

**Safeaero 220EH**

# The future of de-icing



**SAFEAERO**  
i Trelleborg AB

# SAFEAERO 220EH

## The one-person operated de-icer

The **SAFEAERO 220EH** with its enormous operational radius (nozzle reach horizontal 14 m, vertical over 22 m and operator's eye height 16 m) and its very compact size, make it the ideal de-icer to perform de-icing operations on aircrafts ranging from turboprops up to the new Airbus A380.

The uniqueness of this product lies in the fact that this machine was designed specifically for one person operation. This eliminates communication problems between operator and driver and operating costs are significantly lower than a truck mounted two person operated de-icer.

The compact and low profile design along with a completely enclosed cabin and large windows provides excellent visibility. The car-like driving and operating system

provides an easy, safe and efficient de-icing environment under all conditions. Under-wing de-icing can also be easily performed from the operator's cabin.

A "stepless" proportional mixing system allows the operator to choose the exact mixture of ADF and water depending on the weather conditions. This means the glycol consumption can be reduced to a minimum, which saves costs and protects the environment.

For maintenance and service, a full diagnostic and faultfinding system is integrated into the onboard computer.

The **SAFEAERO 220EH** is CE certified and follows IATA recommendations for de-icers and European safety standards for ground support equipment.



Under-wing de-icing from cabin

## Engine/Transmission

The **SAFEAERO 220EH** vehicle has as standard equipment a single four-cycle water-cooled diesel engine. The engine offers adequate power required for all functions and operates well below the maximum power rating. The starting and stopping of the engine is simply accomplished by way of a single ignition key. The vehicle is equipped with hydrostatic drive, for smooth acceleration and driving comfort.



## Chassis/Brakes

The chassis is specially designed for the **SAFEAERO 220EH**. It is equipped with a spring-loaded front axle, with an excellent turning radius (only 7,2 m) and is equipped with automatic hydraulic locking cylinders to be used during the de-icing and anti-icing operation. The rear axle is firm without springs. The vehicle has two-wheel drive on front axle. The brakes are electro-pneumatically operated with spring-loaded parking brakes on the rear axle for maximum safety. An optional differential lock on the drive axle is available.





# Operator's cabin

The cabin is specially designed for the de-icer operators. Emphasis is placed on good ergonomics and simple operation and manoeuvring, instrument positioning and operator's view.

A large touch screen monitor provides the operator with all necessary information.

The cabin is completely enclosed and provides space for one operator and one instructor.

The cabin is provided with forced air heating and ventilation.

The cabin has large windows, giving the operator maximum view in all directions. The window frames are narrow to allow maximum operator visibility.

The windows have parallel operating wipers. Window washing equipment includes a 12 litre fluid tank.

The cabin is fitted at the end of the telescope arm and can be slewed  $\pm 90^\circ$ . It is automatically levelled when elevating and lowering the telescopic boom.

The cabin is equipped with an "autopark" switch making it easy for the operator to return to the parking position from any position of the boom and/or cabin.



Outstanding comfort for operator

# Operator's controls

The operator's seat is adjustable, with spring suspension and has an electrical heating system.

The control sticks are conventionally positioned and provided with the following:

## Left side joystick

- Main boom out/in
- Main boom up/down
- Main boom swing right/left
- Cabin swing right/left
- Autopark
- Flow rate adjustment

## Right hand joystick

- Spray nozzle right/left
- Spray nozzle up/down
- Fluid spray on/off
- Spray jet characteristics
- Spray nozzle telescope arm out/in
- Spray nozzle telescope arm up/down



Car-like driving

The desired flow rate of de- and anti-icing fluids is adjustable in four different steps also by touch screen buttons.

A wheel position indicator on the steering column displays the turning angle of the front wheels.

