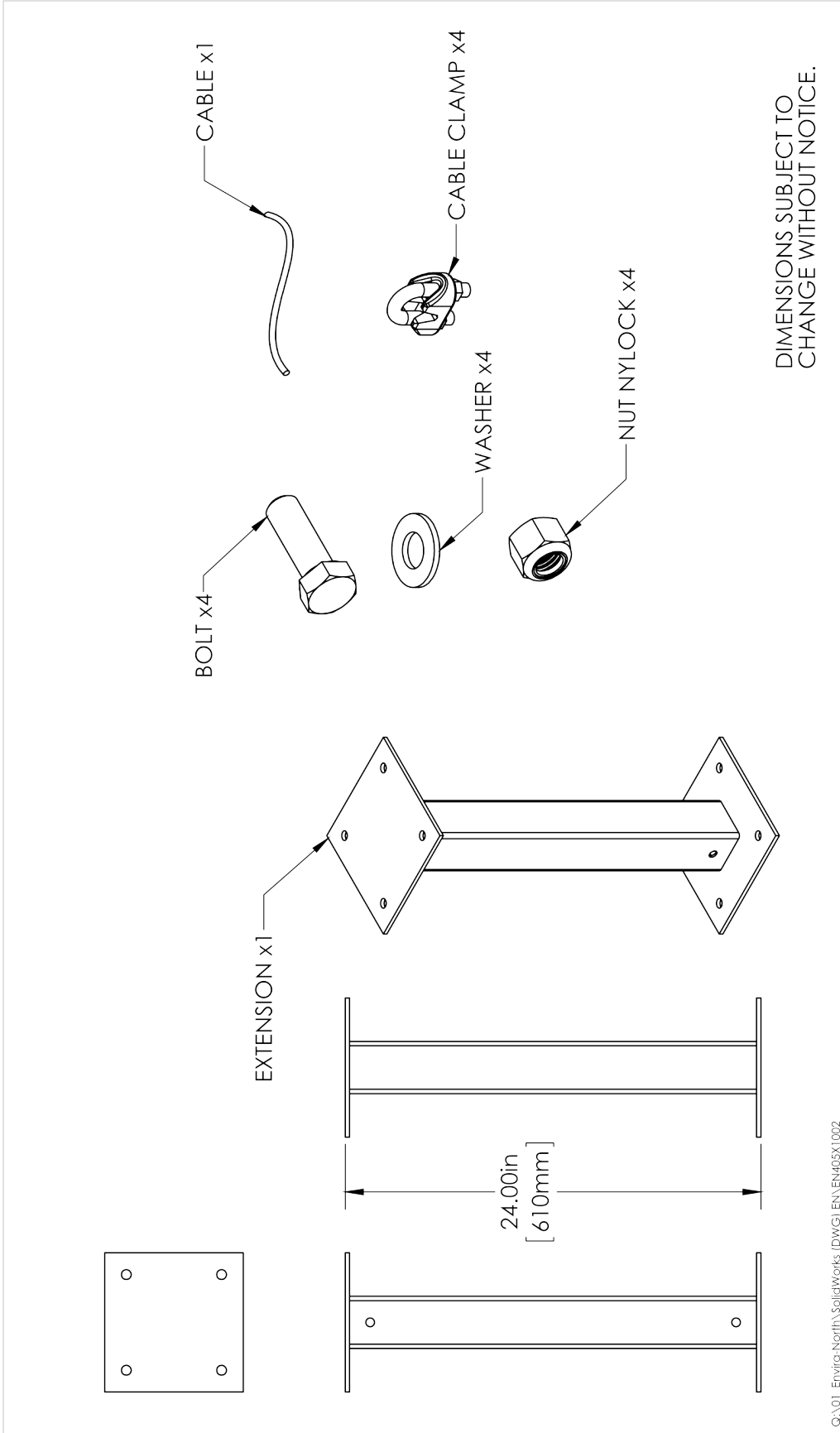


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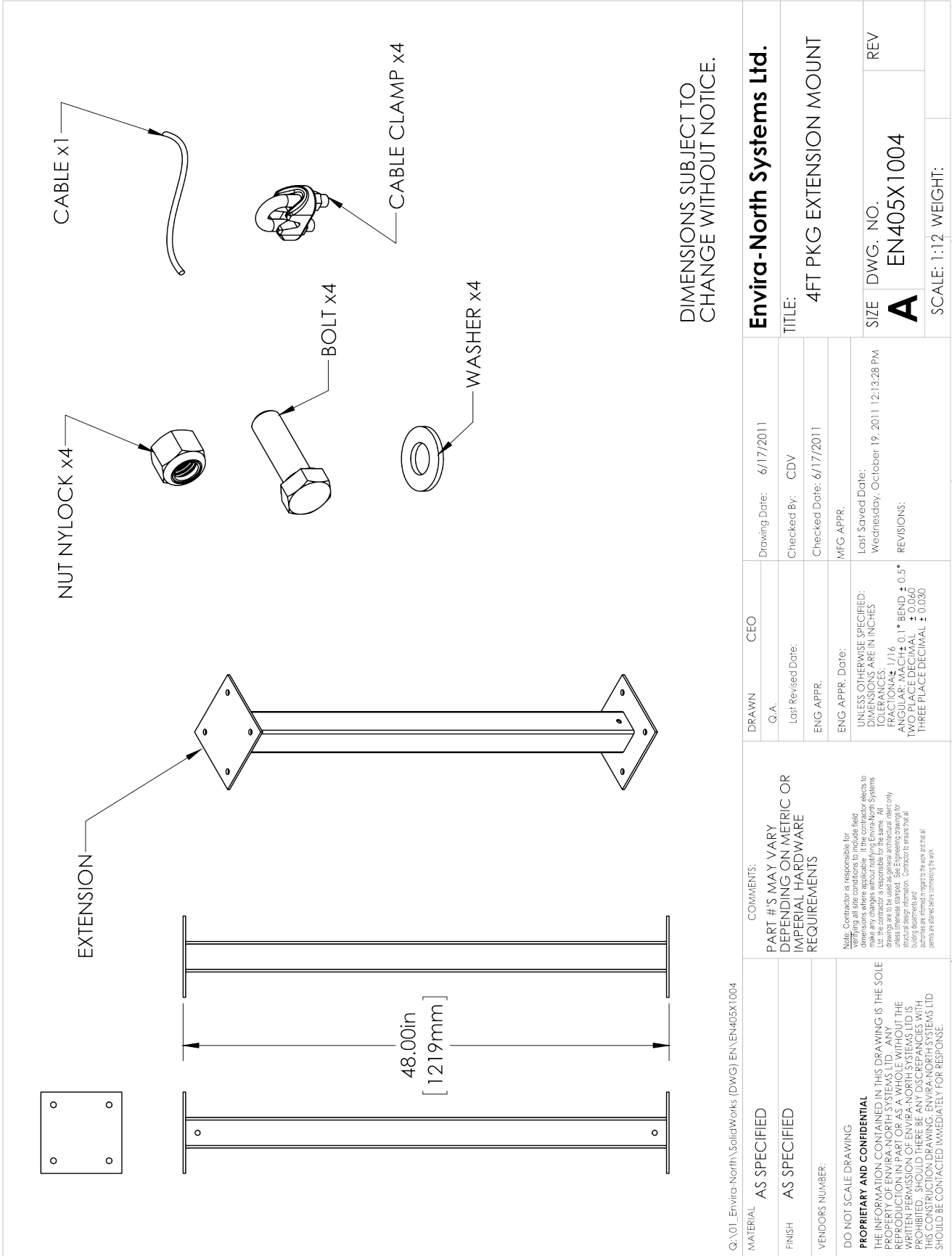
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2 FT EXTENSION

