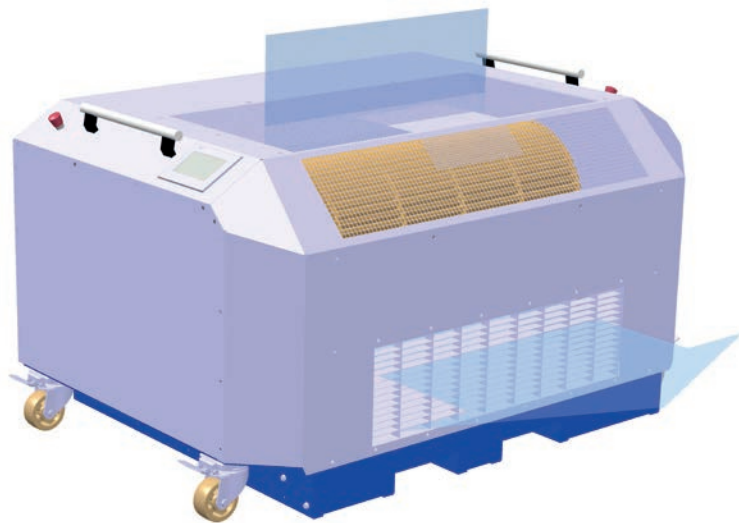


Technical Documentation

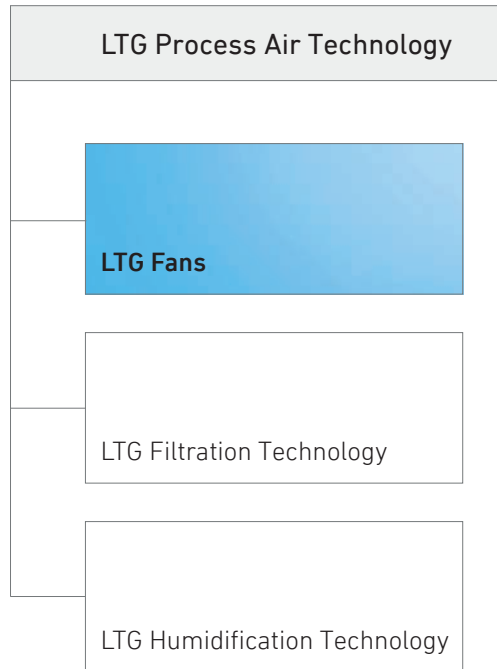
# LTG Fans

Fahrtwind-Simulators\*

## Series VQF



\* Fahrtwind = wind generated by a moving vehicle



#### COMMENT

The dimensions in this technical leaflet are indicated in inches.

The sizes indicated in this leaflet are subject to the general tolerances according to DIN ISO 2768-cL.

The technical documents include technical leaflets, operating and maintenance instructions, technical data sheets, the order documents and the rating plate.

Special designs on request.

## PRODUCT OVERVIEW VQF

Type	Average outlet velocity at nominal speed [mph] ([km/h])	Outlet area H x W [inch] ([mm])	Air outlet height above floor [inch] ([mm])	Air volume at nominal speed [cfm] ([m³/h])	Ambient temperature [°F] ([°C])	Motor output [hp] ([kW])	Weight [lb] ([kg])	mobile	Requirements	Page
VQF 200/1000	44 (70)	39.4 x 4.8 (1000 x 121)	8 - 59.1 (200 - 1500)	5290 (9000)	+50 to +104 (+10 to +40)	3.4 (2.5)	441 (200)	yes		19
VQF 500/800	60 (100)	22.9 x 31.5 (584 x 800)	9.5 - 23.6 (240 - 600)	27 664 (47 000)	+39 to +104 (+4 to +40)	89 (66)	1279 (580)	no		21
	75 (120)	24.8 x 24.8 (630 x 630)	4.1 (105)	28 253 (48 000)	-40 to +104 (-40 to +40)	75 (55)	1168 (530)	yes		23
	99 (160)	11.8 x 31.5 (300 x 800)	8 (200)	23 544 (40 000)	-22 to +104 (-30 to +40)	60 (45)	1102 (500)	yes		25
VQF 500/1250	84 (135)	11.6 x 40.6 (294 x 1030)	8 - 20 (200 - 500)	24 014 (40 880)	+14 to +104 (-10 to +40)	30 (22)	1830 (830)	yes	WLTP, CFR	13
	84 (135)	11.6 x 40.6 (294 x 1030)	8 - 20 (200 - 500)	24 014 (40 880)	-22 to +104 (-30 to +40)	40 (30)	1940 (880)	yes	WLTP, CFR	13
	84 (135)	11.6 x 40.6 (294 x 1030)	8 - 20 (200 - 500)	24 014 (40 880)	-40 to +140 (-40 to +60)	40 (30)	1940 (880)	yes	WLTP, CFR	13
	84 (135)	14.2 x 44 (356 x 1118)	8 - 20 (200 - 500)	30 149 (51 300)	+14 to +104 (-10 to +40)	70 (52)	2205 (1000)	yes	WLTP, CFR, EPA	15
	99 (160)	11.6 x 40.6 (294 x 1030)	8 - 20 (200 - 500)	28 253 (48 000)	+14 to +104 (-10 to +40) -22 to +104 (-30 to +40) -40 to +140 (-40 to +60)	72.5 (54)	2205 (1000)	yes	WLTP, CFR, RDE	14
VQF 630/1250 with nozzle	93 (150)	24.8 x 24.8 (630 x 630)	3.4 (85)	36 786 (60 000)	+14 to +104 (-10 to +40)	147.5 (110)	4321 (1960)	no	WMTC	27
VQF 630/1400	93 (150)	15 x 39.4 (382 x 1000)	8 - 20 (200 - 500)	33 720 (57 300)	+14 to +104 (-10 to +40)	75 (55)	5291 (2400)	no		29
VQF 800/1250 with 3 nozzles	60 (100)	36 x 42.1 (914 x 1070)	2 - 13.8 (50 - 350)	57 681 (98 000)					SC03	31
	84 (135)	11.8 x 39.4 (300 x 1000)	8 - 20 (200 - 500)	24 014 (40 800)	-22 to +122 (-30 to +50)	147.5 (110)	6393 (2900)	yes	WLTP	31
	99 (160)	23.6 x 39.4 (600 x 1000)	2 - 13.8 (50 - 350)	57 681 (98 000)					RDE	31
VQF 800/1400	56 (90)	19.2 x 55.1 (488 x 1400)	17.9 - 25.8 (455 - 655)	36 790 (62 500)	-13 to +104 (-25 to +40)	40 (30)	4960 (2250)	no		33
VQF 1000/1600	87 (140)	31.5 x 47.2 (800 x 1200)	1.8 (45)	79 460 (135 000)	-40 to +122 (-40 to +50)	215 (160)	8818 (4000)	no		35
VQF 1000/2000	87 (140)	33.5 x 63 (850 x 1600)	1.8 - 19.5 (45 - 495)	117 130 (199 000)	-31 to +131 (-35 to +55)	335 (250)	12 125 (5500)	no		38
	93 (150)	31.5 x 59 (800 x 1500)	3.9 - 17.7 (100 - 450)	105 948 (180 000)	-31 to +122 (-35 to +50)	268 (200)	11 023 (5000)	no		38
	99 (160)	31.5 x 55.1 (800 x 1400)	2 - 13.8 (50 - 350)	105 355 (179 000)	+50 to +95 (+10 to +35)	147.5 (110)	12 787 (5800)	no	WLTP	38
	124 (200) with nozzle	18.1 x 63 (460 x 1600)	1.8 - 19.5 (45 - 495)	117 130 (199 000)	-31 to +131 (-35 to +55)	147.5 (110)	12 125 (5500)	no		38

## ALREADY USED BY LEADING CAR MANUFACTURERS



Application example: Porsche, type VQF 500/1000



Application example: Daimler, type VQF 500/1000



## ALREADY USED BY LEADING CAR MANUFACTURERS



Application example: Tesla, type VQF 500/1400



Application example: Audi, type VQF 500/1000

## ALREADY USED BY LEADING CAR MANUFACTURERS



Application example: Ford, type VQF 1000/2000



Application example: Ford, type VQF 500/1400



## ALREADY USED BY LEADING CAR MANUFACTURERS



*Application example:*  
Volkswagen,  
type VQF 500/1000



*Application example:*  
Volvo, type VQF 500/1000



*Application example:*  
Alpina, type VQF 500/800

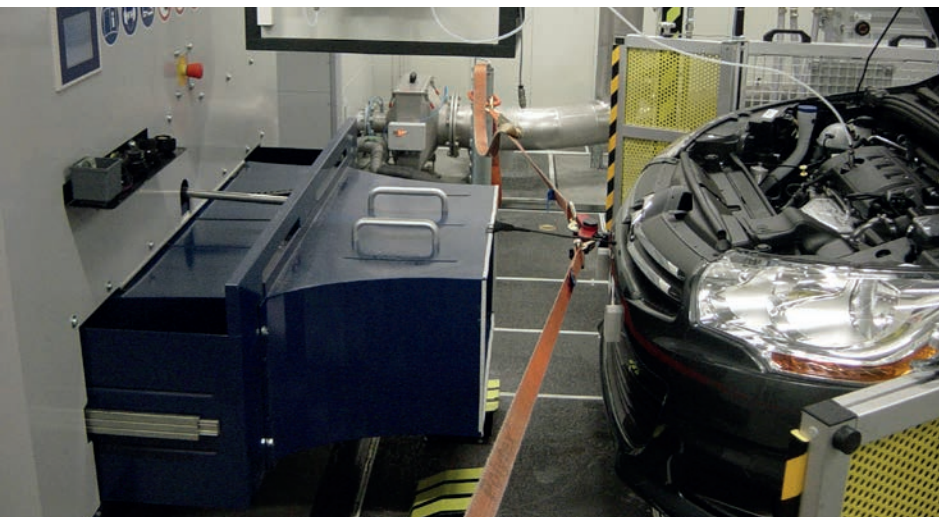
## ALREADY USED BY LEADING CAR MANUFACTURERS



Application example:  
BMW, type VQF 500/1000



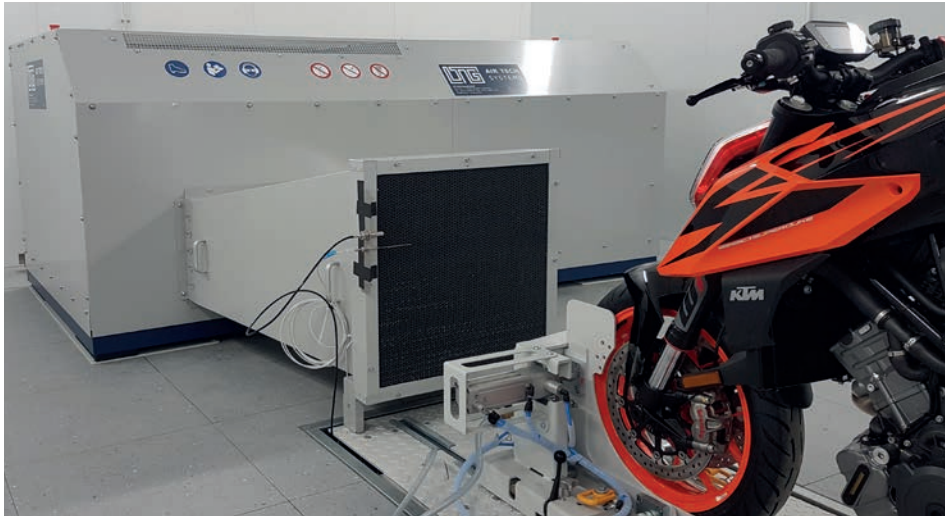
Application example:  
Jeep, type VQF 500/1250



Application example:  
Citroen, type VQF 630/1400



## ALREADY USED BY LEADING CAR MANUFACTURERS



Application example:  
KTM, type VQF 630/1250

## ADDITIONAL FAHRTWIND-SIMULATORS ARE SUCCESSFULLY USED BY:

- |   |                       |                       |
|---|-----------------------|-----------------------|
| • ABB France                                      | • Kristl, Seibt & Co  | • TU Cottbus          |
| • Angelantoni                                     | • KTM                 | • TÜV Nord            |
| • Apicom  | • Lingemann           | • TÜV Süd             |
| • Argonne National Lab                            | • Logitrade           | • Umicore             |
| • AVL   | • MAGNA Steyr         | • VW Südafrika        |
| • Ceprocs   | • MBtech              | • Weiss Umwelttechnik |
| • Continental                                     | • Mitsubishi          | • 3R Co., Ltd.        |
| • Daimler   | • Nedcar              |                       |
| • Danae   | • Nissan              |                       |
| • Denso   | • Opel                |                       |
| • Eberspächer                                     | • Porsche             |                       |
| • Ferrari   | • PSA Peugeot Citroën |                       |
| • Fiat Chrysler Automobiles                       | • Renault             |                       |
| • Ford UK   | • SAAB                |                       |
| • GM  | • Sagatron            |                       |
| • Harley Davidson                                 | • SEAT                |                       |
| • Hochschule Ulm                                  | • Siemens VDO         |                       |
| • Horiba  | • Suzuki              |                       |
| • IAV - Ingenieurgesellschaft<br>Auto und Verkehr | • TCA                 |                       |
| • Johnson Controls                                | • Toyota Group        |                       |

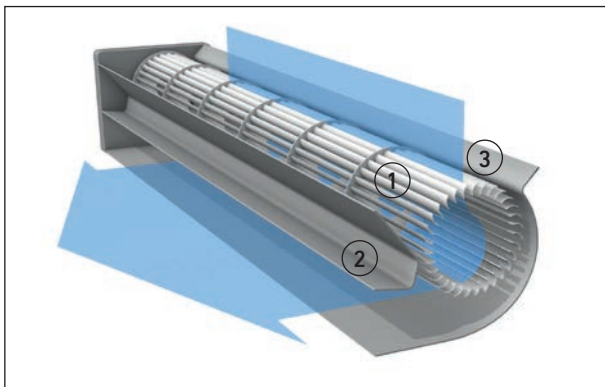
## APPLICATION

The compact LTG Fahrtwind-Simulators were specifically designed for use in roller type dynamometers. However, they are equally appropriate for general cooling or flow simulation applications.