# Computer/controller system

One of the leading innovations is a computerized system with a touch screen monitor. The heart of this system is a CPU which controls all functions of the de-icer. This system provides a full diagnostic and fault-finding feature for all main systems and components. The touch screen monitor is the main interface between the operator and the de-icer and provides an excellent

overview for the operator and the maintenance personnel.

If the de-icer is equipped with the optional CMS de-icing coordinator system, the processor manages all communication between the de-icing control station and the de-icer.



State-of-the-art computer technology



## Mixing system for maximum savings

The mixing system for water and ADF is equipped with:

- Automatic mixing alarm if the mixture deviates more than -0/+3% from the set value.
- Mixture setting either "stepless" from 4 to 75% for maximum saving of ADF or a fixed mixture setting of separate choices e.g. 0/25/50/75/100% is also available.
- A double mixing system is available which allows mixing between water and Type I as well between water and Type II/IV fluids
- The mixing ratio is automatically adjusted according to the temperature (two temperature sensors mounted on de-icer) or can be entered manually

The computer screen in the cabin indicates the actual mixing ratio, shows the flow rate and total consumption of fluid and a printer registers time and fluid consumption.

## Telescoping boom

The telescopic boom has three sections and can be positioned from a horizontal level to an angle of 70°. Maximum nozzle swing reach right/left is 14 meters and maximum nozzle height is 22 meters.

The telescopic boom is controlled by hydraulic proportional valves for smooth and precise movements.

## Spray nozzle

The revolutionary "4 MODE NOZZLE CONTROL" helps to reduce the glycol consumption, eases the work of the operator and provides the following options

- proportional control of nozzle by joy-stick
- speed control of nozzle by joy-stick
- automatic swipe function of nozzle
- under-wing function of nozzle

The spray nozzle is fitted on a telescopic arm outside the cabin, with a maximum reach of 8,3 m from the center of the cabin. The nozzle is operated from the cabin and is fully adjustable. The fluid flow rate is adjustable between 20 and 220 l/min.

The fluid jet shape is adjustable from a concentrated beam to a cone shaped spray. Fluid pressure at pump is up to 15 bar and spraying distance is approximately 15 m.

A hand operated spray gun with 10m hose on automatic hose reel is placed in front part of the vehicle.

## Tanks/Heater

An electrical heater sufficient to maintain the fluid temperature of +85°C at an ambient temperature of -15°C is installed in the tank.

An optional diesel burner with 870 kW output can be installed to provide instant hot fluid at nozzle.

The tanks have sufficient expansion volume and ventilation to prevent overflow and pressure increase. Filling capacity 1000 l/minute.

The tanks are equipped with automatic overflow protection, inspection manhole, internal baffle plates, draining plugs and a pressure filling system placed on the right side. Top filling (including safety rails) can be installed as an option.

## Striking advantages

- One person operated
- Car-like driving
- Outstanding comfort for operator
- Under-wing de-icing from cabin
- Revolutionary nozzle control system
- State-of-the-art computer technology
- Stepless mixing system 4-75%
- Operational range from Turboprops up to A380





## Emergency systems

A battery powered emergency pump is connected to the hydraulic system. Start/stop switches are positioned in a separate cabinet. The switches can be reached from the outside of the vehicle and inside the operator's cabin.

Four emergency stop switches are installed, three outside of the vehicle and one in the cabin.

## Operating safety

No operator communication problem as SAFEAERO 220 is fully optimized for one-person operation. Ultrasonic sensors are installed for added collision avoidance.

Excellent operator visibility in all directions through large side, front and rear windows as well heated overhead windows and front and rear mounted video cameras.

## Operational efficiency

Outstanding manoeuvrability thanks to the custom designed chassis and enormous operational action radius of spray nozzle.

Under-wing spraying capability and de-icing with aircraft engines running.

Efficient glycol utilization thanks to the computers precise setting from 4 to 75% ADF.



Stepless mixing system 4-75%



## CMS de-icer coordination system

A coordination/management system has been developed for full control and action of the de/anti-icing procedure mainly for using SAFEAERO 220 as the de-icing equipment.