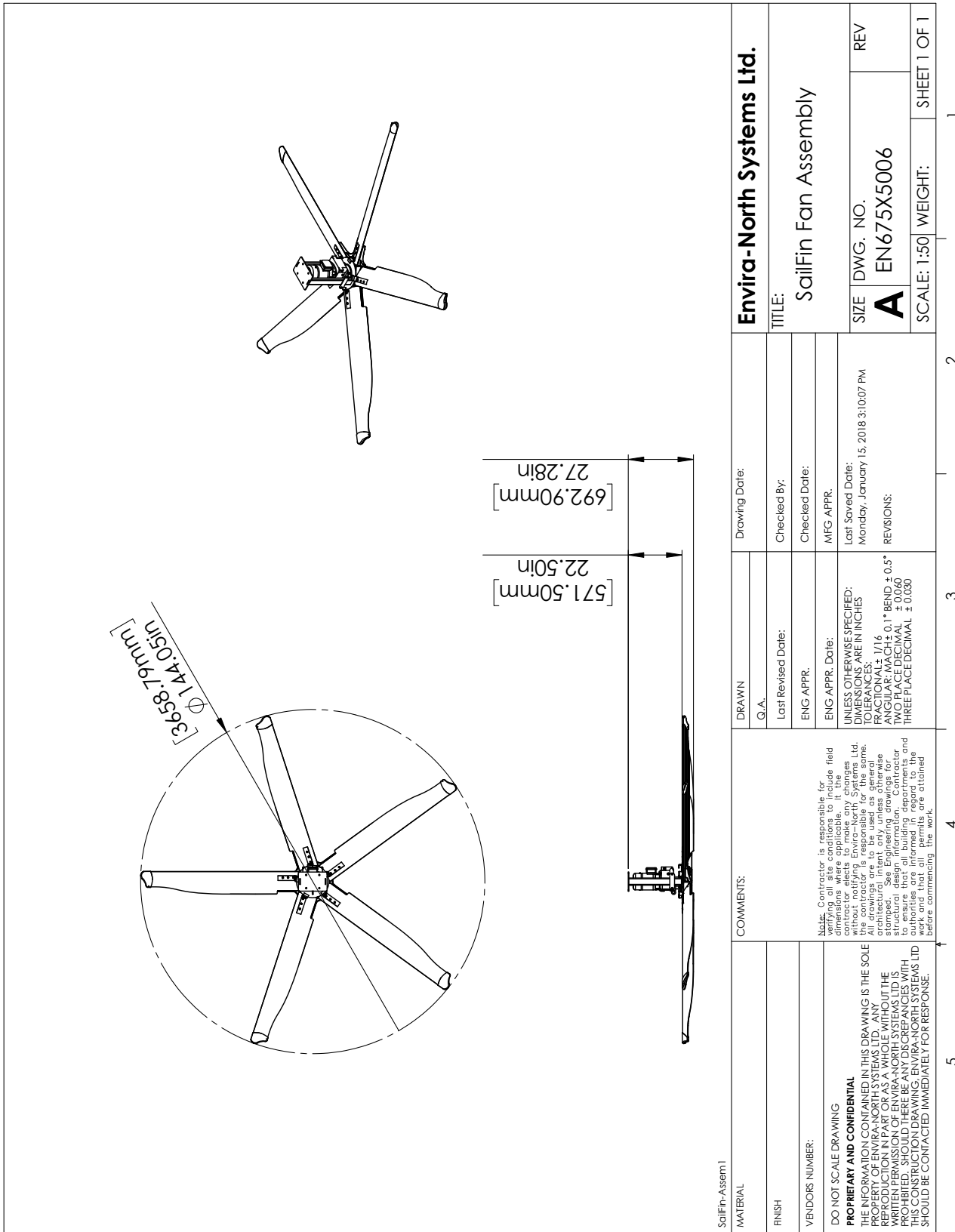


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4 FT EXTENSION



3.7 M (12 FT) ALTRA-AIR SAILFIN FAN SPEC DRAWING



SailFin-Assem 1

MATERIAL

FINISH

VENDORS NUMBER:

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COMMENTS:

Note: Contractor is responsible for providing all dimensions to the field contractor elects to make any changes to the dimensions where applicable. If the contractor is responsible for the work, all drawings are to be used as general architectural intent only, unless otherwise noted. Contractor shall be responsible to ensure that all building departments and structural design information, Contractor work and that all permits are obtained before commencing the work.

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G.A.

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ENG APPR.

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UNLESS OTHERWISE SPECIFIED:
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 BEND ± 0.5"
 TWO PLACE DECIMAL ± 0.040
 THREE PLACE DECIMAL ± 0.030

Drawing Date:

Checked By:

Checked Date:

MFG APPR.

Last Saved Date:
 Monday, January 15, 2018 3:10:07 PM

REVISIONS:

Envira-North Systems Ltd.

TITLE:
 SailFin Fan Assembly

SIZE DWG. NO.
A EN675X5006

SCALE: 1:50 WEIGHT: SHEET 1 OF 1

3.7 M (12 FT) ALTRA-AIR SAILFIN FAN SPECIFICATIONS

General

Model Number.....	EN675X5006
Diameter.....	3.7 m (12 ft)
Number of Blades.....	5
Motor Power.....	0.75 kW (1 HP)
Noise Level.....	62.5 dBA
Weight (no mount).....	111 kgs (245 lbs)
Packaged Fan (30" x 31" x 32").....	128.8 kgs (284 lbs*)
Packaged Blades (11" x 11" x 72").....	50.4 kgs (111 lbs)

* Mounts, extensions & controls packages separately. Weights may vary.



Performance

Maximum Velocity.....	1.96 m/s (386 ft/min)
Airflow.....	33,236 l/s (70,424 CFM)
Maximum Speed.....	105 RPM
Power Usage.....	782 W
Maximum Effective Diameter.....	24 m (80 ft)

Construction

Frame.....	Galvanized Steel Frame
Hub.....	713 Cast Aluminum Alloy
Blades.....	6063 Extruded Anodized Aluminum
Blade End Caps.....	High Impact Polystyrene

Safety Components

Safety Cables.....	3/16" Stainless Steel
Guy Wires.....	1/8" Stainless Steel
Safety Clips.....	Zinc Plated Steel

Mounting Hardware

Standard Mount.....	Universal I-Beam Clamp w/ Swivel
Standard Drop.....	1 ft / 2 ft / 4 ft
Drop Extensions (Optional).....	1 ft / 2 ft / 4 ft

Mounting

Open Web Steel Joist (Optional).....	Steel Beam With Brackets
Wood Beam Mount (Optional).....	Steel Machined Mount Plates
Concrete Beam Mount (Optional).....	Steel Beam with Matching Mount Plates
Purlin "Z" Mount (Optional).....	Steel Beam Brackets
Steel Thickness Varies Depending on Beam Span.....	Consult Factory for Specifics

*Please see Altra-Air Installation Guide for more information regarding mounting hardware.