Among the versatile applications are e.g. the automotive industry as well as test labs for machine design and systems.

One of the main features of the LTG units is the use of tangential fans which, due to their special airflow principle, offer significant advantages:

- Uniform laminar airflow over the entire length of the fan outlet
- Space-saving applications thanks to the 90° airflow pattern



- ① Impeller
- ② Vortex generator
- ③ Fan guide plate

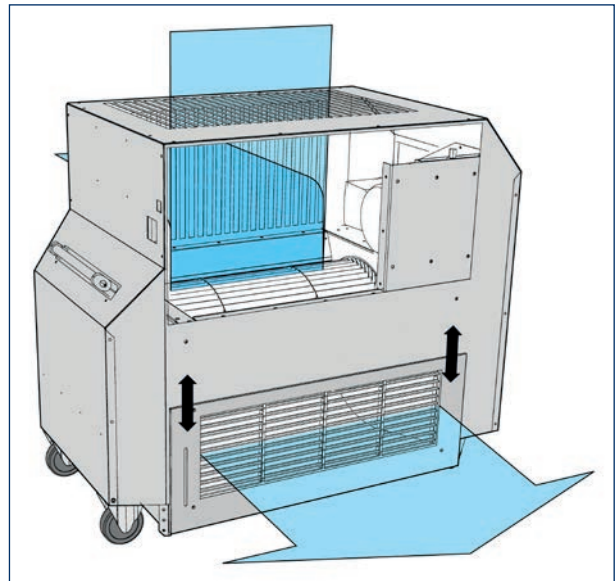


Full load operation

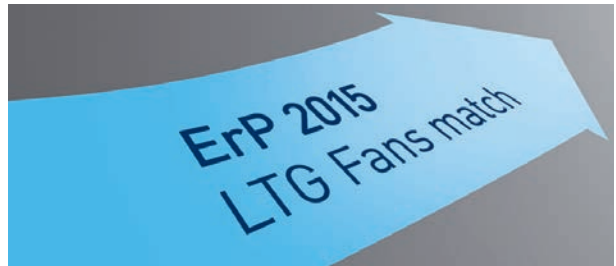
## FUNCTIONAL PRINCIPLE

The tangential fan of the Fahrtwind-Simulator pulls in ambient air through an inlet protection screen.

The adjustment of the required air speed is done through a VFD. It can be done directly at the operator panel on the unit or using an external voltage signal according to the required air speed.



Airflow principle Fahrtwind-Simulator

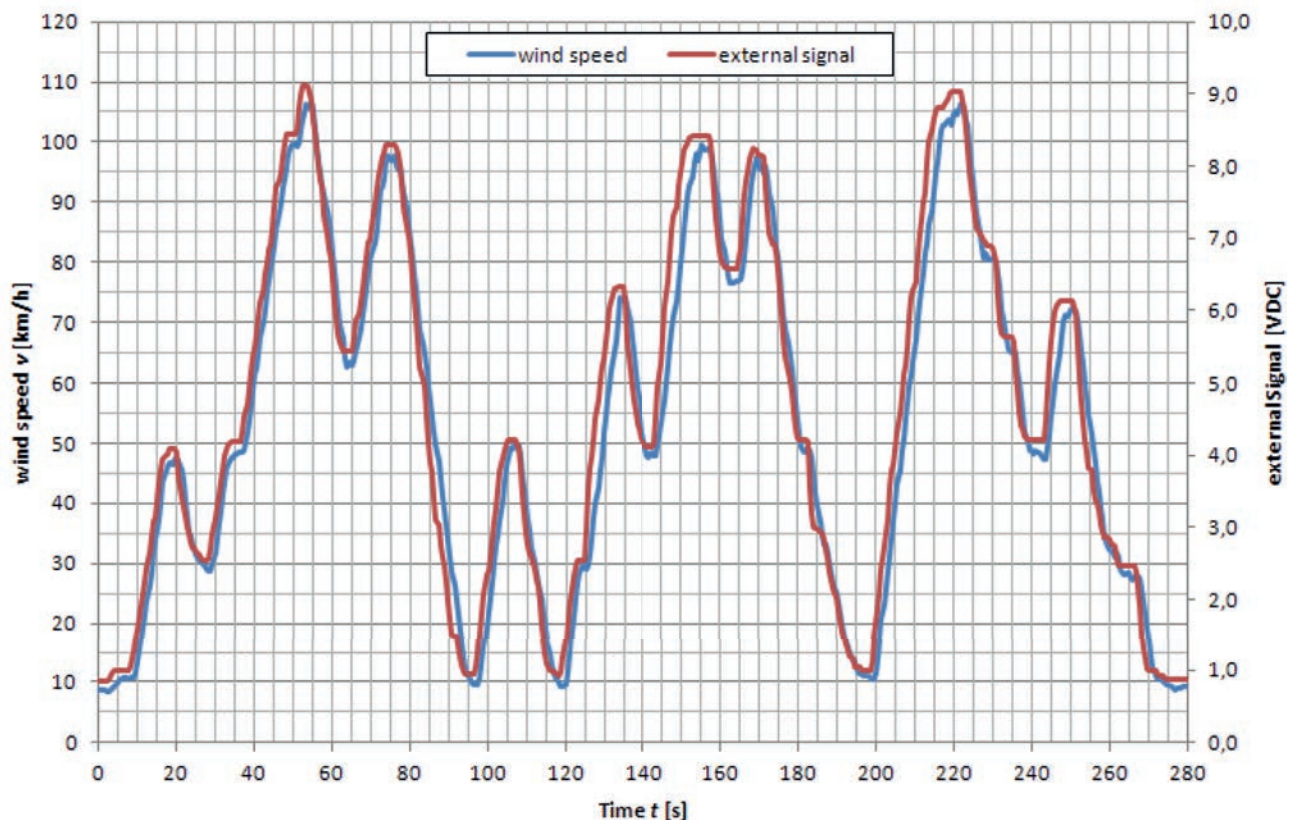


LTG offers various models to meet any test requirements and conditions. Customized versions on request. Depending on the specific version, Fahrtwind-Simulators series VQF may be used for tests with the following driving cycles:

- WLTP – regulation (EU) 2017/1151
- WMTC – regulation (EU) 2017/1151
- CFR – directive CFR § 1066.105 (c) (1) (i to iv) / (c) (2)
- RDE – regulation (EU) 2016/427
- EU – directive 70/220/EWG – 2007
- EU – rule 83 of the UNECE; chapter 6
- EU – rule 83 of the UNECE; annex 3
- EU – MVEG-A
- EU – NEDC (New European Driving Cycle)
- EU – ECE/UDC (Urban Driving Cycle)
- EU – EUDC (Extra Urban Driving Cycle)
- USA – Urban Dynamometer Driving Schedule (UDDS)
- USA – US06
- USA – SC03
- USA – Refueling emission test
- USA – Hot soak test
- USA – Diurnal emission test
- USA – Running loss testing
- USA – FTP75
- Japan – 10 Mode Cycle
- Japan – 10-15 Mode Cycle
- Japan – JC08 Cycle

Other driving cycles on request.

#### REACTION TIME OF THE LTG FAHRTWIND-SIMULATORS



The figure above shows a driving cycle, which exemplifies how fast the LTG Fahrtwind-Simulators follow the required speed (not valid for all types).

At the reference signal of 0 V a minimal flow of 1,24 - 4,35 mph (2 - 7 km/h) results from the standby drive depending on the type.



## LTG FAHRTWIND-SIMULATOR TYPE VQF 500/1250 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

**Mobile, height adjustment 8 to 20 in (200 to 500 mm)**

### SPECIFICATION

- Meets the global requirements of the WLTP cycle according to VO (EU) 2017/1151, and the requirements of the test cycles based on CFR § 1066.105 (c) (1) (i to iv) / (c) (2), i. e. FTP, HFET, US06 & LA-92
- For simulations up to 84 mph or 99 mph (135 km/h or 160 km/h) with realistic and reproducible measuring results
- A lot of adjustments possible (mobile and electrically height-adjustable for optimal use on different vehicle types)
- Compact and ergonomic design
- All components in one casing
- Control of the Fahrtwind-Simulator via integrated operator panel or interface with the test cell
- Different drive versions and other system solutions available
- Continuous speed adjustment via frequency inverter through external set point input (0 - 10 V or 4 - 20 mA)
- For voltages 400 V/50 Hz and 380 - 480 V/60 Hz

### APPLICATION

The compact LTG Fahrtwind-Simulators were specifically designed for the use in roller type dynamometers. However, they are equally appropriate for general cooling or flow simulation applications.

Among the versatile applications are e.g. the automotive industry as well as test labs for machine design and systems.

One of the main features of the LTG units is the use of tangential fans which, due to their special airflow principle, offer significant advantages:

- Even airflow over the entire length of the fan outlet, also vertical across the entire defined height
- Space-saving thanks to the 90° - airflow pattern

### DESIGN

The Fahrtwind-Simulator is shipped completely assembled and ready for plug-in.

It includes the tangential fan type VQN 500/1250 with belt drive, motor, frequency inverter and a mobile casing on four sturdy lockable casters.

The outlet height can be power adjusted.

### OPERATION

Ergonomic operation through colored touch panel. All functions like fan control, height adjustment and fault or maintenance notifications are displayed there. The outlet velocity can be controlled through an external signal (0 - 10 V or 4 - 20 mA) and synchronized with the dynamometer. The touch panel is available with additional memory e.g. to store outlet heights for different vehicle types. The touch panel is mounted on the side of the unit according to current safety regulations. Optional a second display is available in the front of the unit.