For more detailed information please contact us.

### Optional open platform



# TECHNICAL DATA SAFEAERO 220EH

## Dimensions

Width	2,85 m
Chassis length (including towing hitch)	8,55 m
Height	3,5 m
Total weight without fluid (incl. diesel heater)	19300 kg
Tank capacity up to (1,2 or 3-tank version)	8400 l
Wheel base	3,8 m
Turning radius (measured from centre tread of front wheels)	7,2 m
Turning between walls, required distance	18 m
Inside cabin height	1,7 m
Maximum eye height of operator	16 m
Maximum height of nozzle above ground	22 m
Maximum nozzle swing reach right/left	14 m
Maximum cabin rotation	± 90°
Nozzle telescope arm length from center of cabin	4-8,3 m
Nozzle turning up/down	+70°-120°
Nozzle turning left/right	±90°
Ground clearance	250 mm

## Speed

Driving speed	Approx. 40 km/h
Driving speed with raised or extended boom	Max. 6 km/h

## Pumping Capacity

De-icing flow rate	80-220 l/min
Anti-icing flow rate	20-100 l/min

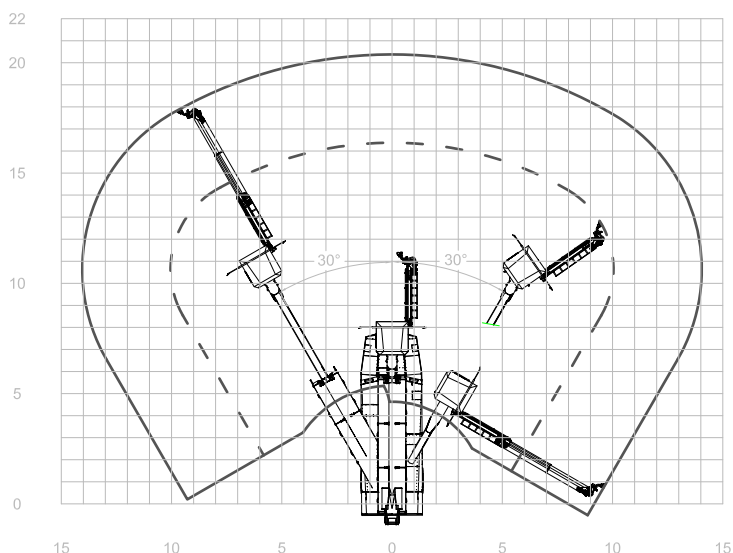
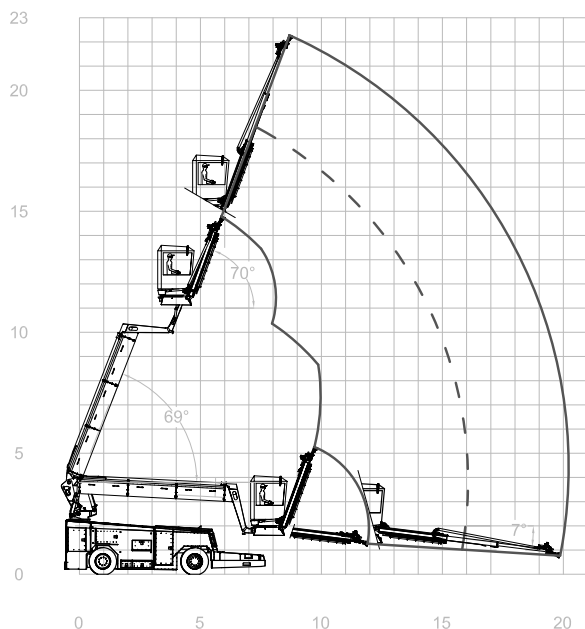
## Wind stability

Maximum velocity	20,6 m/sec
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## Cabin

Maximum load capacity	205 kg
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All technical data are subject to change without notice.



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