Gear Motor

Type.....	Helical Inline Reducer
HP.....	1 HP (50 Hz / 60 Hz)
Ratio.....	13.39
Volts.....	230 V / 400 V / 460 V / 575 V
Amps Consumed.....	3 A @ 230 V
Insulation Class.....	F
Torque.....	53 Nm (39 ft-lbs)
Thrust.....	125 N (28 lbs)

Fan Control

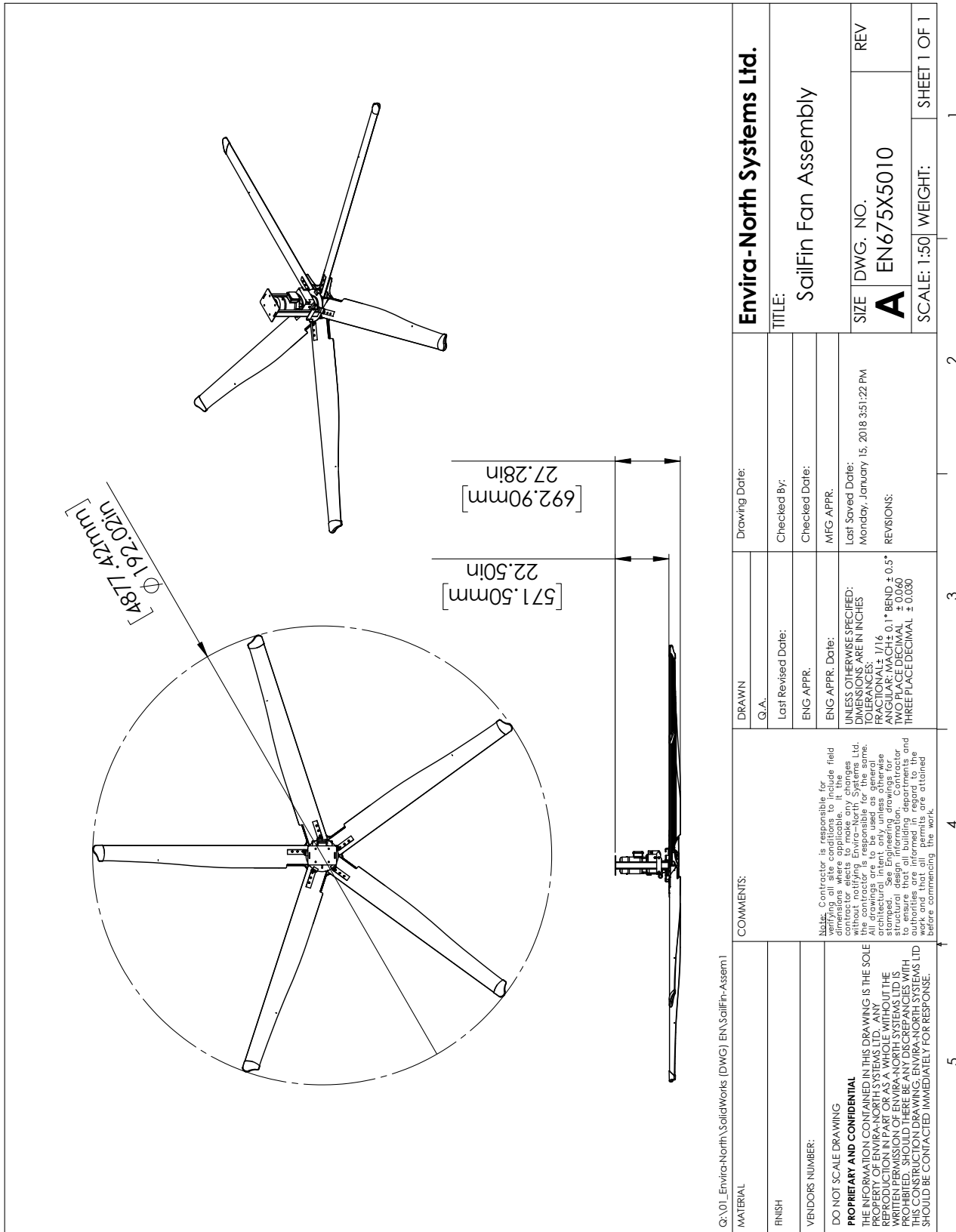
Enclosure.....	IP65
Operation.....	Key Pad
Control Options (Not Included).....	Low Voltage / Temperature Control
Standard Power.....	208 V / 230 V / 400 V / 460 V / 575 V
Special Wiring (Thermostats, Fire Alarm Interface, Networking Etc.)(Optional).....	Consult Factory
50 / 60 Hz Operation	

Warranty

Motor, Gearbox & Control Panel.....	3 Years
Blades, Hub & Mounting System.....	Lifetime

*Please see Altra-Air Installation Guide for warranty specifications and exclusions.

4.9 M (16 FT) ALTRA-AIR SAILFIN FAN SPEC DRAWING



Q:\01_Envira-North\SolidWorks (DWG) EN_SailFin-Assem1

MATERIAL		DRAWN		DRAWING DATE:		Envira-North Systems Ltd.	
FINISH		G.A.		Checked By:		TITLE: SailFin Fan Assembly	
VENDORS NUMBER:		Last Revised Date:		Checked Date:		SIZE DWG. NO. REV	
DO NOT SCALE DRAWING		ENG APPR.		MFG APPR.		A EN675X5010	
<p>PROPRIETARY AND CONFIDENTIAL</p> <p>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ENVIRA-NORTH SYSTEMS LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ENVIRA-NORTH SYSTEMS LTD IS PROHIBITED. SHOULD THERE BE ANY DISCREPANCIES WITH THIS CONSTRUCTION DRAWING, ENVIRA-NORTH SYSTEMS LTD SHOULD BE CONTACTED IMMEDIATELY FOR RESPONSE.</p>		<p>UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGULAR: ± 1/16 TWO PLACE DECIMAL ± 0.040 THREE PLACE DECIMAL ± 0.030</p>		<p>Last Saved Date: Monday, January 15, 2018 3:51:22 PM</p> <p>REVISIONS:</p>		SCALE: 1:50 WEIGHT: SHEET 1 OF 1	
<p>Notes: Contractor is responsible for providing all field dimensions where applicable. If the contractor elects to make any changes, the contractor is responsible for the structural design information. Contractor to ensure that all building departments and permits are obtained before commencing the work.</p>		<p>COMMENTS:</p>		<p>5</p>		<p>2</p>	
		<p>4</p>		<p>3</p>		<p>1</p>	

4.9 M (16 FT) ALTRA-AIR SAILFIN FAN SPECIFICATIONS

General

Model Number.....	EN675X5010
Diameter.....	4.9 m (16 ft)
Number of Blades.....	5
Motor Power.....	1.1 kW (1.5 HP)
Noise Level.....	62.7 dBA
Weight (no mount).....	125 kgs (275 lbs)
Packaged Fan (30" x 31" x 32").....	128.8 kgs (284 lbs*)
Packaged Blades (11" x 11" x 96").....	60.8 kgs (134 lbs)

* Mounts, extensions & controls packages separately. Weights may vary.



Performance

Maximum Velocity.....	2.79 m/s (550 ft/min)
Airflow.....	59,953 l/s (127,033 CFM)
Maximum Speed.....	80 RPM
Power Usage.....	939 W
Maximum Effective Diameter.....	43 m (140 ft)

Construction

Frame.....	Galvanized Steel Frame
Hub.....	713 Cast Aluminum Alloy
Blades.....	6063 Extruded Anodized Aluminum
Blade End Caps.....	High Impact Polystyrene

Safety Components

Safety Cables.....	3/16" Stainless Steel
Guy Wires.....	1/8" Stainless Steel
Safety Clips.....	Zinc Plated Steel

Mounting Hardware

Standard Mount.....	Universal I-Beam Clamp w/ Swivel
Standard Drop.....	1 ft / 2 ft / 4 ft
Drop Extensions (Optional).....	1 ft / 2 ft / 4 ft

Mounting

Open Web Steel Joist (Optional).....	Steel Beam With Brackets
Wood Beam Mount (Optional).....	Steel Machined Mount Plates
Concrete Beam Mount (Optional).....	Steel Beam with Matching Mount Plates
Purlin "Z" Mount (Optional).....	Steel Beam Brackets
Steel Thickness Varies Depending on Beam Span.....	Consult Factory for Specifics

*Please see Altra-Air Installation Guide for more information regarding mounting hardware.