Operation via touch panel



Operating panel, air inlet above



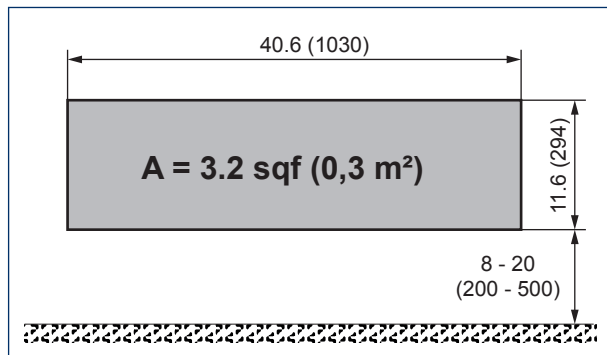
Air outlet side



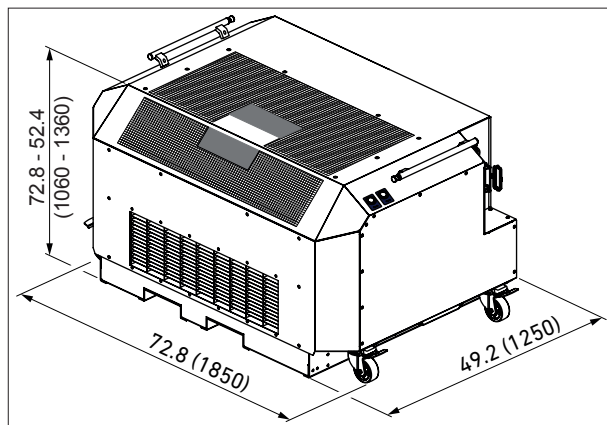
Power supply connection

## LTG FAHRTWIND-SIMULATOR TYPE VQF 500/1250 FOR VEHICLE ROLLER TYPE DYNAMOMETERS, UP TO 84 MPH (135 KM/H)

### OUTLET AREA



### DIMENSIONS



### TECHNICAL DATA

#### Standard model

Average outlet velocity at nominal speed:	84 mph
Air volume at nominal speed	24 014 cfm
Ambient temperature (without humidity and condensate formation)	+40 to +104 °F
Motor output	30 hp
Outlet area	11.6 x 40.6 in
Air outlet height above floor	8 to 20 in
Weight	Approx. 830 lb

#### Low temperature model

Average outlet velocity at nominal speed	84 mph
Air volume at nominal speed	24 014 cfm
Ambient temperature (without humidity and condensate formation)	-22 to +104 °F
Motor output	40 hp
Outlet area	11.6 x 40.6 in
Air outlet height above floor	8 to 20 in
Weight	Approx. 940 lb

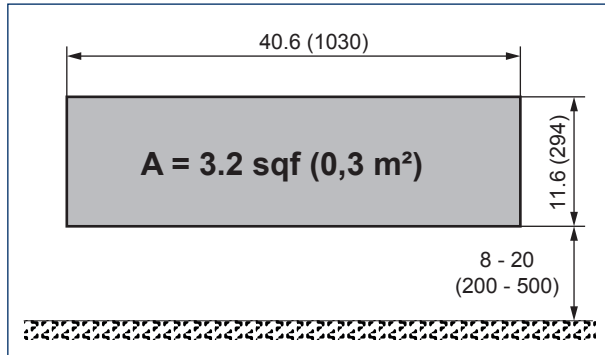
#### Multi temperature model \*

Average outlet velocity at nominal speed	84 mph
Air volume at nominal speed	24 014 cfm
Ambient temperature (without humidity and condensate formation)	-40 to +140 °F
Motor output	40 hp
Outlet area	11.6 x 40.6 in
Air outlet height above floor	8 to 20 in
Weight	Approx. 940 lb

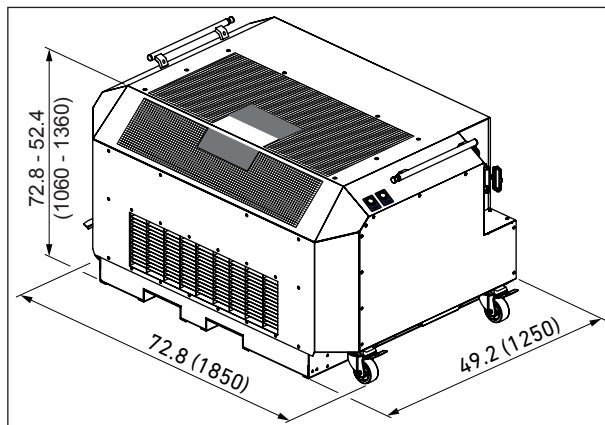
\* To handle cooling and flow simulations with increased requirements to the ambient temperature.  
Controls in separate control cabinet  
32 x 12 x 48 (W x D x H), external operating panel

## LTG FAHRTWIND-SIMULATOR TYPE VQF 500/1250 FOR VEHICLE ROLLER TYPE DYNAMOMETERS, UP TO 100 MPH (160 KM/H)

### OUTLET AREA



### DIMENSIONS



### TECHNICAL DATA

#### Standard model

Average outlet velocity at nominal speed	99 mph
Air volume at nominal speed	28 253 cfm
Ambient temperature (without humidity and condensate formation)	14 to +104 °F
Motor output	72.5 hp
Outlet area	11.6 x 40.6 in
Air outlet height above floor	8 to 20 in
Weight	Approx. 2205 lb

#### Low temperature model

Average outlet velocity at nominal speed	99 mph
Air volume at nominal speed	28 253 cfm
Ambient temperature (without humidity and condensate formation)	-22 to +104 °F
Motor output	72.5 hp
Outlet area	11.6 x 40.6 in
Air outlet height above floor	8 to 20 in
Weight	Approx. 2205 lb

#### Multi temperature type \*

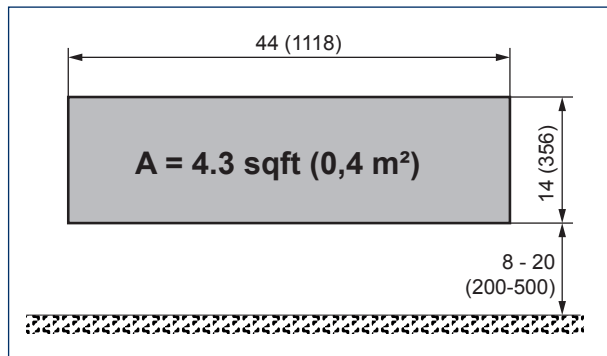
Average outlet velocity at nominal speed	99 mph
Air volume at nominal speed	28 253 cfm
Ambient temperature (without humidity and condensate formation)	-40 to +140 °F
Motor output	72.5 hp
Outlet area	11.6 x 40.6 in
Air outlet height above floor	8 to 20 in
Weight	Approx. 2205 lb

\* To handle cooling and flow simulations with increased requirements to the ambient temperature.  
Controls in separate control cabinet  
32 x 12 x 48 (W x D x H), external operating panel



# LTG FAHRTWIND-SIMULATOR TYPE VQF 500/1250 FOR VEHICLE ROLLER TYPE DYNAMOMETERS, ACCORDING TO EPA REQUIREMENTS

## OUTLET AREA

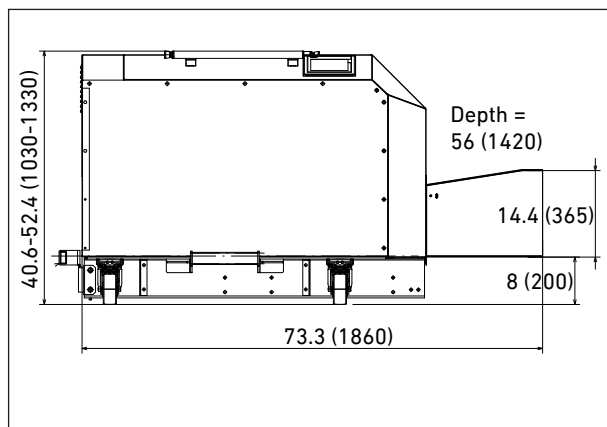


## TECHNICAL DATA

### Standard model

Average outlet velocity at nominal speed	84 mph
Air volume at nominal speed	30 149 cfm
Ambient temperature (without humidity and condensate formation)	-14 to +104 °F
Motor output	70 hp
Outlet area	14.2 x 44 in
Air outlet height above floor	8 to 20 in
Weight	Approx. 2205 lb

## DIMENSIONS



## LTG FAHRTWIND-SIMULATOR TYPE VQF 500/1250, ACCESSORIES

### DRIVE

NEW

#### COMFORT DRIVE Double-wheel drive



- Battery-powered
- Intuitive handling
- Ergonomic movement
- Integrated safety switch
- Modular system
- Highly manoeuvrable

### AUTOMATION

#### Distance measurement vehicle-nozzle with ultrasound sensor



Feedback via interface:  
(0 - 10 V)

- Speed
- Device height
- Distance from the vehicle

### ELECTROMAGNETIC COMPATIBILITY

#### EASY DRIVE Electric tractor



- Flexible use for multiple units
- Compact, autonomous transport assistance
- Simple and safe coupling system
- Retrofit possible

#### Certification according to EMC-ILA®



EMC integration guideline for achieving electromagnetic compatibility in electrical systems of the automotive industry.

(EMV-ILA® is a registered trademark of Steinbeis GmbH & Co. KG für Technologietransfer, D-70174 Stuttgart, Germany, [www.emv-ila.de](http://www.emv-ila.de))

#### SUPER DRIVE All-wheel drive



- Handling without compromises
- Precise positioning in any direction, incl. turn
- Patented drive kinematics
- Technology: four 24 V motors
- Battery operation
- Retrofit possible

#### Base frame 11.8 in (300 mm) additional height



- For taller vehicles, such as SUV and off-road vehicles
- Height adjustment of basic unit remains 20 to 31.5 in (500 to 800 mm) above the bottom)

#### Integrated Sensors Humidity and Temperature

- Positioned in the fan's inlet or outlet area
- Meets the normative requirements
- Analogue output or optional via digital unit interface

#### Digital Interface Non-dissipative Communication

- Digital interface via Ethernet to integrate the Fahrtwind-Simulator into the test cells
- Optimal for long cables due to transmission without loss, compared to analogue signals
- Profinet Communication

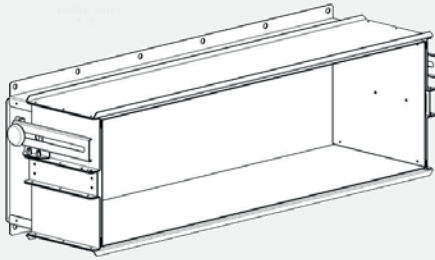
### CASTERS AND BRAKES

- Standard: 4 x swivel caster with brake
- Option 1: - Caster with brake and with latch, 90° each, suitable in combination with drive "Easy Drive"
- Option 2: - Monitoring of the brake, fan only operational with the brake activated, suitable for standard caster with brake
- Additional option: Surrounding protective bumper

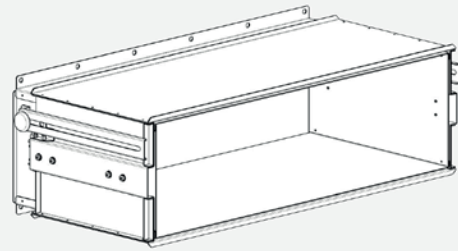
## LTG FAHRTWIND-SIMULATOR TYPE VQF 500/1250, ACCESSORIES

### ATTACHMENT NOZZLES

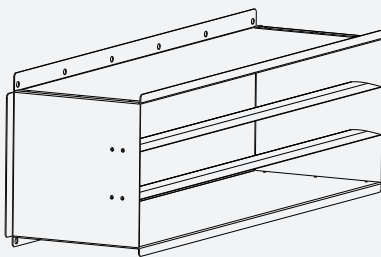
**Adjustable nozzle**  
**L=11.8-20 in (300-500 mm)**



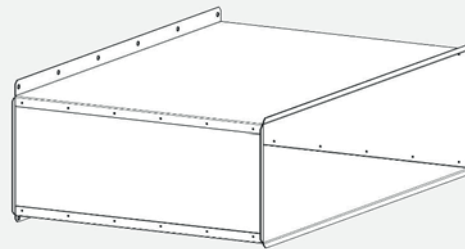
**Adjustable nozzle**  
**L=20-35.4 in (500-900 mm)**



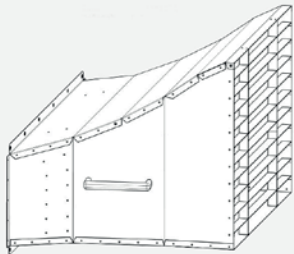
**Nozzle**  
**L=11.8 in (300 mm)**



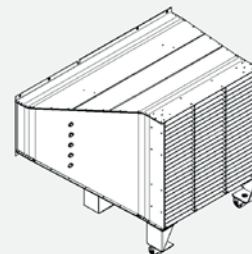
**Nozzle**  
**L=27.6 in (700 mm)**



**Nozzle with cross-section**  
**31.5 x 23.6 in (800 x 600 mm)**



**Nozzle with cross-section**  
**24.8 x 24.8 in (630 x 630 mm)**



### MISCELLANEOUS

- Further accessories on request
- Customer-specific, individual solutions on request



## LTG FAHRTWIND-SIMULATOR TYPE VQF 200/1000 FOR LABS, TEST CELLS, MECHANICAL SHOPS

**Ambient temperature +50 to +104 °F (+10 to +40 °C), mobile**

### APPLICATION

Type VQF 200/1000 has been designed specifically for labs, test cells, mechanical shops to meet different requirements regarding cooling or conditioning.

The mobile and space-saving unit can be used to targeted blow on the objects from down or up.



*Fahrtwind-Simulator type VQF 200/1000*

### DESIGN

The Fahrtwind-Simulator is shipped completely assembled.

The ergonomic design includes a mobile frame with tangential fan type TM 200/1000 and a control panel (with the completely installed control). Various types and sizes on request.