Gear Motor

Type.....	Helical Inline Reducer
HP.....	1.5 HP (50 Hz / 60 Hz)
Ratio.....	23.74
Volts.....	230 V / 400 V / 460 V / 575 V
Amps Consumed.....	3.6A @ 230 V
Insulation Class.....	F
Torque.....	141 Nm (104 ft-lbs)
Thrust.....	231 N (52 lbs)

Fan Control

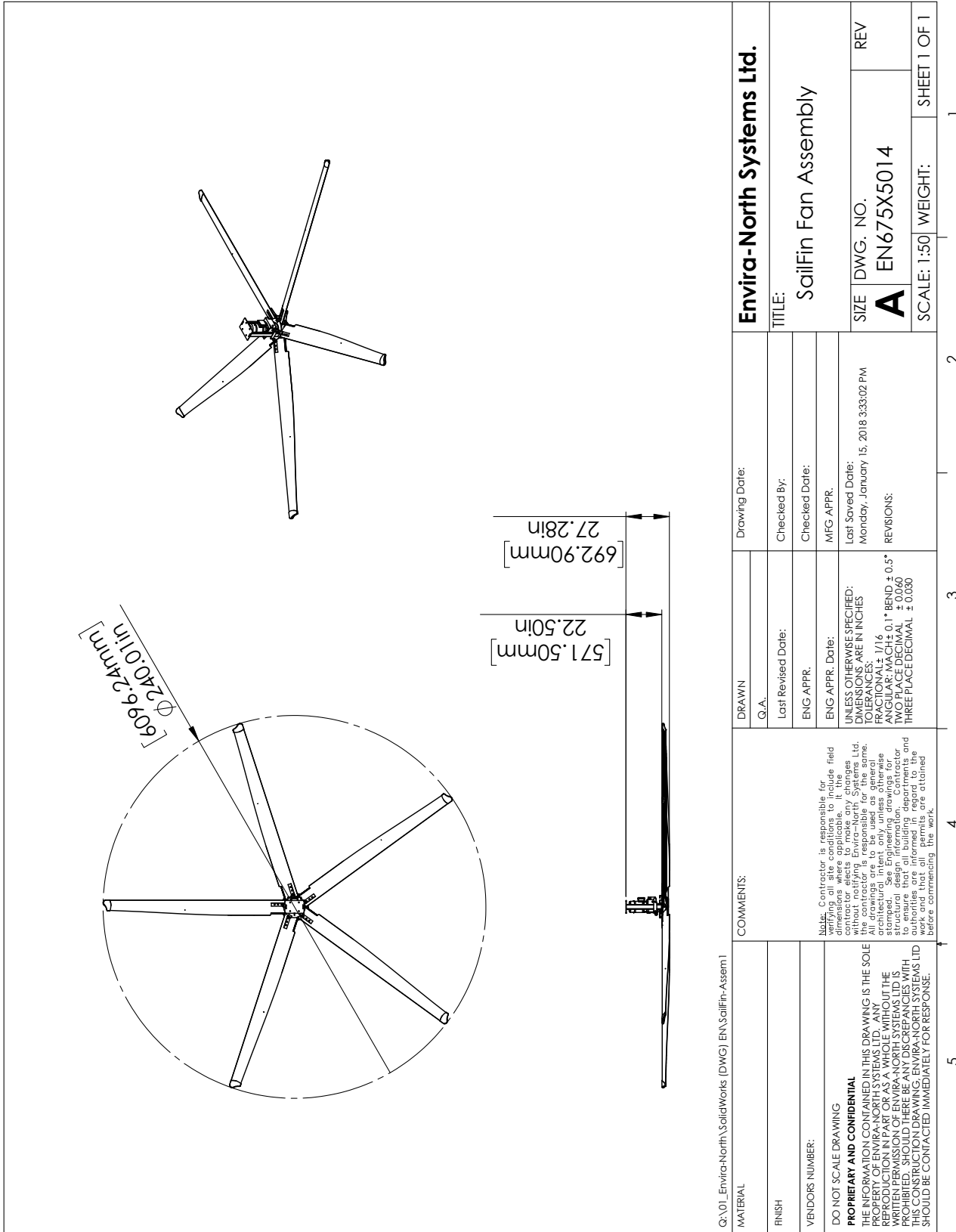
Enclosure.....	IP65
Operation.....	Key Pad
Control Options (Not Included).....	Low Voltage / Temperature Control
Standard Power.....	208 V / 230 V / 400 V / 460 V / 575 V
Special Wiring (Thermostats, Fire Alarm Interface, Networking Etc.)(Optional).....	Consult Factory
50 / 60 Hz Operation	

Warranty

Motor, Gearbox & Control Panel.....	3 Years
Blades, Hub & Mounting System.....	Lifetime

*Please see Altra-Air Installation Guide for warranty specifications and exclusions.

6.1 M (20 FT) ALTRA-AIR SAILFIN FAN SPEC DRAWING



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MATERIAL		DRAWN		Drawing Date:		Envira-North Systems Ltd.	
FINISH		G.A.		Checked By:		TITLE: SailFin Fan Assembly	
VENDORS NUMBER:		Last Revised Date:		Checked Date:		SIZE DWG. NO. REV	
DO NOT SCALE DRAWING		ENG APPR.		MFG APPR.		A EN675X5014	
<p>PROPRIETARY AND CONFIDENTIAL</p> <p>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ENVIRA-NORTH SYSTEMS LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ENVIRA-NORTH SYSTEMS LTD IS PROHIBITED. SHOULD THERE BE ANY DISCREPANCIES WITH THIS CONSTRUCTION DRAWING, ENVIRA-NORTH SYSTEMS LTD SHOULD BE CONTACTED IMMEDIATELY FOR RESPONSE.</p>		<p>UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGULAR ± 1/16 TWO PLACE DECIMAL ± 0.040 THREE PLACE DECIMAL ± 0.030</p>		<p>Last Saved Date: Monday, January 15, 2018 3:33:02 PM</p> <p>REVISIONS:</p>		SCALE: 1:50 WEIGHT: SHEET 1 OF 1	
COMMENTS:		<p>Note: Contractor is responsible for providing dimensions to the field contractor elects to make any changes to the dimensions where applicable. If the contractor is responsible for the work, all drawings are to be used as general architectural intent only, unless otherwise noted. Contractor shall be responsible to ensure that all building departments and structural design information. Contractor shall be responsible for obtaining all permits before commencing the work.</p>					

6.1 M (20 FT) ALTRA-AIR SAILFIN FAN SPECIFICATIONS

General

Model Number.....	EN675X5014
Diameter.....	6.1 m (20 ft)
Number of Blades.....	5
Motor Power.....	1.5 kW (2 HP)
Noise Level.....	63.4 dBA
Weight (no mount).....	140 kgs (320 lbs)
Packaged Fan (30" x 31" x 32").....	128.8 kgs (284 lbs*)
Packaged Blades (11" x 11" x 120").....	75.7 kgs (167 lbs)

* Mounts, extensions & controls packages separately. Weights may vary.



Performance

Maximum Velocity.....	2.56 m/s (505 ft/min)
Airflow.....	83,157 l/s (176,200 CFM)
Maximum Speed.....	63 RPM
Power Usage.....	1460 W
Maximum Effective Diameter.....	61 m (200 ft)

Construction

Frame.....	Galvanized Steel Frame
Hub.....	713 Cast Aluminum Alloy
Blades.....	6063 Extruded Anodized Aluminum
Blade End Caps.....	High Impact Polystyrene

Safety Components

Safety Cables.....	3/16" Stainless Steel
Guy Wires.....	1/8" Stainless Steel
Safety Clips.....	Zinc Plated Steel

Mounting Hardware

Standard Mount.....	Universal I-Beam Clamp w/ Swivel
Standard Drop.....	1 ft / 2 ft / 4 ft
Drop Extensions (Optional).....	1 ft / 2 ft / 4 ft

Mounting

Open Web Steel Joist (Optional).....	Steel Beam With Brackets
Wood Beam Mount (Optional).....	Steel Machined Mount Plates
Concrete Beam Mount (Optional).....	Steel Beam with Matching Mount Plates
Purlin "Z" Mount (Optional).....	Steel Beam Brackets
Steel Thickness Varies Depending on Beam Span.....	Consult Factory for Specifics

*Please see Altra-Air Installation Guide for more information regarding mounting hardware.

Gear Motor

Type.....	Helical Inline Reducer
HP.....	2 HP (50 Hz / 60 Hz)
Ratio.....	27.24
Volts.....	230 V / 400 V / 460 V / 575 V
Amps Consumed.....	5.6A @ 230 V
Insulation Class.....	F
Torque.....	217 Nm (160 ft-lbs)
Thrust.....	280 N (63lbs)

Fan Control

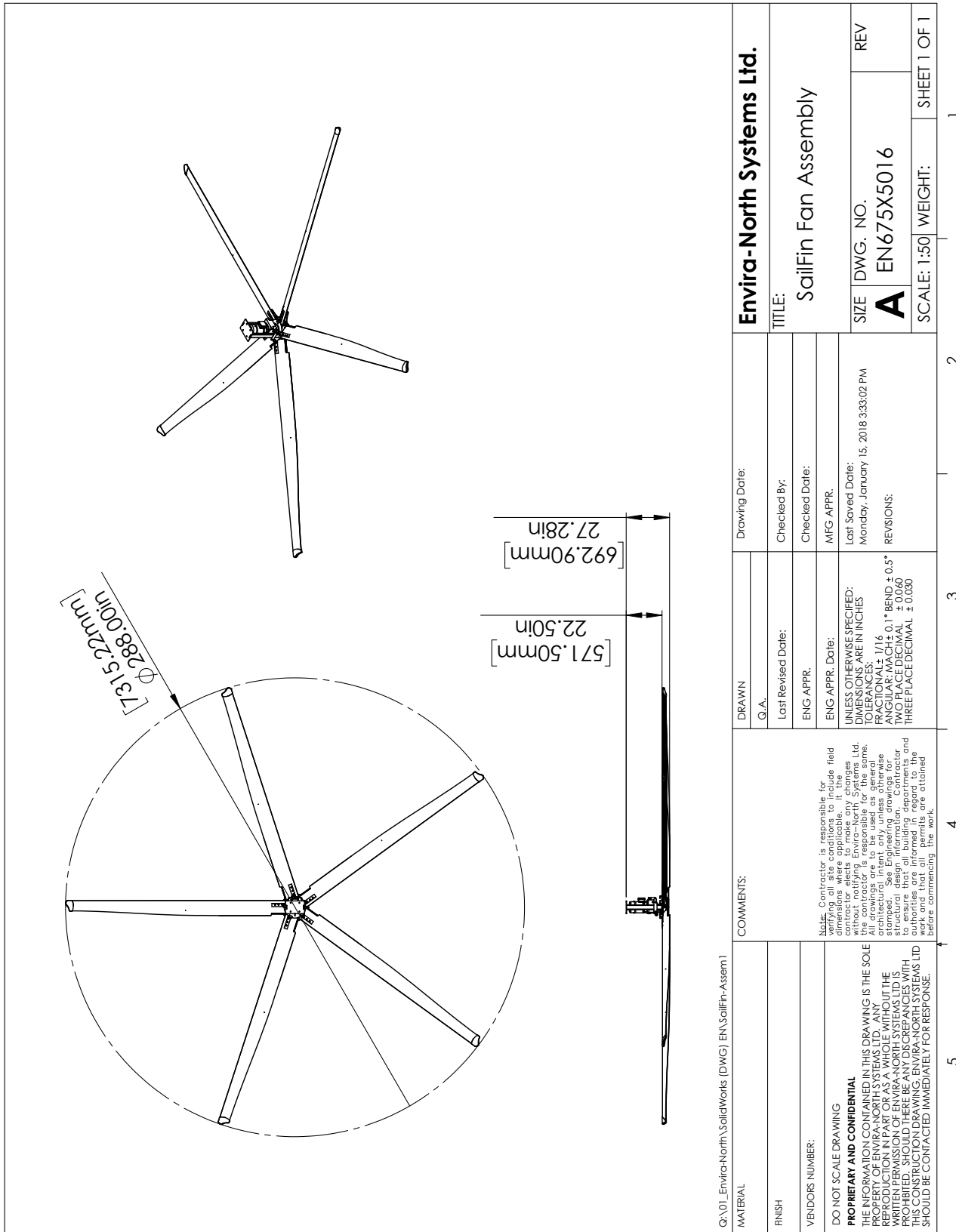
Enclosure.....	IP65
Operation.....	Key Pad
Control Options (Not Included).....	Low Voltage / Temperature Control
Standard Power.....	208 V / 230 V / 400 V / 460 V / 575 V
Special Wiring (Thermostats, Fire Alarm Interface, Networking Etc.)(Optional).....	Consult Factory
50 / 60 Hz Operation	

Warranty

Motor, Gearbox & Control Panel.....	3 Years
Blades, Hub & Mounting System.....	Lifetime

*Please see Altra-Air Installation Guide for warranty specifications and exclusions.

7.3 M (24 FT) ALTRA-AIR SAILFIN FAN SPEC DRAWING



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MATERIAL		COMMENTS:		Envira-North Systems Ltd.	
FINISH		<p>Note: Contractor is responsible for providing materials to the field dimensions where applicable. If the contractor elects to make any changes to the materials, the contractor is responsible for the structural design information. Contractor to ensure that all building departments and permits are obtained before commencing the work.</p>		TITLE: SailFin Fan Assembly	
VENDORS NUMBER:		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGULAR: ± 1/16 TWO PLACE DECIMAL ± 0.040 THREE PLACE DECIMAL ± 0.030		SIZE DWG. NO. A EN675X5016	
DO NOT SCALE DRAWING PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ENVIRA-NORTH SYSTEMS LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ENVIRA-NORTH SYSTEMS LTD IS PROHIBITED. SHOULD THERE BE ANY DISCREPANCIES WITH THIS CONSTRUCTION DRAWING, ENVIRA-NORTH SYSTEMS LTD SHOULD BE CONTACTED IMMEDIATELY FOR RESPONSE.		Drawing Date: Checked By: Checked Date: MFG APPR. Last Saved Date: Monday, January 15, 2018 3:33:02 PM REVISIONS:		SCALE: 1:50 WEIGHT: SHEET 1 OF 1	

7.3 M (24 FT) ALTRA-AIR SAILFIN FAN SPECIFICATIONS

General

Model Number.....	EN675X5016
Diameter.....	7.3 m (24 ft)
Number of Blades.....	5
Motor Power.....	1.5 kW (2 HP)
Noise Level.....	63.4 dBA
Weight (no mount).....	157 kgs (347 lbs)
Packaged Fan (30" x 31" x 32").....	128.2 kgs (284 lbs)*
Packaged Blades (11" x 11" x 144").....	86 kgs (190 lbs)

* Mounts, extensions & controls packaged separately. Weights may vary.