*Application example: Porsche, type VQF 200/1000*

## LTG FAHRTWIND-SIMULATOR TYPE VQF 200/1000 FOR LABS, TEST CELLS, MECHANICAL SHOPS

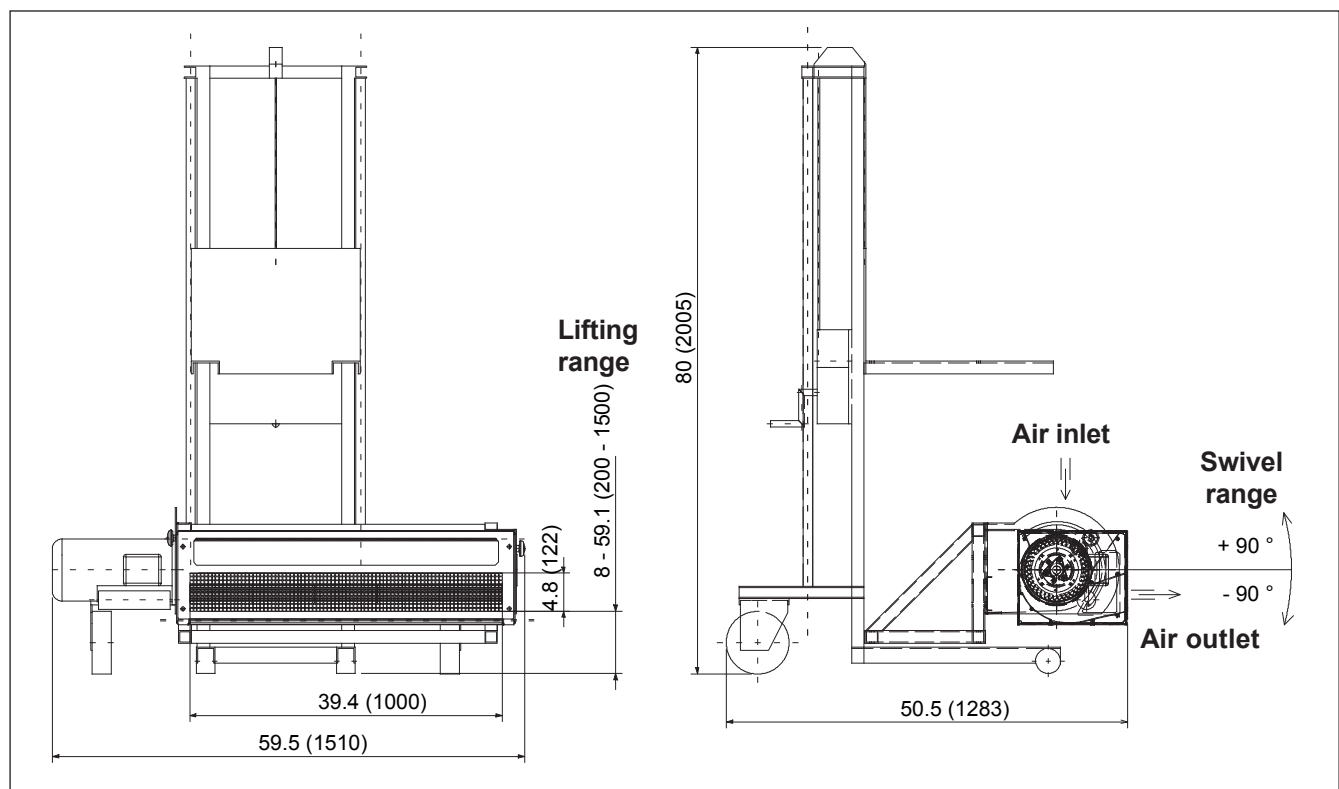
### SPECIFICATION

- Ready-to-use plug-in version
- Mobile use due to casing on casters
- Ideal to blow air above or underneath a vehicle
- Ideal for all motor locations: front, rear, middle engine
- Can be used for many different vehicle types
- Space-saving, easy handling
- Continuously adjustable of 51.2 in (1300 mm)
- High-performance tangential fan, swivelling by 180°

### TECHNICAL DATA

Average outlet velocity at nominal speed	43 mph
Air volume at nominal speed	5290 cfm
Ambient temperature (without humidity and condensate formation)	+50 to +104 °F
Motor output	approx. 3.4 hp
Outlet area	9.4 x 4.8 in
Air outlet height above floor	8 - 59.1 in

### DIMENSIONS



## LTG FAHRTWIND-SIMULATOR TYPE VQF 500/800 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

**Ambient temperature +39 to +104 °F (+4 to +40 °, height adjustment 9.5 to 23.6 in (240 to 600 mm)**

### APPLICATION

Type VQF 500/800 has been designed specifically for roller type dynamometers, with limited space in front of the vehicle.

The whole unit can be adjusted in height to perfectly match many different vehicle types.



*Fahrtwind-simulator type VQF 500/800 for vehicle roller type dynamometers, air outlet side*

### DESIGN

The Fahrtwind-Simulator is shipped completely assembled. It can be handled with a fork lift.

It includes the tangential fan type VQN 500/800 with belt drive, motor, vibration reduced design, wiring, and is mounted on a height adjustable frame with lifting columns. Controls are in a separate control panel unit VFD.

The air outlet height is electrically adjustable.



## LTG FAHRTWIND-SIMULATOR TYPE VQF 500/800 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

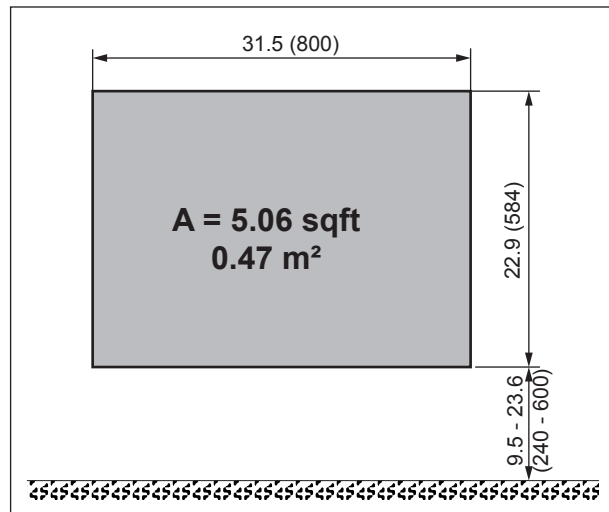
### SPECIFICATION

- Compact design
- Ready-to-use plug-in version including control panel and frequency inverter drive
- Continuously adjustable air outlet height (electric powered)
- Vibration reduced design
- Optional location of the power connection (left or right)
- Transport and set-up with a powered moving device

### TECHNICAL DATA

Average outlet velocity at nominal speed	60 mph
Air volume at nominal speed	27 700 cfm
Ambient temperature (without humidity and condensate formation)	+39 to +104 °F
Motor output	89 hp
Outlet area	22.9 x 31.5 in
Air outlet height above floor	9.5 to 23.6 in
Weight	Approx. 1279 lb

### OUTLET AREA



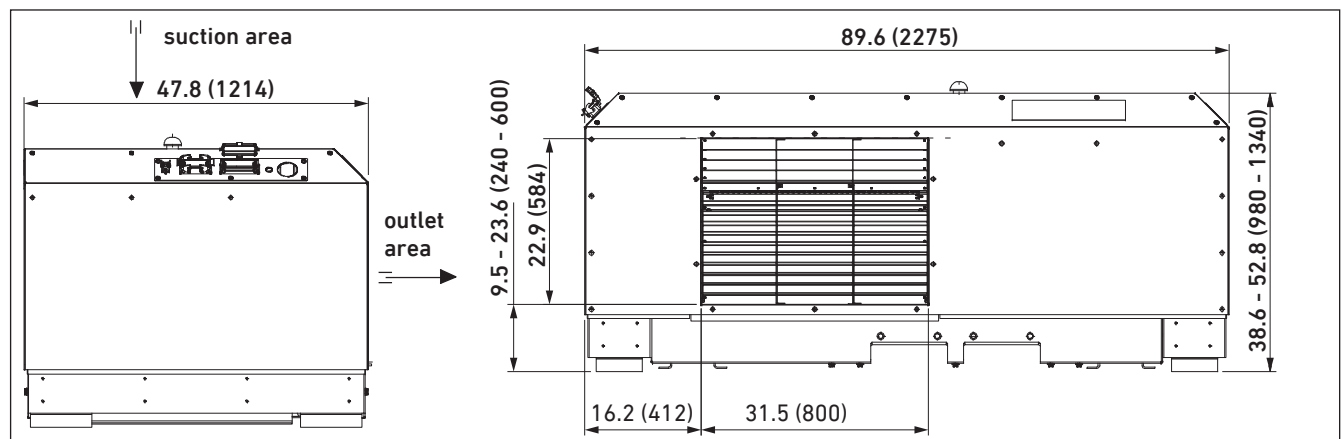
### OPERATION

Ergonomic operation through colored touch panel. All functions like fan control, height adjustment and fault or maintenance notification are displayed there. The outlet velocity can be controlled through an external signal (0 - 10 V) and the speed can be synchronized with the dynamometer. The touch panel is available with additional memory e.g. to store outlet heights for different vehicle types. The touch panel is mounted on the side of the unit according to effective safety regulations. Optional a second display is available in the front of the unit.



Operation via touch panel

### DIMENSIONS



## LTG FAHRTWIND-SIMULATOR TYPE VQF 500/800 FOR MOTORCYCLE ROLLER TYPE DYNAMOMETERS

**Ambient temperature -40 to +104 °F (-40 to +40 °C), mobile**

### APPLICATION

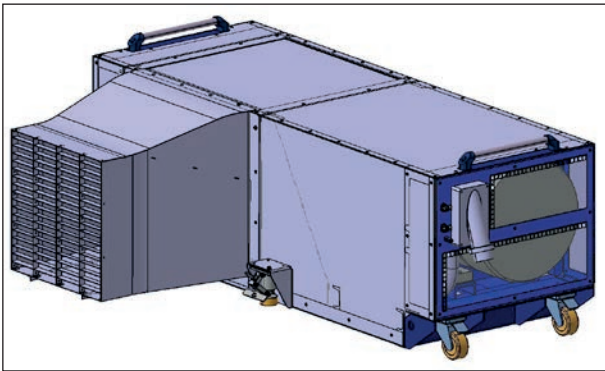
This version of type VQF 500/800 has been designed for motorcycle roller type dynamometers to perform exhaust measurements at speeds up to 75 mph (120 km/h).

It is essential for the accuracy of the measuring results that all relevant components such as the exhaust system and motor cooling are uniformly air supplied. The Fahrtwind-Simulator has been provided with a square air outlet nozzle to meet exactly that requirement.

### DESIGN

The Fahrtwind-Simulator is shipped completely assembled, except for the air outlet nozzle. Prior to first use the outlet nozzle is to be mounted to the unit casing.

The Fahrtwind-Simulator includes a direct-drive tangential fan type VQN 500/800 with shaft coupling, with motor and casing, mounted to a frame with swivel casters, the air outlet nozzle with fittings, protective air inlet and outlet grille, and the electrical connections.



*Fahrtwind-Simulator type VQF 500/800 for motorcycle roller type dynamometers, air outlet side with nozzle and protective grille*



*Fahrtwind-Simulator type VQF 500/800 for motorcycle roller type dynamometers, drive side with electrical connections*



*Fahrtwind-Simulator type VQF 500/800 for motorcycle roller type dynamometers, drive side/backside*

## LTG FAHRTWIND-SIMULATOR TYPE VQF 500/800 FOR MOTORCYCLE ROLLER TYPE DYNAMOMETERS

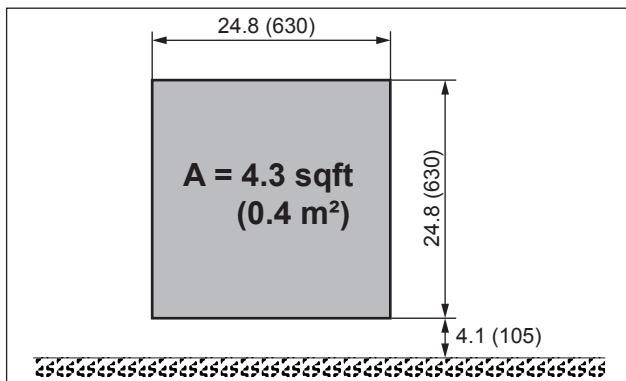
### SPECIFICATION

- For use in climatic chambers from -40 to +104 °F (-40 to +40 °C) (non condensing)
- Compact design
- Ready-to-use plug-in version
- Activation from outside the test cell
- Air outlet nozzle detachable for transport
- Lockable swivel casters for transport

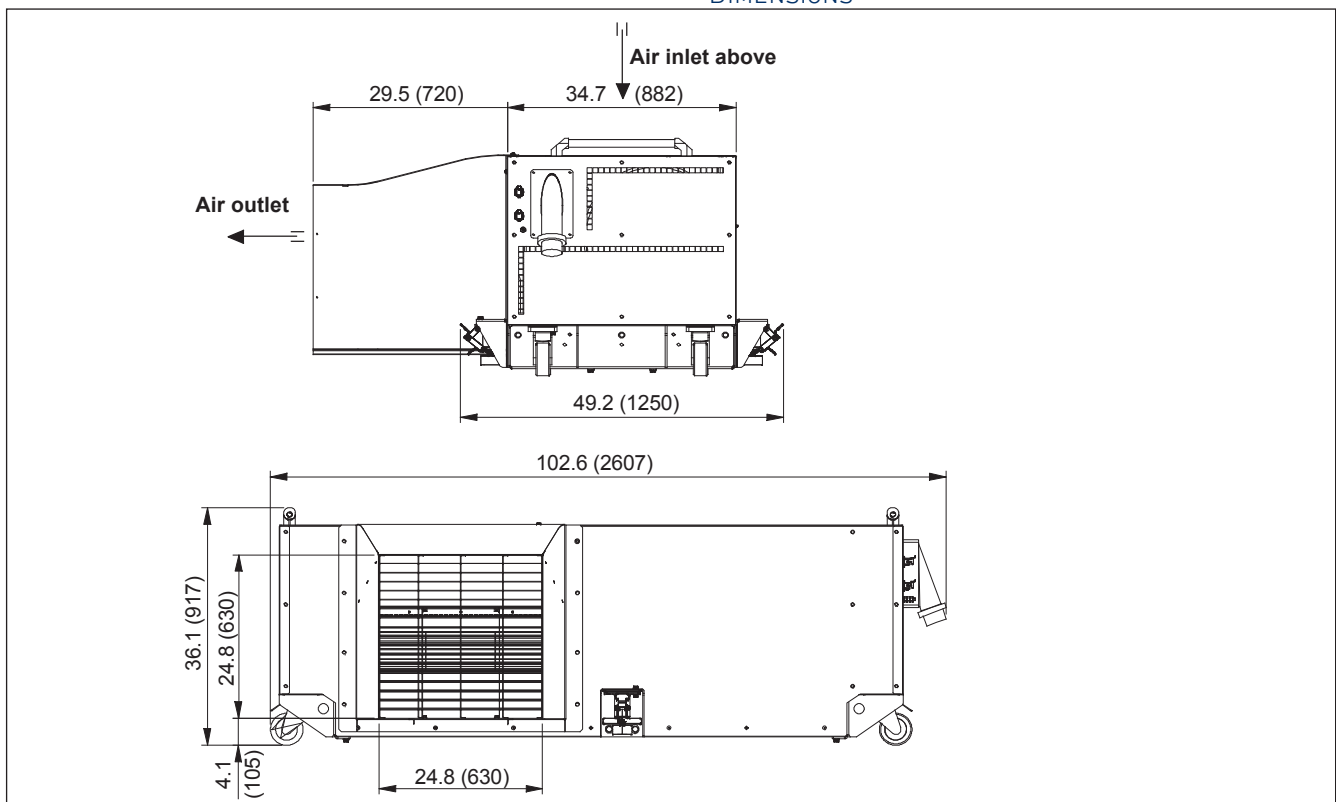
### TECHNICAL DATA

Average outlet velocity at nominal speed	75 mph
Air volume at nominal speed	28 300 cfm
Ambient temperature (without humidity and condensate formation)	-40 to +104 °F
Motor output	75 hp
Outlet area	24.8 x 24.8 in
Air outlet height above floor	Approx. 4.1 in
Weight	Approx. 1168 lb

### OUTLET AREA



### DIMENSIONS



## LTG FAHRTWIND-SIMULATOR TYPE VQF 500/800 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

**Ambient temperature -22 to +104 °F (-30 to +40 °C), mobile**

### APPLICATION

This version of type VQF 500/800 has been designed for vehicle roller type dynamometers to perform exhaust measurements at speeds up to 99 mph (160 km/h).

It is essential for the accuracy of the measuring results that all relevant components, such as catalytic converter and oil tray, are uniformly air supplied.



*Fahrtwind-Simulator type VQF 500/800 for vehicle roller type dynamometers, air outlet side with protective grid.*



*Fahrtwind-Simulator type VQF 500/800*

### DESIGN

The Fahrtwind-Simulator is delivered completely assembled.

It includes a direct-drive tangential fan type VQN 500/800 with shaft coupling, motor and casing, mounted to a mobile frame with swivel casters, suction and diffusion grille as well as the electrical connections.



*Fahrtwind-Simulator type VQF 500/800 for vehicle roller type dynamometers, drive side/backside.*



*Fahrtwind-Simulator type VQF 500/800 for vehicle roller type dynamometers, drive side with electrical connections.*



## LTG FAHRTWIND-SIMULATOR TYPE VQF 500/800 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

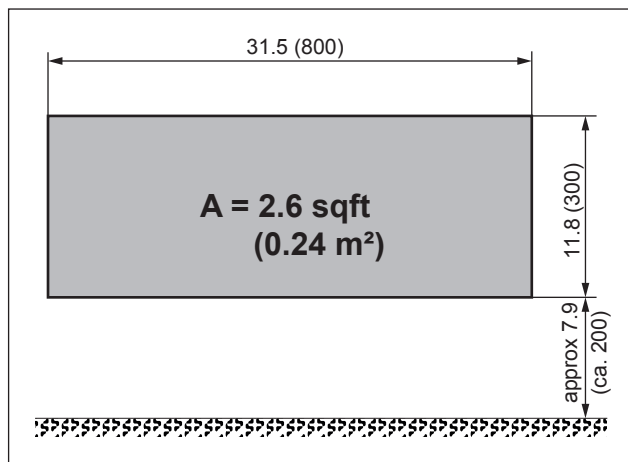
### SPECIFICATION

- For use in climatic chambers from -22 to +104 °F (-30 to +40 °C) (non condensing)
- Compact design
- Ready-to-use plug-in version
- Activation from outside the test cell
- Lockable swivel casters for transport

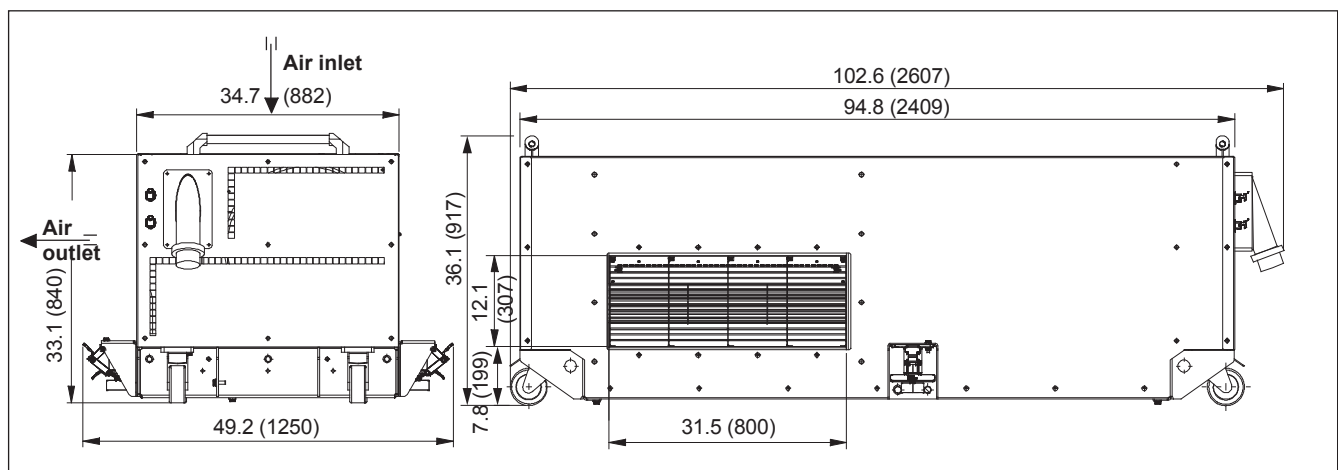
### TECHNICAL DATA

Average outlet velocity at nominal speed	99 mph
Air volume at nominal speed	23 500 cfm
Ambient temperature (without humidity and condensate formation)	-22 to +104 °F
Motor output	60 hp
Outlet area	11.8 x 31.5 in
Air outlet height above floor	Approx. 8 in
Weight	Approx. 1102 lb

### OUTLET AREA



### DIMENSIONS



## LTG FAHRTWIND-SIMULATOR TYPE VQF 630/1250 FOR MOTORCYCLE ROLLER TYPE DYNAMOMETERS

**Ambient temperature +50 to +104 °F (+10 to +40 °C)**

### APPLICATION

Type VQF 630/1250 for motorcycle roller type dynamometers was developed for Fahrtwind-simulation at high speeds and short acceleration times.

This makes the unit optimal for performance and exhaust measurements on motorcycle chassis dynamometers.

The entire front of the motorcycle must be subject to an even flow in order to receive reliable measuring results and to protect the engine and exhaust system from overheating.

### DESIGN

The Fahrtwind-simulator includes the tangential fan type VQN 630/1250 with belt drive, motor and an fixed outlet nozzle.

The controls are located in a separate control cabinet.

Incl. frequency inverter drive and an external operator panel.



*Fahrtwind-Simulator type VQF 630/1250*



*Application example: KTM, type VQF 630/1250*

## LTG FAHRTWIND-SIMULATOR TYPE VQF 630/1250 FOR MOTORCYCLE ROLLER TYPE DYNAMOMETERS

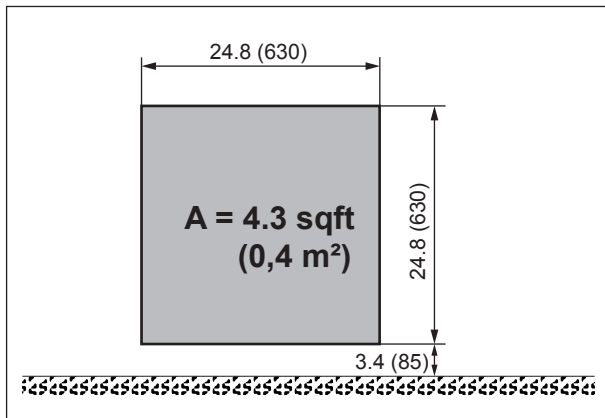
### SPECIFICATION

- High performance density
- Large simulation range up to 93 mph (150 km/h)
- Fast acceleration 0 - 37 mph (0 - 60 km/h) in 3 s,  
0 - 62 mph (0 - 100 km/h) in 10 s
- Uniform airflow over the entire outlet area
- Continuously variable speed adjustment through frequency inverter with analog input 0 - 10 V

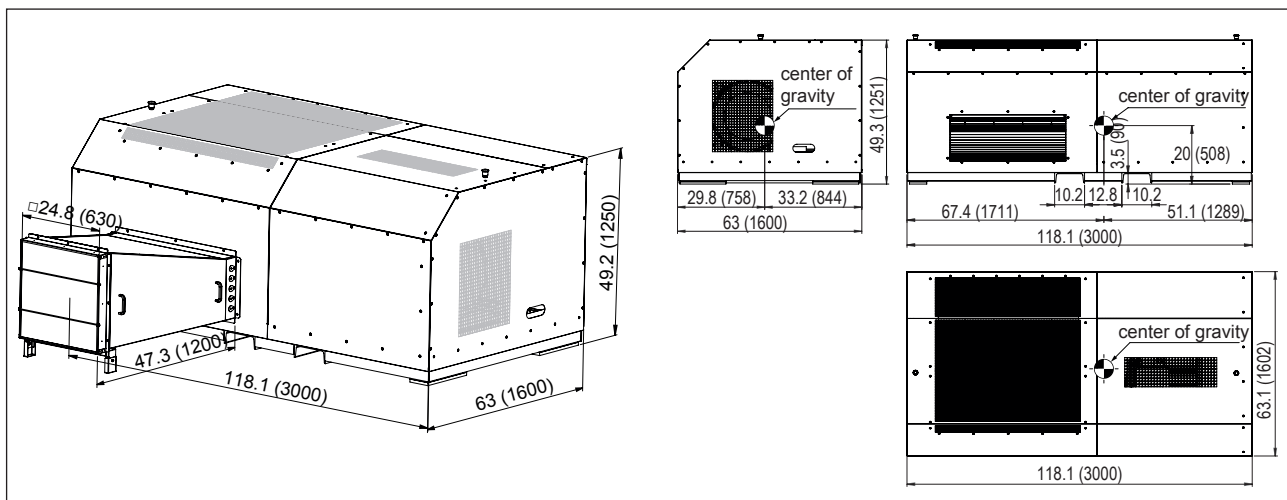
### TECHNICAL DATA

Average outlet velocity at nominal speed	93 mph
Air volume at nominal speed	36 800 cfm
Ambient temperature (without humidity and condensate formation)	+50 to +104 °F
Motor output	147.5 hp
Outlet area	24.8 x 24.8 in
Air outlet height above floor	Approx. 3.4 in
Weight	Approx. 4321 lb

### OUTLET AREA



### DIMENSIONS



## LTG FAHRTWIND-SIMULATOR TYPE VQF 630/1400 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

**Ambient temperature +50 to +104 °F (+10 to +40 °C), height adjustment 8 to 20 in (200 to 500 mm)**

### APPLICATION

Type VQF 630/1400 was designed for vehicle and roller type dynamometers for airflow simulation where speeds up to 93 mph (150 km/h) are required.