Performance

Maximum Velocity.....	2.52 m/s (497 ft/min)
Airflow.....	148,676 l/s (315,026 CFM)
Maximum Speed.....	53 RPM
Power Usage.....	1486 W
Maximum Effective Diameter.....	(70 m) 230 ft

Construction

Frame.....	Galvanized Steel Frame
Hub.....	713 Cast Aluminum Alloy
Blades.....	6063 Extruded Anodized Aluminum
Blade End Caps.....	High Impact Polystyrene

Safety Components

Safety Cables.....	3/16" Stainless Steel
Guy Wires.....	1/8" Stainless Steel
Safety Clips.....	Zinc Plated Steel

Mounting Hardware

Standard Mount.....	Universal I-Beam Clamp w/ Swivel
Standard Drop.....	1 ft / 2 ft / 4 ft
Drop Extensions (Optional).....	1 ft / 2 ft / 4 ft

Mounting

Open Web Steel Joist (Optional).....	Steel Beam With Brackets
Wood Beam Mount (Optional).....	Steel Machined Mount Plates
Concrete Beam Mount (Optional).....	Steel Beam with Matching Mount Plates
Purlin "Z" Mount (Optional).....	Steel Beam Brackets
Steel Thickness Varies Depending on Beam Span.....	Consult Factory for Specifics

*Please see Altra-Air Installation Guide for more information regarding mounting hardware.

Gear Motor

Type.....	Helical Inline Reducer
HP.....	2 HP (50 Hz / 60 Hz)
Ratio.....	30.43
Volts.....	230 V / 400 V / 460 V / 575 V
Amps Consumed.....	5.7 A @ 230 V
Insulation Class.....	F
Torque.....	248 Nm (183 ft-lbs)
Thrust.....	632 N (142 lbs)

Fan Control

Enclosure.....	IP65
Operation.....	Key Pad
Control Options (Not Included).....	Low Voltage / Temperature Control
Standard Power.....	208 V / 230 V / 400 V / 460 V / 575 V
Special Wiring (Thermostats, Fire Alarm Interface, Networking Etc.)(Optional).....	Consult Factory
50 / 60 Hz Operation	

Warranty

Motor, Gearbox & Control Panel.....	3 Years
Blades, Hub & Mounting System.....	Lifetime

*Please see Altra-Air Installation Guide for warranty specifications and exclusions.

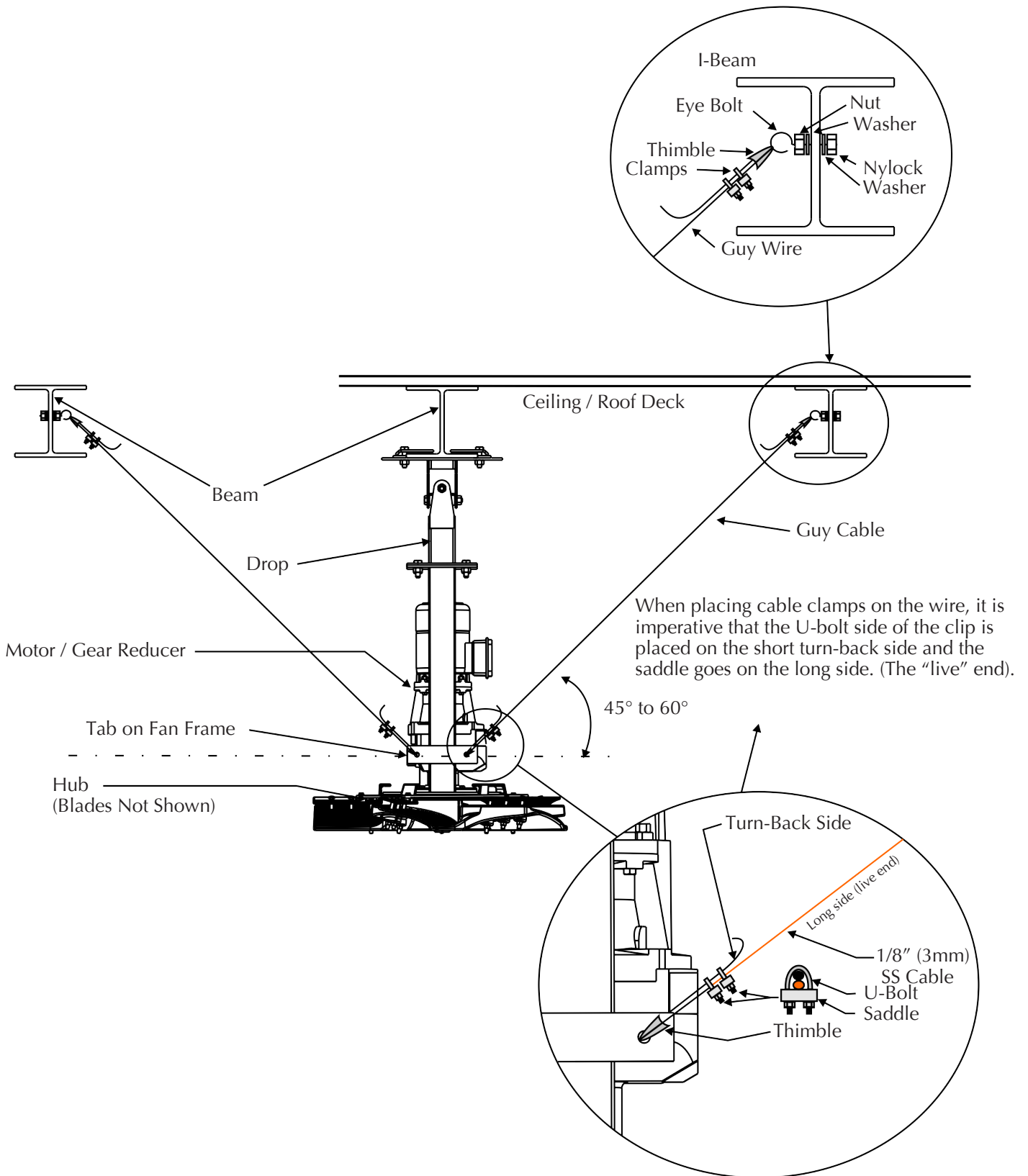
SUMMARIZED FAN SPECIFICATIONS

Ultra-Air Sailfin Fans Performance Specifications				
Fan Size in Diameter	12 ft	16 ft	20 ft	24 ft
	3.7 m	4.9 m	6.1 m	7.3 m
Motor Power	1 HP	1.5 HP	2 HP	2 HP
	0.75 kW	1.1 kW	1.5 kW	1.5 kW
Power Consumption	782 W	939 W	1460 W	1486 W
	782 W	939 W	1460W	1486 W
Actual Amps at 230 Volts	3 A	3.6 A	5.6 A	5.7 A
	3 A	3.6 A	5.6 A	5.7 A
Torque	39 ft-lbs	104 ft-lbs	160 ft-lbs	183 ft-lbs
	53 Nm	141 Nm	217 Nm	248 Nm
Thrust	28 lbs	52 lbs	63 lbs	142 lbs
	125 N	231 N	280 N	632 N
Speed	105 rpm	80 rpm	63 rpm	53 rpm
	105 rpm	80 rpm	63 rpm	53 rpm
Airflow	70,424 cfm	127,033 cfm	176,200 cfm	315,026 cfm
	33,236 l/s	59,953 l/s	83,157 l/s	148,676 l/s
Maximum Effective Diameter	80 ft	140 ft	200 ft	230 ft
	24 m	43 m	61 m	70 m
Maximum Velocity	386 ft/min	550 ft/min	505 ft/min	497 ft/min
	1.96 m/s	2.79 m/s	2.56 m/s	2.52 m/s
Weight (No Mount)	245 lbs	275 lbs	320 lbs	347 lbs
	111 kgs	125 kgs	145 kgs	157 kgs
Noise Level	62.5 dBA	62.7 dBA	63.4 dBA	63.4 dBA
	62.5 dBA	62.7 dBA	63.4 dBA	63.4 dBA

The data in this specification sheet represent the most current data developed by Envira-North Systems or other agencies. Envira-North Systems is constantly seeking to improve its products for the betterment of its customers; we therefore reserve the right to change these specifications as required without notification. Weights are subject to change. Please contact our shipping department for the latest information on shipping container sizes and weights. Maximum effective diameter is where horizontal airspeed at 1.0 ft above floor drops below 0.2 m/s in an empty room.



GUY WIRES



ALTRA-AIR SAILFIN FAN PACKAGING DETAILS

Packaged Fan

30" x 31" x 32" (76.2 cm x 78.74 cm x 81.28 cm)
284 lbs (128.8 kgs)

24 FT (7.3 M) Packaged Blades

11" x 11.5" x 144" (27.9cm x 29.2cm x 365.8cm)
190lbs (86kgs)

20 FT (6.1 M) Packaged Blades

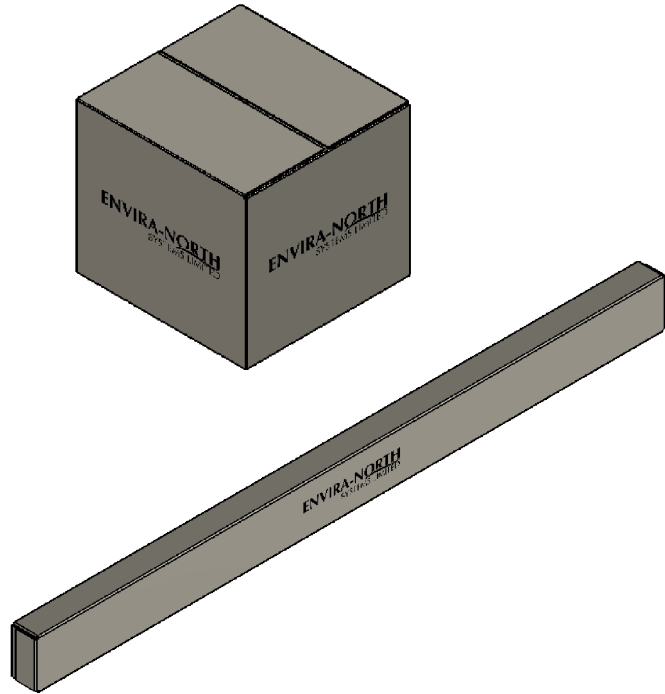
11" x 11.5" x 120" (27.9cm x 29.2cm x 304.8cm)
167lbs (75.7kgs)

16 FT (4.9 M) Packaged Blades

11" x 11.5" x 96" (27.9cm x 29.2cm x 243.8cm)
134lbs (60.8kgs)

12 FT (3.7 M) Packaged Blades

11" x 11.5" x 72" (27.9cm x 29.2cm x 182.9cm)
111lbs (50.4kgs)



MOUNTS & EXTENSIONS PACKAGING DETAILS

These items can be placed inside the packaged fan when ordering with a fan. (Excluding 4 FT (1.22 M) items)
Please add the additional weight to the fan packages above.

1 FT (0.31 M) Packaged UMH Mount

9" x 9" x 15" (22.9 cm x 22.9 cm x 38.1 cm)
22 lbs (9.98 kgs)

2 FT (0.61 M) Packaged UMH Mount

9" x 9" x 28" (22.9 cm x 22.9 cm x 71.1 cm)
33 lbs (14.97 kgs)

4 FT (1.22 M) Packaged UMH Mount

9" x 9" x 51" (22.9 cm x 22.9 cm x 129.5 cm)
47 lbs (21.32 kgs)

2 FT (0.61 M) UMH Extension

9" x 9" x 28" (22.9 cm x 22.9 cm x 71.1cm)
21 lbs (9.53 kgs)

4 FT (1.22 M) UMH Extension

9" x 9" x 49" (22.9 cm x 22.9 cm x 124.5 cm)
31 lbs (14.06 kgs)

CERTIFICATION DETAILS

Envira-North Systems Ltd.

'Declaration of Conformity'

DECLARATION OF CONFORMITY

according to the
Safety of Machinery Directive (98/37/EC),
Low Voltage Directive (2006/95/EC), Electromagnetic Compatibility Directive (2004/108/EC),
and including amendments by the CE Marking Directive, 93/68/EEC

Type of equipment: Industrial Ceiling Fans
Type designation: Series #EN6XXX
Manufacturer: Envira-North Systems Ltd.
92 Railway Street
Seaforth, ON N0K 1W0
Canada

The following harmonized European standards or technical specifications have been applied:

<u>Standard</u>	<u>Subject</u>
ISO/TR 12100-1: 2003	Safety of Machinery - Basic Concepts, General Principles for Design - Part 1: Basic Terminology, Methodology.

With reference to the Safety of Machinery Directive:

The product complies with good engineering practice in safety matters within the EU, even though it may not fully comply with the safety standards/specifications listed above, (see Technical Construction File). The product is CE marked in year 2010. Envira-North Systems Ltd. has an internal production control system and formal quality control process that ensures compliance between the manufactured products and the technical documentation.

With reference to the EMC Directive:

Full utilization of CE Certified or equivalent equipment.

With Reference to the Low Voltage Directive:

Full utilization of CE Certified or equivalent equipment.

As manufacturer/maker's authorized representative, we declare under our sole responsibility that the equipment follows the provisions of the Directives stated above (this Declaration of Conformity and its associated Technical Construction Files shall be retained and valid for a minimum of ten years following the below Date).

CE

10

Signing Authority:

Date:

Cathy Yanneste
Senior Administrator
Envira-North Systems Ltd.

Prepared By:

Date:

Paul M. Johnson, C.E.T., ASQ
President
Neoteric Enterprises Inc.

CONTROL OPTIONS

EssentialAIR FAN CONTROL

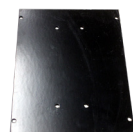
VFD



- Wall Mounted Variable Frequency Drive (VFD) Configuration
- Minimal Distance Between VFD & HVLS Fan
- One Per Fan Required

ZoneAIR FAN CONTROL

VFD



Mount Plate



Wiring Harness

- Fan Mounted VFD
- One ZoneAir Control Per Fan Required
- Package Includes Mounting Plate + Wiring Harness
- Designed to Provide a Single Control for Multiple Fans
- Requires Additional Controls

OPTIONS



LOW VOLTAGE CONTROL (LVC)

- Controls Groups of (up to) Seven (7) Fans
- Lockable Cover
- Stop Button
 - Forward/Reverse
 - Speed Up/Down
 - Toggle Between Manual/Auto Modes

OPTIONS



TEMPERATURE CONTROL (TFD-1)

- Programmed for Automatic Fan Speeds
- Constantly Measures Temperature
- Automatically Adjusts to Your Set Points

CommandAIR FAN CONTROL

VFD



Remote Keypad



100' (30.48m)
CAT 5 Cable



Mount Plate



Wiring
Harness

- Fan Mounted VFD
- One CommandAIR Control Per Fan Required
- Package Includes Mounting Plate + Wiring Harness + Control Wire
- and Remote Keypad
- Provides Remote Troubleshooting for Fan Mounted VFD
- User Friendly, Simplified Installation and Operation

LIMITATION OF WARRANTY & LIABILITY

Three Year Limited Warranty

The Altra-Air fans are of industrial grade construction and should provide many years of virtually maintenance-free use. Warranty duration is as follows:

a) Air foil shaped Blade	Lifetime Warranty
b) Aluminum alloy Hub	Lifetime Warranty
c) Motor	3 year Limited Warranty
d) Gear Reducer	3 year Limited Warranty
e) VFD control panel	3 year Limited Warranty
f) Labour	1 year Limited Warranty (pre-approved)
g) Custom fan wraps/paint	1 year Limited Warranty

Envira-North warrants that this Product will under normal use and service as specified by Envira-North, operate properly and be free of defects in materials and workmanship for a period of three years from the date of purchase by customer. The term “operate properly” in this context applies to mechanical, electrical and structural functions only. No guarantee, unless and except by separate written agreement, is made regarding dimensions of air movement generated or the effectiveness of this Product for its intended purpose.