With its electric powered adjustable outlet height and the electrical extension of the outlet nozzle applications from passenger cars to small transporters are possible.

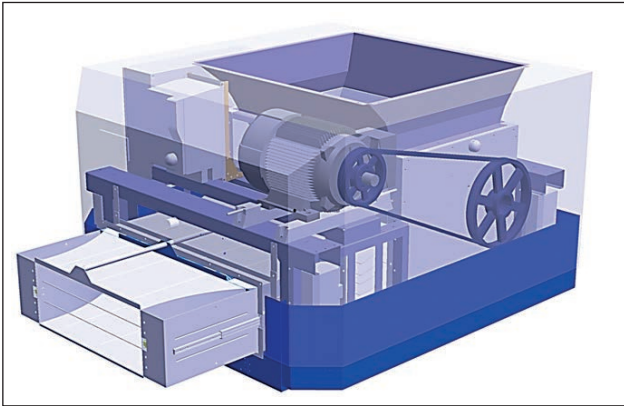
With a separate nozzle special applications are possible.

### DESIGN

The Fahrtwind-Simulator is shipped completely assembled. It can be handled with a powered moving device.

It includes the tangential fan type VQN 630/1400 with belt drive, motor, frequency inverter, vibration reduced design, electrical equipment and wiring.

The Fahrtwind-Simulator is installed on a height-adjustable frame with lifting columns



*Fahrtwind-Simulator type VQF 630/1400*



*Fahrtwind-Simulator type VQF 630/1400, air outlet side*



*Fahrtwind-Simulator type VQF 630/1400, air outlet side and operator side*



*Fahrtwind-Simulator type VQF 630/1400, height-adjusted, extensible outlet nozzle*

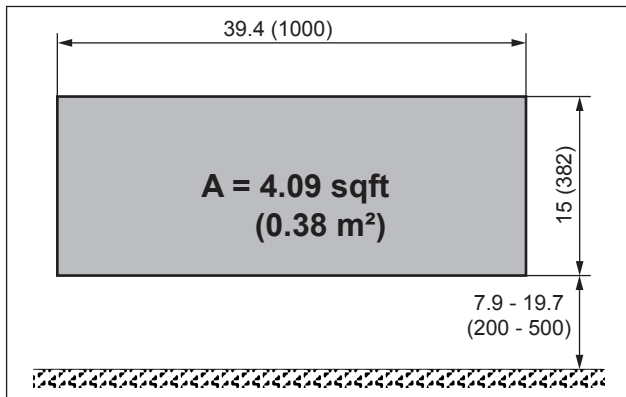


## LTG FAHRTWIND-SIMULATOR TYPE VQF 630/1400 FOR VEHICLE CHASSIS DYNAMOMETERS

### SPECIFICATION

- High performance density
- Large simulation range up to 93 mph (150 km/h)
- Fast acceleration 0 - 37 mph (0 - 60 km/h) in 3 s,  
0 - 62 mph (0 - 100 km/h) in 10 s
- Uniform airflow over the entire outlet area
- Continuously variable speed adjustment through frequency inverter with analog input 0 - 10 V

### OUTLET AREA



### TECHNICAL DATA

Average outlet velocity at nominal speed	93 mph
Air volume at nominal speed	33 720 cfm
Ambient temperature (without humidity and condensate formation)	+50 to +104 °F
Motor output	75 hp
Outlet area	15 x 39.4 in
Air outlet height above floor	8 to 20 in
Weight	Approx. 5291 lb

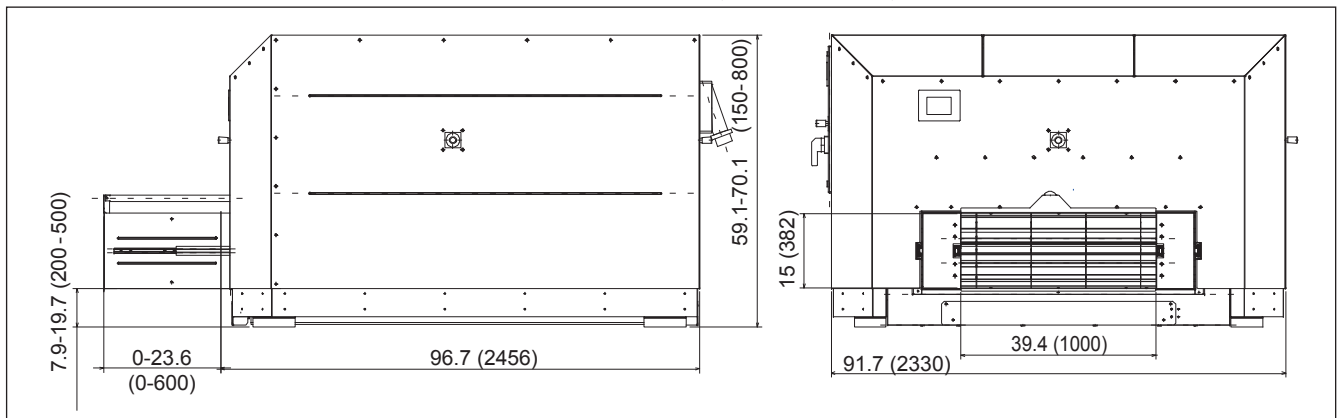
### OPERATION

Ergonomic operation through colored touch panel. All functions like fan control, height adjustment and fault or maintenance notification are displayed there. The outlet velocity can be controlled through an external signal (0-10 V or 4-20 mA) and the speed can be synchronized with the dynamometer. The touch panel is available with additional memory e.g. to store outlet heights for different vehicle types. The touch panel is mounted on the side of the unit according to effective safety regulations. Optional a second display is available in the front of the unit.



Operation via touch panel

### DIMENSIONS



## LTG FAHRTWIND-SIMULATOR TYPE VQF 800/1250 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

**Ambient temperature -22 to +122 °F (-30 to +40 °C), electrical mobile**

### SPECIFICATION

- Meets the global requirements of the WLTP cycle and RDE according to VO (EU) 2017/1151 (also WMTC) and SC03-test according to SFTP (Supplemental Federal Test Procedure)
- Compact design
- High power density
- Large simulation range up to approx. 60/84/99 mph (100/135/160 km/h)
- Uniform airflow, also vertically, over the entire specified height
- All electronics with controls and frequency inverter in separate cabinet outside the test cell
- Smooth adjustment of the speed by frequency inverter via analogue input 0 - 10 V
- Continuously height adjustment, electrically powered
- Independently electrically movable in longitudinal direction
- Completely enclosed unit

### APPLICATION

Type VQF 800/1250 has been designed for airflow simulation in climatic/emission tests under SC03 conditions with customer specific nozzle.

In order to obtain reliable measuring results and protect the exhaust system from overheating, it must be ensured that the entire front including the under body of the vehicle respectively the aggregate carrier are in the air stream.

Additionally the whole unit can be electrically height adjusted and moved independently for optimal adjustment to many different vehicle types.

### DESIGN

The Fahrtwind-Simulator is shipped completely assembled. It includes a tangential fan type VQN 800/1250 with belt drive, a motor with frequency inverter and a touchscreen panel to control and check all functions.

The outlet height can be electrically adjusted.

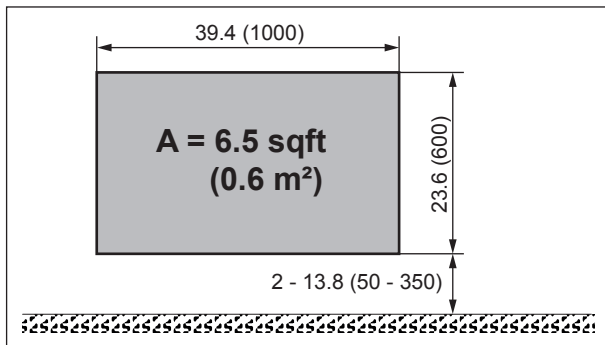
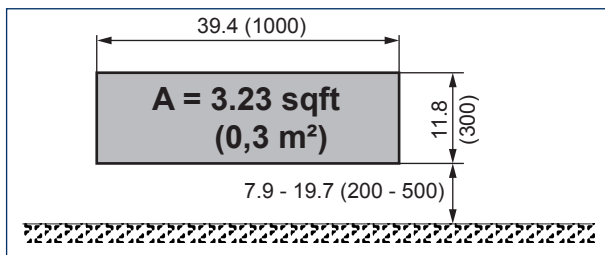
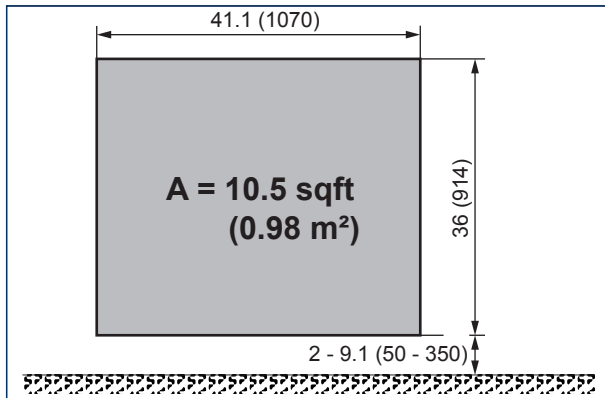
The unit can be electrically moved through motorized casters.



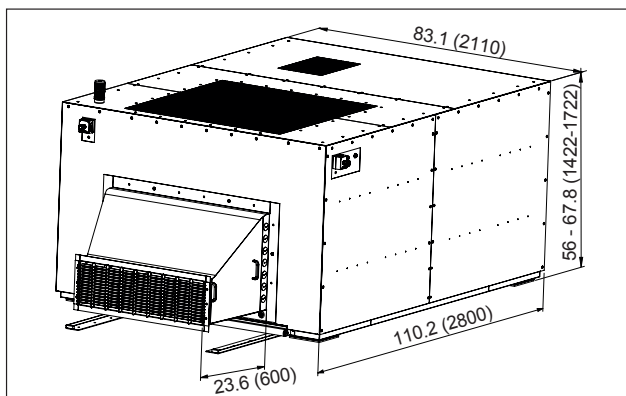
*Fahrtwind-Simulator type VQF 800/1250, height-adjustable, extensible air outlet nozzle*

## LTG FAHRTWIND-SIMULATOR TYPE VQF 800/1250 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

### OUTLET AREA



### DIMENSIONS



### TECHNICAL DATA

#### Basic unit

Ambient temperature (without humidity and condensate formation)	-22 to +122 °F
Motor output	147.5 hp
Weight	Approx. 6393 lb

#### Operation with customer specific SC03-nozzle

Average outlet velocity at nominal speed	60 mph
Air volume at nominal speed	57 681 cfm
Outlet area	36 x 42.1 in
Air outlet height above floor	2 to 9.1 in

#### Operation with WLTP-nozzle

Average outlet velocity at nominal speed	84 mph
Air volume at nominal speed	24 014 cfm
Outlet area	11.8 x 39.4 in
Air outlet height above floor	8 - 20 in

#### Operation with RDE-nozzle

Average outlet velocity at nominal speed	99 mph
Air volume at nominal speed	57 681 cfm
Outlet area	23.6 x 39.4 in
Air outlet height above floor	2 - 13.8 in

## LTG FAHRTWIND-SIMULATOR TYPE VQF 800/1400 FOR ENVIRONMENTAL SIMULATION, ALL STAINLESS STEEL VERSION

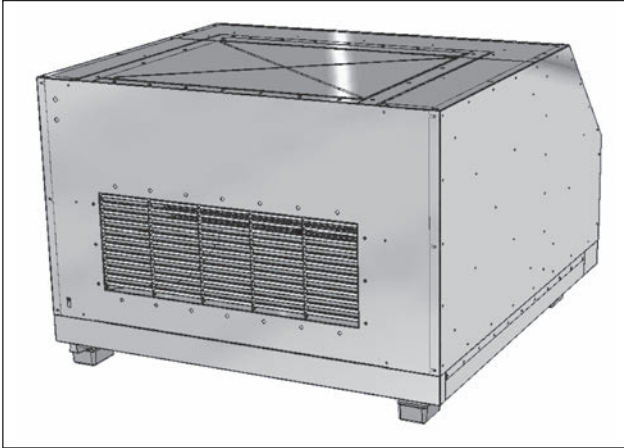
**Ambient temperature -13 to +104 °F (-25 to +40 °C), height adjustment 17.9 to 25.8 in (455 to 655 mm)**

### APPLICATION

Type VQF800/1400 has been designed for airflow simulation with salt spray.

All stainless steel the system is perfect for performance and exhaust measurements on vehicle chassis dynamometers on which corrosion tests are performed.

In order to obtain reliable measuring results and protect the engine and exhaust system from overheating, it must be ensured that the entire front of the vehicle is in the air stream.



*Fahrtwind-Simulator type VQF 800/1400*

### DESIGN

The Fahrtwind-Simulator is shipped completely assembled.

The unit is made of stainless steel, parts that may corrode easily are protected in a separate stainless steel enclosure.

The LTG Fahrtwind-Simulator consists of a tangential fan type VQN 800/1400 with belt drive and motor.

The air outlet height is electrically adjustable.

The Fahrtwind-Simulator has been designed in a way to allow for add-on components (e.g. heat exchanger) to be installed directly to the unit's air inlet side.



## LTG FAHRTWIND-SIMULATOR TYPE VQF 800/1400 FOR ENVIRONMENTAL SIMULATION, ALL STAINLESS STEEL VERSION

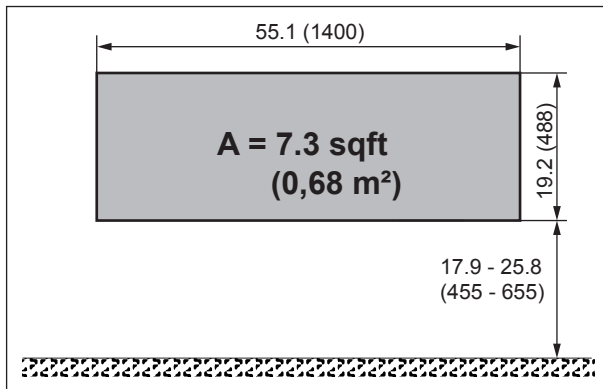
### SPECIFICATION

- Corrosion resistant casing made of stainless steel
- Compact design
- High power density
- Large simulation range up to 56 mph (90 km/h)
- Uniform airflow over the entire outlet area
- All components in one casing
- Continuous speed adjustment through analog input frequency inverter with 0 - 10 V.
- Electric powered continuous height adjustment by 8 in (200 mm)

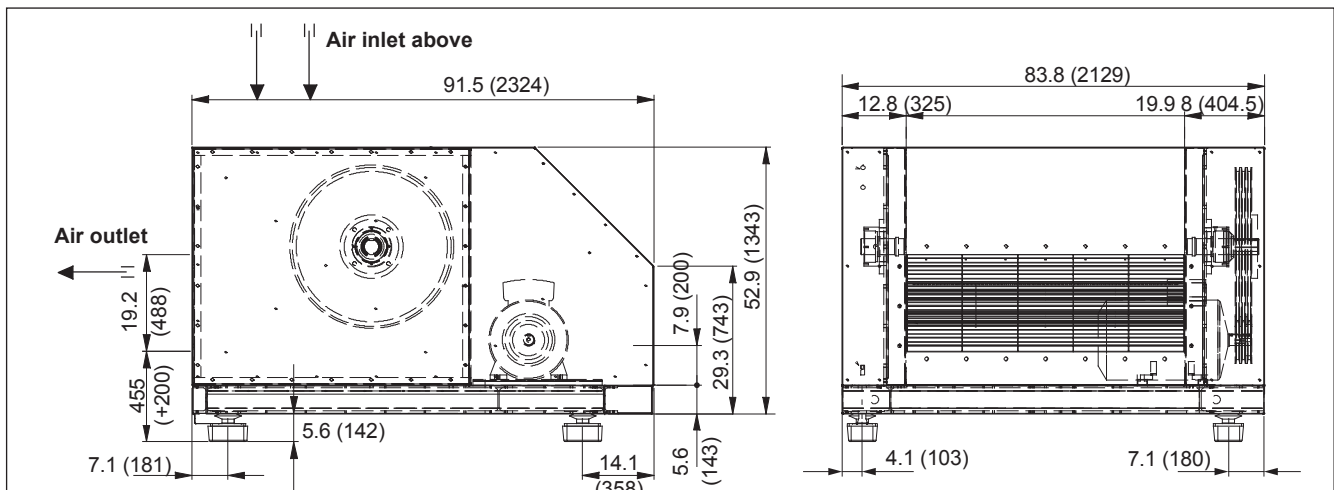
### TECHNICAL DATA

Average outlet velocity at nominal speed	56 mph
Air volume at nominal speed	36 790 cfm
Ambient temperature (without humidity and condensate formation)	-13 to +104 °F
Motor output	40 hp
Outlet area	19.2 x 55.1 in
Air outlet height above floor	17.9 to 25.8 in
Weight	approx. 4960 lbs

### OUTLET AREA



### DIMENSIONS



## LTG FAHRTWIND-SIMULATOR TYPE VQF 1000/1600 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

**Ambient temperature -40 to +122 °F (-40 to +50 °C), extendable outlet nozzle**

### APPLICATION

has been designed specifically for vehicle roller type dynamometers, used for exhaust measurements with small trucks at speeds up to 87 mph (140 km/h).

It is important for the accuracy of the measuring results that all relevant components, such as the catalytic converter and the oil pan, are uniformly supplied with air.

The transport of the unit into the test cell and its positioning are done with a fork lift or rails. For this purpose, the unit has a detachable sub frame and a lift gear.

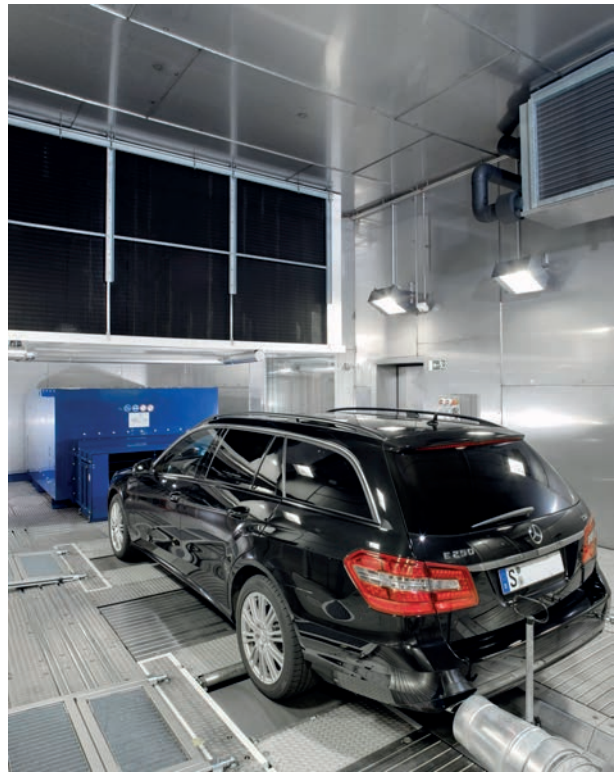
### DESIGN

The Fahrtwind-Simulator is shipped completely assembled - except for the air outlet nozzle and the lift gear.

It includes a tangential fan type VQN 1000/1600 with belt drive, motor and casing on a welded base frame and a ready-to-use plug-in terminal box including all necessary electrical connections.



*Fahrtwind-Simulator type VQF 1000/1600, air outlet side*



*Fahrtwind-Simulator type VQF 1000/1600, air outlet side*



*Fahrtwind-Simulator type VQF 1000/1600, air outlet side*

## LTG FAHRTWIND-SIMULATOR TYPE VQF 1000/1600 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

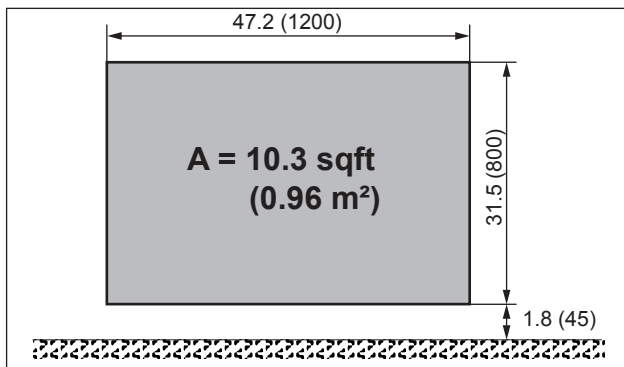
### SPECIFICATION

- Outlet velocity up to 87 mph (140 km/h)
- For use in environmental test chambers at temperatures of -40 to +122 °F (-40 to +50 °C) (non-condensing)
- Ready-to-use plug-in version
- Controls from outside the test cell
- Extendable outlet nozzle
- Chassis and lift gear for transportation
- Inductive speed sensor (optional)

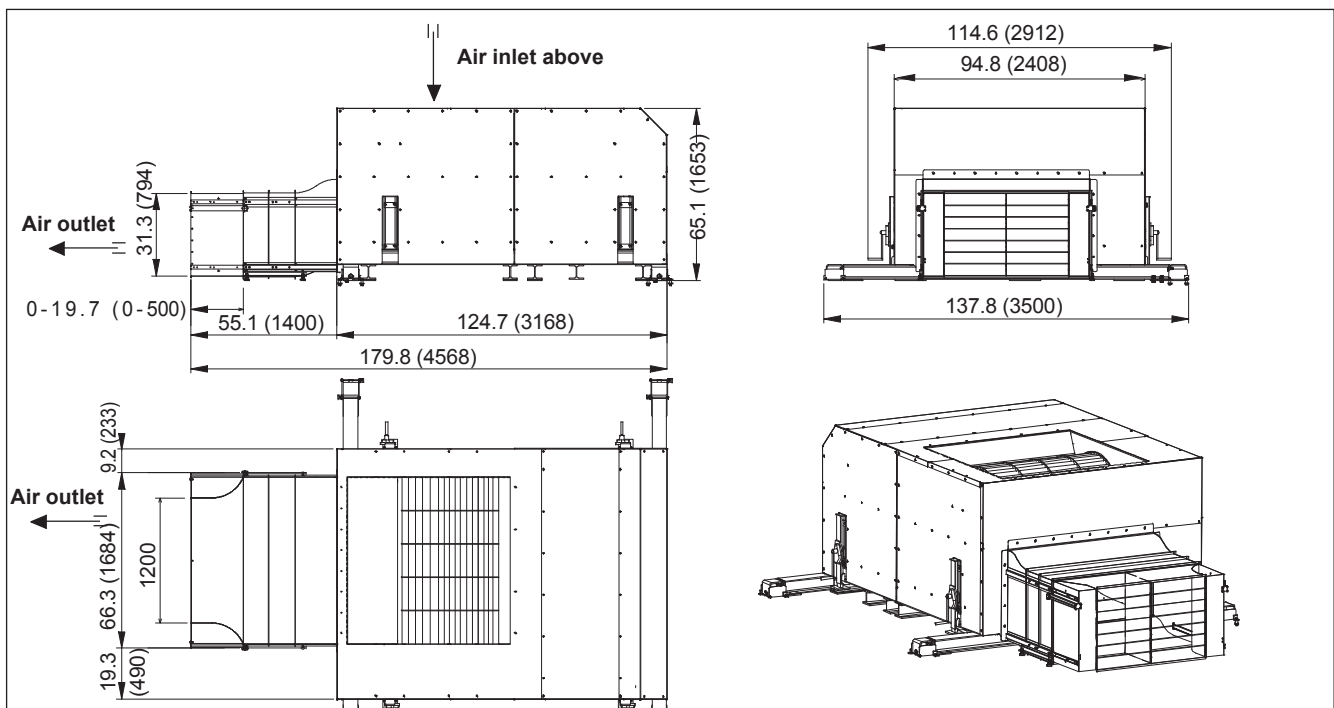
### TECHNICAL DATA

Average outlet velocity at nominal speed	87 mph
Air volume at nominal speed	79 460 cfm
Ambient temperature (without humidity and condensate formation)	40 to +122 °F
Motor output	215 hp
Outlet area	31.5 x 47.2
Air outlet height above floor	1.8 in
Weight	Approx. 8800 lbs

### OUTLET AREA



### DIMENSIONS



## LTG FAHRTWIND-SIMULATOR TYPE VQF 1000/2000 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

**Ambient temperature -31 to +131 °F (-35 to +55 °C), height adjustment 1.8 to 19.5 in (45 to 495 mm), extendable outlet nozzle**

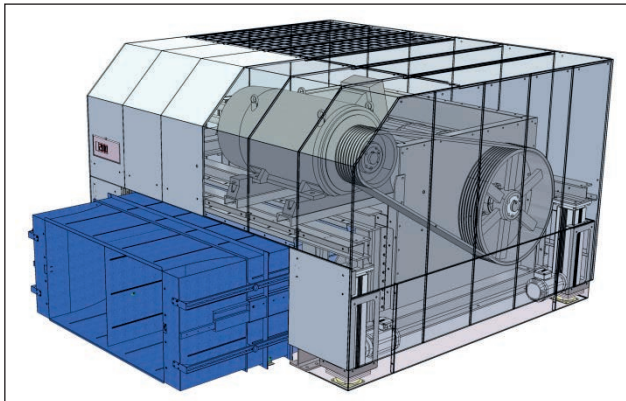
### APPLICATION

Type VQF 1000/2000 covers a particularly wide range of requirements. It has been designed for application in roller type dynamometers with extreme climatic conditions and can be operated at temperatures between -31 and +131 °F (-35 and +55 °C).