Labour Warranty will cover all reasonable costs paid by the customer to an independent contractor (including dealers) to remove, dismantle, reassemble or reinstall any of the warranted Products during the first year that the Product is in service. All receipts are to be submitted to Envira-North which will be paid upon completion of the installation of the Product and after the return of the failed unit. Envira-North will only issue a credit/cheque to the customer/dealer and will not be held responsible for paying the independent contractor.

WARRANTY EXCLUSIONS

Please note that the following may or could void any or all of the above listed Warranties.

- Please note that the following may or could void any or all of the above listed Warranties.
- Not following required installation procedures as in installation guide and all other documentation supplied with the fans and related equipment, supplied by manufacturers of individual fan and control components.
- Not following all relevant codes and ordinances, not limited to National Electrical Code, provincial or state and local building codes.
- Not following electrical engineering industry standards regarding approved method of installing solid-state electrical equipment having characteristics of fans and all components included in this product.
- Any modification to installation, product and or controls without written authorization from Envira-

North, even if attempting to diagnose and or repair a problem.

- Misuse, abuse, accidents, unreasonable use or Acts of God.
- Incorrect electrical current, voltage or supply.
- Running fans at higher than recommended speeds.
- Re-setting parameters of any control without prior approval from Envira-North.
- Failure to use all installation and mounting hardware supplied by Envira-North.
- Failure to perform periodic maintenance as detailed in the Envira-North installation guide.

Envira-North reserves the right to make the final determination, based on its own evaluation of the components as to whether:

- The problem in question is the result of a defect in design, workmanship or materials and not the result of error, misuse or abuse on the part of the customer as stated above.
- Whether the problem or defect is material and requires action under this Warranty.
- Whether the remedy of repair or replacement is appropriate.

Envira-North will not be responsible for remedial work necessary to correct installation procedures that do not conform to those established by the instructions, codes and standards, regardless of when the installation occurred.

With regard to electrical and electronic components provided by Envira-North that comprise part of the Products, including motors, motor drives and variable frequency drives, Envira-North relies on the determination by the original manufacturer as to whether the failure of such component was the result of a defect. If the manufacturer of such component determines that there was no defect and therefore refuses to cover it under warranty, Envira-North likewise will not warranty such item unless Envira-North determines that the failure of such electrical or electronic component was the result of a defect of design, workmanship or material within some other part of the products.

WARRANTY DURATION

With respect to replacement or repair rendered, Envira-North warrants that the parts replaced or repaired will operate properly and be free from defects in materials and workmanship for a period of 90 days from the shipment date of the replacement products to the customer, or for the remainder of the original Warranty period, whichever is longer.

WARRANTY CLAIM INSTRUCTIONS

1. Contact your original dealer/salesman of the purchase when you first notice problem with the Product.
2. It will be the responsibility of the dealer or salesman to assist the customer in determining what Product is causing the problem.
3. If they cannot diagnose the problem, they are to contact Envira-North with all the necessary information.

4. The appropriate department will then be in contact with the customer to determine the cause of the problem.
5. Once diagnosed, submit a Purchase Order for a replacement component complete with price.
6. Replacement component will be shipped out upon receipt of the PO. This PO allows for an order to be established in the Envira-North System.
7. Once the units have been changed over, submit all pre-approved costs to Envira-North for payment.
8. No credits or cheques will be issued until all original products are received back at Envira-North or unless Envira-North directs otherwise.

RECOMMENDED MAINTENANCE SCHEDULE

1. No maintenance shall be done on the fan, mount or guy wires while it is in operation or powered.
2. No maintenance shall be done on the fan controller while powered unless the task involves reprogramming or troubleshooting the electrical system.
3. No maintenance shall be done within a 6m horizontal radius of the fan and 4 ft below and none above the blade level while it is in operation.
4. While doing maintenance on the fan, mount, or guy wires, a safety barrier shall be erected at a radius of 6m of the centre of the fan.
5. The fan controller shall be locked out while maintenance is ongoing on the fan, mount, or guy wires.
6. All personnel working on the fan, mount, or guy wires, shall wear the appropriate personal safety equipment as mandated by local, provincial, and national regulations.
7. A risk assessment shall be performed before any maintenance is done on the fan, mount, guy wires and fan controller.
8. A tailboard meeting shall be performed before any work is done. A checklist shall be completed and shall include any emergency contacts for the area.

POWER UNIT

MOTOR

Our motor or gearmotor manufacturers supply Envira-North with motors/gearmotors built for our application. Designed for use with variable frequency drives; they are wound with 200°C moisture resistant Inverter Spike Resistant (ISR) magnetic wire which dramatically extends the life of the motor compared to motors with non-ISR wire. They have a three year limited warranty.

MAINTENANCE SCHEDULE

Initial Six Months

- Check for hot spots
- Re-tighten all loose electrical connections

Repeat Every Eighteen Months Thereafter

GEAR REDUCER / MOTOR

Altra-Air Fans are driven through Nord Helical Gear Reducers/Gearmotors. Nord is the best gear reducer for our particular application in terms of precision, durability, efficiency, reliability and quiet operation. They have a three year limited warranty.

MAINTENANCE SCHEDULE

Initial Eighteen Months

- Check oil level

Change Oil Every 20,000 Hours of Normal Use

BLADES

The airfoil blades are designed for maximum efficiency and quietness with a minimum air disruption directly below the fan. All our blade shapes are extruded from 6063-aluminum alloy and heat-treated to T-5 condition. They are anodized to .0004 10 Microns clear for corrosion resistance and ease of cleaning. The blades have a lifetime warranty.

MAINTENANCE SCHEDULE

Initial Six Months

- Ensure blades are intact, level and clean as required

Every Eighteen to Thirty-Six Months Thereafter

DROP / MOUNTING

The drop and mounting system is designed to prevent vibration or horizontal movement from being transferred back into the building structure. The system is easily installed in almost any building and allows fans to hang level from beams.

MAINTENANCE SCHEDULE

Initial Six Months

- Physical check of fan guy wires, re-tightening of clamps if required
- Check all nuts/bolts/clamps (missing/loose/damaged)
- Physical check of safety cable, re-tightening of clamps if required

After Eighteen Months Thereafter

CONTROL PANEL

Altra-Air controls are variable frequency drives which provide soft start/stop, variable speed control and overload protection for the motors. The VFD also allows fan control to be automated and/or integrated with other systems. The controls come with a three year limited warranty.

MAINTENANCE SCHEDULE

Initial Twelve Months

- Check for loose/discoloured wires
- Check for hot spots
- Re-tighten all loose electrical connections

Every Eighteen Months Thereafter

NOTE: Maintenance schedule is based on running 5,000 hrs / year and is a guide line to ensure safe and continuous operation of the fan(s). In case of extreme operating (e.g. high humidity, aggressive environment or large temperature variations), shorter intervals between service is recommended.

Tel: 1-519-527-2198 Fax: 1-519-527-2560
Toll Free: 1-886-771-7766

bigair@enviranorth.com

139 Sparling St. P.O Box 668
Seaforth, Ontario
Canada N0K 1W0

enviranorth.com