The integrated electric height adjustment with a range up to 17.7 in (450 mm) allows for testing almost any type of vehicle. Other contributing factors are the air outlet nozzle with continuous extension of up to 47.2 in (1200 mm) and the air outlet area.

Mounting of an additional nozzle (optional) allows for simulation of velocities up to 124 mph (200 km/h) / (without nozzle up to 87 mph (140 km/h)).

The transport of the unit and its positioning in the test cell are done with a fork lift or rails. The VQF 1000/2000 has for this purpose a sub frame for transportation which can be removed after the lifting cylinders have been put into operation.



*Fahrtwind-simulator type VQF 1000/2000, air outlet side with continuously extendable outlet nozzle*

### DESIGN

The Fahrtwind-Simulator is delivered completely assembled.

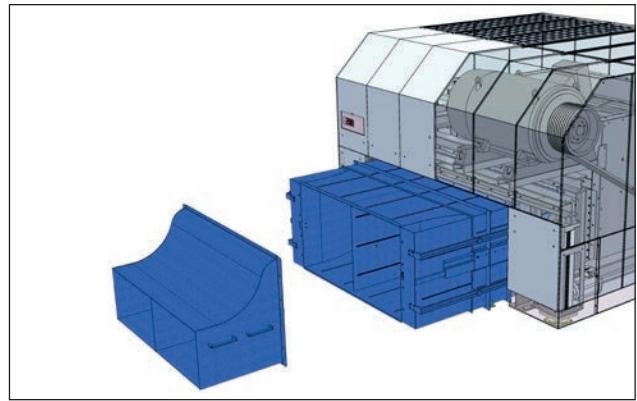
It consists of a type VQN 1000/2000 tangential fan with motor and belt drive. All components are installed on a welded base frame and are completely enclosed by a housing.

The air outlet height is electrically adjustable.

There is a separate terminal box for connection of the controls and one for the motor cable.

The current outlet speed of the Fahrtwind-simulator may be read from the front display panel at any time.

There are 3 emergency stop buttons located around the device to ensure safe operation.



*Fahrtwind-Simulator type VQF 1000/2000, optional adapter nozzle for increasing the outlet velocity*



*Fahrtwind-Simulator type VQF 1000/2000*



*Fahrtwind-Simulator type VQF 1000/2000*



## LTG FAHRTWIND-SIMULATOR TYPE VQF 1000/2000 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

### SPECIFICATION

- Meets the global requirements of the WLTP cycle according to VO (EU) 2017/1151
- Contact sensor for automatic adapter nozzle detection
- Use in climate chambers between -31 and +131 °F (-35 to +55 °C) (non condensing)
- Control from outside the test stand
- Mechanically extendable outlet nozzle up to 47.2 in (1200 mm)
- Continuously electrically adjustable air outlet height up to 17.7 in (450 mm)
- Speed sensor
- Temperature sensor
- Front-side display

### DESIGN

The Fahrtwind-Simulator is delivered completely assembled.

It consists of a type VQN 1000/2000 tangential fan with motor and belt drive, frequency inverter and mobile housing with latchable rolls.

The air outlet height is electrically adjustable.

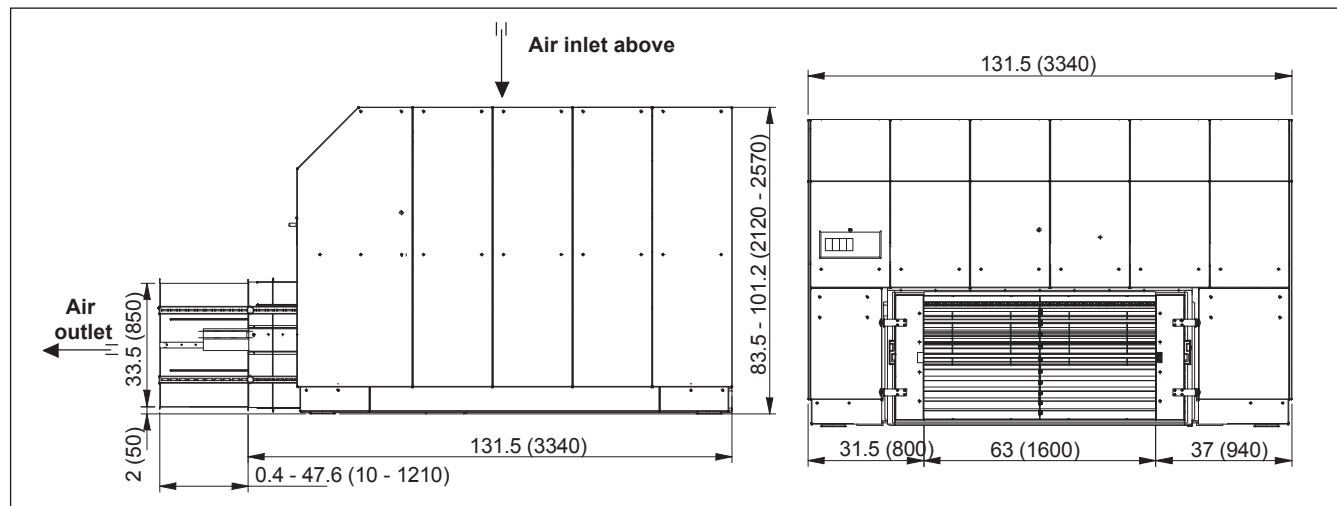
### OPERATION

Ergonomic operation through coloured touch panel. All functions like fan control, height adjustment and fault or maintenance report are displayed there. The outlet velocity can be controlled through an external signal (0 - 10 V or 4 - 20 mA) and the speed can be synchronized with the roller dynamometer. The touch panel is available with additional memory e.g. to memorize outlet heights for different vehicle types. The touch panel is mounted on the side of the unit according to effective safety regulations. Optional a second display is available on the front of the unit.



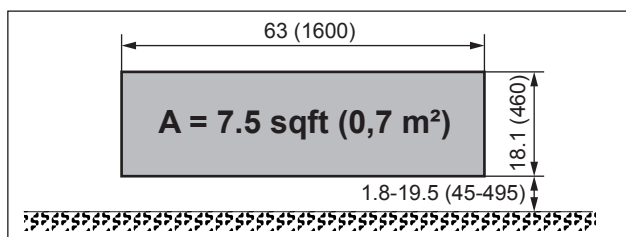
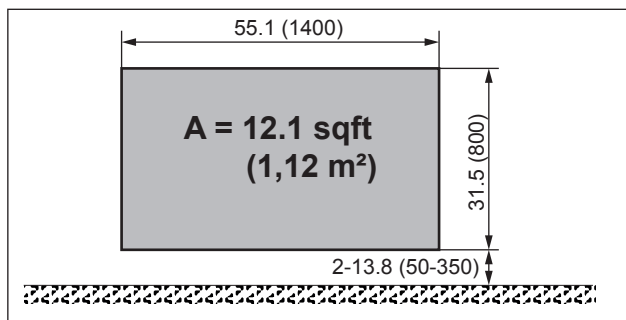
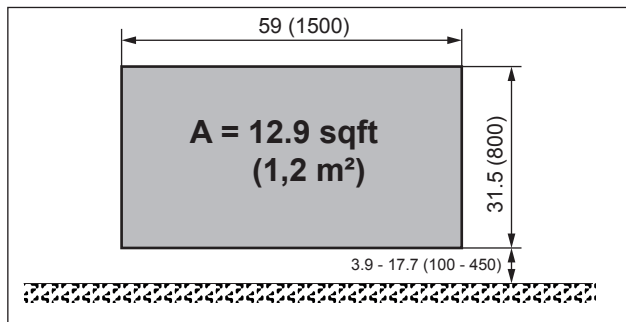
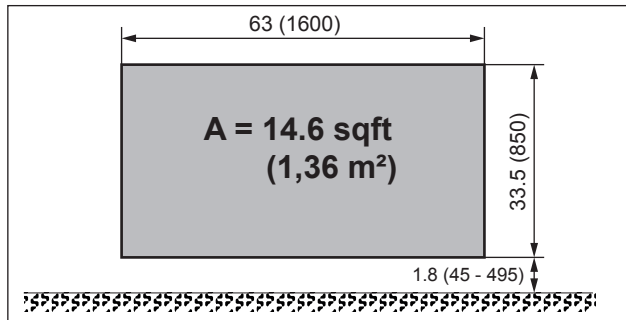
Operation via touch panel

### DIMENSIONS



## LTG FAHRTWIND-SIMULATOR TYPE VQF 1000/2000 FOR VEHICLE ROLLER TYPE DYNAMOMETERS

### OUTLET AREA



### TECHNICAL DATA

Average outlet velocity at nominal speed	87 mph
Air volume at nominal speed	117 000 cfm
Ambient temperature (without humidity and condensate formation)	-31 to +131 °F
Motor output	335 hp
Outlet area	33.5 x 63 in
Air outlet height above floor	1.8 to 19.5 in
Weight	Approx. 12 000 lbs

Average outlet speed at nominal speed	93 mph
Air volume at nominal speed	106 000 cfm
Ambient temperature (without humidity and condensate formation)	-31 to +122 °F
Motor output	268 hp
Outlet area	31.5 x 59 in
Air outlet height above floor	3.9 to 17.7 in
Weight	Approx. 11 000 lbs

Average outlet speed at nominal speed	99 mph
Air volume at nominal speed	105 500 cfm
Ambient temperature (without humidity and condensate formation)	+50 to +95 °F
Motor output	268 hp
Outlet area	31.5 x 55.1 in
Air outlet height above the bottom	2 to 13.8 in
Weight	Approx. 13 000 lbs

Average outlet speed at nominal speed	124 mph with nozzle
Air volume at nominal speed	117 000 cfm
Ambient temperature (without humidity and condensate formation)	-31 to +131 °F
Motor output	335 hp
Outlet area (with nozzle)	18.1 x 63 in
Air outlet height above floor	1.8 to 19.5 in
Weight	Approx. 12 000 lbs

## ACCESSORIES

### HIGH-PERFORMANCE ANEMOMETER VQ\_VA/40/D 85

#### APPLICATION

Speed-dependent wind simulation requires extremely precise measurement of the air speed.

This type of measurements can be performed using a certified and calibrated impeller wheel anemometer. Thanks to the large impeller wheel, the anemometer available at LTG has an optimum integration surface for improved evaluation of the measurement data.

#### TECHNICAL DATA

Possible measuring range	0.7 - 90 mph
Temperature range	+14 to +175 °F
Head size	Ø 3.3 x 3.1
Total length	8.9 in
Output signal	0 - 2 V
Measurement accuracy	± 1.5 % of mean speed.

#### INCL. DIGITAL DISPLAY INSTRUMENT MINIAIR2

- Automatic sensor and range detection
- Flow and temperature measurements
- Humidity and speed
- Mean, minimum, maximum values at the touch of a button
- Freely selectable measurement time (2 s - 2 h)
- Measurement time memory for repetitive measurements
- Recorder output 0 - 1 V and output for Mini2Logger
- Battery and mains operation





**AIR TECH  
SYSTEMS**

### **COMFORT AIR TECHNOLOGY**

Air Conditioning Systems  
Air Diffusers  
Air Distribution

### **PROCESS AIR TECHNOLOGY**

Fans  
Filtration Technology  
Humidification Technology

### **ENGINEERING SERVICES**

Laboratory Test & Experiment  
Field Measurement & Optimization  
Simulation / Expertise  
R&D & Start-up

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